Australian Bureau of Statistics

2001

YEAR BOOK AUSTRALIA

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COMMONWEALTH BUREAU OF CENSUS AND STATISTICS,
MELBOURNE.

OFFICIAL

YEAR BOOK

OF THE

COMMONWEALTH OF AUSTRALIA,

CONTAINING AUTHORITATIVE STATISTICS FOR THE PERIOD

1901-1907

AND CORRECTED STATISTICS FOR THE PERIOD 1788 TO 1900.

No. 1.—1908.

PUBLISHED UNDER THE AUTHORITY OF THE MINISTER OF HOME AFFAIRS,
BY

G. H. KNIBBS,
FELLOW OF THE ROYAL STATISTICAL SOCIETY, ETC., ETC.
COMMONWEALTH STATISTICIAN.

BY AUTHORITY.
McCARRON, BIRD & CO., PRINTERS, COLLINS STREET, MELBOURNE.

Australian Bureau of Statistics

2001

YEAR BOOK AUSTRALIA

This edition of Year Book Australia
is a contribution by the
Australian Bureau of Statistics
to celebrate the
Centenary of Federation

Centenary of Federation

2001

YEAR BOOK AUSTRALIA

Dennis Trewin
Australian Statistician

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Cover: Old Parliament House, closed as an Australian Parliament in May 1988, is now an exhibition centre and museum of Australian political history. The central flagpole appears as though it is part of this building. In fact, the flag, flying 81 metres high, is part of New Parliament House, unseen in the background. Both buildings, in Australia's national capital of Canberra, are powerful symbols of our nation which in 2001 celebrates its Centenary of Federation.

Photograph: Courtesy of AUSPIC

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Preface

Year Book Australia is the principal reference work produced by Australian Bureau of Statistics (ABS). It provides a comprehensive and detailed statistical overview of various aspects of the economy and social conditions in Australia, together with their administrative and legislative background. In addition, it contains descriptive matter dealing with Australia's government, international relations, defence, geography and climate.

The first Official Year Book of the Commonwealth was published in 1908, although individual Australian States and colonies had been producing year books for several decades previously.

This 2001 edition of Year Book Australia is a special edition, the ABS's contribution to the Centenary of Federation. For this edition the ABS invited a small number of distinguished Australians, authorities in their fields, to contribute significant articles in their areas of interest. The resulting eleven Centenary Articles follow the chapters to which they relate. I am very grateful to these authors for their excellent contributions. (Naturally the opinions expressed in the articles are those of the authors, not necessarily those of the ABS.)

In this regard I am very pleased that Bill McLennan, my immediate predecessor as Australian Statistician, has contributed one of the Centenary Articles.

I would like to thank Ian Castles, Vice President of the Academy of the Social Sciences in Australia and a former Australian Statistician, for his help in identifying the authors of the Centenary Articles.

Professor Max Neutze, one of Australia's most distinguished economists and a long-serving member of the Australian Statistics Advisory Council, was to contribute a Centenary Article on *Housing markets and public policy*. Sadly Professor Neutze died last October, before he could complete his article.

Most of the 30 chapters in this Centenary of Federation edition contain additional historical material; as well, some chapters have been completely reworked. I would like to thank the many chapter authors and other contributors, both within and outside the ABS, for their efforts.

This 83rd Year Book contains the title page and table of contents of the first, *Official Year Book of the Commonwealth of Australia, 1901–1907*, published in 1908. It is interesting how many topics were as important then as they are today. The CD-ROM version of this Year Book also contains the whole of the first edition, as well as copies of the many articles and feature pieces appearing in the 83 editions of the Year Book from the first to this latest edition.

ABS publications draw extensively on information provided freely by individuals, businesses, governments and other organisations. Their continued co-operation is very much appreciated. As well as my thanks above to individual authors, I would also like to express my appreciation to the organisations which have kindly supplied material for inclusion in this Centenary of Federation edition of *Year Book Australia*.

In this special edition, I take the opportunity to extend my thanks to the many ABS staff who contribute each year to the preparation and production of the Year Book. In particular my thanks go to a former employee of the ABS, Fred von Reibnitz; the present edition of *Year Book Australia* is his fifth as editor.

Australian Bureau of Statistics
Canberra
January 2001

Dennis Trewin
Australian Statistician

Introduction

Year Book Australia provides a comprehensive overview of the economic and social conditions of contemporary Australia. It is a statistically oriented publication with sufficient background information to establish a context for the statistics and to assist in understanding and interpreting them.

Many of the statistics are derived from the ABS, the official statistical agency which produces the Year Book. However, a great deal of the information is also contributed by other, predominantly government, organisations. The official nature of the contributors to the Year Book ensures a high degree of objectivity and reliability in the picture presented of contemporary Australia.

The Year Book also presents some historical and international perspectives on Australia. As *Year Book Australia* 2001 is a special edition, the ABS's contribution to the Centenary of Federation, its historical content has been enhanced considerably, and it contains Centenary Articles by eleven distinguished Australians, authorities in their fields.

Year Book Australia 2001 is also available on CD-ROM. Its contents are included in *Australia Now—A Statistical Profile* on the ABS Internet site at *http://www.abs.gov.au*. The Year Book is also the source for *Australia at a Glance* (1309.0).

Finding information

The contents pages at the beginning of the Year Book and preceding each chapter provide a guide to the broad subjects contained in each chapter. The index assists in locating information on more specific subjects. A list of Special Articles which have appeared in previous editions is contained at the end of the Year Book. A collection of Special Articles is included in *Australia Now—A Statistical Profile* on the ABS Internet site.

The tables and graphs in a chapter are numbered and the text is cross-referenced, as necessary, to the table or graph to which it relates.

Further information

While the statistics and descriptive information contained in the Year Book provide a comprehensive overview of Australia, they represent only a relatively small part of the statistics and other information available. The Year Book is aimed primarily at providing a ready and convenient source of reference, both to those familiar and unfamiliar with a particular subject. In other words, because of the range of subjects, and limitations on the size of the Year Book, it aims at breadth rather than depth of information.

For those requiring information in greater depth, the Year Book also serves as a directory to more detailed sources, with the source shown for each statistical table, graph and map. Where the ABS is the source, the title and catalogue number of the relevant publication are quoted. For other sources, the name of the organisation is shown, and the publication title where appropriate. Relevant ABS and other publications are also listed at the end of each chapter together with a selection of relevant Internet sites. A useful complementary publication is the *ABS Catalogue of Publications and Products* (1101.0) which lists all current publications and products of the ABS.

Year Books or Statistical Summaries produced by the ABS for each State or Territory provide information similar to that contained in *Year Book Australia*, for the State or Territory concerned.

In many cases, the ABS can also provide information which is not published or which is compiled from a variety of published and unpublished sources. Information of this kind may be obtained through the Information Consultancy Service. Charges are generally made for such information. Inquiries may be made by contacting the Inquiries Section in the nearest ABS office.

The annual reports of government departments and agencies also provide a valuable source of more detailed information on subjects covered in the Year Book.

For a variety of reasons, it is not possible for all statistics in the Year Book to relate to the latest or the same year. Readers wishing to obtain or clarify the latest available statistics should contact the relevant source.

Comments from readers

The ABS endeavours to keep the balance of the contents of the Year Book in line with the

ever-changing nature of the nation. For this reason comments on the adequacy and balance of the contents of the Year Book are welcomed and should be directed to the attention of the Editor of the Year Book, Australian Bureau of Statistics, PO Box 10, Belconnen ACT 2616.

Symbols and abbreviations

The following symbols, where shown in columns of figures or elsewhere in tables, mean:

n.a.	not available
n.y.a	not yet available
–	nil or rounded to zero (including null cells)
. .	not applicable
n.p.	not available for separate publication (but included in totals where applicable)
p	preliminary—figures or series subject to revision
r	figures or series revised since previous issue
n.e.i.	not elsewhere included
n.e.c.	not elsewhere classified
n.e.s.	not elsewhere specified
—	break in continuity of series (where drawn across a column between two consecutive figures)
*	subject to high standard errors and should be used with caution
**	subject to sampling variability too high for practical purposes (i.e. relative standard error greater than 50%)
~	approximately
$m	$ million
$b	$ billion (thousand million)

The following abbreviations are used for the titles of the Australian States and Territories and Australia:

NSW	New South Wales
Vic.	Victoria
Qld	Queensland
WA	Western Australia
SA	South Australia
Tas.	Tasmania
NT	Northern Territory
ACT	Australian Capital Territory
Aust.	Australia

Yearly periods shown, for example, as 1999, refer to the year ended 31 December 1999; those shown, for example, as 1999–00 or 1999–2000, refer to the year ended 30 June 2000. Other yearly periods are specifically indicated. The range of years shown in the table headings, for example, 1901 to 1998–99, indicates the period covered, but does not necessarily imply that each intervening year is included or that the yearly period has remained the same throughout the series.

Values are shown in Australian dollars ($) or cents (c) unless another currency is specified.

Where figures have been rounded, discrepancies may occur between sums of the component items and totals.

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PREFACE.

By the Constitution of the Commonwealth of Australia, the Commonwealth is empowered "to make laws for the peace, order, and good government of the Commonwealth, with respect to," *inter alia*, "Census and Statistics." In exercising the power so conferred, a "Census and Statistics Act" was passed in 1905, and in the year following the "Commonwealth Bureau of Census and Statistics" was created. The publication here presented is therefore the first authoritative Year Book issued under the Federal Constitution.

In addition to Statistics for the whole of the Federal period, 1901 to 1907, this Year Book also furnishes corrected statistics for the period 1788 to 1900. This was necessary to constitute this publication the authoritative source of statistical information for the Commonwealth of Australia for the whole Federal period, and to shew the proper relation of that information to the past statistical history of Australia.

The general arrangement of the publication, differing somewhat from that of previous Year Books, is shewn in the synopsis on pp. v. to xvi. immediately following, and will be substantially adhered to in the future issues.

In addition, however, to what may be called purely statistical matter, each issue will contain articles dealing at length with some particular subject or subjects of more or less permanent interest. It is undesirable as well as impracticable to repeat these year after year, seeing that it would unduly increase the size of the publication. As a rule, therefore, only a brief condensation of special articles will appear in subsequent issues of the Year Book, or they may be omitted altogether.

The general statistical matter will, of course, be brought up to date from year to year, and, except in cases intended to specially illustrate or elaborate some question of peculiar importance, will be set forth on each occasion with equal fulness. In this way each Year Book will, by reason of its special features, have some measure of independent interest.

Through the co-operation of the various State Bureaux with the Commonwealth Bureau it has been possible to considerably advance the accuracy, and in general the intrinsic value, of Australian Statistics. The collection of data is also being continually improved.

It has been found desirable to deal with the subject matter from a threefold aspect, viz.:—

(i.) The development of the component States.

(ii.) The progress of Australia as a whole from the earliest times.

(iii.) The statistical comparison of Australia with other leading countries of the world.

In the endeavour to supply reliable details of this character, considerable difficulties have been experienced, more particularly as regards the early years of Australian colonisation, and although assistance has been cordially rendered not only by the State Statistical Bureaux, but also by other State Departments that were in a position to help, the results obtained must in many cases be considered as roughly approximate only.

A feature of this publication is the use made of maps and diagrams. The changing boundaries of the various States, the distribution of the population of Australia, of its rainfall, etc., the development of its railway system, and similar facts can be properly appreciated only by the use of maps. In like manner the progress of events, the characteristics of growth and decline, can in general be represented much better graphically than numerically. The diagram or "graph" is a direct picture in which the relative magnitudes are preserved and by which instantaneous comparisons are made possible.

The graph has also the advantage of shewing current events in relation to the past, from which often they derive their significance, and comparisons of the graphs of interdependent facts often throw light on the nature of the interdependence.

The development of Australia has been in many instances very remarkable, and this could be shewn only by graphs dating back to its beginning in 1788. In most cases accurate data are not available for years much before 1860. In such cases, therefore, it seemed sufficient at present to give continuous results from that year onwards.

The great mass of material embodied in this Year Book has been carefully examined, but to hope that all error has been avoided would be idle. If readers will kindly point out any errors or limitations which they may discover, the Commonwealth Statistician will much appreciate the opportunity thus afforded of perfecting the matter and arrangement of the Year Book.

In conclusion, the Commonwealth Statistician desires to express his cordial thanks to the State Statisticians, and to the responsible officers of the various Commonwealth and State Departments, who have so kindly supplied all desired information.

G. H. KNIBBS,
Commonwealth Statistician.

COMMONWEALTH BUREAU OF CENSUS AND STATISTICS.
31*st March*, 1908.

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The development of official statistics in Australia, and some possible future challenges

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Introduction

This article briefly describes the development of official statistics in Australia,[1] and highlights and compares the situation 100 years ago with today. It also presents the author's views on some of the challenges that could face Australian statisticians in the years ahead.

Colonialisation to Federation

Initially, the colonialisation of Australia, which commenced in 1787, was seen as an economic means of disposing of felons. The British Government was insistent that comprehensive accounting records were kept, and that reports were prepared on social and legal matters, to judge whether this experiment was a success. The first Governor-in-Chief, Arthur Phillip, was implicitly instructed to collect and collate information in numerical form, which he duly did in a report to his masters each year. The same story applied to the other colonies as they were established.

The first major change occurred in 1815 when, following an overhaul of colonial administration, the systematic collection of a wide range of data was commenced, primarily it seems for the UK Colonial Office. In 1822 an annual reporting system was set up, called the Blue Books, and their emergence probably reflected the new imperial situation following the loss of the American colonies and the end of the Napoleonic wars. While the Governor was formally responsible for their production, the Colonial Secretary, a public servant, did the actual statistical collating. The topics in the Blue Books reflected the British preoccupation with the cost of the colonies, and the Blue Books appear to have been regarded rather as documents for the guidance of the administration in the Colonial Office than as a contribution to a scheme of statistics for Australia, let alone internationally. However, local influences increasingly affected the character of these books, and the practice developed of retaining copies in the colonies for local use. As a result, it is in the work of preparing them that we find the germ of the development of Australian statistics.

A most significant statistical occurrence around this time was the conduct of the first formal census, which was held in the colony of New South Wales in 1828. Prior to this the counting of the population had been by musters. Thereafter, Censuses were held in NSW and the other colonies at regular intervals, with the form and timing of the Censuses being decided in the colonies.

* While taking full responsibility for the article's content, I am grateful for the many helpful comments and suggestions from Dennis Trewin, Tim Skinner and Rob Edwards of the ABS, and Brian Pink (formerly of the ABS, now heading Statistics New Zealand).

Self-government in the colonies occurred progressively from 1855. Then it was entirely for the colonies to decide on the range and quality of their statistical records. In all the colonies after a transition period, the Blue Books were transformed into the Statistical Registers of the second half of the nineteenth century, and although there were marked similarities, the responses of the colonies inevitably were different. In turn these Statistical Registers were transformed into Year Books with analysis of and comments on the statistics.

Using the Victorian colony as an example, because its experiences mirror what happened in the other colonies, the first step was the establishment in early 1855 of a Registrar of Births and Deaths and the setting up of an elaborate and uniform system to record vital events and derive comprehensive statistics from them. Within the office, a Statistical Branch was also used to collect agricultural statistics and produce annual statistics for Victoria. However, there is reason to believe that the Registrar-General was inclined to look upon the compilation of the annual Statistical Registers as an onerous addition to his legitimate work, and that therefore no serious attempts were made to improve the publications. As might be expected, the lack of uniformity in the coverage and the presentation of statistics in these annual volumes across the colonies was keenly felt. Indeed:

> "The Government of Victoria expressed a hope ... to the effect that the three colonies should not only unite in regard to the enumeration of the people, but to recast and assimilate, in concert, all "blue books" and other statistics, on a scientific and practical basis, [and that this] would meet with the concurrence of the Government of New South Wales and South Australia."[2]

In 1874 the Statistical Branch was separated from the Registrar-General's office and established as a separate organisation in the Department of the Chief Secretary, with its head being called the Government Statist, the first such appointment in the colonies.

The next major step forward was the publication of an annual summary of Victorian statistics, containing not only bare tabulations, but also analyses of the figures; the Victorian Year Book was to fill that role. As the Government Statist at that time said:

> "It will be my endeavour in this succession of volumes to record facts with correctness and impartiality; to comment on them only so far as may be necessary as to elucidate them properly; to set up no theories except such as may be fairly deducible from the materials before me; and, in drawing inferences, to exercise perfect fairness to all sections of the community." [3]

This quote shows that the principles of a sound, open and objective statistical system were established in Australia many years ago.

Continuing with the Victorian example, the responsibility for conducting the 1854 Census was given to the newly created Office of the Registrar-General. Along with attempts to produce uniform annual statistics in the second half of the 1850s, discussions and negotiations began about holding the Census in 1861 in all of the Australian colonies on the same day as it was held in Great Britain and Ireland. In the event most colonies did so and censuses were then conducted every ten years.

At this stage of development, official statistics of the Australian colonies were certainly of high international quality, both in content and presentation. This may seem surprising, but it has been said that:

> "To a considerable extent the achievement was, for a number of reasons, a legacy of British colonial rule. First, the colonies had been required to produce official statistics on an annual basis.... Second, the statistics had to be of a range and quality to satisfy the British authorities, who required them for efficient administration. Third, the statistics had to be brought together by a single officer, the local Colonial Secretary, who took some final responsibility for their accuracy and their presentation; there was therefore a central statistical authority and this contrasted markedly with the British position. Finally, the authority was required to present all the relevant statistics of the colony in a single volume—the Blue Book. As an offshoot of these developments, it was natural for the colonies to begin the production of a consolidated volume of annual statistics for their own use."[4]

Things, however, were not quite as rosy as that quote might indicate. Due to many reasons, not the least being the inequality in the funding of the various statistical offices of the colonies, the quality and the scope of the statistical work emerging from the colonies varied enormously. Attempts were made to overcome this, especially by including in the Victorian Year Book and *The Seven Colonies of Australia* published by New South Wales a large amount of information relating to all the colonies. Knibbs, the first Commonwealth Statistician, put the issue rather forcefully as follows:

> "Notwithstanding this early recognition that the Statistics of Australia should develop a uniform plan, the autonomy of each State led to divergencies of domestic policy and practice. These divergencies tended also to manifest themselves in the statistical technique, as well as in the facts collated. Even where there seemed to be unity of action, or identity in the data to be collected, the unity and identity were often more apparent than real. The comparative studies made by each Statistician revealed with more and more clearness, in proportion as they were thorough, the grave lack of uniformity in the statistical data and methods of the several States, however excellent these may have been considered alone."[5]

Several conferences of the Statisticians of the various colonies were held from 1861 to deal with the matters where coordination was most urgently required. Beside the exchange of ideas, the main result was to maintain a certain degree of rapport between the Statisticians of the colonies, rather than to bring about any very fundamental advance in statistical method. Agreement was reached on what was to be included in 'Australian Statistics' and considerable agreement was reached on the conduct of several Population Censuses. Knibbs did say later that there was "still much to be achieved".[6]

At the time of Federation, there was a Government Statistician, or Statist, in all colonies except in Queensland and Western Australia where they were appointed in 1904 and 1918 respectively. The range of statistical data the bureaux were dealing with at that time was considerable, and was approximately as follows:

- statistics collected entirely by the bureaux included agriculture, dairy farming, live stock, manufactories, municipal administration, hospitals, asylums. etc.;
- statistics compiled in the bureaux from data collected by other public departments included population, births, deaths and marriages, banks, life assurance, trade, shipping, and criminal justice; and
- statistics collected and compiled by other agencies and adapted for publication by the bureaux included public finance, railways and tramways, posts, telegraphs and telephones, land settlement, meteorology, mining production, water conservation and irrigation, civil justice, and public instruction, scientific societies, museums etc.

Federation to integration

Federation of the colonies into the Commonwealth of Australia on the 1 January 1901 had many implications for official statistics in Australia. The first major task was the 1901 Census, and from the outset it was clear that generally accepted population figures would be essential as a basis for apportioning to and for the States. This indeed was an important issue with respect to the status of official statistics in the new country, and the Statistical Conference held in February 1900 addressed these matters.

It is interesting to note that almost immediately there was discussion among the newly created States of Australia, and indeed New Zealand, about the need for uniformity in the preparation of statistical returns. This was an urgent matter in the view of the Commonwealth, so that its administration could be well founded on a good statistical base, and one which would allow international comparisons. A conference of the relevant Statisticians discussed this first in January 1902, but while there was agreement on the need for uniformity, as there had been for many years, no concrete agreement was reached about how to proceed. This was to be a continuing theme for many years, including discussions between Commonwealth and State Ministers.

After conferences with the State Governments, the Commonwealth Government decided to exercise its power under the Constitution to place the

responsibility for taking Censuses of the Population and the compilation and publication of statistics with the Commonwealth. In 1905, the new Census and Statistics Act was approved by Federal Parliament. It dealt among other things with the appointment and powers of the Statistician, arrangements with the States for the collection of data and responsibilities for the taking of Censuses of population. The second reading speech of the Minister for Home Affairs, when he introduced the Census and Statistics Bill into Parliament, made several interesting points. He said: "The object of the Bill is to enable the Commonwealth to establish a central bureau of statistics in order that it may ... publish certain statistics having reference to the affairs of Australia as a whole". The reason for a centralised Bureau was given as a need to "bring into line the statistics of the States for the purpose of comparison, and to lay down a uniform method for the collection of statistics". In addition, "the central department will collect all information in regard to subjects specially controlled by the Commonwealth, such as imports and exports, trade, and commerce generally including inter-State transactions, navigation and shipping, postal, defence and other matters". He also said: "we could establish a central Commonwealth bureau and enter into negotiations with the various States with a view to utilising their departments to the fullest possible extent".

The first Year Book[7] reported, in relation to the organisation of the Commonwealth Bureau, that

> "foreign Governments were asked—(a) to furnish their statistical publications, including such back numbers as could be spared; and (b) to enter into a general agreement for exchange of publications. It would be impossible to speak too highly of the generous response which has been made to this request, a request to which a young country like Australia can make adequate return only in the somewhat distant future".

It is good to record that some significant return has been made to the international statistical community generally over the years since then.

Practically the first matter of importance to be considered after the passing of the Census and Statistics Act was the question of the relations between the Commonwealth Bureau and the existing State Bureaux. Knibbs' comments about this pivotal issue are revealing:

> "Two methods of procedure were open to the Federal Government. The first was the complete unification of all statistical organisations in Australia. If this had been adopted the Commonwealth would have controlled all statistical work, and would have been represented in each State by a Branch office which would have undertaken the collection and first tabulation of statistical data under the direction of the central bureau. A second method was to preserve the internal independence of the State Bureaux, and to arrange for them to furnish the Federal Bureau with data compiled according to a system agreed upon. The Federal Government chose the second method as being, at present, and in view of all circumstances, more suitable to the actual condition of Australian Statistics, and it was thereupon resolved to hold a conference of Statisticians which should discuss the arrangements to be made in order to satisfy the requirements of the State Governments as well as those of the Federal Government."[8]

The upshot of this was that there was a Federal Bureau, as an office within a Commonwealth department, and State Bureaux, also as offices within State departments, operating independently, but with respect to Australian statistics cooperating with the Federal Bureau. The regular meetings of the Chief Statisticians of the Federal and State Bureaux, termed the Conference of Statisticians, was the mechanism used to coordinate activities aimed at producing uniform Australian statistics. This process worked to some extent but was slow, tedious and not very effective.

The first conference after the establishment of the Commonwealth Bureau of Census and Statistics occurred late in 1906. At that meeting a set of statistical forms were approved that the State Statisticians agreed to compile and furnish to the Commonwealth about their respective States for the purposes of compiling statistics for Australia. It is not surprising that these arrangements were fraught with difficulties. Indeed in 1908 the then Commonwealth Statistician advised his Minister that the Commonwealth Bureau "is at the mercy of the slowest and least efficient State Bureau

for the completion of practically the whole of its statistics". This crippling dependence was obviously irksome. "Unless more strenuous efforts are made by the States to supply the Commonwealth with statistical information it will become necessary for the central authority to obtain statistical information directly instead of through the State Statisticians."

In addition, it was soon found necessary for the Commonwealth Bureau to undertake original compilations, and develop the scope of its work beyond the mere summarisation and analysis of returns furnished by the State Bureaux. The Commonwealth Bureau moved into the direct compilation of commerce and shipping, vital, industrial, employment, wages and prices statistics. It also put a lot of effort into the publication of the *Official Year Book of the Commonwealth of Australia*, the first issue of which appeared in 1908.

Indeed this matter of coordination, or more specifically the lack of it, was discussed by Ministers of the Commonwealth and the States, and in 1916 a motion was passed in favour of amalgamating the statistical bureaux. This did not come to pass, in part one suspects because the State Statisticians remained unwilling to surrender the autonomy that they and their predecessors had enjoyed for so long. Indeed, many unsuccessful attempts were made over the next 30 years to have significant organisational changes implemented. A major one, which was partly successful, occurred at the 1923 Premier's Conference when the Prime Minister proposed that the State statistical services be transferred to the Commonwealth. At the time Tasmania alone agreed, and this transfer was effected in 1924. A direct result was the significant influence statisticians from Tasmania then had on the Commonwealth Office by the transfer and promotion of staff to senior positions, including as Commonwealth Statistician, in the Commonwealth Bureau in Canberra.

The rapport the Commonwealth Bureau had with Australians in conducting the Population Census is well shown by the following poem:[9]

My happy home, one week ago, my bungalow, "The Nest",
was bounded north by Paradise, the place of perfect rest.
Now all is gloom where gaiety and merriment erst reigned,
relations with my better half are most distinctly strained.

On Sunday night, I gaily took my fountain pen in hand,
and started to enumerate for Knibbs our little band.
At question 1, I paused, and to my nice lady said:
"At last I get a chance to write myself down as "The Head".

No better wife than mine has shared the lot of mortal man,
she is a perfect helpmate, in accordance with the plan,
but on one point that gentle dame I've never dared to cross;
she has been, ever since we wed, undoubtedly the "The Boss".

And when I wrote that I "John Smith, Bricklayer," was the head,
what hit me hard was what she looked—for not a word she said.
Her name is Marian, she says, but as an honest man,
I wrote it from the record of her birth as "Mary Anne".

She looked her wrath—a wiser man had better know his mate.
I wrote her age—per record still—"next birthday 48".
Then Marian broke loose, and said unpleasant things to me.
I told her all the questions must be answered truthfully.

Her speech was brief and to the point.
She rose and left the room.
Our happy home is now about as joyous as a tomb.
We do not speak, as we pass by. At least she will not speak,
and this condition will endure for all the wretched week,
because I did as Knibbs decreed and, acting in good sooth,
wrote for him "confidentially" some brief domestic truth.

It is pleasing to note that this spirit of cooperation continues today.

Returning to the question of the overall statistical service, there seems little doubt that all the State Governments used their

own statistical services as a significant input to their policy and planning activities, just as they had in the colonial days. This rather intense interest in statistics waned over the years as the power of the Commonwealth increased. Finally, the advent of the Second World War forced the issue in that the governments of Australia had to think collectively.[10] Indeed certain fields of statistics, such as manpower, physical controls on the economy (with the market economy being suspended), production and use of materials, were recognised as vital to the Federal Government for the prosecution of the war. The Federal Government also took over the collection of taxes. The corollary was that the State Governments needed statistics less and less. This trend continued after the war, when the focus was on post-war reconstruction. The Federal Government's commitment to a full employment policy, which it embodied in a White Paper in 1945, had great significance for the scope of the Commonwealth Bureau's role. At that time statistics of manpower, production, stocks, trade, economic indicators and national accounts all became essential instruments for the Federal Government, with the Commonwealth Bureau being in control of their production. Also the buoyant economic conditions after the war did not encourage the State Governments' interest in monitoring the course of the economy.

As it happened, fate may have played a significant hand. It turned out that an acting appointment in the late 1930s, and straight after the war, from the New South Wales Bureau to the office of Commonwealth Statistician was a trigger to progress the integration of State and Federal Statistical Bureaux. A further significant boost was the strong endorsement of the Prime Minister and the then Premier of New South Wales in the late 1940s to 'closer coordination'. In fact, the Commonwealth Bureau staff in New South Wales and the State Department staff were housed together. Finally, a series of separate agreements, between the Commonwealth and the States in 1957 and 1958, created an integrated statistical service where the State and Federal Bureaux became one organisation operated by the Commonwealth, which was responsible for serving both Commonwealth and State Governments' statistical needs. Each State Bureau became an office of the Commonwealth Bureau under the immediate direction of the existing State Statistician, who then held office under both Commonwealth and State legislation. No State would be required to surrender its sovereign powers in the field of statistics, but they agreed to exercise them in a special way through an integrated service. The reality was that the State Governments generally had shown little interest in, or expenditure on, statistics in the late 1940s and 1950s, and so what they handed over was a depleted statistical compiling capacity with limited methodological or interpretive skills.

The integrated statistical service had a long gestation period with a difficult birth; its growth toward maturity would have difficulties as well.

Integration to the new millennium

For about ten years thereafter the operation of the integrated statistical service changed very little from when it was a collection of separate and independent offices. In one sense this is not surprising given the history of the organisation and its staffing. However, there were many forces operating to influence how this statistical service would develop. Some of the important ones were very significant increases in the demands for statistics, the need for efficient and long-term management, the impact of technology and the requirement for international comparability. In fact, all these forces are so closely intertwined and interlinked that it is impossible to trace the influence of each separately. Rather, some key aspects will be highlighted, roughly in the order in which they occurred.

Over the next 20 years, the demand for official statistics increased significantly due to the greater use of statistics in planning and research, not only by the public sector of the economy but also by private enterprise. Existing collections were enlarged and new ones instituted in the various economic and social fields. In addition, the State-based factory and agricultural censuses were replaced by national collections, which was a significant step towards standardisation. Also, towards the end of the 1960s it became obvious that there were shortcomings in many of the important economic statistics. As many of these series had a common origin, the idea was put forward of 'integrating' all the economic censuses and surveys. This became a nation-wide project aimed at ensuring that the collections for each

industry would fit together without overlap, duplication or omission in coverage, and produce a range of economic data according to a common system of concepts. To do this it was necessary to standardise all the data collected and to prepare a register of businesses operating in Australia.[11] This process impacted strongly in all offices and gave another thrust to the move to a more centrally planned and managed approach. It is worth noting that the impact of the integrated economic collections, and the growth in the demand for statistics, was significant on both the Federal and State organisations. Again using the example of Victoria, at the time of integration in 1958 there were about 100 people employed in the Victorian Office, but by 1977 there were nearly 500 (today there are 350).

To meet this new demand, staffing not only had to be increased but the right type of staff had to be employed. After integration, this was an important issue as most staff in the State Offices were male and normally ex-service, whose strength was in keeping an operation running but not usually in initiating change. The most significant step taken to address these matters was the recruitment of many graduate staff, and of particular importance here was the statistics cadetship scheme. In this scheme, which still operates today, the Bureau employed young people before they finished their degrees.[12] The scheme was remarkably successful, having a strong and continuing impact in both Central and State Offices. Many graduates of the scheme went on to senior level positions in the Bureau including as Australian Statistician, in other government departments including as Permanent Secretaries, and in the private sector.

In another sense, the slow change at the start of the integrated statistical service was not surprising, given the size of Australia and the difficulties that then existed with communication. However, technology became a driving force for change. The large volume of statistical information being collected could no longer be handled efficiently by manual methods, and after the Second World War various types of mechanical processing were implemented. In the early 1960s the Commonwealth Statistician established a computer network in all State Offices, which from the beginning was closely managed from the centre. The growing use of technology thus became a strong impetus for a more coordinated and centrally managed statistical system. (As an example of the interlinking of these forces for change, it is interesting to note that the development of this network required many skilled computing experts who were not readily available in Australia. The solution was twofold. First, to undertake extensive training of staff in the skills required, and these courses predated any undergraduate computing courses offered by Australian universities. Second, to recruit many such people from the United Kingdom. They served the Bureau very well, and eventually had a significant impact on computing elsewhere in Australia.)

Another important change was the introduction in the mid 1960s of a capacity to conduct interview surveys at households across Australia. It was initiated by the Commonwealth Government specifically to run a labour force survey. This time-critical collection, which employed a large number of part-time interviewers across Australia, was centrally planned and centrally managed. This was another forerunner of the changes that would be made in the management of the integrated service, with Central Office senior management having more direct involvement in the activities of the State Offices. It also provided the basis on which the ABS was able, in the years to come, to build its large program of labour and social surveys, collectively called the Population Surveys.

A further important factor which influenced the way the integrated service operated was the upsurge in the use of sampling and other methodological techniques, which were used to help meet the demand for more and different statistics within reasonable costs. People with these skills were, and still are, scarce resources, and it was natural, therefore, for them to be generally located in the centre. As their work encompassed the whole of the integrated service, there is no doubt that they were, and still are, a strong unifying force. Although the cadetship scheme was, and still is, a great source for people with these skills, there was a need to recruit and to mount special recruitment campaigns.

By the early 1970s, although the Bureau's statistical output had expanded considerably and had a more contemporary flavour, the management of the statistical service was still firmly based on the conduct of annual

Conferences of Statisticians, but with Central Office playing a more decisive role, due in part to the central management of many of the new initiatives and services. Significant changes had taken place in the staffing of the organisation, especially in Central Office.

At around this time, the Federal Government began to ask more of the statistical service. It believed that it was important for the quality and consistency of governmental and parliamentary decisions, and for the community's capacity to evaluate them, that official data systems, particularly in closely interrelated areas of social and economic policy, be mutually compatible and reflect the dynamic needs of the Australian economy and community. To this effect, the Government commissioned an independent inquiry, the 'Committee on the Integration of Data Systems', which reported in 1974. Among other things, the Committee concluded that coordination and compatibility were more likely to be achieved under a centralised than a decentralised form of statistical organisation, and that if any such central statistical authority were established it should be user-oriented, serve the government and the community as a whole and be policy neutral, and that its output should reflect an appropriate balance between different fields of economic and social statistics and between short, medium and long-term needs.

This led to the establishment of the Australian Bureau of Statistics in 1975 as an independent statutory authority, with the Australian Statistician given a secure and fixed-term appointment. (Previously, the ABS was in effect an agency of the Treasury Department.) The Statistician was made responsible for the control of the operations of the Bureau, and its functions were:

- to constitute the central statistical authority for the Australian Government and, by arrangements with the Governments of the States, provide statistical services for those Governments;
- to collect, compile, analyse and disseminate statistics and related information;
- to coordinate, and provide advice on, statistical activity at the Federal level (although by invitation it is sometimes done at the State level as well); and
- to liaise internationally with respect to statistics.

Further, an Australian Statistics Advisory Council was established, with its members representative of users and suppliers of statistics, to advise on long-term statistical priorities and strategic issues.

For the first time Australia's statistical agency was organisationally independent of any department of State. Further, the Statistician was given the powers of a Departmental Permanent Head in respect of the Public Service Act. Perhaps, at this stage, it could be considered that the integrated statistical service had just reached adulthood.

A major step in its maturing process, which came soon thereafter, was the development and adoption of a coordinated and comprehensive planning and management system for the Bureau. The aim was for the first time to manage the ABS strategically by stimulating long-range thinking, by responding to the changing environment, and by reassessing what the Bureau did and how. It was based on developing a corporate plan, containing a mission statement, to give the medium term perspective, and setting in place a rolling three-year forward work program which was updated annually to ensure that the Bureau used its resources efficiently and effectively. At the same time matrix management was implemented, with statistical and services program managers in the Central (i.e. Canberra) Office being responsible in a planning and strategic sense for all activities in their programs across all offices, while the day-to-day operational responsibilities lay with the senior managers in each State Office. This once again reinforced the holistic approach being taken to the management of the statistical service. It really heralded the first time the integrated statistical service operated as a whole rather than as the sum of its parts. The ABS is still successfully managed this way today. (It is interesting to note that around this time, perhaps as a direct result of these changes to a centrally managed statistical service, the Annual Conference of Statisticians ceased and was replaced by biannual meetings, of the senior staff of all Offices of the Bureau, which were more management focused.)

The maturing of the computer services and infrastructure in the ABS brought on other changes that had significant impacts. In the absence of well-developed computing

facilities in the State government agencies, the State Offices had undertaken a significant proportion of the processing work associated with State administrative systems, such as crime, education, traffic accidents, industrial accidents, hospital morbidity etc. As plans were being made to move from clerical to computer possessing, the question was asked whether the ABS should be responsible for this processing work. It was decided that the interest of the ABS was in the summary data coming from the administrative systems, not in the data entry and the associated computer processing work, and that work should be 'returned' to the owner of the administrative systems, i.e. the State agencies running these systems. This decision was not popular with the States, as it imposed a load on them that the Commonwealth had been carrying. Importantly, this change did allow more ABS resources to be channelled into other social statistics work, which the ABS was best placed to do: specifically to use its capacity to efficiently conduct household surveys. Indeed, this change was the first time the ABS went beyond relying on the Population Census and administrative by-product data for most of its social statistics. The buildup of the Population Surveys started with the poverty surveys in the early 1970s conducted for the Henderson Poverty Enquiry, and with health surveys soon thereafter.

At around this time, a fundamental change occurred in the way the ABS viewed itself. It acknowledged that its success, or otherwise, was not judged solely on its output, but rather on how well its statistics are used by governments and the community. In doing so the ABS accepted that it should take positive steps to direct and encourage the flow of statistics, both published and unpublished, to users, i.e. to 'market' its statistics. Indeed this thrust is encapsulated in the ABS mission:

> "We assist and encourage informed decision making, research and discussion within governments and the community, by providing a high quality, objective and responsive national statistical service."

Marketing is an ongoing activity that covers all means of dissemination, and includes all types of contacts with users. Indeed today the opportunities offered by technological change, including the ability to store and access vast amounts of data easily and efficiently as well as disseminate them, place great importance on this function being undertaken well. Indeed, the ABS has expanded its publication program very significantly both for paper publications, now exceeding five per working day, and electronic dissemination, where publications and other publishable statistical data can be accessed electronically over the Internet. In addition, a big effort has been made to implement user friendly and consistent publication standards.

A very important change occurred in 1981 when the *Census and Statistics Act 1905* was significantly amended. The impetus came from the Australian Law Reform Commission's report *Privacy and the Census*, which recommended that there was a need to reaffirm and clarify the importance of confidentiality in the statistics legislation. However, the amendments achieved many other things; the most important was perhaps that they put into law the power given to the Statistician in 1975 to "control the operation of the Bureau". Specifically, they removed all references to the Minister in administrative areas, and said that the Statistician would determine what statistics would be collected, when and how often. They also provided that the Statistician could direct a person to supply information requested, and institute legal action if necessary which carried possible substantial penalties for non-observance. On the other side of the operations, they placed an obligation on the Statistician to compile and analyse the information collected and to publish and disseminate it. The changes were also aimed at providing a better and different service to users of statistics, particularly by enabling unidentified and unidentifiable unit record information to be released under very tight and specific conditions; this service has proved to be most effective, popular and well appreciated by most users of data. There is no doubt that by this time the integrated statistical service had matured a little.

A major change in how economic statistics were to be collected was agreed during the mid 1980s, with much more reliance to be placed on using income tax information, both as a better source of information to update the ABS business register and as a direct source of data, particularly for small businesses. This decision offered two advantages: first, improvements to the statistical output, especially for small domains, particularly small area information,

and second, a reduction in the load placed on small businesses. At the same time it was decided to place greater emphasis on economy-wide surveys and to directly link, and confront, the national accounts with the various economic censuses and surveys. After a lot of complex work, this strategy is coming into place and is being aided quite significantly by the current implementation of the goods and services tax. Both users and suppliers of data should benefit considerably from these major changes.

In the late 1980s, the ABS further extended the household survey program, committing to regular 'core' surveys in high priority areas (income, health, disability and the aged, and childcare). By the late 1990s, the program had been further expanded, mainly by the injection of user funding for specific surveys, but demand continued to grow and regularly exceeded capacity. In 2000, the ABS has further extended the program to meet some high priority gaps (Indigenous statistics, more frequent health surveys, general social surveys), to respond to contemporary needs and to enable most areas of social concern to be covered from within the ABS budget.

The most significant organisational change in the statistical service undertaken recently has been the centralising in the various State Offices of the collections for specific subject matter fields. Up until then, all State Offices collected and collated statistics for most collections run by the ABS, i.e. it still mirrored the pre-integration approach. No longer is this the case. For example, all agriculture statistics are collected and processed by the Tasmanian Office. This is a form of centralisation, but it is geographically dispersed, with each State bearing responsibility for a set of specific subject matter fields. (This solution, I expect, should probably be viewed as unique to Australian conditions as it is a product of our history.) This change has achieved large efficiency gains, even over and above the reduced management overheads, because of a stronger focus on operational process improvement. Effectiveness has also improved, perhaps due to re-engineering which had to be done to implement the change, and there have been quality improvements through the impact of standardisation.

Another big difference from the past in the statistical service today is the emphasis that is now placed on the analysis and interpretation of the statistical output. This has many facets, ranging from analysing the data in each statistical release and explaining their implications to users, to being involved in the building of models of the economy. Included in these activities are the calculation and publication of seasonally adjusted estimates and the provision of 'trend' information so that data can be better understood; initially there was controversy surrounding their publication, but both are now considered helpful by users. The ABS also publishes some well accepted, comprehensive analytic publications like the quarterly *Australian Economic Indicators* and the annual *Australian Social Trends*. Some bold steps were taken in the early 1970s to adjust the population estimates for Australia to take account of the known, and differential, undercount coming from the Census. (The way this decision was, and continues to be, well accepted by all users, shows how good the ABS's integrity is in the eyes of users; this has been reinforced by the strident reaction statistical agencies in some other countries have faced when they have suggested a similar solution.) More recently, some important work has commenced on measuring productivity in parts of the services sector, and with a reasonable level of success.

Over the last 40 years, the Bureau has been increasingly active in the international scene; there are several reasons for this. First, statistical standards, which are important within a country so that statistical series can be easily and accurately related to each other, are also essential so that valid international comparisons can be made, a requirement which has become increasingly important over the years. For many years these standards have been put together and sanctioned at the international level. The major arena is based on the United Nations, and within that on the UN Statistical Commission (UNSC), a representative group of official statisticians from a range of countries, which is a subsidiary body of the UN Economic and Social Council. The role of UNSC should be paramount in terms of standard setting, but in reality it acts as an advisory body to the UN Statistical Division, the statistical arm of the UN Secretary-General. Liaison is thus still necessary with the statistical arms of other UN bodies, such as ILO, FAO, WHO and UNESCO, and with international agencies

such as the World Bank, the International Monetary Fund and Eurostat, the statistical arm of the European Union. ABS staff have been very active and significant contributors to all these agencies, and within the UN structure they have played leading and determining roles at the UNSC and at the Committee on Statistics of the Economic and Social Commission for Asia and the Pacific (ESCAP), the regional arm of the UN. Second, the Bureau has always tried to be a 'good international citizen', particularly within the Asia-Pacific region. It has adopted an open door policy by welcoming delegations from the statistical agencies of other countries, and many countries take advantage of it each year. It has also been active in providing assistance to statistical agencies that are not so developed, in the form of consultancies and the provision of short-term experts; the philosophy has always been to help and advise but not to do. These efforts have often been lauded in international forums. The Bureau can honestly claim that it has made at least "adequate return" as promised by the Commonwealth Statistician in 1904, and it can be expected to add interest to this return in the years ahead.

An important point not made before is the long-term investment by the ABS in recruiting, training and developing its staff. There are many facets to this, but three are worth highlighting. First, the employment of young, promising undergraduates, and paying them to complete degrees before commencing work in the ABS, has been very successful in terms of long-term tenure. Second, there is a significant expenditure per annum of at least 5% of budget on staff development. Third, there is a policy to ensure that all senior staff have had a broad range of work experiences, across various subject matter and service areas and in regional offices as well as Central Office. The result has been high quality staffing, and staffing at senior levels with the experience and training to foster and maintain a strong corporate and strategic view, which is the mode of operation of the senior management group of the Bureau. The success of this approach is shown by the large number of ex-ABS staff who have worked, or are working, in senior positions in the official statistical agencies of other countries.

The effective use of technology has had a long impact on ABS operations, in addition to the role it played as a driving force for change in the early 1960s. Indeed, the ABS has built a lot of its productivity improvements around its strategic technology decisions. Five issues are relevant here:

- involvement of the most senior group of ABS management in strategic technology planning since the early 1960s;
- adherence to a corporate governance model for IT that has resulted in a very high degree of standardisation of our hardware and software infrastructure across all of our offices around Australia;
- significant and ongoing technology-related skills training for all ABS staff to ensure effective application of technology in business processes;
- strong security policy, procedures and practices for our IT environment; and
- most recently, the development of a single logical repository, known as the ABS Data Base (ABSDB), for the documentation, storage and management of data and associated information describing and locating them for dissemination and reference purposes.

More recently, the advent of desktop computing, more efficient networks, effective workplace tools (such as Lotus Notes), the Internet and the use of video conferencing are rapidly changing the dynamics of this large and dispersed organisation.

I should point out that although Australia has, in the main, a centralised statistical system, not all statistical work is done in the ABS. A reasonable amount of statistical activity is undertaken in Federal and State government departments, but generally speaking the ABS is across most of this activity. For example, the ABS works closely with the Australian Institute of Health and Welfare, which has a significant statistical role with respect to statistics produced from the administrative systems of governments in these fields. Another model of cooperation has been the establishment of national statistics centres in the fields of crime and justice, culture and leisure, Aboriginal and Torres Strait Islander statistics and, quite recently, education and training. Here the ABS has formed partnerships with the key players, including part funding, to develop statistics in these fields, particularly from administrative systems

At the millennium, the integrated statistical service has matured a lot, and serves the governments and the people of Australia very well. It produces a massive amount of output, which is both quite diverse and detailed, and its staffing levels have grown to over 3,000. The service is well managed with a firm eye being kept on future requirements and demands, and with a positive approach to staff development. It has an enviable record in maintaining the secrecy of the data collected, and as a result receives very strong support from respondents, enjoying cooperation rates better than elsewhere in the world. Its use of technology for the production of statistics, for the dissemination of data and other information, and for management, is at the leading edge. It has an outstanding reputation for both its performance and its international contribution, from inside Australia and world-wide.

The millennium onwards

From this strong and stable base, the ABS is well situated to develop further to respond to the changes that will happen in society and government in Australia and internationally. The basic role of the ABS is unlikely to change, although how it does things and what it does may change significantly. The providers and users of statistics will still expect that the best possible and most appropriate set of statistics will be available to governments and the community, and that these will be provided without fear or favour. The Australian Statistician will continue to carry significant personal and community responsibility; the position is in effect the managing director/chief executive officer of a large public company, charged with showing a return (in terms of its statistical output) to its owners and shareholders, the governments and the general public of Australia. Many forces might come to bear on this process, including changes in the focuses of government, in community attitudes, in the availability and use of technology, and in international requirements.

The recently adopted *ABS Corporate Plan, 2000* has as its first objective "an expanded and improved national statistical service". The aim here is for the ABS to make better use of data available from all sources, whether from government or private sector administrative or transactional data sources, in providing official statistics to users. This is a formal recognition that the ABS cannot collect all data, but what it can do is utilise its skills in managing and disseminating data to ensure that users have the best national statistical service possible. No doubt this is a step in the right direction, even though it may only be the first one.

What has already happened, and it will continue, is that official statisticians are no longer the only ones looked to for credible data for decision making.[13] This will bring with it no doubt, if it has not already happened in some countries like the USA, the loss of the unquestioned authority of official statisticians; thankfully it does not seem to have happened yet in Australia. What will likely follow from this is a more worrying loss in the perceived integrity of official statistics, a very serious outcome indeed and one the ABS will need to guard against.

As has already happened, and will continue, the demand for information, either more or new data, will increase rapidly, with the need for it to be presented more and more quickly. In addition, data by themselves will not be enough, as data from many sources will need to be integrated to throw light on the topic of interest for decision and policy making. The lesson for the ABS is not to attempt to do everything, which does not happen today, but to ensure that the market the ABS is addressing is understood and well defined, and that issues such as integrity and brand identification are cherished. In these areas the ABS is starting from a good position indeed.

One can confidently predict that the demand from governments for statistics will continue to be strong. Indeed there are signs, such as the provision of all the revenue collected from the goods and services tax to the States, that the demand from the States will increase. In addition there is a considerable thrust now for most issues to be considered on a regional basis, where the regions often cut across State boundaries. The ABS needs to be aware of these forces, and to think through how it should respond, perhaps with an emphasis on the use of analytic methods.

Increasingly, statisticians are being asked to provide measures in areas where the underlying concepts and frameworks are at best ill defined or non-existent. Before

statisticians can bring facts to bear on topics such as 'the new economy', the 'knowledge-based economy', 'innovation', 'social capital', 'genuine progress', and 'sustainability', they will need to work closely with theoreticians and policy analysts to tease out the underlying policy interests and develop appropriate statistical frameworks. Indeed, even the concept of 'industry' is quite nebulous these days and a fundamental rethink of that classification is overdue.

Many people would say that the biggest changes in the future will be technology driven, and they may be right. The consensus is that the Internet will be the most significant development, and that it will play the most significant role in the development of the global village.[14] As is already evident, it will change the way we work and whom we work with, how we shop, what we buy and how much we pay, and how we build personal relationships and maintain them. Most importantly, it is expected that the Internet will be the avenue for commerce for the next millennium. For statistics there have been predictions that, in the coming century, the impact of technology will be such that there will no longer be such a thing as a national economy. (That begs the question whether there is such a thing today!) The argument is put forward that there will be regional economic hubs feeding into one world economy. Even if this does not happen completely, the implications for official statistics generally are quite significant, both for assessing the validity of the current set of economic indicators and for defining the most appropriate set for the future.

Following on from this discussion, of course, are the more mundane but still important issues of collecting data electronically from respondents, both businesses and individuals, and distributing more data in this way. In addition, as more personal dealings are electronic, massive databases of information will be compiled, as indeed has already happened in Australia. Utilising these databases, such as point of sales data, will be an interesting analytic challenge and a prime objective for the ABS. Privacy will be an important issue in all these dealings.

The attitude of the community to employment is changing, and perhaps may change significantly over the next 20 years. It has often been predicted that careers within an organisation, or a few organistions, will be a thing of the past, being replaced by individuals managing their careers. This may bring with it dramatic changes to organisational design, with a large impact on organistions like the public service and perhaps businesses in Asia. The movement of employees between employers will not of course be bounded by the borders of countries; people will increasingly move from country to country in pursuit of career opportunities, as they do even today. The implication for the ABS may be great.

This discussion leads one to consider the international statistical scene, as the changes considered above, if they occur, should have massive impacts on statistical standards, and perhaps even for the collection of global statistics. It might even be possible to have international links between statistical systems; two examples worth considering might be cross checking international trade data and the flow of people in and out of countries. In my view the international scene is not in good shape at the moment and would not be capable of facing such challenges, being at its best chaotic and at its worst very ineffective. There are many players including, from the UN umbrella, the UN Statistics Division and the statistics areas of ILO, FAO, WHO, UNDP, UNFPA and UNESCO. The World Bank, the International Monetary Fund, the OECD and Eurostat also need to be counted. The problem is that there is never any joint involvement of the chief statisticians of the countries and these international agencies aimed at setting the world's statistical agenda. Unfortunately the statisticians of the countries of the world have not played an important enough role in the management and development of international statistics policy. It is urgent that this matter be addressed, and the UN Statistical Commission might be a good starting point to do so. Globalisation in its broadest sense also makes one wonder whether there might be a need for an international statistics agency given the task of keeping the statistics for the world in order.

Conclusion

It must always be remembered that politicians the world over have a love-hate relationship with official statistics, and hence with statisticians. This is perhaps not surprising because official statistics are used

by governments both for support and for illumination, and by others to judge the performance of governments and their programs. In this complex relationship it has been said that an indicator of how well a democracy is working is the degree of independence the official statistical agencies are accorded, and their performance in producing relevant and timely statistics. Currently, the ABS performs well against these criteria and we should expect the same to be the case in 100 years time.

Endnotes

1 The contents draw heavily on the special article ''Australian Statisticians and the Development of Official Statistics'' published in *Year Book Australia 1988*, and on the first chapter, *Statistical Recording,* in *Victorian Year Book 1973*.

2 *Statistical Register of South Australia*, 1859, Report, p. iii.

3 *Victorian Year Book Containing a Digest of the Statistics of the Colony for the Year 1873* by Henry Heylyn Hayter, pp. iii–iv.

4 Colin Forster and Cameron Hazelhurst 1988, ''Australian Statisticians and the Development of Official Statistics'', *Year Book Australia 1988*, p. 33.

5 Commonwealth Bureau of Census and Statistics (CBCS) 1908, *Official Year Book of the Commonwealth of Australia, 1901–1907*, p. 5.

6 Op. cit., p. 6.

7 Op. cit., p. 12.

8 Unpublished and undated paper, G. H. Knibbs, *The Development of the Statistical System of Australia*, p. 6.

9 'JD' published in *Smith's Weekly*, 9 April 1921.

10 Unpublished and undated paper, E.K. Foreman, *State Governments' Statistical Requirements—-Historical Perspective*.

11 For an account of the ''Integration'' project see the Special Article ''Australian Integrated Censuses'' in *Year Book Australia 1970*, p. 1041.

12 For more detail on this and other initiatives in this era see the Special Article 'Two great Commonwealth Statisticians' in *Year Book Australia 2000* p. xi.

13 Hermann Habermann, *Two Statistical Challenges for the Future*, paper presented to the 30th anniversary celebrations of the Statistical Institute for Asia and the Pacific, Tokyo, 26 August 2000.

14 *Trend Letter*, Vol 18, No 24, 9 December 1999.

1 Geography and climate

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Introduction

Geography is the science of the earth's form, its physical features, climate and population, and how they relate to each other. The first part of this chapter describes Australia's land forms and topographic features and how they were formed. The second part describes the island continent's wide range of climatic conditions (further detail on these is contained in the accompanying Centenary Article *A hundred years of science and service—Australian meteorology through the twentieth century*). The third part discusses water resources, a major factor in land form and climate which impacts on many aspects of life in Australia.

Geography of Australia

Position and area

Australia comprises a land area of about 7,692,030 square kilometres (see table 1.1). The land lies between latitudes 10°41´South (Cape York) and 43°39´South (South East Cape, Tasmania) and between longitudes 113°09´East (Steep Point, Western Australia) and 153°39´East (Cape Byron, New South Wales). The most southerly point on the mainland is South Point (Wilson's Promontory) 39°08´South. The latitudinal distance between Cape York and South Point is about 3,180 kms, while the latitudinal distance between Cape York and South East Cape, Tasmania, is 3,680 kms. The longitudinal distance between Steep Point and Cape Byron is about 4,000 kms.

The area of Australia is almost as great as that of the United States of America (excluding Alaska), about 50% greater than Europe (excluding the former USSR) and 32 times greater than the United Kingdom. Tables 1.2 and 1.3 show the area of Australia in relation to areas of other continents and selected countries.

1.1 AREA, COASTLINE, TROPICAL AND TEMPERATE ZONES, AND STANDARD TIMES

	Estimated area			% of total area		Standard times	
	Total	Total area	Length of coastline(a)	Tropical zone	Temperate zone	Meridian selected	Ahead of GMT(b)
State/Territory	km^2	%	km				hours
New South Wales	800 640	10.41	2 140	. .	100	150°E	10.0
Victoria	227 420	2.96	2 510	. .	100	150°E	10.0
Queensland(c)	1 730 650	22.5	13 350	54	46	150°E	10.0
South Australia	983 480	12.79	5 070	. .	100	142°30´E	9.5
Western Australia	2 529 880	32.89	20 780	37	63	120°E	8.0
Tasmania	68 400	.89	4 880	. .	100	150°E	10.0
Northern Territory	1 349 130	17.54	10 950	81	19	142°30´E	9.5
Australian Capital Territory	2 360	.03	. .	. .	100	150°E	10.0
Jervis Bay Territory	70	. .	60	. .	100	150°E	10.0
Australia	**7 692 030**	**100.00**	**59 740**	**39**	**61**	**. .**	**. .**

(a) Includes islands. (b) Greenwich Mean Time. During daylight saving periods, an hour should be added to the times in this column. (c) Queensland does not have daylight saving.

Source: Bureau of Meteorology and AUSLIG.

1.2 AREAS OF CONTINENTS

	Area '000 km^2
Continents	
Asia	44 614
Africa	30 319
North, Central America and West Indies	24 247
South America	17 834
Europe	10 600
Australia and Oceania	8 504
Total land mass (excluding Antarctic continent)	**135 774**

Source: Encyclopaedia Britannica; World Book Encyclopedia.

1.3 AREAS OF SELECTED COUNTRIES

	Area '000 km^2
COUNTRIES (SEVEN LARGEST)	
Russia	17 075
Canada	9 976
China	9 596
United States of America	9 629
Brazil	8 511
Australia	7 692
India	3 287
SELECTED OTHER COUNTRIES	
Belorus	208
France	547
Germany	357
Indonesia	1 919
Japan	377
Kazakhstan	2 717
Papua New Guinea	462
New Zealand	269
Ukraine	604
United Kingdom	244

Source: Encyclopaedia Britannica; World Book Encyclopedia; AUSLIG.

Landforms and their history

Australia is the lowest, flattest and, apart from Antarctica, the driest of the continents. Unlike Europe and North America, where some landscapes date back to 'only' 20,000 years ago, when great ice sheets retreated, the age of landforms in Australia is generally measured in many millions of years. This fact gives Australia a very distinctive physical geography. Map 1.4 shows the elevation of the Australian continent.

The continent can be divided into three parts:

- the Western Plateau;
- the Central Lowlands; and
- the Eastern Highlands.

The Western Plateau consists of very old rocks (some over 3,000 million years old), and much of it has existed as a landmass for over 500 million years. Several parts have individual plateau names (e.g. Kimberley, Hammersley, Arnhem Land, Yilgarn). In the Perth area, younger rocks along a coastal strip are separated from the rest by the Darling Fault escarpment. The Nullabor Plain is virtually an uplifted sea floor, a limestone plain of Miocene age (about 25 million years).

The Central Lowlands stretch from the Gulf of Carpentaria through the Great Artesian Basin to the Murray–Darling Plains. The Great Artesian Basin is filled with sedimentary rocks which hold water that enters in the wetter Eastern Highlands.

Much of the centre of Australia is flat, but there are numerous ranges (e.g. Macdonnels, Musgrave) and some individual mountains of which Uluru (Ayers Rock) is probably the best known. Faulting and folding in this area took place long ago. The area was worn to a plain, the plain uplifted and then eroded to form the modern ranges on today's plain. In looking at Uluru, one remarkable thing is not so much how it got there, but that so much has been eroded from all around to leave it there.

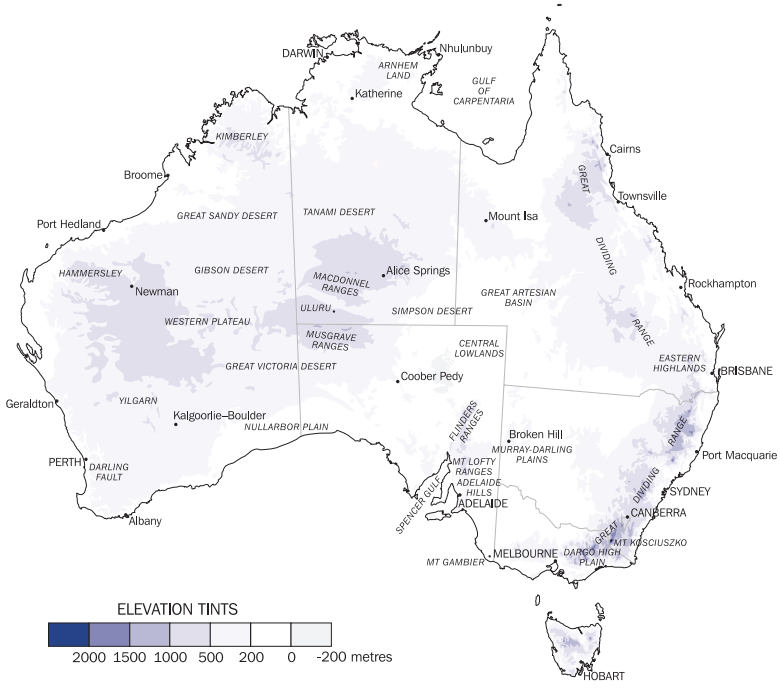
In the South Australian part of the Central Lowlands, fault movements are more recent, and the area can be considered as a number of blocks that have been moved up and down to form a series of ranges (Mt Lofty, Flinders Ranges) and hills (such as the Adelaide Hills), with the down faulted blocks occupied by sea (e.g. Spencer Gulf) or lowlands including the lower Murray Plains.

The Eastern Highlands rise gently from central Australia towards a series of high plateaus, and even the highest part around Mt Kosciuszko (2,228 metres) is part of a plateau.

There are a few younger faults and folds, such as the Lake George Fault near Canberra, and the Lapstone Monocline near Sydney.

Some plateaus in the Eastern Highlands are dissected by erosion into rugged hills, and the eastern edges of plateaus tend to form high escarpments. Many of these are united to form the Great Escarpment that runs from northern Queensland to the Victorian border. Australia's highest waterfalls (Wollombi on the Macleay, Wallaman Falls on a tributary of the Herbert, Barron Falls near Cairns, and Wentworth Falls in the Blue Mountains) all occur where rivers flow over the Great Escarpment. For most of its length

1.4 AUSTRALIA, Elevation



Source: AUSLIG 1996.

the Great Dividing Range (separating rivers flowing to Central Australia from rivers flowing to the Pacific) runs across remarkably flat country. In eastern Victoria, however, the old plateau has been eroded into separate High Plains (such as Dargo High Plain).

The present topography results from a long landscape history which can be started in the Permian, about 290 million years ago, when much of Australia was glaciated by a huge ice cap. After the ice melted, parts of the continent subsided and were covered with sediment to form sedimentary basins such as the Great Artesian Basin. By early Cretaceous times, about 140 million years ago, Australia was already so flat and low that a major rise in sea level divided it into three landmasses as the shallow Cretaceous sea spread over the land.

In the following Tertiary times, Australia can be regarded as a landscape of broad swells varied by a number of sedimentary basins (Murray, Gippsland, Eucla, Carpentaria, Lake Eyre and other basins). These slowly filled up and some are now sources of coal or oil. The Eastern Highlands were uplifted about this time.

Throughout the Tertiary, volcanoes erupted in eastern Australia. Some individual volcanoes were the size of modern Vesuvius, and huge lava plains covered large areas. Volcanic activity continued up to a few thousand years ago in Victoria and Queensland. Australia's youngest volcano is Mt Gambier in South Australia, about 6,000 years old.

Between 55 and 10 million years ago, Australia drifted across the surface of the earth as a plate, moving north from a position once adjacent to Antarctica. There have been many changes in the climate of Australia in the past, but oddly these do not seem to be due to changing latitude (associated with global scale plate movements). Even when Australia was close to the South Pole, the climate was relatively warm and wet, and this persisted for a long time despite changes in latitude. It was probably under this climate that the deep weathered, iron-rich profiles that characterise much of Australia were formed. Aridity only seems to have set in after Australia reached its present latitude, and the northern part was probably never arid.

Today a large part of Australia is arid or semi-arid. Sand dunes are mostly longitudinal and are aligned with dominant wind directions associated with the regular passage of high pressure cells (anticyclones). These 'highs' rotate anticlockwise and track at about 28°S in winter and 38°S in summer, resulting in predominantly south-east to easterly flows in the north and north-west to westerly flows in the south. Looking down from above, the south-east Trade Winds or 'Trades' would be those winds in the top right hand quarter of a hypothetical, stationary 'high' centred on the Australian continent.

The dunes are mostly fixed now. Stony deserts or gibber plains (covered with small stones or 'gibbers') are areas without a sand cover and occupy a larger area than the dune fields. Salt lakes occur in many low positions, in places following lines of ancient drainage. They are often associated with lunettes, dunes formed on the downwind side of lakes. Many important finds of Aboriginal prehistory have been made in lunettes. Despite the prevalence of arid conditions today, real aridity seems to be geologically young, with no dunes or salt lakes older than a million years.

The past few million years were notable for the Quaternary ice age. There were many glacial and interglacial periods (over 20) during this time, the last glacial period occurring about 20,000 years ago. In Tasmania there is evidence of three different glaciations: the last glaciation, one sometime in the Quaternary, and one in the Tertiary. On the mainland there is evidence of only the last glaciation, and the ice then covered only 25 square kilometres, in the vicinity of Mt Kosciuszko.

The broad shape of Australia has been influenced over long periods by earth movements associated with large tectonic processes. However, much of the detail has been carved by river erosion. A significant number of Australia's rivers, like the Diamantina River, drain inland. While they may be eroding their valleys near their highland sources, their lower courses are filling up with alluvium, and the rivers often end in salt lakes which are dry for most of the time. Other rivers reach the sea, and have dissected a broad near-coast region into plateaus, hills and valleys. Many of the features of the drainage pattern of Australia have a very long history, and some individual valleys have maintained their position for hundreds of millions of years. The salt lakes of the Yilgarn Plateau in Western Australia are the remnants of a drainage pattern that was active before continental drift separated Australia from Antarctica.

During the last ice age, sea level was more than 100 metres lower than it is today; the current outer reef area of the Great Barrier Reef would have been the coast at that time. The rivers tended to cut down to the lower level, especially towards the sea. When the sea level rose again, some of the lower valleys were drowned, making fine harbours—like Sydney Harbour—while others tended to fill with alluvium as the sea rose—making the typical lowland valleys around the Australian coast.

Coastal geomorphology is also largely the result of the accumulation of sediment in drowned coasts. In some areas, such as Ninety Mile Beach (Victoria) or the Coorong (South Australia), there are beaches made simply from this accumulation. In much of the east there is a characteristic alternation of rocky headland and long beach, backed by plains filled with river and marine sediments.

The offshore shape of Australia, revealed in isobath contours, results mainly from the pattern of break-up of the super-continent of which Australia was once a part. In some areas, such as the Great Australian Bight, there is a broad continental shelf bounded by a steeper continental slope. In other areas, like south-east New South Wales around Merimbula and much of the Tasmanian coastline, the continental shelf is very narrow, sometimes coming to within 20 nautical miles of the coast. The Queensland coast is bounded by a broad plateau on which the Great Barrier Reef has grown in only the last two million years. In South Australia, the continental shelf is grooved by submarine canyons.

The Australian landforms of today are thus seen to result from long continued processes in a unique setting, giving rise to typical Australian landscapes, which in turn provide the physical basis for the distribution and nature of biological and human activity in Australia.

Rivers and lakes

As can be inferred from the elevation and relief map (map 1.4), the rivers of Australia may be divided into two major classes: those of the coastal margins with moderate rates of fall, and those of the central plains with very slight fall. Of the rivers of the east coast, the longest in Queensland are the Burdekin and the Fitzroy, while the Hunter is the longest coastal river of New South Wales. The longest river system in Australia is the Murray–Darling which drains part of Queensland, the major part of New South Wales and a large part of Victoria, finally flowing

into the arm of the sea known as Lake Alexandrina, on the eastern side of the South Australian coast. The length of the Murray is about 2,520 kms, and the Darling and Upper Darling together are also just over 2,000 kms long. The rivers of the north-west coast of Australia, for example the Murchison, Gascoyne, Ashburton, Fortescue, De Grey, Fitzroy, Drysdale and Ord, are of considerable length. So also are those rivers in the Northern Territory, for example the Victoria and Daly, and those on the Queensland side of the Gulf of Carpentaria, such as the Gregory, Leichhardt, Cloncurry, Gilbert and Mitchell. The rivers of Tasmania have short and rapid courses, as might be expected from the configuration of the land.

There are many types of lake in Australia, the largest being drainage sumps from the internal rivers. In dry seasons, these lakes finally become beds of salt and dry mud. The largest are Lake Eyre 9,500 square kilometres, Lake Torrens 5,900 square kilometres and Lake Gairdner 4,300 square kilometres.

Other lake types are glacial, most common in Tasmania; volcanic crater lakes, predominantly in Victoria and Queensland; fault angle lakes, of which Lake George near Canberra is a good example; and coastal lakes formed by marine damming of valleys.

Climate of Australia

The island continent of Australia features a wide range of climatic zones, from the tropical regions of the north, through the arid expanses of the interior, to the temperate regions of the south.

Widely known as 'The Dry Continent', the land mass is relatively arid, with 80% having a median rainfall less than 600 mm per year and 50% less than 300 mm (the average is 450 mm). Seasonal fluctuations can be large, with temperatures ranging from above 50°C to well below zero. However, extreme minimum temperatures are not as low as those recorded in other continents, due to Australia's relatively low latitude, the lack of high mountains to induce orographic cooling (which is in the order of –0.6°C/100 m increase in elevation), and the large expanse of relatively warm surrounding oceans.

Although the climate can be described as predominantly continental, the insular nature of the land mass produces modifications to the general continental pattern.

Australia experiences many of nature's more extreme phenomena, particularly droughts, floods, tropical cyclones, severe storms and bushfires.

Climatic controls

The generally low relief of Australia is evident in the elevation and relief map (map 1.4). Compared to other continents, Australia causes little obstruction to the atmospheric systems which control the climate. A notable exception is the eastern uplands which modify the atmospheric flow, sometimes causing the 'Easterly Dip' which is evident in some surface pressure charts.

In the winter half of the year (May–October) anticyclones, or high pressure systems, pass from west to east across the continent and may remain almost stationary over the interior for several days. These anticyclones may be 4,000 kms wide and, in the Southern hemisphere, rotate anticlockwise. Northern Australia is thus influenced by mild, dry south-east winds, and southern Australia experiences cool, moist westerly winds. The westerlies, and the frontal systems associated with extensive depressions (lows, sometimes called extra-tropical cyclones) travelling over the Southern Ocean, have a controlling influence on the climate of southern Australia during the winter season, causing rainy periods. Periodic north-west cloud bands in the upper levels of the atmosphere over the continent may interact with southern systems to produce rainfall episodes, particularly over eastern areas. Cold outbreaks, particularly in south-east Australia, occur when cold air of Southern Ocean origin is directed northwards by intense depressions having diameters up to 2,000 kms. Cold fronts associated with the southern depressions, or with secondary depressions over the Tasman Sea, may produce strong winds and large day-to-day variations in temperature in southern areas, particularly in coastal regions.

In the summer half of the year (November–April) the anticyclones travel from west to east on a more southerly track across the southern fringes of Australia, directing easterly winds generally over the continent. Fine, warmer weather predominates in southern Australia with the passage of each anticyclone. Heat waves occur when there is an interruption to the eastward progression of the anticyclone ('blocking') and winds back northerly and later north-westerly. Northern Australia comes under the influence of summer disturbances associated with the southward intrusion of warm moist monsoonal air from north of the intertropical convergence

zone, resulting in a hot rainy season. Southward dips of the monsoonal low pressure trough sometimes spawn tropical depressions, and may prolong rainy conditions over northern Australia for up to three weeks at a time.

Tropical cyclones are strong, well-organised low pressure systems of tropical origin where average surface winds are expected to reach at least gale force (speed equivalent of 63–87 km/h)—gusts can be up to 50% higher than the average. Winds associated with severe tropical cyclones reach at least hurricane force (119 km/h)—the highest wind speed recorded in Australia was 267 km/h, which occurred with Tropical Cyclone Vance (March 1999). Tropical cyclones develop over the seas around northern Australia where sea surface temperatures exceed 26°C in summer. Interestingly, tropical cyclones do not usually form within 5° (or so) north or south of the Equator because the Coriolis Force associated with the rotation of the Earth is close to zero in this zone and this 'twist' is important for cyclone formation. Their frequency of occurrence and the tracks they follow vary greatly from season to season. On average, about three cyclones per season directly affect the Queensland coast, and about three affect the north and north-west coasts. Tropical cyclones approaching the coast usually produce very heavy rain and high winds in coastal areas. Some cyclones move inland, losing intensity but still producing widespread heavy rainfall and, occasionally, moderate to severe damage.

The climate of eastern and northern Australia is influenced by the Southern Oscillation (SO), a see-sawing of atmospheric pressure between the northern Australian/Indonesian region and the central Pacific Ocean. This Oscillation is one of the most important causes of climatic variation after the annual seasonal cycle over eastern and northern Australia. The strength of the SO is defined by the Southern Oscillation Index, which is a measure of the difference in sea level atmospheric pressure between Tahiti in the central Pacific and Darwin in northern Australia. At one extreme of the Oscillation, the pressure is abnormally high at Darwin and abnormally low at Tahiti. Severe and widespread drought over eastern and northern Australia generally accompanies this extreme. These conditions generally commence early in the year, last for about 12 months, and have a recurrence period of two to seven years.

The above extreme is sometimes immediately preceded or followed by the opposite extreme where pressures at Darwin are abnormally low and those at Tahiti are abnormally high. In this case, rainfall is generally above average over eastern and northern Australia.

The SO is linked to sea surface temperatures (SSTs) in the Pacific Ocean. Dry extreme SO years are accompanied by above normal SSTs in the central and/or eastern equatorial Pacific and vice versa. Dry extreme years are called El Niño years (El Niño is 'baby boy' in Spanish). Wet extreme years are called La Niña years (La Niña is 'baby girl'). Continuing research into the El Niño/La Niña phenomenon is revealing the connectivity between atmospheric circulation, sea surface temperatures, currents (surface as well as deep currents) and their interaction with the land masses. An article in *Chapter 1, Geography and climate* of *Year Book Australia 1998* provides further detail.

Rainfall and other precipitation

Annual

The area of lowest rainfall is in the vicinity of Lake Eyre in South Australia, where the median annual rainfall is only about 100 mm. Another very low rainfall area is in Western Australia in the region of the Giles–Warburton Range, which has a median annual rainfall of about 150 mm. A vast region, extending from the west coast near Shark Bay across the interior of Western Australia and South Australia to south-west Queensland and north-west New South Wales, has a median annual rainfall of less than 200 mm. This region is not normally exposed to moist air masses for extended periods and rainfall is irregular, averaging only one or two days per month. However, in favourable synoptic situations, which occur infrequently over extensive parts of the region, up to 400 mm of rain may fall within a few days and cause widespread flooding.

The region with the highest median annual rainfall is the east coast of Queensland between Cairns and Cardwell, where Happy Valley has a median of 4,436 mm (43 years from 1956 to 2000 inclusive) and Babinda a median of 4,092 mm (84 years from 1911 to 2000 inclusive). The mountainous region of western Tasmania also has a high annual rainfall, with Lake Margaret having a median of 3,565 mm (76 years to 1987 inclusive).

The Snowy Mountains area in New South Wales also has a particularly high rainfall. While there are no gauges in the wettest area, on the western slopes above 1,800 metres elevation, runoff data suggest that the median annual rainfall in parts of this region exceeds 3,000 mm. Small pockets with

median annual rainfall exceeding 2,500 mm also exist in the mountainous areas of north-east Victoria and some parts of the east coastal slopes. Map 1.5 shows average annual rainfall over the Australian continent.

Seasonal

As outlined earlier, the rainfall pattern of Australia is strongly seasonal in character with a winter rainfall regime in the south and a summer regime in the north.

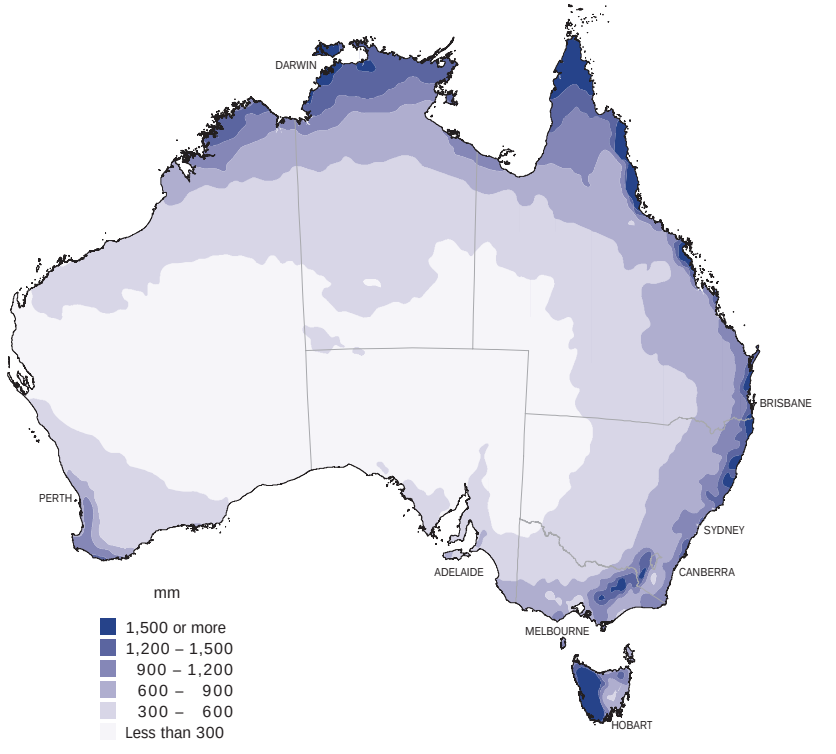
The dominance of rainfall over other climatic elements in determining the growth of specific plants in Australia has led to the development of a climatic classification based on two main parameters, median annual rainfall and the incidence of seasonal rainfall.

Evaporation and the concept of rainfall effectiveness are taken into account to some extent in this classification, by assigning higher median annual rainfall limits to the summer zones than to the corresponding uniform and winter zones. The main features of the seasonal rainfall are:

- marked wet summer (the 'Monsoon') and dry winter of northern Australia;
- wet summer and relatively dry winter of south-eastern Queensland and north-eastern New South Wales;
- uniform rainfall in south-eastern Australia—much of New South Wales, parts of eastern Victoria and southern Tasmania;
- marked wet winter and dry summer of south-west Western Australia and, to a lesser extent, much of the remainder of southern Australia directly influenced by westerly circulation (sometimes called a 'Mediterranean' climate); and
- arid area comprising about half the continent extending from the north-west coast of Western Australia across the interior and reaching the south coast at the head of the Great Australian Bight.

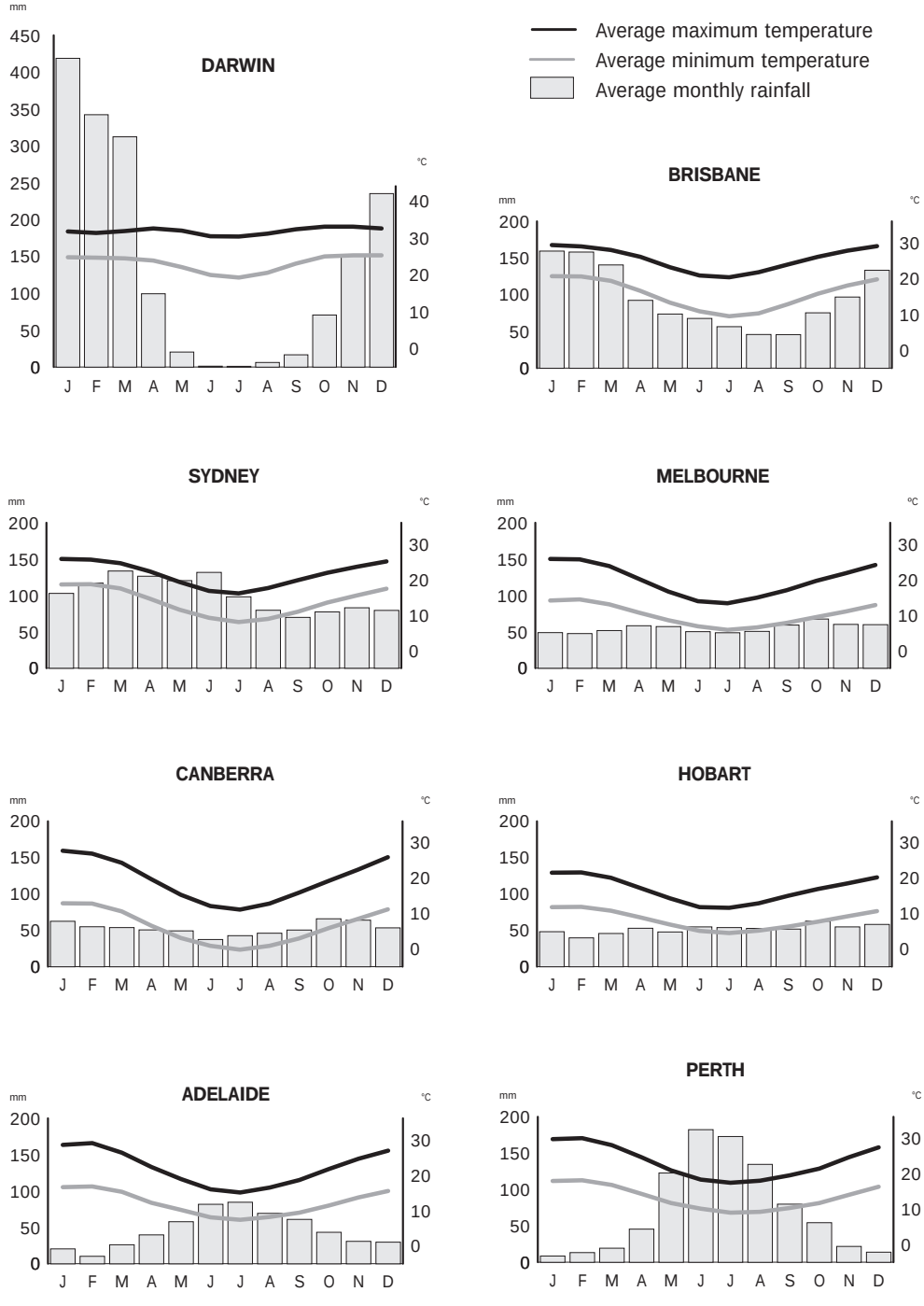
Figure 1.6 comprises individual graphs showing the monthly rainfall for all capital cities, as well as for Alice Springs and Davis Base in Antarctica.

1.5 AVERAGE ANNUAL RAINFALL

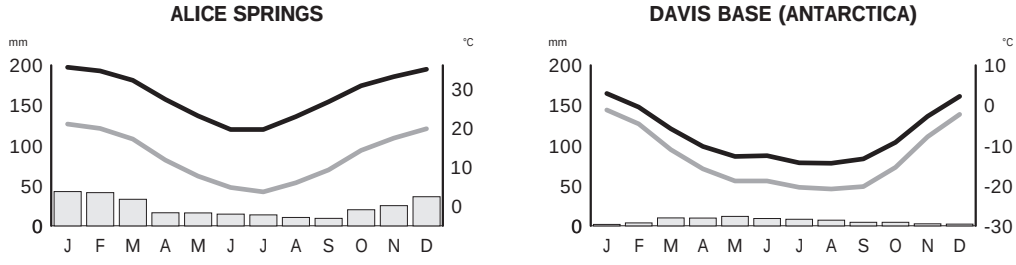


Source: Bureau of Meteorology.

1.6 MONTHLY RAINFALL(a) AND AVERAGE(a) MAXIMUM AND MINIMUM TEMERATURES, Capital Cities, Alice Springs and Davis Base, Antarctica



1.6 MONTHLY RAINFALL(a) AND AVERAGE(a) MAXIMUM AND MINIMUM TEMERATURES, Capital Cities, Alice Springs and Davis Base, Antarctica *continued*



(a) The number of years covered by the averages vary by location. The longest timespan of observations is 154 years for Brisbane; the shortest is 19 years for Adelaide.

Source: Bureau of Meteorology.

Darwin shows the rainfall distribution pattern typical of the wet summer and dry winter seen in far northern Australia, and Brisbane the wet summer/relatively dry winter typical of southeastern Queensland. By contrast, Adelaide and Perth show the wet winter/dry summer pattern whereas Sydney, Melbourne, Canberra and Hobart show a relatively uniform pattern of rainfall throughout the year. Alice Springs shows a low rainfall pattern throughout the year typical of arid inland areas.

Precipitation at Davis Base is mainly as snow, but is measured as water after melting. The pattern reflects the very low precipitation levels on the Antarctic continent.

Rainday frequency

A rainday occurs when more than 0.2 mm of rain falls in 24 hours, usually from 9 a.m. to 9 a.m. the next day. The frequency of raindays exceeds 150 per year in much of Tasmania (with a maximum of over 250 in western Tasmania), southern Victoria, parts of the north Queensland coast and in the extreme south-west of Western Australia. Over most of the continent the frequency is less than 50 raindays per year. The area of low rainfall with high variability, extending from the north-west coast of Western Australia through the interior of the continent, has less than 25 raindays per year. In the high rainfall areas of northern Australia, the number of raindays is about 80 per year, but heavier falls occur in this region than in southern regions.

Rainfall intensity

The values in table 1.7 represent intensities over only small areas around the recording points because turbulence and exposure characteristics of the measuring gauge may vary over a distance of a few metres. The highest 24 hour (9 a.m. to 9 a.m.) falls are listed in table 1.8. Most of the very high 24 hour falls (above 700 mm) have occurred in the coastal strip of Queensland, where a tropical cyclone moving close to mountainous terrain provides ideal conditions for spectacular falls.

1.7 HIGHEST RAINFALL INTENSITIES

Station	Period of record	Years of complete records	Period in hours: 1	3	6	12	24
			mm	mm	mm	mm	mm
Adelaide	1897–2000	96	59	133	141	141	141
Alice Springs	1951–1998	46	75	87	109	160	207
Brisbane	1911–1998	87	99	142	182	266	327
Broome	1948–2000	49	157	322	429	470	497
Canberra	1937–2000	40	40	57	67	76	135
Carnarvon	1956–2000	41	44	64	83	99	121
Charleville	1953–1999	42	48	75	88	118	142
Darwin (airport)	1953–2000	42	89	160	214	263	380
Esperance	1963–1998	31	39	50	51	76	86
Hobart	1911–1999	88	28	56	87	117	168
Meekatharra	1953–2000	42	60	67	81	111	120
Melbourne	1873–2000	107	75	91	91	97	130
Mildura	1953–2000	42	53	60	68	68	91
Perth	1946–1992	45	33	63	87	113	121
Sydney	1913–2000	83	120	191	197	244	340
Townsville	1953–1999	44	131	253	361	482	564

Source: Pluviograph records in Bureau of Meteorology archives.

1.8 HIGHEST DAILY RAINFALLS(a)

State/Territory	Amount mm	Date
New South Wales		
Dorrigo (Myrtle Street)	809	21.2.1954
Cordeaux River	573	14.2.1898
Victoria		
Tanybryn	375	22.3.1983
Club Terrace	285	24.6.1998
Queensland(b)		
Beerwah (Crohamhurst)	907	3.2.1893
Finch Hatton PO	878	18.2.1958
South Australia		
Motpena	273	14.3.1989
Nilpena	247	14.3.1989
Western Australia		
Roebourne (Whim Creek)	747	3.4.1898
Roebuck Plains	568	6.1.1917
Tasmania		
Cullenswood	352	22.3.1974
Mathinna	337	5.4.1929
Northern Territory		
Roper Valley Station	545	15.4.1963
Angurugu (Groote Eylandt)	513	28.3.1953
Australian Capital Territory		
Lambrigg	182	27.5.1925

(a) The standard daily rainfall period is 9 a.m. to 9 a.m.
(b) Bellenden Ker (Top Station) has recorded a 48 hour total of 1947 mm on 4–5 January 1979, including 960 mm from 3 p.m. on the 3rd to 3 p.m. on the 4th. No observation was made at 9 a.m. on the 4th.

Source: Bureau of Meteorology.

1.9 HIGHEST ANNUAL RAINFALLS

State/Territory	Station	Year	Amount mm
NSW	Tallowwood Point	1950	4 540
Vic.	Falls Creek SEC	1956	3 739
Qld	Bellenden Ker (Top Station)	1979	11 251
SA	Aldgate State School	1917	1 853
WA	Armadale (Jarrahdale PO)	1917	2 169
Tas.	Lake Margaret	1948	4 504
NT	Pirlangimpi	1998	2 762

Source: Bureau of Meteorology.

Thunderstorms and hail

A thunderday at a given location is a calendar day on which thunder is heard at least once. The average annual number of thunderdays varies from 88 per year near Darwin to less than 10 per year over parts of the southern regions. Convectional processes during the summer wet season cause high thunderstorm incidence in northern Australia. The generally high incidence of thunderdays (40–60 annually) over the eastern upland areas is caused mainly by orographic uplift of moist air streams.

Hail, mostly of small size (less than 10 mm diameter), occurs with winter-spring cold frontal activity in southern Australia. Summer thunderstorms, particularly over the uplands of eastern Australia, sometimes produce large hail (greater than 10 mm diameter). Large hail capable of piercing light-gauge galvanised iron occurs at irregular intervals and sometimes causes widespread damage.

Snow

Generally, snow covers much of the Australian Alps above 1,500 metres for varying periods from late autumn to early spring. Similarly, in Tasmania the mountains are covered fairly frequently above 1,000 metres in these seasons. The area, depth and duration are highly variable. Light snowfalls can occur in these areas at any time of year. In some years, snow falls in the altitude range of 500–1,000 metres. Snowfalls at levels below 500 metres are occasionally experienced in southern Australia, particularly in the foothill areas of Tasmania and Victoria, but falls are usually light and short lived. In some seasons, parts of the eastern uplands above 1,000 metres from Victoria to south-eastern Queensland have been covered with snow for several weeks. On sheltered slopes around Mount Kosciuszko (2,228 metres) small areas of snow may persist through summer, but there are no permanent snowfields.

Temperature

Average temperatures

Average annual air temperatures range from 28°C along the Kimberley coast in the extreme north of Western Australia to 4°C in the alpine areas of south-eastern Australia. Although annual temperatures may be used for broad comparisons, monthly temperatures are required for detailed analyses.

July is the month with the lowest average temperature in all parts of the continent. The months with the highest average temperature are January or February in the south and December in the north (except in the extreme north and north-west where it is November). The slightly lower temperatures of mid-summer in the north are due to the increase in cloud during the wet season.

Average monthly maximum and minimum temperatures for all capital cities, and also for Alice Springs and Davis Base in Antarctica, are shown in figure 1.6.

Temperatures in Darwin in tropical northern Australia are relatively constant throughout the year. In other cities, there is a greater seasonal variation between summer and winter months. The seasonal variation in temperature, as well as the difference between maximum and minimum value in any month, is greater for the inland cities of Canberra and Alice Springs than it is for the coastal cites, where proximity to the ocean moderates temperature extremes.

Average monthly maxima

In January, average maximum temperatures exceed 35°C over a vast area of the interior and exceed 40°C over appreciable areas of the north-west. The consistently hottest part of Australia in terms of summer maxima is around Marble Bar in Western Australia (150 kilometres south-east of Port Hedland) where the average is 41°C and daily maxima during summer may exceed 40°C consecutively for several weeks at a time.

In July, a more regular latitudinal distribution of average maxima is evident. Maxima range from 30°C near the north coast to 5°C in the alpine areas of the south-east.

Average monthly minima

In January, average minima range from 27°C on the north-west coast to 5°C in the alpine areas of the south-east. In July, average minima fall below 5°C in areas south of the tropics (away from the coasts). Alpine areas record the lowest temperatures; the July average low is –5°C.

Extreme maxima

The highest extreme maxima in Australia are recorded in two regions, the Pilbara and Gascoyne regions of north-western Western Australia, and a broad belt extending from south-western Queensland across South Australia into south-eastern Western Australia. Many stations in this region have exceeded 48°C. Extreme temperatures in this southern belt are higher than those further north, due to the long trajectory over land of hot north-west winds from northern Australia, and the lower moisture levels in summer compared with northern Australia.

Most other stations in mainland Australia, except those near parts of the Queensland or Northern Territory coasts or above 500 metres elevation, have extreme maxima between 43 and 48°C. Most Tasmanian stations away from the north coast have extreme maxima between 35 and 40°C. The lowest extreme maxima are found in northern Tasmania (e.g. 29.5°C at Low Head, near George Town) and at high elevations (e.g. 27.0°C at Thredbo (Crackenback)).

While high temperatures are more common inland than they are near the coast, the highest temperatures recorded differ little between the two, except in Queensland, the Northern Territory and northern Tasmania. Notable extreme maxima observed near the coast include 50.5°C at Mardie and 49.1°C at Roebourne in Western Australia, and 49.4°C at Whyalla and 47.9°C at Ceduna in South Australia.

Extreme maximum temperatures recorded at selected stations, including the highest recorded in each State/Territory, are shown in table 1.10.

1.10 EXTREME MAXIMUM TEMPERATURES

Station	°C	Date
New South Wales		
Wilcannia	50.0	11.1.1939
Victoria		
Swan Hill(a)	49.4	18.1.1906
Queensland		
Cloncurry(a)	53.1	16.1.1889
South Australia		
Oodnadatta	50.7	2.1.1960
Western Australia		
Mardie	50.5	20.2.1998
Tasmania		
Bushy Park(a)	40.8	26.12.1945
Hobart	40.8	4.1.1976
Northern Territory		
Finke	48.3	2.1.1960
Australian Capital Territory		
Canberra (Acton)	42.8	11.1.1939

(a) Under review due to possible faulty equipment.

Source: Bureau of Meteorology.

Extreme minima

The lowest temperatures in Australia have been recorded in the Snowy Mountains, where Charlotte Pass (elevation 1,760 metres) recorded –23.0°C on 28 June 1994 (see table 1.11). Outside the Snowy Mountains, the lowest extreme minima on the Australian mainland are found above 500 metres elevation in the tablelands and ranges of New South Wales, eastern Victoria and southern Queensland. Many stations in this region have recorded –10°C or lower, including –14.6°C at Gudgenby and –14.5°C at Woolbrook. Temperatures below –10°C have also been recorded in central Tasmania. At lower elevations, most inland places south of the tropics have extreme minima between –3 and –7°C, and such low temperatures have also occurred in favoured locations within a few kilometres of southern and eastern coasts, such as Sale (–5.6°C), Bega (–8.1°C), Grove (–7.5°C) and Taree (–5.0°C).

In the tropics, extreme minima below 0°C have been recorded at many places away from the coast, as far north as Herberton (–5.0°C). Some locations near tropical coasts, such as Mackay (–0.8°C), Townsville (0.1°C) and Kalumburu (0.3°C) have also recorded temperatures near 0°C. In contrast, some exposed near-coastal locations, such as Darwin, have never fallen below 10°C, and Thursday Island, in the Torres Strait, has an extreme minimum of 16.1°C.

1.11 EXTREME MINIMUM TEMPERATURES

Station	°C	Date
New South Wales		
Charlotte Pass	–23.0	18.6.1994
Victoria		
Mount Hotham	–12.8	30.7.1931
Queensland		
Stanthorpe	–11.0	4.7.1895
South Australia		
Yongala	–8.2	20.7.1976
Western Australia		
Booylgoo Springs	–6.7	12.7.1969
Tasmania		
Shannon	–13.0	30.6.1983
Butlers Gorge	–13.0	30.6.1983
Tarraleah	–13.0	30.6.1983
Northern Territory		
Alice Springs	–7.5	12.7.1976
Australian Capital Territory		
Gudgenby	–14.6	11.7.1971

Source: Bureau of Meteorology.

Heat waves

Periods with a number of successive days having a temperature higher than 40°C are relatively common in summer over parts of Australia. With the exception of the north-west coast of Western Australia, however, most coastal areas rarely experience more than three successive days of such conditions. The frequency increases inland, and periods of up to ten successive days have been recorded at many inland stations. This figure increases to more than 20 days in parts of western Queensland and north-west Western Australia. The central part of the Northern Territory and the Marble Bar–Nullagine area of Western Australia have recorded the most prolonged heat waves. Marble Bar is the only known station in the world where temperatures of more than 37.8°C (100°F) have been recorded on as many as 161 consecutive days (30 October 1923 to 7 April 1924).

Heat waves are experienced in the coastal areas from time to time. During 11–14 January 1939, for example, a severe heat wave affected south-eastern Australia: Melbourne had a record of 45.6°C on the 13th and Sydney a record of 45.3°C on the 14th.This heatwave also set record high temperatures in many other centres in New South Wales, Victoria and South Australia.

The Kimberley district of Western Australia is the consistently hottest part of Australia in terms of annual average maximum temperature. Wyndham, for example, has an annual average maximum of 35.6°C.

Other aspects of climate

Frost

The frequency of frost, which can cause serious losses of agricultural crops, depends on a number of factors. In coastal areas the relatively warm ocean temperatures ameliorate those on land, while distance from the Equator and elevation above sea level are major cooling influences. In addition, variations in topography can lead to local effects such as the accumulation of cold air in frost hollows. Hence frost hazard is greatest in areas which are away from the coast, are at relatively high elevations and have complex terrain which allows cold air drainage down slopes.

Parts of Australia most subject to frost are the eastern uplands from north-eastern Victoria to the western Darling Downs in southern Queensland where there may be more than ten nights a month with readings of 0°C (or under) for three to five months of the year. On Tasmania's Central Plateau similar conditions occur for three to six months of the year. Frosts may occur within a few kilometres of the coasts except in the Northern Territory and most of the north Queensland coasts.

Frosts may occur at any time of the year over most of Tasmania, large areas of the tablelands of New South Wales and much of inland Victoria, particularly the north-east. Frosts start in April and end in October over most of the interior of the continent, and on the highlands of Queensland as far north as the Atherton Plateau. Minimum temperatures below 0°C can be experienced in most of the subtropical interior in June and July.

The median frost period over the continent varies from over 200 days per year in the south-eastern uplands areas south of the Hunter Valley, to none in northern Australia. The annual frost period generally decreases from about 100 days inland to below 50 days towards the coast in the southern regions of the continent, but there is widespread local variation. In Tasmania the frost period exceeds 300 days on the uplands and decreases to 100 days near the coast.

Humidity

Australia is a dry continent in terms of the water vapour content or humidity of the air, and this element may be compared with evaporation to which it is related. Moisture content can be expressed by a number of parameters, of which the most commonly known is relative humidity. This can be thought of as the relative evaporating power of the air; when the humidity is low, a wet surface, like our skin, can evaporate freely. When it is high, evaporation is retarded. People can feel this as discomfort or even stress as the body's ability to perspire (and hence cool) decreases with increasing relative humidity. The combination of high temperature and high humidity is potentially dangerous for people who are active in such conditions.

The main features of the relative humidity pattern are:

- over the interior of the continent there is a marked dryness during most of the year, notably towards the northern coast in the dry season (May–October);
- the coastal fringes are comparatively moist, although this is less evident along the north-west coast of Western Australia where continental effects are marked;
- in northern Australia, the highest values occur during the summer wet season (December–February) and the lowest during the winter dry season (June–August); and
- in most of southern Australia the highest values are experienced in the winter rainy season (June–August) and the lowest in summer (December–February).

Global radiation

Global (short wave) radiation includes that radiation energy reaching the ground directly from the sun and that received indirectly from the sky, scattered downwards by clouds, dust particles, etc.

A high correlation exists between daily global radiation and daily hours of sunshine. On the north-west coast around Port Hedland, where average daily global radiation is the highest for Australia (640 milliwatt hours), average daily sunshine is also highest, being approximately ten hours. Sunshine is more dependent on variations in cloud coverage than is global radiation, since the latter includes diffuse radiation from the sky as well as direct radiation from the sun. An example is Darwin where, in the dry month of July, sunshine approaches twice that of the wet (cloudy) month of January, but global radiation amounts for the two months are comparable.

Sunshine

Sunshine here refers to bright or direct sunshine. Australia receives relatively large amounts of sunshine although seasonal cloud formations

have a notable effect on its spatial and temporal distribution. Cloud cover reduces both incoming solar radiation, and outgoing long wave radiation and thus affects sunshine, air temperature and other climatic elements on the Earth's surface.

Most of the continent receives more than 3,000 hours of sunshine a year, or nearly 70% of the total possible. In central Australia and the mid-west coast of Western Australia, totals slightly in excess of 3,500 hours occur. Totals of less than 1,750 hours occur on the west coast and highlands of Tasmania; this amount is only 40% of the total possible per year (about 4,380 hours).

In southern Australia, the duration of sunshine is greatest about December when the sun is at its highest elevation, and lowest in June when the sun is lowest. In northern Australia, sunshine is generally greatest over the period August to October prior to the wet season, and least over the period January to March during the wet season.

Cloud

Seasonal changes in cloudiness vary with the distribution of rainfall. In the southern parts of the continent, particularly in the coastal and low-lying areas, the winter months are generally more cloudy than the summer months. This is due to the formation of extensive areas of stratiform cloud and fog during the colder months, when the structure of the lower layers of the atmosphere favours the physical processes resulting in this type of cloud. Particularly strong seasonal variability of cloud cover exists in northern Australia where skies are clouded during the summer wet season and mainly cloudless during the winter dry season. Cloud coverage is greater near coasts and on the windward slopes of the eastern uplands of Australia and less over the dry interior.

Fog

The formation of fog depends on the occurrence of favourable meteorological elements—mainly temperature, humidity, wind and cloud cover. The nature of the local terrain is important for the development of fog and there is a tendency for this phenomenon to persist in valleys and hollows. The incidence of fog may vary significantly over distances as short as one kilometre.

Fog in Australia tends to be more common in the south than the north, although parts of the east coastal areas are relatively fog-prone even in the tropics. Incidence is much greater in the colder months, particularly in the eastern uplands. Fog may persist during the day, but rarely until the afternoon over the interior. The highest fog incidence at a capital city is at Canberra which has an average of 47 days per year on which fog occurs, 29 of which are in the period May to August. Brisbane averages 20 days of fog per year. Darwin averages only two days per year, in the months of July and August.

Winds

The mid-latitude anticyclones are the chief determinants of Australia's two main prevailing wind streams. In relation to the west-east axes of the anticyclones these streams are easterly to the north and westerly to the south. The cycles of development, motion and decay of low-pressure systems to the north and south of the anticyclones result in diversity of wind-flow patterns. Wind variations are greatest around the coasts where diurnal land and sea-breeze effects are important.

Orography affects the prevailing wind pattern in various ways, such as the channelling of winds through valleys, deflection by mountains and cold air drainage from highland areas. An example of this channelling is the high frequency of north-west winds at Hobart caused by the north-west to south-east orientation of the Derwent River Valley.

Perth is the windiest capital with an average wind speed of 15.6 km/h; Canberra is the least windy with an average wind speed of 5.4 km/h.

The highest wind speeds and wind gusts recorded in Australia have been associated with tropical cyclones. The highest recorded gust was 267 km/h at Learmonth, Western Australia on 22 March 1999 (occurring with Tropical Cyclone Vance); gusts reaching 200 km/h have been recorded on several occasions in northern Australia with cyclone visitations. The highest gusts recorded at Australian capitals were 217 km/h at Darwin and 156 km/h at Perth.

Droughts

Drought, in general terms, refers to an acute deficit of water supply to meet a specified demand. The best single measure of water availability in Australia is rainfall, although parameters such as evaporation and soil moisture are significant, even dominant in some situations. Demands for water are very diverse, hence the actual declaration of drought conditions for an area will generally also depend on the effects of a naturally occurring water deficit on the principal local industries.

Since the 1860s there have been ten major Australian droughts. Some of these major droughts could be described as periods consisting of a series of dry spells of various lengths, overlapping in time and space, and totalling up to about a decade. The drought periods of 1895–1903 (the so-called 'Federation drought'), 1958–68, 1982–83 and 1991–95 were the most devastating in terms of their extent and effects on primary production. The latter drought resulted in a possible $5b cost to Australia's economy, and $590m in drought relief by the Commonwealth Government. The remaining major droughts occurred in 1864–66 (and 1868), 1880–86, 1888, 1911–16, 1918–20 and 1939–45.

In this same period, several droughts of lesser severity caused significant losses over large areas of some States. They occurred in 1922–23 and 1926–29, 1933–38, 1946–49, 1951–52, 1970–72, 1976 and 1997–2000.

South-eastern Australia (New South Wales, southern Queensland, Victoria, Tasmania and the settled parts of South Australia) contains about 75% of the nation's population, and droughts affecting this region have a markedly adverse impact on the economy. There have been nine severe droughts in south-eastern Australia since 1888, and these were encompassed within the major Australian droughts specified above, except for the severe drought in 1972. Drought definitions, and the area of coverage and length of droughts, together with related information, may be obtained from *Year Book Australia 1988*.

Floods

Widespread flood rainfall may occur anywhere in Australia, but it has a higher incidence in the north and in the eastern coastal areas. It is most economically damaging along the shorter streams flowing from the eastern uplands eastward to the seaboard of Queensland and New South Wales. These flood rains are notably destructive in the more densely populated coastal river valleys of New South Wales—the Tweed, Richmond, Clarence, Macleay, Hunter and Nepean–Hawkesbury—all of which experience relatively frequent flooding. Although chiefly caused by summer rains, they may occur in any season.

The great Fitzroy and Burdekin river basins of Queensland receive flood rains during the summer wet seasons. Much of the run-off due to heavy rain in north Queensland west of the eastern uplands flows southward through the normally dry channels of the network of rivers draining the interior lowlands into Lake Eyre. This widespread rain may cause floods over an extensive area, but it soon seeps away or evaporates, occasionally reaching the lake in quantity. The Condamine and other northern tributaries of the Darling also carry large volumes of water from flood rains south through western New South Wales to the Murray, and flooding occurs along their courses at times.

Flood rains occur at irregular intervals in the Murray–Murrumbidgee system of New South Wales and Victoria, the coastal streams of southern Victoria and the north coast streams of Tasmania.

Water resources

Rainfall, or the lack of it, is the most important single factor determining land use and rural production in Australia. The scarcity of both surface and ground water resources, together with the low rates of precipitation which restrict agriculture (quite apart from economic factors), has led to extensive programs to regulate supplies by construction of dams, reservoirs, large tanks and other storages.

The major topographical feature affecting the rainfall and drainage patterns in Australia is the absence of high mountain barriers. Australia's topographical features encompass sloping tablelands and uplands along the east coast Main Divide, the low plain and marked depression in the interior, and the Great Western Plateau.

Only one-third of the Australian land area drains directly to the ocean, mainly on the coastal side of the Main Divide and inland with the Murray–Darling system. With the exception of the latter, most rivers draining to the ocean are comparatively short, but account for the majority of the country's average annual discharge. Surface drainage is totally absent from some arid areas of low relief.

Australia's large area (just under 7.7 million square kilometres) and latitudinal range (3,680 kms) have resulted in climatic conditions ranging from alpine to tropical. Two-thirds of the continent are arid or semi-arid, although good rainfalls (over 800 mm annually) occur in the northern monsoonal belt under the influence of the Australian–Asian monsoon, and along the eastern and southern highland regions under the influence of the great atmospheric depressions of the Southern Ocean. The effectiveness of the rainfall is greatly reduced by marked alternation of wet and dry seasons, unreliability from year to year, high temperatures and high potential evaporation.

The availability of water resources controls, to a large degree, the possibility and density of settlement; this in turn influences the quality of the water through production and disposal of waste. Most early settlements were established on the basis of reliable surface water supplies and, as a result, Australia's population is concentrated along the coast, mainly in the comparatively fertile, well-watered east, south-east and far south-west.

As settlement spread into the dry inland grazing country, the value of reliable supplies of underground water was realised. Observations of the disappearance of large quantities of the rainfall precipitated on the coastal ranges of eastern Australia eventually led to the discovery of the Great Artesian Basin, which has become a major asset to the pastoral industry. Development, however, has not been without costs. Significant environmental degradation and deterioration in water quality are becoming evident. Table 1.12 summarises Australia's major ground water resources.

Permanent rivers and streams flow in only a small part of the continent. The average annual discharge of Australian rivers has been assessed at 397 million megalitres, of which 100 million megalitres are now estimated to be exploitable on a sustained yield basis. This is small in comparison with river flows on other continents.

In addition, there is a pronounced concentration of run-off in the summer months in northern Australia, while the southern part of the continent has a distinct, if somewhat less marked, winter maximum.

Even in areas of high rainfall, large variability in flow means that, for local regional development, most streams must be regulated by surface storage. However, in many areas evaporation is so great that storage costs are high in terms of yield. Extreme floods also add greatly to the cost of water storage, because of the need for adequate spillway capacity.

Table 1.13 provides a broad comparison of rainfall and run-off by continent. Map 1.14 shows the location of Australia's Drainage Divisions, and table 1.15 summarises Australia's surface water resources by Drainage Division. The Drainage Division with the highest intensity of run-off is Tasmania with 13% of the total from only 0.8% of the area. Conversely, the vast area of the Western Plateau (2,450,000 square kilometres, approximately 32% of Australia) has no significant run-off at all.

1.12 AUSTRALIA'S MAJOR GROUND WATER RESOURCES, By State/Territory

		Ground water resource					
		Major divertible resource					
State/Territory	Area of aquifers km^2	Fresh GL	Marginal GL	Brackish GL	Saline GL	Total GL	Abstraction during 1983–84 GL
New South Wales	595 900	881	564	431	304	2 180	242
Victoria	103 700	469	294	69	30	862	146
Queensland	1 174 800	1 760	683	255	144	2 840	962
South Australia	486 100	102	647	375	86	1 210	504
Western Australia	2 622 000	578	1 240	652	261	2 740	355
Tasmania	7 240	47	69	8	—	124	5
Northern Territory	236 700	994	3 380	43	10	4 420	24
Australia	**5 226 440**	**4 831**	**6 877**	**1 833**	**835**	**14 376**	**2 238**

Source: Australian Water Resources Council, 1987.

1.13 RAINFALL AND RUN-OFF OF THE CONTINENTS

Continent	Area km^2	Average yearly rainfall mm	Run-off mm	Run-off %	Run-off km^3
Africa	30 300 000	690	260	38	7 900
Asia	45 000 000	600	290	48	13 000
Australia	7 700 000	465	57	12	440
Europe	9 800 000	640	250	39	2 500
North America	20 700 000	660	340	52	6 900
South America	17 800 000	1 630	930	57	16 700

Source: Department of Resources and Energy, 1983.

1.14 LOCATION OF DRAINAGE DIVISIONS

Source: Australian Water Resources Council, 1987.

1.15 SURFACE WATER RESOURCES, By Drainage Division

				Surface water resource					
				Major divertible resource					
Drainage division	Area	Mean annual run-off	Mean annual outflow	Fresh	Marginal	Brackish	Saline	Total	Developed resource
	km^2	GL	GL	GL	GL	GL	GL	GL	GL
North-East Coast	451 000	83 900	83 900	22 900	—	—	—	22 900	3 540
South-East Coast	274 000	41 900	41 900	14 700	236	113	16	15 100	4 280
Tasmania	68 200	52 900	52 900	10 900	—	—	—	10 900	1 020
Murray—Darling	1 060 000	24 300	12 200	12 300	42	32	—	12 400	10 000
South Australian Gulf	82 300	877	767	160	71	34	4	269	118
South-West Coast	315 000	6 670	6 600	1 390	466	894	164	2 870	385
Indian Ocean	519 000	3 960	3 840	235	50	7	4	295	27
Timor Sea	547 000	80 700	80 700	22 000	—	—	—	22 000	1 980
Gulf of Carpentaria	641 000	92 500	92 500	13 200	—	—	—	13 200	78
Lake Eyre	1 170 000	6 310	—	204	—	—	—	204	26
Bulloo—Bancannia	101 000	1 090	—	41	—	—	—	41	—
Western Plateau	2 450 000	1 580	—	102	—	—	—	102	—
Total(a)	**(b)7 680 000**	**397 000**	**375 300**	**98 100**	**870**	**1 080**	**190**	**100 000**	**21 500**

(a) Totals rounded. (b) Total area differs slightly from that in table 1.1, due to improvements in mapping reflected in that table, but not in this table from an earlier source.

Source: Australian Water Resources Council, 1987.

To summarise, the mean annual run-off across Australia is 397 million megalitres. As table 1.13 shows, the portion of run-off able to be diverted for use is very low compared to that in other continents, and results from the high variability of stream flow, high rates of evaporation and the lack of storage sites on many catchments. On an Australia-wide basis, only 21.5% of the divertible resource has currently been developed for use; much of the remaining resource is available in remote regions where development is impractical and uneconomic. In areas such as the Murray–Darling Division, where water is scarce, there are few resources not yet developed, and management is focusing on greater efficiency in water use.

Water resources are assessed within a framework comprising four levels:

- the *total* water resource is the volume of water present in the environment, measured as mean annual run-off for surface water, and mean annual recharge for ground water;
- the *divertible* resource is the portion of run-off and recharge which can be developed for use;
- the *developed* resource is the portion of the divertible resource which has been developed for use; and
- resource *utilisation* is a measure of the portion of the developed resource which is actually used.

Emphasis is given to the second level of assessment, the divertible resource, as the prime measure of the resource. The divertible resource is defined as the average annual volume of water which, using current technology, could be removed from developed or potential surface water or ground water sources on a sustained basis, without causing adverse effects or long-term depletion of storages.

Australia's water resources are managed by a large number of resource management agencies, irrigation authorities, metropolitan water boards, local government councils and private individuals. State authorities dominate the assessment and control of water resources as, under the Commonwealth Constitution, primary responsibility for management of water rests with the individual State Governments. The Commonwealth Government is responsible for matters relating to the Territories, and participates indirectly through financial assistance or directly in the coordination or operation of interstate projects through bodies such as the Murray–Darling Basin Commission.

A description of the management, main storage and use of water resources across the States and Territories is contained in the chapter *Water resources* in the 1994 and earlier editions of Year Book Australia.

Bibliography

Australian Bureau of Statistics, *Year Book Australia 1988*, Special Article on *Drought*.

Australian Water Resources Council 1987, *1985 Review of Australia's Water Resources and Water Use, Volume 1: Water Resources Data Set*, Department of Primary Industries and Energy, AGPS, Canberra.

Bureau of Meteorology:

—1988, *Climatic Averages, Australia*, Canberra.

—1989a, *Climate of Australia*, Canberra.

—1989b, *Selected Rainfall Statistics, Australia*, Canberra.

—2000, *Climatic Atlas of Australia: Rainfall*, Canberra.

Encyclopaedia Britannica.

Parkinson, G. (ed.) 1986, *Climate, Atlas of Australian Resources*, Volume 4.

Stern, H., de Hoedt, G. and Ernst, J. 2000, "Objective classification of Australian climates", *Aust. Met. Mag*. 49. 87–96.

World Book Encyclopedia.

Internet sites

ACT Electricity and Water, *http://www.actew.com.au*

Australian Surveying and Land Information Group (AUSLIG), *http://www.auslig.gov.au*

Bureau of Meteorology, *http://www.bom.gov.au*

Bureau of Rural Sciences, *http://www.affa.gov.au/outputs/ruralscience.html*

Department of Natural Resources and Environment, Victoria, *http://www.nre.vic.gov.au*

Department of Primary Industries, Water and Environment, Tasmania, *http://www.dpiwe.tas.gov.au*

NSW Department of Land and Water Conservation, *http://www.dlwc.nsw.gov.au*

Queensland Department of Natural Resources, *http://www.dnr.gov.au/longpdk*

South Australia Department of Primary Industry and Resources, *http://www.pir.sa.gov.au*

Water and Power Authority, Northern Territory, *http://www.nt.gov.au/pawa*

Water and Rivers Commission, Western Australia, *http://www.wrc.wa.gov.au*

Western Australia Department of Agriculture, *http://www.agric.wa.gov.au*

A hundred years of science and service—Australian meteorology through the twentieth century

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Introduction

Australia's weather and climate inspired the dreamtime legends of its first inhabitants and shaped its development as an infant nation. The violent thunder squalls which greeted the First Fleet as they rounded Van Dieman's Land provided a foretaste of worse to come, and the shipwrecks which soon littered the southern coastline reminded recent arrivals from Europe, if reminder were needed, of the ferocity of the storms which swept in without warning from the southern ocean. The extremely dry conditions in the early years at Sydney Cove (Tench 1789; Nicholls 1988) exacerbated the trauma of the starvation years (Hughes 1987). And the nineteenth century manifestations of what we now know as El Niño and the Southern Oscillation soon brought the droughts and flooding rains that wrought great hardship on the early settlers and established, in prose and verse, the enduring images of the Australian bush.

Meteorology has a proud place in the early life of the colonies and the birth of the Federation. Australia's meteorological pioneers established observing networks throughout the length and breadth of the continent, and collected the data needed to map the climate of the interior and develop a scientific basis for forecasting of events as diverse as the southerly busters of the NSW coast and the monsoon rains and cyclones of the tropical north. Nothing mattered quite so much in the preparations for the opening of the first Federal Parliament in Melbourne as the timing of the arrival of the deep depression which threatened to add fierce wintery squalls and driving rain to the pageantry of the occasion.

That Parliament was subsequently to put in place the legislation which led to the establishment of the Commonwealth Bureau of Meteorology by bringing together the separate colonial/State Meteorological Services that had existed up to that time, in an arrangement which has provided Australia with one of the most effective national meteorological service systems in the world. The remarkable advances that have occurred in the science and practice of meteorology through the twentieth century have greatly reduced the toll of natural disasters and brought enormous benefits to virtually all walks of life. They have laid the foundation for even greater benefits from meteorological science and services in the twenty-first century.

The origins of Australian meteorology

Meteorology, along with astronomy, is one of the oldest sciences we have. Although the systematic study of Australia's weather and climate began with the arrival of the First Fleet in January 1788, the origins of Australian meteorology go back long before the time of European settlement to the observations, belief systems and lifestyle of the Aborigines who, over a period of 40,000 years or more, had witnessed the retreat of the last ice age and learned to live with the rhythm of the seasons and the extremes of weather and climate.

In the beginning

All the weather and climate phenomena we know today played a part in the lives of the early inhabitants of the Australian continent. But in different parts of Australia there were different names and different explanations for the various atmospheric forces—thunder, lightning, rainbows, clouds and winds—and the march of the seasons. The peoples of Arnhem Land defined the seasons in terms of the 'balmarrk wana' or 'big winds' with the wet season brought on by barra the north-west monsoon (Jones and Meehan 1997). The Aboriginal people of central Australia developed a very different understanding of the seasons, and their influence on the land and its animals and plants. Further south in Tasmania, they had learned to recognise the signs of changing weather and to make use of fire for protection against the cold.

Much of the modern understanding of the Aboriginal interpretation of weather and climate in various parts of Australia has been captured in a series of writings and paintings by anthropologist Charles P. Mountford, and artist Ainslie Roberts (figure C2.1).

C2.1 The Sound of Lightning: a Dreamtime Legend depicted by artist Ainslie Roberts. The Aborigines of northern Australia have a number of myths that explain the thunder, the lightning, the wet-season clouds and the rain. In the wet season, the thunder man Mamaragan, roaring with laughter, beats the great stones of the sky together. His laughter is the rolling thunder, the sharper crack of lightning is the sound of the stones striking each other and the lightning is the sparks flying from them. The rain caused by this disturbance falls to the thirsty earth and gives life and food to mankind and all other creatures.

Australia's meteorological pioneers

The foundations of Australia's meteorological records were laid at Sydney Cove by Lieutenant William Dawes who built a small observatory there and commenced regular observations in September 1788 (McAfee 1978). While participating fully in local exploration and other aspects of the early life of the colony, Dawes maintained his observations with great dedication, often making readings up to six times per day, through until December 1791, shortly before he returned prematurely to England, having incurred the displeasure of the Governor for his refusal to participate in reprisal raids against the Aborigines.

Following Dawes' departure, the systematic collection of meteorological observations in the colony lapsed until the arrival of the soldier-scientist, Sir Thomas Brisbane, as Governor. He established an observatory at Parramatta where records were maintained from 1822 until 1826. The next systematic series of observations in the Sydney area was begun in 1832 by Commander Phillip Parker King, who had already, in 1822, published the first description of Australian climate *On the maritime geography of Australia*. These were maintained through only until 1848. However, in 1858 continuous observations recommenced at the newly constructed Sydney Observatory on what is now known as Observatory Hill. Meteorological observations were also commenced at other locations in New South Wales, including at Port Macquarie (1840), and in Adelaide (1839), Brisbane (1840), Hobart (1841), Melbourne (1856) and Perth (1876).

The first thorough study of the Australian climate was published in 1859 by William Stanley Jevons, a gold assayer at the Sydney Branch of the Royal Mint who was subsequently to make major contributions in the fields of logic, statistics and economics and who has been variously described as Australia's first social scientist and "one of the greatest Englishmen of the nineteenth century". Jevons' 52-page study of the climate of Australia and New Zealand covers the general characteristics of Australian temperature and rainfall and patterns of drought and flood. Among the achievements of his pioneering study, he correctly recognised the highly variable nature and spatial coherence of Australian rainfall (Nicholls 1998).

C2.2 The meteorological stand of Georg von Neumayer's Flagstaff Observatory established in Melbourne in 1856.

At about the same time as Jevons was beginning his studies, a series of remarkable figures arrived on the Australian meteorological landscape (Gibbs 1975). In Melbourne, Georg von Neumayer, a young Bavarian ship's officer, established an observatory at Flagstaff Hill in 1856 (figure C2.2) and maintained a meticulously compiled set of meteorological observations until he left Australia in 1863, when his work was taken over by Robert Ellery. In 1855, Charles Todd, aged 30, arrived in Adelaide from Cambridge as Superintendent of Telegraphs. Over the succeeding decades he constructed telegraph lines to New South Wales, Victoria and Darwin, establishing meteorological stations all the way. He organised the realtime collection of the data by telegraph and began the preparation of synoptic maps.

With the ability to collect meteorological data by telegraph established, the 1870s, 80s and 90s saw the increasing use of synoptic charts of pressure, wind, temperature and rainfall for daily weather forecasting. On 5 February 1877 the NSW Government Meteorologist, Henry Chamberlain Russell, published Australia's first newspaper weather map. Russell went on to become one of the leading scientific figures in the colony, becoming the first President of the then Australasian Association for the Advancement of Science in 1888. Clement Wragge was appointed Government Meteorologist in Brisbane in 1887 and quickly emerged as the most colourful and controversial meteorologist on the Australian scene. He also became involved in controversial experiments in rainmaking and introduced the practice of naming Southern Ocean storms and tropical cyclones, initially after mythological figures, but later after politicians who incurred his displeasure.

The lead-up to Federation

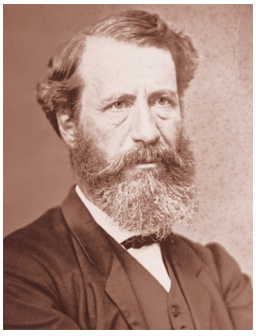
Already by the 1870s, the need for standardisation and coordination of data collection was becoming apparent, and intercolonial meteorological conferences were held in Sydney in 1879 and in Melbourne in 1881 and 1888 aimed at achieving national uniformity in observational practices, improving the telegraphic collection of weather bulletins and ensuring that weather forecasts and bulletins issued by the separate colonial observatories were confined to their own colonies. By and large, these arrangements worked well. Only Clement Wragge in Queensland continued to defy the understandings reached, and despatched his forecasts far and wide throughout Australia. It was becoming clear, however, that the weather did not recognise the colonial boundaries and that meteorology should become a Commonwealth function on Federation. Because of the long-standing links between the meteorological and astronomical activities of the colonies, astronomy was eventually included along with meteorology in the provision of Section 51 (viii) of the Constitution that the Commonwealth Parliament would have the power to make laws "for the peace, order and good government of the Commonwealth with respect to...astronomical and meteorological observations".

Australia's meteorological pioneers

William Dawes *arrived in Australia with the First Fleet as a Lieutenant in the Royal Marines, having served in the American War of Independence, and subsequently pursued studies in engineering and surveying. Equipped with meteorological and astronomical books and instruments provided by the Royal Astronomer, he immediately began construction of an observatory at what is now known as Dawes Point, near the southern pylon of the Harbour Bridge. Dawes' meteorological journal provides a detailed chronology of the early weather of the colony from September 1788 until his departure for England in December 1791.*

Thomas Brisbane *arrived in Sydney as Governor of NSW in 1821 and, building on his scientific background (he was a graduate of the University of Edinburgh) and a deep interest in meteorology and navigation, acquired during his many sea voyages, he immediately established a meteorological and astronomical observatory at his own expense at Parramatta. He maintained detailed observations at Parramatta from 1822 until he left the Colony in 1824. While in Sydney, he founded the Philosophical Society of Australia for the presentation of scientific papers in meteorology and other fields.*

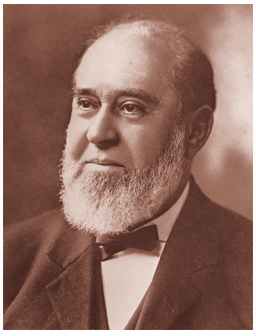
Charles Todd *became Superintendent of Telegraphs and Government Astronomer and Meteorologist in South Australia in 1855 at the age of 30. By 1858 he had completed telegraph links to Victoria and NSW and, by 1872, the overland telegraph to Darwin. As Superintendent of Telegraphs, he made it a duty of all his telegraph operators to make and transmit meteorological observations and he had soon established extensive observing networks throughout South Australia and the Northern Territory, and into Western Australia. Elected a Fellow of the Royal Society of London in 1869, he played a leading role in the scientific life of South Australia, even after his formal retirement, until his death in 1909.*



Georg von Neumeyer *a Bavarian Ship's Officer who had obtained his doctorate at Munich in 1849, first arrived in Melbourne in 1852. Convinced of the importance of meteorology, he returned to Europe in 1854 and obtained the instruments necessary to establish an observatory in Melbourne. Initially working as a private citizen, he established a number of observing stations throughout Victoria, mainly at lighthouses. In 1859, he was appointed as Government Astronomer. He gradually built up the observatory recruiting, inter alia, W. J. Wills who was subsequently to perish in the ill-fated Burke and Wills expedition. Neumeyer played a leading role in the early scientific life of Melbourne before returning again to Europe in 1863.*

Robert Ellery *arrived in Melbourne in 1852 and set up practice as a doctor at Williamstown where he established an observatory in 1853. Following Neumayer's departure from Australia in 1863, he was appointed as Government Astronomer and Meteorologist. He expanded the Victorian observing networks and began collecting observations by telegraph from further afield as a basis for the preparation of daily synoptic charts which first appeared in the Melbourne Argus in September 1881. Ellery became a leading figure in the Melbourne scientific community and served for almost 20 years as President of the Royal Society of Victoria.*

Clement Wragge *arrived in Australia from England as a seaman at a young age and, after some years in New South Wales and Queensland, left for the US, but returned to South Australia and came under the influence of Sir Charles Todd. He returned to England in 1878 and established the Ben Nevis Observatory in Scotland in 1881. Back in Australia, he established observatories on Mt Lofty (SA), Mt Wellington (Tasmania) and Mt Kosciusko (NSW) before being appointed Queensland Government Meteorologist in 1887. From there he began issuing weather maps and forecasts for the whole of Australia. When passed over for the post of Commonwealth Meteorologist in 1907 he moved to Auckland and established a private weather service.*



Henry Chamberlain Russell *was Australia's first native born Government Meteorologist, the first graduate of Sydney University to be elected a Fellow of the Royal Society, and the first President of the Australasian Association for the Advancement of Science. After his permanent appointment as Government Astronomer and Meteorologist in 1870 he initiated a rapid expansion of the observing networks throughout New South Wales. In July 1877 he issued the first synoptic chart published in an Australian newspaper, and in 1879 he convened the first of the intercolonial meteorological conferences aimed at achieving uniformity in data collection. He wrote extensively on scientific matters and was the first to describe the behaviour of the migratory southern hemisphere anticyclones. He retired in 1905.*

Meteorology in the twentieth century

Although meteorological influences had shaped the development of the colonies through most of the nineteenth century and the Centennial Drought of 1888, which had followed several decades of generally plentiful rains, was still fresh in the minds of the participants in the Constitutional debates, these paled into insignificance with the onset of the Federation Drought and the inauguration of the Commonwealth on the first day of the new century.

The forecast for the First Parliament

Unlike Posts and Telegraphs and some other former colonial functions, the responsibility for meteorology did not automatically transfer to the Commonwealth on 1 January 1901. It was thus some time before the new meteorological arrangements could be negotiated, and none of the necessary understandings were in place in time for the opening of the First Parliament in Melbourne on 9 May 1901. The most ominous forecasts over the previous week, and right up to the day before the opening, came from Clement Wragge in Brisbane: "Fierce westerly squalls with driving rain are (now) tearing through the channel between Cape Otway and Flinders Island, and the Federal Parliament will be opened amid the blustering grandeur of a blow from Antarctica". His South Australian and Victorian counterparts had been more optimistic early, but eventually conceded the possibility of showers (Souter 1988). In the event, the crowds who lined the streets of Melbourne to greet the royal procession on its way to the opening ceremony were well and truly wind blown, if not completely drenched. Wragge felt vindicated.

The Meteorology Act 1906

Difficult negotiations lay ahead. Not all of the State Governments were happy at the prospect of transferring their meteorological records, facilities and staff to the Commonwealth, and a conference in Adelaide in May 1905 failed to reach agreement, with several States arguing that, while there should be a central Commonwealth institution for theoretical meteorology, the collection of data and provision of services should remain with the State Meteorologists. In the end, the Premiers' Conference of April 1906 agreed that there should be a single Federal Meteorological Department responsible for both science and services meeting the needs of both the Commonwealth and the States. The Premiers also resolved "that the (State) astronomical and meteorological departments be transferred to the Commonwealth together".

The Minister for Home Affairs and father of the House, the Hon. William H. Groom, introduced the Bill for a Meteorology Act into the House of Representatives on 1 August 1906. There was a high level of bipartisan support for the proposed consolidation of meteorological functions, with debate centering mainly on whether the astronomical function should be taken over by the Commonwealth at the same time (it was not) and on whether some local meteorological functions should remain with the States (they were not). Future Prime Minister Joseph Cook was forthright in stressing the importance of a unified federal service and the benefits that would result from its establishment.

The expectations of the proposed Meteorological Department were high. In the words of the member for Echuca (Mr James McColl): "In our present complex civilisation where interests are so inter involved and worldwide, the discovery and formulation of laws governing the weather are of first importance. To obtain an accurate meteorological system throughout Australia, the government would be justified in incurring almost any expenditure. To all sections of the community the matter is one of great importance—to those interested in commerce, transportation, navigation, agriculture, and trade of all descriptions. In short, it concerns everybody whose living and comfort depend upon the seasons and upon the weather".

The *Meteorology Act 1906*, establishing the position of Commonwealth Meteorologist, setting down the functions of what was soon to become known as the Commonwealth Bureau of Meteorology, and authorising the conclusion of arrangements for transfer to the Commonwealth of the meteorological records and facilities of the States, received Royal Assent on 28 August 1906.

The birth of the Bureau

The Bureau of Meteorology formally commenced operation on 1 January 1908 under the first Commonwealth Meteorologist, Henry Hunt, who had been appointed in 1907 ahead of the controversial Queenslander Clement Wragge. The Bureau was housed in the 'Frosterly' building at the corner of Victoria and Drummond Streets, Carlton (figure C2.3), a home which was to serve as its national headquarters until it consolidated its by then dispersed Melbourne operations in a new high rise building at 150 Lonsdale St in 1974.

C2.3 'Frosterly' at No 2 Drummond Street, the headquarters of the Bureau of Meteorology from 1908 until 1974.

On 18 January 1908, a full page article in the Melbourne Argus asserted that "There is probably no other country in the world—not excepting even the United States of America—which is so vitally affected by its varying weather conditions as Australia", and described in detail the working of the new Bureau including the combined role of the Melbourne Office as both a national headquarters and a Divisional Office for Victoria. It noted that each morning the Melbourne Office received a total of 217 reports from across the Commonwealth as the basis for preparation of guidance forecasts for the Divisional Meteorologists in the other capitals. The centrally-produced forecasts were initially not well received in distant capitals, and so began the ebb and flow of pressures for greater decentralisation of forecasting which has characterised Australian meteorology through most of the twentieth century.

The early years

The early years of the Bureau were a period of great scientific progress in the face of a difficult struggle for the funds to pay staff salaries and maintain operations. Henry Hunt, who had worked under H. C. Russell in Sydney, already had a distinguished scientific record and, with the assistance of colleagues Griffith Taylor (later Professor of Geography at Sydney, Chicago and Toronto Universities) and E. T. Quayle, soon published a definitive treatise *The Climate and Weather of Australia* (Hunt, Taylor and Quayle 1913).

By 1919 the permanent staff of the Bureau had grown from an initial Australia-wide complement of 30 (supported by several thousand volunteer observers) to 71. These included two future Directors of the Bureau (W. S. Watt and E. W. Timcke).

The Depression years of the late 1920s and early 30s, with their severe restraint on government spending, were a difficult time for the Bureau. This was exacerbated by the lack of understanding on the part of the Public Service authorities of the need for scientific qualifications for Bureau staff, a problem which was to impair the work of the Bureau for most of the following half century (Gibbs 1982). With the loss of Edward Kidson in 1927 to become Director of the New Zealand Meteorological Office and the retirement of Hunt in 1931, the Bureau lost its scientific leadership and fell into a period of scientific stagnation.

Meteorological services for civil aviation

Major new requirements for meteorological services emerged with the rapid growth of civil aviation throughout the 1930s. Initially the services for aviation were supplied from the capital city Divisional Offices but, following the loss of the *Southern Cloud* and *Kyeema* due to weather, and the opening of the Imperial Airways Service in 1934, it was soon realised that a much expanded and improved weather service was required. The first meteorological office for purely aviation purposes was established in Darwin in 1934 to support the Empire Flying Boat route and, by 1939, the Bureau was operating a total of 23 aerodrome observing offices, including ten providing forecasts and briefing for pilots.

The arrangements for provision of weather services for civil aviation were to undergo many changes through the rest of the century, particularly following the establishment of the International Civil Aviation Organization (ICAO) in 1946. The extension of forecasting offices to more and more airports came to an end in the early 1970s with the consolidation of most of the Bureau's forecasting staff in capital city Regional Forecasting Centres, with only briefing and very short term forecasting functions remaining at a few airports. This was later further centralised, mainly for cost reduction reasons, in the early 1990s.

Meteorology at the universities

Despite some useful work in a few geography departments, the Australian universities showed little interest in meteorology through the 1920s and 30s. In a report to the Prime Minister in 1937, the UK aviation expert H. E. Wimperis recommended, inter alia, the initiation of university research aimed at more accurate weather forecasting and improved understanding of the structure of the atmosphere. This led to Bureau funding for a small meteorological department at Melbourne University. The first Reader-in-Charge was the distinguished German polar scientist Dr Fritz Loewe, who provided inspiration to a generation of Bureau meteorologists from the late 1930s onwards. The Wimperis report was followed by a further report on meteorological research and training in the universities and the Bureau, by the then Director General of the UK Meteorological Office, Sir George Simpson.

Under Loewe, and subsequently Dr Uwe Radok, the Meteorology Department at Melbourne University played a leading role in the development of Australian Antarctic meteorology and glaciology, but struggled for recognition and critical mass. It did not achieve professorial status until 1980. With the departure of Dr Peter Schwerdtfeger to Adelaide and Professor Bill Budd to Hobart, Melbourne retained only a small, albeit highly productive, meteorological effort in the School of Earth Services, with Monash University emerging as the strongest Australian university in meteorological research and teaching during the 1970s and 80s. Initially, under the leadership of Professor Bruce Morton, it developed as a centre of excellence in geophysical fluid dynamics and a source of many of those who were to later assume important roles on the Australian meteorological scene. Significant university groups in meteorology also developed at Macquarie University (under Dr Edward Linacre and subsequently Professor Ann Henderson-Sellers), Murdoch University and the James Cook University of North Queensland.

C2.4 Former members of the RAAF Meteorological Service gather in Melbourne in August 1995, fifty years after the end of the war.

The RAAF Meteorological Service

With the outbreak of World War II, the Bureau of Meteorology passed from the Department of the Interior to the Department of Air in July 1940, with responsibility for providing all meteorological services needed by the defence forces while still continuing to meet civil requirements.

From April 1941 to July 1946, most of the staff of the Bureau served in uniform throughout Australia and the islands as members of the RAAF Directorate of Meteorological Services under the leadership of Group Captain H. N. Warren. Many of the leaders of the civilian Bureau over the following thirty years were first recruited as forecasters during the period of rapid expansion which followed the outbreak of the war. Whether as members of Mobile Met Flights in Timor, New Guinea, Borneo, Malaysia or the New Hebrides, on station around Australia or, later in the war, at Allied Headquarters in Brisbane, the staff of 'The Met' distinguished themselves through their rapid mastery of the challenges of forecasting in the tropics and provision of outstanding weather support for allied operations (Gibbs 1999). In the words of the War Report of the Chief of Air Staff, "The Met earned and retained the confidence of Allied operational commanders and of associated Allied weather organisations".

CSIR Meteorological Physics

The 1945 decision of the CSIR (Council for Scientific and Industrial Research), now CSIRO, to establish a Section for Meteorological Physics to carry out fundamental studies of atmospheric processes was to have a profound impact on the development of Australian meteorology (Garratt et al. 1998). Located at Aspendale, Victoria, under the leadership of Dr C. H. B. Priestley AO from the UK Meteorological Office, the CSIRO Section (later Division) of Meteorological Physics (now CSIRO Atmospheric Research) went on to become a world leader in atmospheric boundary layer processes, micrometeorology and atmospheric chemistry. Throughout its history, it has had just three Chiefs—Priestley (1946–73), Dr G. B. Tucker (1973–92) and Dr G. I. Pearman AM (1992–). At various stages, it has been involved in co-sponsorship of joint research centres with the Bureau, including the Commonwealth Meteorology Research Centre (CMRC) from 1969 to 1974 and the Australian Numerical Meteorology Research Centre (ANMRC) from 1974 to 1984. The two organisations joined together again in the 1990s as partners in a Cooperative Research Centre for Southern Hemisphere Meteorology located at Monash University.

The Meteorology Act 1955

One of the main purposes of the *Meteorology Act 1906* had been to provide the legislative basis for the appointment of the Commonwealth Meteorologist and authority for negotiations on transfer of the State meteorological observatories to the Commonwealth. The title of Commonwealth Meteorologist had unofficially been changed to Director of Meteorology in the 1930s and, although widely known as the Commonwealth Bureau of Meteorology, no such title had been included in the original Act. By the early 1950s, especially following the establishment of the World Meteorological Organization (WMO) as a specialised agency of the United Nations in 1950, the Meteorology Act had become seriously out of date. In December 1954, the Government decided on its repeal and replacement by a new Act establishing the position of Director of Meteorology and the functions of the Bureau in line with the requirements of the WMO and contemporary practices in other countries.

The Bill for the new Act was introduced into the House of Representatives on 21 April 1955 by the Minister for the Interior, the Hon Wilfred Kent-Hughes. It received strong bipartisan support with special mention made of the need for improved fire, cyclone and flood warning, expanded observation networks and locally based forecasting services. The Bureau was also urged to pursue research into long range forecasting. The Act was assented to on 23 May. It became the basis for a significant reorganisation of the Bureau under the incoming Director of Meteorology, L. J. Dwyer, who had been appointed on the retirement of E. W. Timcke on 1 April 1955. The new Act established the office of Director of Meteorology and the statutory basis for the operation of the Bureau, which continued to be staffed under the Public Service Act as an outrider to the Department of the Interior.

Flood warning

Following widespread pressure for upgraded flood warning services in the wake of the disastrous Hunter floods of 1955, and realisation that the Premiers' Conference agreement of 1936 that the Bureau should assume national responsibility for flood warning had not been explicitly reflected in the new Act, the Government decided, in April 1957, that the Bureau should establish a hydrometeorological service to serve as the national authority for hydrological and water resources data collection, provision of hydrometeorological advice and flood warning.

An extensive program of upgrading of flood warning arrangements commenced in the early 1960s but, following the report of the 1976 Committee of Inquiry into the Bureau (CIBM), a hiatus developed in the early 1980s until new collaborative Commonwealth–State–local government arrangements were put finally in place in 1987 under the auspices of State Flood Warning Consultative Committees.

Long-range forecasting

Australian farmers have always had an insatiable appetite for long range weather forecasts and, for many years, the late Inigo Jones, who had worked under Clement Wragge in Brisbane, provided seasonal forecasts from his privately operated Crohamhurst Observatory in southeast Queensland. Despite two Ministerially commissioned investigations which concluded that his forecasting methods had no scientific basis, the demand for his forecasts remained and the service continued, under Lennox Walker, after his death.

Through the 1950s and 60s, Bureau, CSIRO and university scientists and several private individuals continued to experiment with long range forecasting, but it was not until scientists gained a better understanding of the influence of the ocean and the mechanisms of the El Niño and the Southern Oscillation in the 1970s and 80s that some forecasting skill emerged. During the 1990s, through the work of the Bureau's National Climate Centre and other groups including the Queensland Centre for Climate Applications, Australian scientists have emerged as world leaders in the preparation of seasonal outlooks and their practical application to agriculture and other important economic sectors.

Antarctica

The Bureau of Meteorology is statutorily responsible for Australian meteorological activities in Antarctica and has, from the beginning, been a key member of ANARE (Australian National Antarctic Research Expeditions), often co-located in the same portfolio as the Australian Antarctic Division.

As well as opening observing stations at Australia's Antarctic bases and seconding staff to the IGY (International Geophysical Year) Antarctic Weather Central at Little America, the Bureau took the lead in convening a post IGY international symposium on Antarctic meteorology and subsequently hosting the International Antarctic Analysis Centre (IAAC) and International Antarctic Meteorological Research Centre (IAMRC) in Melbourne. These were headed, over the period 1959–68, by Mr H. R. (Henry) Phillpot, who continued in Antarctic research long after his retirement in 1980 and who, in 1999, was honoured as an 'Australian Science Hero'. Two Australians, Dr N. A. Streten and Mr H. A. Hutchinson, have subsequently chaired the WMO's Working Group on Antarctic Meteorology.

World Meteorological Centre, Melbourne

Following the launch of the first artificial earth satellites and the development of plans for the World Weather Watch (WWW) drawing on the emerging capabilities of meteorological satellites and digital computers, the Australian Government offered, in November 1964, to host one of the proposed three World Meteorological Centres of the WWW. Under the guidance of Dr W. J. (Bill) Gibbs, who had been appointed Director of Meteorology in September 1962 following the death of L. J. Dwyer, and with the Bureau's installation of its first powerful computers in 1968, Australia emerged as the leading meteorological nation of the southern hemisphere and one of the key players on the global meteorological scene.

Regional Forecasting Centres

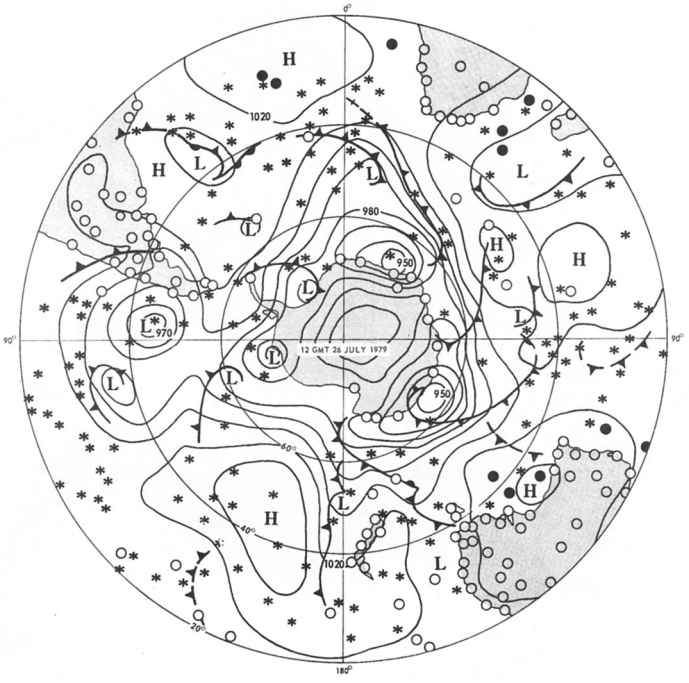
One of the most significant steps in the history of the Bureau was the decision in the late 1960s to consolidate the public weather and aviation forecasting staff of the Bureau into Regional Forecasting Centres (RFCs) in the capital cities. Although it led to the need for new mechanisms for meeting the needs of many geographically dispersed and specialised user communities, the establishment of the RFCs, beginning in Tasmania in 1971, enabled the Bureau to absorb the greatly increased demands for service which flowed from its increased forecasting capabilities and the increased weather sensitivity of such important industry sectors as agriculture, coastal tourism and offshore oil and gas operations.

The Bureau's capabilities were further enhanced through the progressive installation of its Automated Regional Operations System (AROS) through the 1980s and its subsequent replacement by AIFS (Australian Integrated Forecasting System) which now provides the main specialised technological support for Australia's weather services nation-wide.

Global Weather Experiment

The Global Weather Experiment, the field phase of which took place in 1979, was the largest fully international scientific experiment ever undertaken. It was aimed at improving the accuracy and time range of weather forecasting, guiding the design of the most cost-effective observing systems for operational forecasting and pointing the way towards a scientific basis for climate prediction.

Australian meteorologists were deeply involved in the planning of the Experiment from the early 1970s, and Australian support for the specialised observing systems (such as drifting buoys) deployed during 1979 was critical to its success. For the first time, the global meteorological research community turned their primary attention to the problems of the southern hemisphere (graph C2.5) and so laid the foundation for the enormous progress in southern hemisphere meteorology that took place in the closing years of the twentieth century.



C2.5 Typical distribution of data over the southern hemisphere during the 1979 Global Weather Experiment. Open circles are land-based synoptic stations, solid circles are ships and asterisks are drifting buoys.

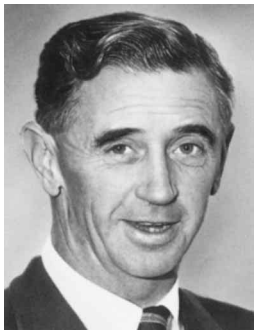
Commonwealth meteorologists of the twentieth century

Henry A. Hunt *(1907–31) began his meteorological career as an assistant to H. C. Russell in Sydney. He had already won an international prize for his work on the Southerly Buster when appointed as Australia's first Commonwealth Meteorologist in 1907. He was immediately despatched on a world trip to assess the latest developments in meteorology. Although he provided outstanding scientific leadership to the early Bureau, he fought a long and difficult battle through the period of the First World War and the Great Depression to obtain the resources needed to build the networks and scientific basis for Australia's meteorological services.*

William S. Watt *(1931–40) had been assistant to Henry Hunt and was appointed as Commonwealth Meteorologist following successful appeal against the promotion of Henry Barkly. He presided over a difficult period for the Bureau with little support for its scientific development and little awareness in government of the imminent need for major expansion to meet the needs of civil aviation and subsequently the war effort. He participated in the 1935 IMO (International Meteorological Organization) Conference of Directors in Warsaw and the 1937 meeting of IMO Regional Association V (South West Pacific) in Wellington.*

H. Norman Warren *(1940–50) was Public Service Inspector for Tasmania before being appointed as Assistant Director of the Bureau in 1938 and shortly thereafter as Director of Meteorology. Almost immediately, as Group Captain Warren, he was called on to manage the transformation of the Bureau into the RAAF Meteorological Service. After return of the Bureau to civilian status in 1946, he became deeply involved in international meteorology, chairing the committee which drafted the final text of the WMO Convention in Washington DC in October 1947. He died in office on his way home from a session of the WMO Executive Committee in August 1950.*

Edward W. (Tim) Timcke OBE *(1950–55) joined the Bureau in Adelaide in about 1911 as a meteorological assistant. After service in France in World War I, he returned to the Sydney office of the Bureau in 1919 and moved to Melbourne in 1929. He was a candidate for the post of Director of Meteorology when Warren was appointed. He then served as deputy to Warren through and after World War II and represented him at several international meetings. As Director, he presided over a period of consolidation and staff reductions brought on by general government cutbacks in the Public Service. He was, however, able to expand the Bureau's upper air networks and establish observing stations at Heard and Macquarie Islands.*



Leonard J. (Len) Dwyer *(1955–62) joined the Bureau in September 1937 as a meteorological assistant and soon became a trainee meteorologist. By 1940 he headed the Bureau's Training Section and subsequently became responsible for the RAAF Mobile Meteorological Flights during World War II. After the war, he worked in the Aviation Section of the Bureau's Central Office before being recruited to the position of Chief Clerk. An aggressive personality with a flair for management, he presided over a period of rapid technological progress, and improvement and extension of Bureau services. He served as President of WMO Regional Association V from 1957 until 1962. He died in office in May 1962.*

William J. (Bill) Gibbs OBE *(1962–78) was born in Sydney and joined the Bureau of Meteorology in 1939 on the eve of World War II. After almost two years in Port Moresby, he was posted to Allied Headquarters in Brisbane. After the war, he accompanied H. N. Warren to the Washington Conference of Directors which finalised the WMO Convention, and subsequently returned to the US for study in 1952 as a Fulbright Scholar. Dr Gibbs served as the Bureau's Assistant Director Research from 1958 until 1962 and became Director of Meteorology in 1962. He was First Vice President of WMO from 1967 until 1978. He played a pioneering role in Australian tropical meteorology and Antarctic meteorology and in the study of Australian drought. He retired in July 1978.*

John W. Zillman AO *(1978–) joined the Bureau of Meteorology as a Cadet Meteorologist in Brisbane in 1957. After a period in operational forecasting in NSW and Queensland, he was appointed to the Southern Hemisphere Analysis Centre in Melbourne in 1966 and subsequently to the International Antarctic Meteorological Research Centre. After study in the US (1970–72) he became Assistant Director Research in 1974 and succeeded Dr W. J. Gibbs as Director of Meteorology in July 1978. He coordinated Australia's participation in the 1979 Global Weather Experiment and negotiated the strengthening of the research role of the Bureau in the early 1980s. He was First Vice President of WMO from 1987 to 1995, and has been its President since 1995.*

Research in the Bureau

After several decades of unsuccessful efforts to obtain Public Service Board agreement to the upgrading of the research role and staffing of the Bureau to enable it to discharge its statutory responsibilities on a sound scientific basis, agreement was finally reached in 1983 to the disbandment of the joint Bureau–CSIRO ANMRC and the establishment of the Bureau of Meteorology Research Centre (BMRC), with Research Scientist staffing, as the upgraded research arm of the Bureau. Under the guidance of former ANMRC Officer-In-Charge, Dr D. J. (Doug) Gauntlett, and the newly appointed BMRC Chief, Dr M. J. (Mike) Manton, the BMRC has developed into a world leading research group in southern hemisphere meteorology. It works in close partnership with CSIRO Atmospheric Research under Dr G. I. (Graeme) Pearman AM, and the two organisations have collaborated in a number of major research programs including research associated with Australia's operation of a WMO Global Atmosphere Watch station at Cape Grim in Tasmania.

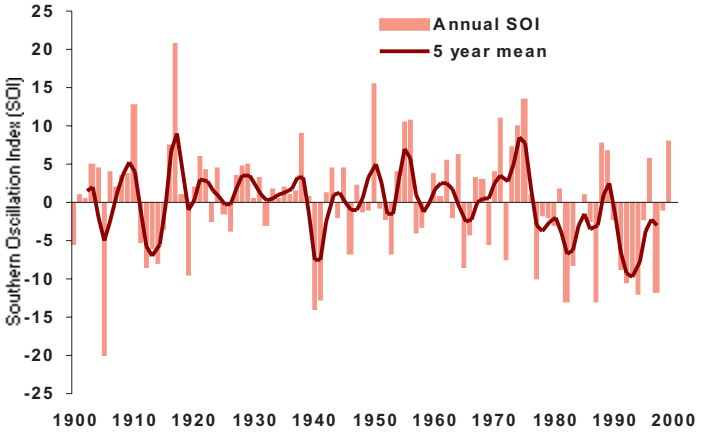
Committees of Inquiry

The 1976 Committee of Inquiry into the Bureau of Meteorology (CIBM) set in train a lengthy process of restructuring of the Bureau's operations, as well as the establishment of the Meteorology Policy Committee (MPC) which served as a non-statutory external advisory body to the Minister until its disbandment in 1990. It played a major role in inspiring and guiding the re-equipment of the Bureau and the upgrading of its warning services during the 1980s.

Further external inquiries and reviews followed, including a 1987 House of Representatives Expenditure Committee Inquiry into the Provision of Meteorological Services ('Gone with the Winds') and a major external 'Review of the Operation of the Bureau of Meteorology' in 1996, with a follow-up study on 'Capturing Opportunities in the Provision of Meteorological Services', both led by former Chief Scientist, Professor R. O. Slatyer AC FRS FAA FTSE.

The weather and climate of the twentieth century

The twentieth century began with Australia still in the grip of the Federation Drought. It witnessed several extended periods of drought and flood associated with the irregular fluctuations of the Southern Oscillation (graph C2.6), many dramatic individual weather events in all States and a gradual overall warming trend across the continent. The general features of the twentieth century climate have been described in various publications (Bureau of Meteorology 1989; Zillman 1994; Bureau of Meteorology 2001). Some of the more notable individual events and trends in Australian weather and climate over the century are described in the following pages.

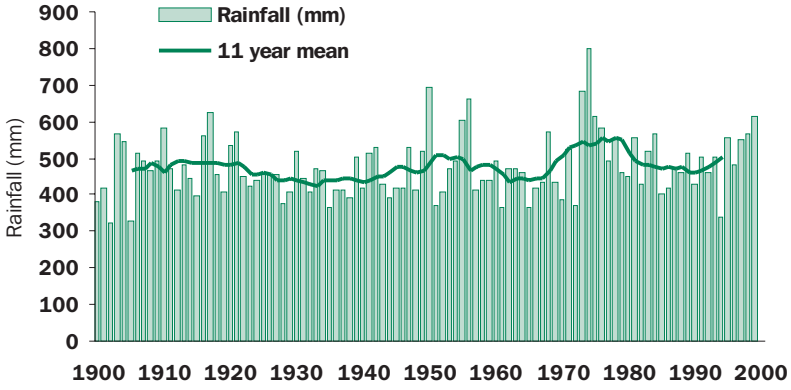


C2.6 Annual values of the Southern Oscillation Index (SOI), a measure of fluctuations in the surface pressure difference between Tahiti and Darwin and a useful indicator of the broadscale controls on Australian weather.

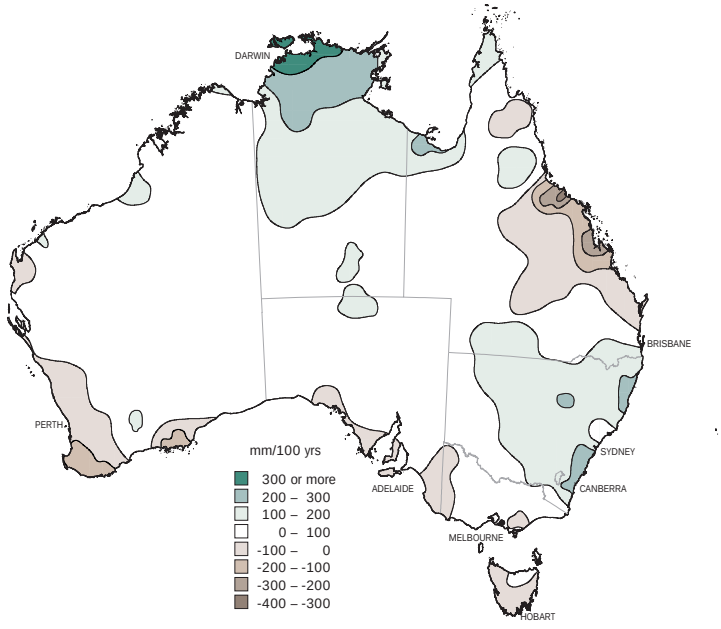
Rainfall

The average annual rainfall over Australia from 1900 to 1999 is shown in graph C2.7 along with an eleven year running mean. The very dry period following Federation and the above average rainfall in the 50s and 70s are clearly evident.

Overall, there is a very weak rising trend in total rainfall during the century, although individual districts have experienced much stronger trends, both positive and negative, as shown in map C2.8.

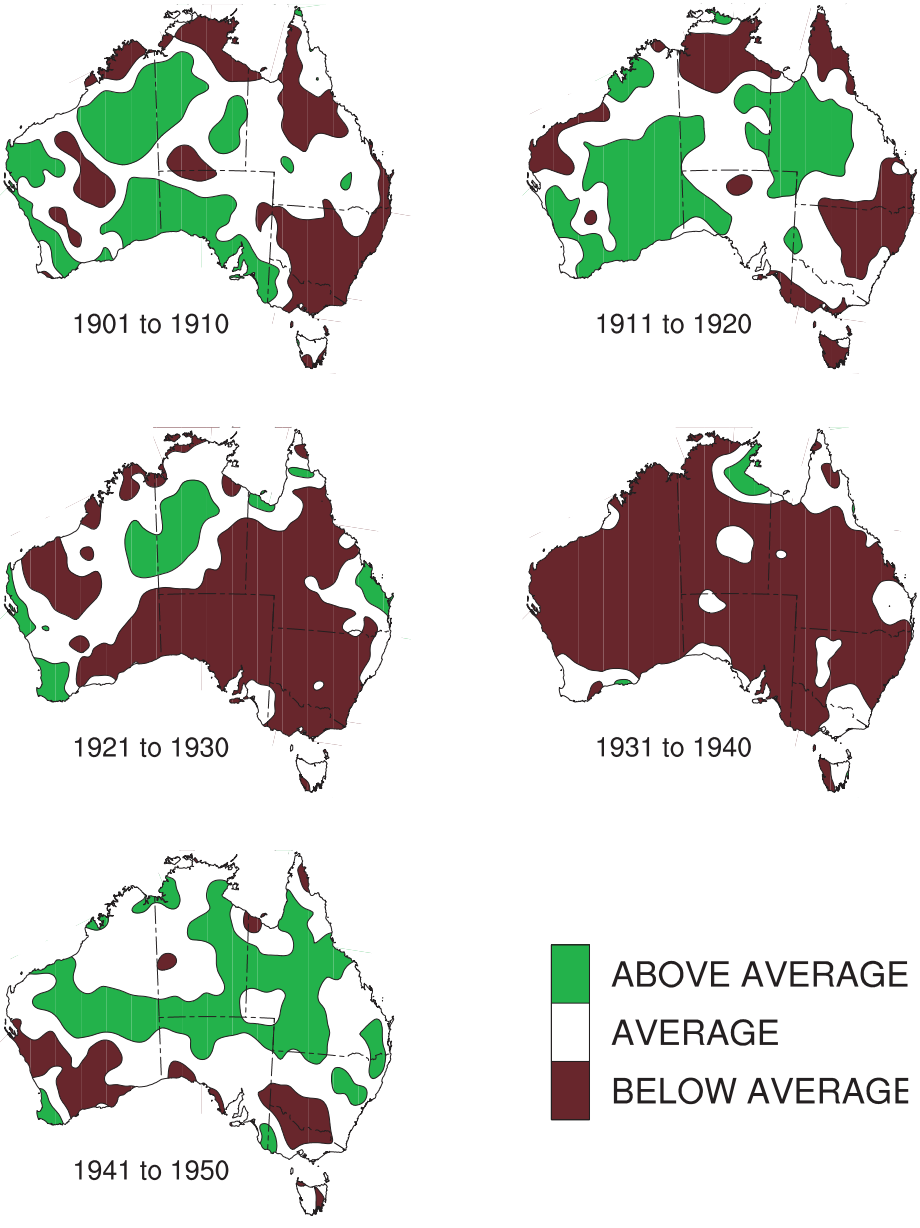


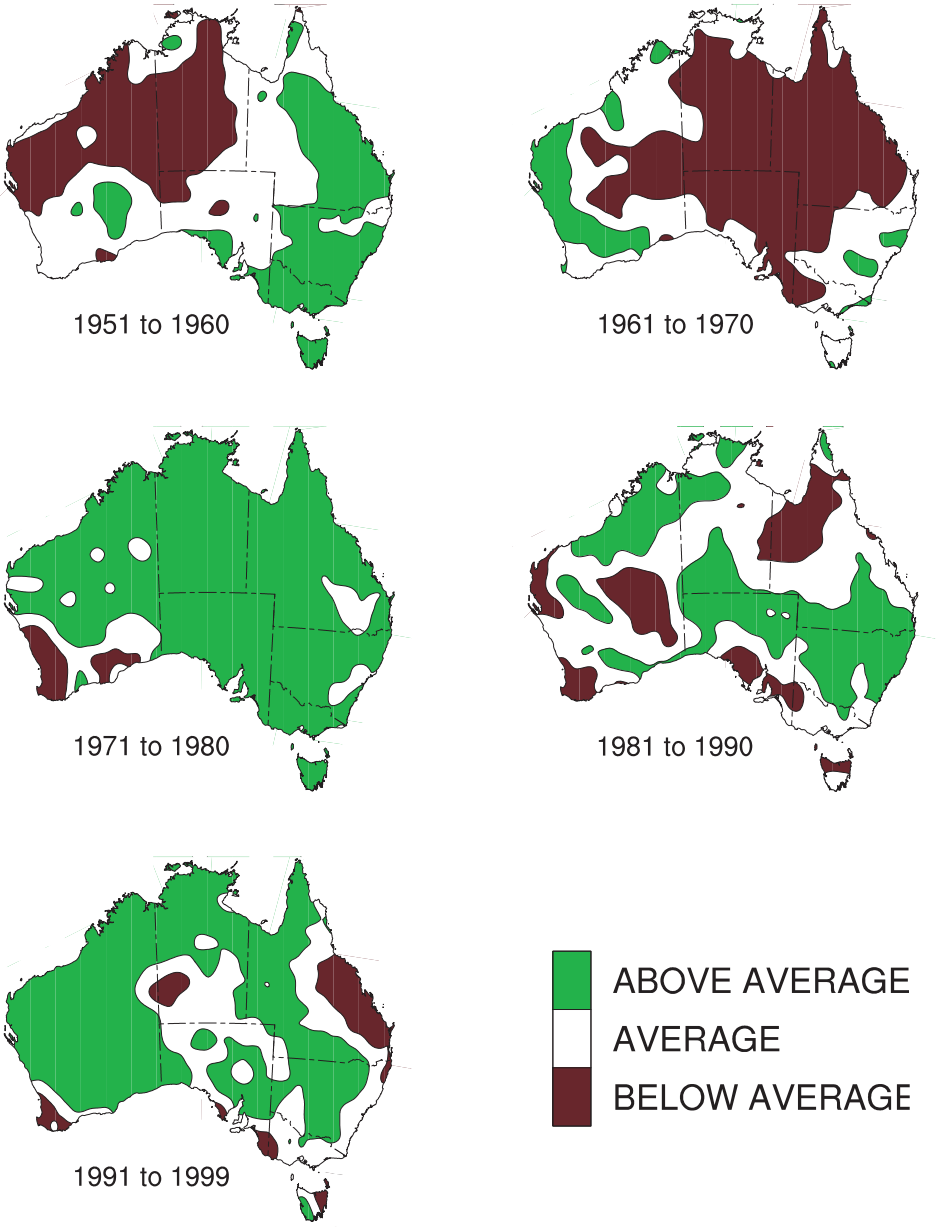
C2.7 Averaged annual mean rainfall (mm) over Australia, 1900–99. The solid line shows the eleven year running mean



C2.8 The spatial pattern of trends in annual mean rainfall over Australia 1900–99 in mm per century. Green areas have become wetter and brown areas drier.

The maps comprising figure C2.9 show the distribution of rainfall over the continent in terms of the three terciles—above average, near average and below average—for each decade in the period 1901 to 1999.



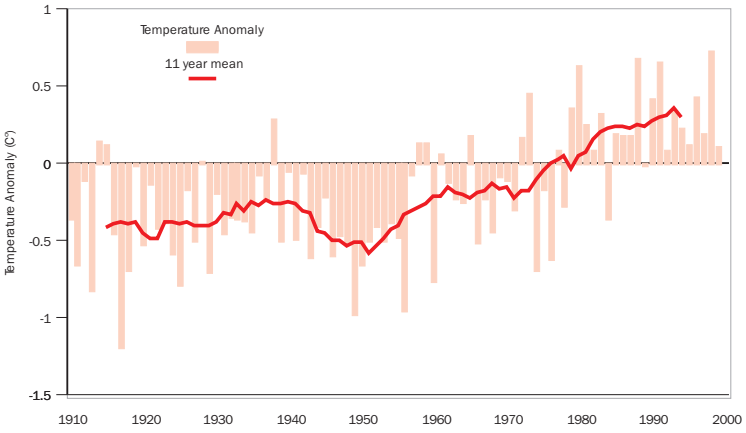


C2.9 The distribution of annual rainfall over Australia in the period 1901 to 1999, by decade. Areas coloured green fall in the upper tercile (i.e. wet) for the decade concerned, while the brown areas fall in the lower tercile (dry).

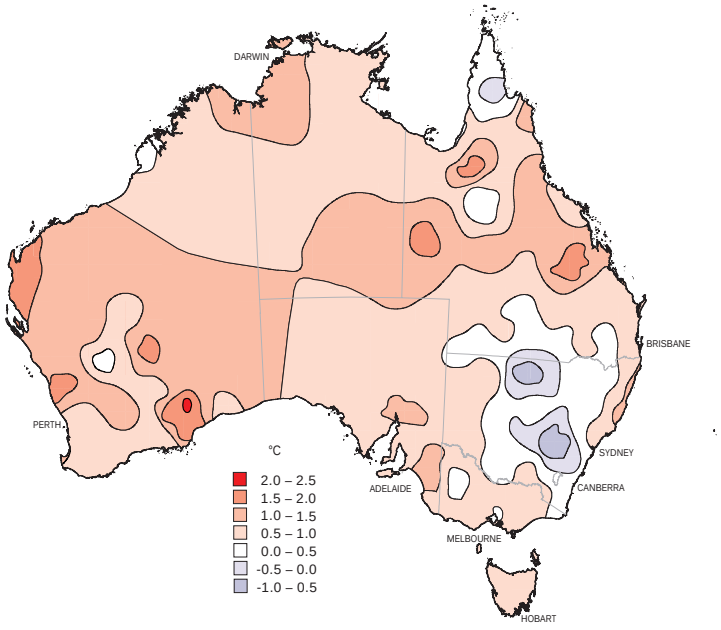
Temperature

The history of annual mean temperature over Australia through most of the twentieth century is shown in graph C2.10.

The overall warming trend during the second half of the century evident in graph C2.10 is much more strongly evident in minimum temperatures than in maximum temperatures and it is not uniform over the continent. In fact, some parts of NSW and northern Queensland experienced a slight cooling trend over the century as a whole, as shown in map C2.11.



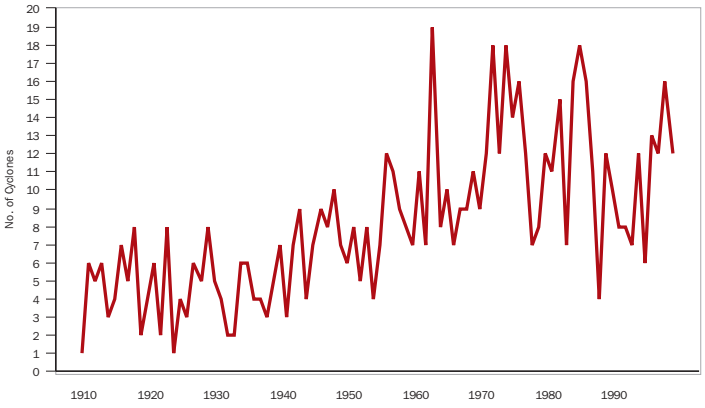
C2.10 Areal average temperature anomalies (°C) over Australia relative to the 1961–90 normals for the period 1910–99.



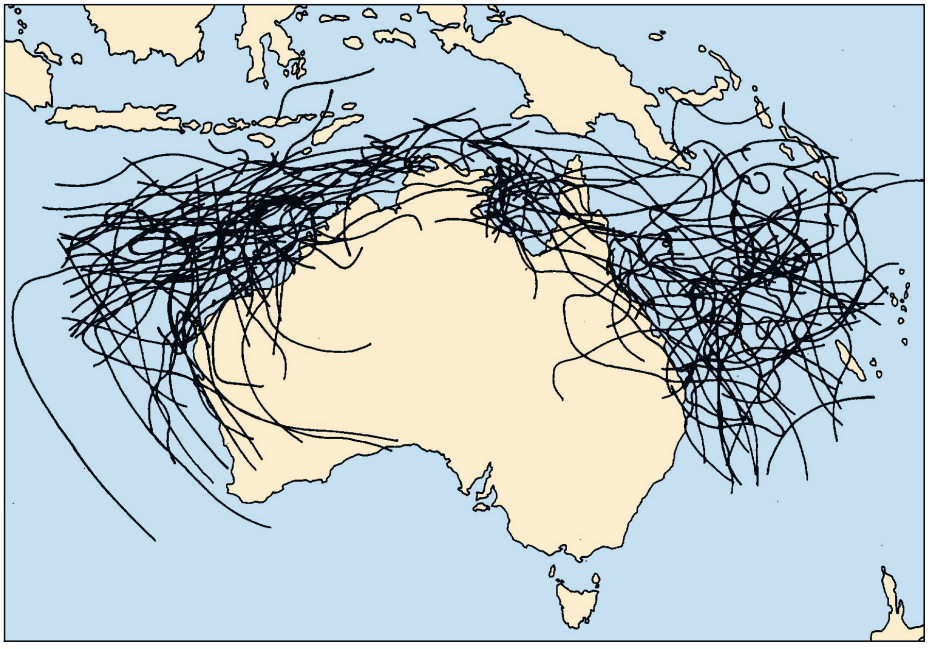
C2.11 The trend in annual mean temperature over Australia for the period 1910–99 in °C per century. Areas coloured red have warmed. Those coloured blue have cooled.

Tropical cyclones

Although a number may have gone undetected in the early years and the apparent increase in frequency in the middle part of the century may not be real, it appears that some 800–1,000 tropical cyclones have developed in the Australian region (105–165°E) during the twentieth century, with as few as one and as many as nineteen in a single season (graph C2.12). Map C2.13 shows their tracks for the ten year period 1970–80.



C2.12 The annual occurrences of tropical cyclones in the Australian region (105—165°E) from July 1909 to June 2000.



C2.13 Tropical cyclone tracks in the Australian region, 1970–80.

The loss of life from tropical cyclones was greatest in the early part of the century, with several infamous cyclones of the early years striking almost without warning. Among the best known are the Broome cyclone of 1908 (loss of 50 lives), the Mackay cyclone of 1918, the Darwin cyclone of 1939, Cyclone Ada (which struck the Whitsunday Islands in January 1970 with a loss of 13 lives), Cyclone Tracy in 1974 and Cyclone Vance (which produced the strongest measured wind gust on mainland Australia (267 km/h) as it passed close to Exmouth, Western Australia, on 22 March 1999).

Floods

The twentieth century witnessed many disastrous floods including both flash floods and riverine floods along the eastern, western and northern coasts as well as in the westward and southwest flowing rivers of the Murray Darling system. Six years: 1954, 55, 56, 59, 71 and 74, stand out as the major flood years of the century, with the Hunter floods of February 1955 and the Brisbane flood of January 1974 perhaps the worst. Other notable floods included the Todd River flood at Alice Springs in March 1910, the Latrobe River flood in Victoria in December 1934, the Charleville flood of April 1990, the North eastern Victorian floods of October 1993 and the Katherine (NT) flood of January 1998.

Droughts

The great Australian droughts of the twentieth century have mostly been closely linked with the major swings in the Southern Oscillation Index (SOI) (graph C2.6), with drought in eastern Australia coinciding with the El Niño (warm central and eastern Pacific ocean) phase of the El Niño–La Niña cycle. The major drought years included:

- 1901–03, the final years of the Federation Drought during which sheep and cattle numbers were halved;
- 1911–16, which saw the loss of 19 million sheep and 2 million cattle;
- 1918–20, which affected virtually all of the continent except for parts of Western Australia;
- 1939–45, a protracted drought with the loss of 30 million sheep between 1942 and 1945;
- 1958–68, a prolonged period of widespread drought with a 40% drop in wheat harvest in the final two years, a loss of 20 million sheep and a decrease of farm income of $300–500m;
- 1982–83, a relatively short but severe drought over eastern Australia with total losses in excess of $3b;
- 1991–95, one of the most severe droughts of the century over north-eastern Australia, with total losses estimated in excess of $5b.

Bushfires

Major bushfires have occurred in most parts of Australia over the past century, many causing significant loss of life and extensive property damage. In the southern States, they have usually been associated with the onset of hot dry northerly winds following extended drought conditions, but in Western Australia they have also been associated with the southern fringe of tropical cyclone circulations such as Cyclone Alby in 1978. Among the most notorious bushfires have been:

- 13 January (Black Friday) 1939, the most disastrous fires experienced to that time extending over three quarters of Victoria with the loss of 71 lives;
- 10 December 1944, devastating fires in the Blue Mountains and other parts of NSW;
- 16 February (Ash Wednesday) 1983, disastrous fires in South Australia and Victoria with the loss of 75 lives and more than 2,000 houses;
- 1–8 January 1994, more than 200 major fires along the NSW coast and ranges with the loss of four lives and 185 houses.

Severe storms

Severe thunderstorms with lightning, hail, tornadoes and strong winds have affected most parts of Australia, with the south west coast of Western Australia and the central coast of NSW having been particularly affected. Some notable storms have occurred on:

- 26 November 1971, when severe storms over the Woden Valley (ACT) caused disastrous flash flooding and loss of life;
- 13 November 1976, when the Sandon (Vic) tornado left a 6km long path of destruction and two persons dead;
- 23 May 1994, when large areas of south western Western Australia experienced violent gales with the loss of two lives and severe damage to some 600 houses;

- 29 September 1996, when widespread severe storms broke out over NSW with three tornadoes and hail up to 7cm. Total damage was estimated at $340m;
- 14 April 1999, when an unseasonal hailstorm struck the eastern suburbs of Sydney at night with damage to 63,000 cars, 22,000 homes and several commercial aircraft.

The great weather and climate events of the twentieth century

The Federation drought, 1895–1902

The five years preceding Federation had been intermittently dry over most of the country. Very dry conditions set in across eastern Australia during the spring of 1901, and became entrenched over the following months. As the drought worsened, enormous sheep and cattle losses were reported from Queensland, and many rivers dried up. The Darling River at Bourke virtually ran dry, while Murray River towns such as Mildura, Balranald and Deniliquin—at that time dependent on the river for transport—suffered badly. The Australian wheat crop was all but lost. Rain in December 1902 brought temporary relief, with a more substantial break in autumn 1903. The long drought and its severe climax in 1902 had devastated stock numbers, and began focusing attention on planning for irrigation, especially in the three States through which the Murray River flows.

The Mackay cyclone of 1918

The Mackay Cyclone was the first of two cyclones to inflict heavy damage on significant population centres in northern Queensland during early 1918. Moving in from the Coral Sea late on 20 January, its devastating winds terrified residents as buildings disintegrated, gas and water supplies failed, and roofing iron scythed though the air. A storm surge inundated the town around 5am, with large waves reportedly breaking in the centre of Mackay. Phenomenal rainfall—1,411mm in three days at Mackay Post Office—generated the worst flooding in Mackay's history. Some 30 people lost their lives, mainly in Mackay and Rockhampton.

Northeastern Tasmanian floods, April 1929

Although northeastern Tasmania's climate is normally relatively benign, it is prone to intense rainfall over short periods. The worst event of the century occurred in April 1929, when 22 people died. Rain commenced late on 3 April and, in three days, up to 500mm fell over the high country of the north-east, and over a smaller area south of the Burnie/Ulverstone area. The Briseis Dam on the Cascade River crumbled, and the resulting torrent, carrying thousands of tons of trees, rocks and gravel, overwhelmed houses and offices, with 14 deaths. Over 1,000 houses in Launceston were inundated, and most other north coastal rivers were heavily flooded. Scenes of devastation—to man-made structures and natural features—were widespread across northern Tasmania. It took many weeks to repair the damage.

Black Friday in Victoria, January 1939

Following an exceptionally dry winter and spring, vegetation over most of Victoria was in an extremely hazardous condition by January 1939. Heatwave conditions from early in the second week of January saw many large fires break out, especially on the 10th when Melbourne registered a maximum of 44.7°C. Twenty-one people died in these fires, which could not be extinguished despite milder conditions in southern Victoria on the 11th and 12th. On the 13th the onset of strong and even hotter winds (Melbourne a record 45.6°C) coalesced these fires into a sea of flame. Several timber towns were burnt to the ground, extensive tracts of mountain forest (including Melbourne's main catchment area) were incinerated, and 50 more people died, many trapped in timber mills. In the ensuing Royal Commission, many changes to rural fire fighting practices in Victoria were proposed, and eventually implemented.

Record floods in New South Wales, February 1955

The Hunter Valley floods of late February 1955 have, in many people's minds, come to symbolise flooding in Australia. A monsoon depression moving south from Queensland desposited up to 250mm of rain in 24 hours over the already-saturated Hunter region. The Hunter, and several west-flowing rivers, swiftly rose to record levels, drowning the surrounding country. In East Maitland, water completely submerged houses, and 15,000 people were evacuated. It was a similar story throughout the Hunter, Macquarie, Namoi and Gwydir River Valleys, with houses destroyed, metres of flood waters in the streets, and many thousands of stock drowned. In all, 14 people died, and damage to bridges, roads, railways and telephone lines took months to repair. This event was the most spectacular of many heavy rain episodes over eastern Australia between late 1954 and the end of 1956.

Fire and storm—Southwest WA, 1961, 1978

Perhaps Western Australia's worst bushfire disaster—the Dwellingup fires—occurred in January 1961. An intense cyclone off the northwest coast led to five days (20 to 24 January) of gusty winds and 40°C temperatures over the lower southwest. Fires, many started by lightning, burnt uncontrolled through this period. Strong northwest winds on the 24th drove the fires southward, destroying the township of Dwellingup, and many houses in other small settlements. Fortunately there was no loss of human life. A similar event occurred in early April 1978, when Cyclone Alby swept past the southwest of Western Australia, generating severe gales (gusts to 150km/h) between Kalbarri and Albany, and causing widespread damage and coastal (storm surge) flooding, as well as raising large dust clouds. Over 360 separate fires flared, more than 114,000 hectares of forest and farmland were burned, and many buildings and homes destroyed.

Brisbane floods, January 1974

Following a very wet 1973, the month of January 1974 featured probably the biggest continent-wide drenching since European settlement, with vast areas of the country inundated. In Brisbane, preceding heavy rain had already produced some flooding when, on 24 January, Cyclone Wanda came ashore north of the city. Wanda inflicted relatively little wind damage, but produced record rains over the Australia Day weekend. In three days, Brisbane received 580mm, with much higher falls over river catchments near the city (1,300mm in five days at Mt Glorious). Many houses bordering rivers and creeks were washed away as rivers rose to their highest levels since the disastrous 1893 floods. Fourteen people died, some trapped in offices by the rising waters.

Cyclone Tracy, Christmas 1974

The year 1974 started with Cyclone Wanda bringing devastating floods to Brisbane, and ended with Darwin devastated by Cyclone Tracy. Small but compact by world standards, 'Tracy' packed unusually strong winds (gusts to 217km/h at Darwin Airport before the recorder failed). Tracy moved in from the Arafura Sea, skirted Bathurst Island, then, swinging sharply south, struck Darwin early on Christmas Day. Good warnings had been issued, but the combination of public indifference (it was Christmas and no severe cyclone had affected Darwin for years), extremely fierce winds, and the loose design of many buildings at that time, led to wholesale destruction. Sixty-five people died and most buildings were totally destroyed or badly damaged. Most of the remaining population was swiftly evacuated. In the wake of Tracy, much more attention was given to building codes and other aspects of disaster planning.

The 1982–83 drought

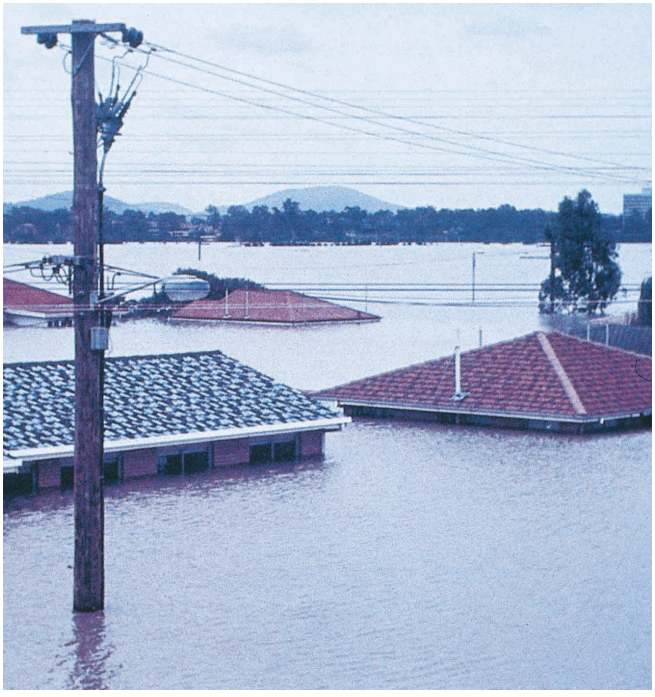
In terms of short-term rainfall deficiencies (up to one year) and their impacts, the 1982–83 drought was probably Australia's worst in the twentieth century. It started in autumn 1982, with severe rainfall deficiencies over eastern Australia exacerbated by frequent sharp frosts in June and July. Dry conditions persisted, and by year's end extensive areas of eastern Australia had had record or near-record low April to December rainfall. The upper Murrumbidgee River became a chain of waterholes. Reservoirs throughout the southeast fell to levels unknown for many years. The northern Australian wet season failed, with record low summer rain in some areas. In February 1983, dust-storms and devastating fires swept the southeastern States, before heavy rain in late March broke the drought. In all, this drought caused losses in excess of $3b, and first brought into public prominence the link between El Niño and Australian drought.

Ash Wednesday fires, February 1983

The severe drought over eastern Australia in 1982 led to tinder dry conditions throughout the grasslands and forests of southeastern Australia. On 16 February 1983, near-gale force northerly winds, and temperatures well over 40°C drove huge fires (many started by arsonists) across Victoria and southeastern South Australia. Seventy-five people died (47 in Victoria, 28 in South Australia), and nearly 2,500 houses were destroyed. The worst affected areas were Victoria's Dandenong Ranges and the Macedon area, and South Australia's Mt Lofty Ranges, all scenic areas with considerable residential populations. Forests in southeastern South Australia and Victoria's Otway Ranges were incinerated. Most deaths occurred in the hour following the cool change, when strong, gusty westerly winds turned long, narrow corridors of flame into wide fronts. The enquiry that followed led to many changes in fire weather briefing procedures, most notably the provision for regular updates on the progress of wind changes.

Sydney hailstorm, April 1999

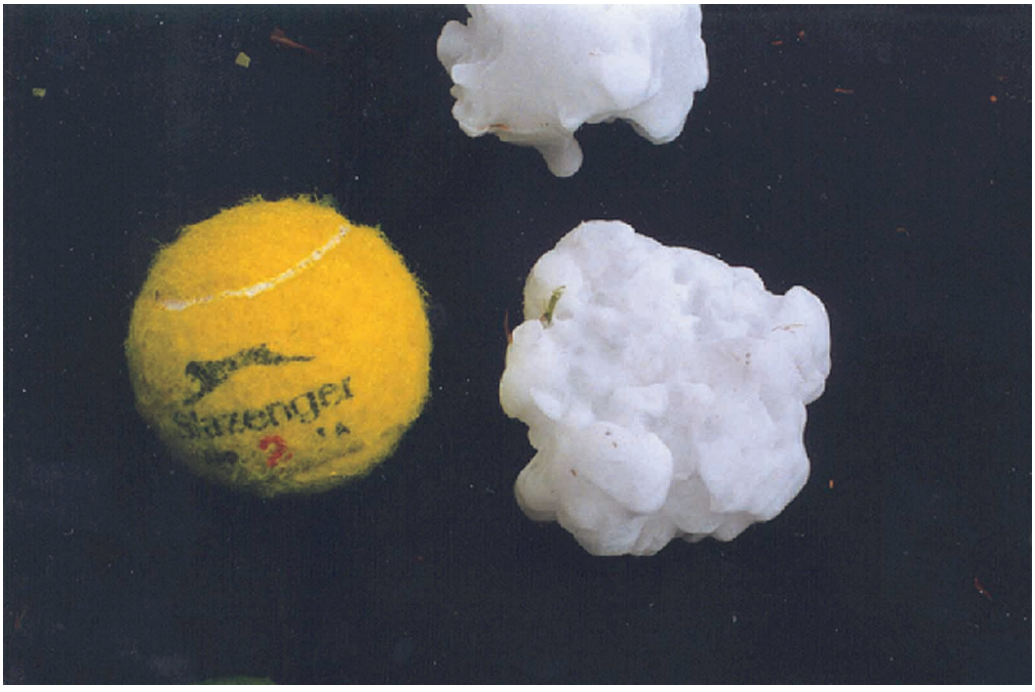
NSW and southern Queensland are particularly prone to large hail, normally accompanying severe thunderstorms developing along low pressure troughs. Late on 14 April 1999, a storm moving parallel to, and just off the southern NSW coast, swung north over the eastern suburbs of Sydney. Huge hailstones, some the size of softballs, and driven by squally winds, struck the city and eastern suburbs. The onslaught of ice badly damaged or destroyed many cars, partly destroyed many homes, and damaged several commercial aircraft. Many thousands of buildings, mostly homes, suffered serious roof damage. Insurance losses exceeded $1.7b, replacing the Newcastle earthquake of 1989 as Australia's costliest natural disaster (in terms of insured losses).



Brisbane floods, January 1974.

Fire in the Penola Forest (SA), Ash Wednesday 1983.

Darwin after Cyclone Tracy, December 1974.



Tennis ball-sized hail, Sydney, April 1999.

A century of progress in science and service

The science and practice of meteorology have made enormous progress through the twentieth century, with very large benefits flowing to all nations, but especially to Australia, from the unique system of international cooperation in the collection and exchange of data and products and through a series of globally coordinated research programs aimed at improved understanding and prediction of weather and climate. The development of Australian meteorology is documented in such publications as Crowder (1995), Webb (1997) and the various annual and research reports of the Bureau and CSIRO. There has been great progress in several areas.

Observing the structure and behaviour of the atmosphere

Australian meteorology in the twentieth century was magnificently served by a tradition of excellence in observational practices and high quality climate records inherited from its pioneers, but these were all simple measurements of quantities such as temperature, wind and rainfall or visual observations of weather, visibility and cloud. After early experiments with balloons and aircraft, a comprehensive upper air (rawinsonde) network for the measurement of temperature, humidity and wind speed up to 25km or more was progressively established from the mid 1940s onwards, and there are now 50 such stations, some automated. At the same time many surface observing stations have been replaced by automatic weather stations to provide information for both day to day weather forecasting and the long term national climate record. These are complemented by many thousands of volunteer observers whose outstanding contribution to Australian meteorology is celebrated this year, the United Nations Year of Volunteers.

Radar and satellite meteorology

Two major developments during the twentieth century greatly enhanced the capability for studying the three dimensional structure of the atmosphere and monitoring individual weather systems. Weather radars were introduced into Australia during the 1950s and 60s and have revolutionised the detection and tracking of severe weather systems, including the tropical cyclones that threaten the northern coastline. The Australian weather radar network now consists of some 50 stations covering the capital cities and most of the tropical coastline.

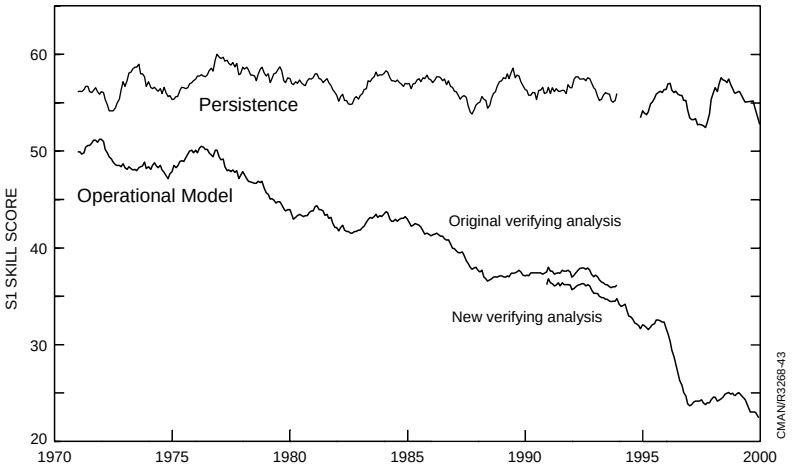
The launch of the first weather satellites in the early 1960s and the special arrangements put in place for accessing their data enabled meteorologists for the first time to reliably track the major southern ocean synoptic systems which largely determine the weather across the southern States. By the close of the century, international weather satellites were providing continuous hour by hour monitoring of weather patterns over the entire Australian region as well as detailed vertical profiles of temperature and wind to complement and integrate the data from the surface-based rawinsonde network.

Numerical weather prediction

Following the establishment of the World Weather Watch in 1964, and the Australian commitment to operating one of the three World Meteorological Centres, Australian meteorologists moved quickly to develop a world class research effort in the then emerging field of numerical weather prediction.

Research carried out in the Australian Numerical Meteorology Research Centre (ANMRC), and subsequently the Bureau of Meteorology Research Centre (BMRC) in close collaboration with overseas research centres, has enabled the Bureau, with the aid of powerful computers first installed in 1968 and progressively upgraded in line with the international state of the art, to operate global, regional and local numerical weather prediction models providing skilful guidance to weather forecasters throughout Australia and its neighbouring countries.

The steady increase in skill since the first introduction of numerical prediction models into the operations of the Bureau in the early 1970s is shown in graph C2.14.



C2.14 The S1 skill score (a measure of forecast error) for operational 24 hour prediction of mean sea level pressure in the Australian region. The increasing skill is evident as an increasing margin over 'persistence', the forecast that would result from assuming that tomorrow's pattern will be the same as today's.

Modelling of climate

Essentially the same models used for numerical weather prediction have, over the past twenty-five years, been progressively converted into climate simulation models by building in the longer term influence and behaviour of the oceans. Both the Bureau and CSIRO now operate sophisticated atmosphere–ocean general circulation models capable of simulating the behaviour of the global climate system—for use both in predicting the natural (El Niño and related) fluctuations of Australian climate on time scales of months to years and projecting future patterns of greenhouse-induced climate change over Australia under various greenhouse gas emission scenarios. Although these models have demonstrated significant skill for seasonal to interannual prediction, there is, so far, little confidence in their ability to provide reliable guidance on greenhouse time scales beyond indicating a general warming trend over the continent during the twenty-first century, with more warming in the interior than near the coast.

Service to the community

Meteorology is one of the most scientifically challenging but also most practically useful fields of science there is. The observing, data collection and modelling work of the Bureau provides the basis for a wide range of services to the Australian community at large and to most major economic sectors including agriculture, transport, energy and the information industries.

Although limited in scope and accuracy in the early part of the century, the Bureau's forecasts have steadily increased in lead time, skill and utility and now provide the basis for many millions of important weather and climate sensitive decisions every day. Economic valuation studies suggest that the overall benefit to the Australian community from the services of the Bureau at the close of the twentieth century exceed their cost by at least an order of magnitude. The continuing progress in national and international meteorological science and technology suggests the opportunity for even greater benefits in terms of safety of life, environmental protection and enhanced social and economic wellbeing through the twenty-first century (Zillman 1999).

References

Blainey G. 1980, *A Land Half Won*, Griffin Press, Adelaide, 388pp.

Bureau of Meteorology 1989, *Climate of Australia*, Australian Government Publishing Service, Canberra, 49pp.

Bureau of Meteorology 2000, *Climate Atlas of Australia, Rainfall* (in press).

Crowder R. B. 1995, *The Wonders of the Weather*, Australian Government Publishing Service, Canberra, 270pp.

Garratt J., Angus D. and Holper P. 1998, *Winds of change*, CSIRO, 136pp.

Gibbs W. J. 1975, *The Origins of Australian Meteorology*, Australian Government Publishing Service, Canberra, 32pp.

Gibbs W. J. 1982, "A perspective of Australian meteorology 1939–78'', *Australian Meteorological Magazine*, 30, 3–17.

Gibbs W. J. 1999, "A Very Special Family: Memories of the Bureau of Meteorology 1946 to 1962'', *Metarch Papers No 13*, Bureau of Meteorology, Melbourne, 259pp.

Hughes R, 1987, *The Fatal Shore*, Pan Books, London, 688pp.

Hunt H. A., Taylor A. G. and Quayle E. T. 1913, *The Climate and Weather of Australia*, Government Printer, Melbourne, 93pp.

Jones R. and Meehan B. 1997, "Balmarrk wana: big winds of Arnhem Land", in E. K. Webb 1997, *Windows on Meteorology. Australian Perspective* (see below).

McAfee R. J. 1981, *Dawes Meteorological Journal*, Australian Government Publishing Service, Canberra, 29pp.

Nicholls N. 1988, "More on early ENSOs: Evidence from Australian documentary sources", *Bulletin American Meteorological Society*, 69, pp. 4–6.

Nicholls N. 1998, "William Stanley Jevons and the climate of Australia", *Australian Meteorological Magazine*, 47, pp. 285–93.

Souter G. 1988, *Acts of Parliament*, Melbourne University Press, 658pp.

Tench W. 1789, *1788* (Edited and introduced by Tim Flannery), The Test Publishing Company, Melbourne, 1996, 280pp.

Webb E. K. 1997, *Windows on Meteorology. Australian Perspective*, CSIRO Publishing, Collingwood, 342pp.

Zillman J. W. 1994, "Climate", *Cambridge Encyclopaedia of Australia*, pp. 9–12.

Zillman J. W. 1999, "Meteorology and oceanography in the twenty-first century", *Bulletin of the Australian Meteorological and Oceanographic Society*, 12, 2, pp. 28–34.

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Introduction

Australia has a federal system of government within which there are four divisions: Commonwealth, State, Territory and local government.

This chapter begins with an article on the history of Australian Federation. It then outlines the basic features of the Australian system of government, including:

- the Constitutional basis of government;
- the Sovereign;
- the Governor-General;
- the Commonwealth Parliament;
- the Commonwealth Government;
- the Australian Public Service;
- Commonwealth elections;
- State government;
- Territory government—self-governing;
- Territory government—non-self-governing;
- local government; and
- the party system.

It also provides details of the Commonwealth Ministry, and of the State and Territory political leaders.

Australian Federation

(This article has been contributed by Scott Bennett of the Parliamentary Library, Canberra.)

Background

New South Wales, Tasmania, Western Australia, Victoria, South Australia and Queensland, were founded as separate British settlements, and at different times during the eighteenth century they each acquired separate systems of government. Despite this, there was a very early tendency to see them as representing a collective entity: as early as 1817 Governor Lachlan Macquarie had used the term 'Australia' in official documents. In the middle of the nineteenth century there were even a few suggestions in favour of a united system of government, though none of these was pushed as a realistic proposal. Among the suggestions were:

1847—a despatch from the United Kingdom spoke of the possible need for "a central legislative authority for the whole of the Australian colonies";

1849—a Privy Council committee recommended that one of the Australian Governors be created 'Governor-General' with power to convene a 'General Assembly of Australia';

1853—a New South Wales constitutional committee spoke of the need for 'a General Assembly', as did a Victorian parliamentary committee;

1857—a message to the UK spoke of a 'Federal Assembly'; and

1860—an attempt was made to convene a conference on federal union.

It was soon clear, however, that what became known as the 'Australian' colonies had much in common: the same language, the same God, the same sovereign. An emerging Australian nationalism was soon obvious, and by the 1880s people began to talk seriously of the possibility of some type of governmental union. Clearly, many Australians agreed with New South Wales Premier, Sir Henry Parkes, that "the crimson thread of kinship runs through us all".

Australian federation was thus partly to do with emotion, but there was also a practical side. During the 1880s serious problems associated with the separate status of the colonies became clear. One of the major Australian concerns was the increase in Chinese immigration which many people saw as a threat to Australian society. Australian governments also became worried about their vulnerability to outside attack, and various Australian fortifications were erected around the coast. Australians were also uneasy about the possibility of European nations establishing colonies close to their shores. Queensland was particularly concerned about German designs on New Guinea.
On 4 April 1883 Queensland annexed eastern

New Guinea, but this was disallowed by the British Government. When Germany annexed a portion of New Guinea in December 1884, this highlighted Australia's lack of independence.

In 1880 Parkes had raised the possibility of creating a federal council of the colonies "to accustom the public mind to federal ideas", but nothing was done. The concerns over defence gave this added point, and in 1885 the Federal Council of Australasia was established to deal with various matters, including maritime defence and relations with the Pacific islands. The Federal Council met every two years from 1886 to 1899, yet achieved little. It had no money, no executive power, limited legislative power, and no way of ensuring that all colonies would abide by its decisions. New South Wales never joined the Council and South Australia was a member only during 1889–90. Clearly, the Federal Council of Australasia was, in a politician's words, "a contemptible phantom".

Despite a gradual movement towards some type of national union, the colonies still maintained a jealous independence, symbolised by their separate flags. As part of this separate status, each colony maintained its own militia force, but these were small and hardly likely to act as a deterrent to an outside threat. In 1889 a UK-commissioned report recommended the establishment of an Australian defence force capable of acting in unison. For this to be achieved, defence force organisation and legislation needed to be uniform. During a visit to Tenterfield (NSW) later in 1889, Sir Henry Parkes referred to this report when he made a ringing call for "a great national Government for all Australia". The Tenterfield Address, as it became known, was said to have played a part in encouraging a general move towards Australian federation.

Immigration and defence were not the only issues bothering the Australian colonies. Since the 1850s, trade and movement between the colonies were restricted by the existence of tariff barriers. The train trip between Sydney and Melbourne, for example, was held up by the need for passengers' luggage to be checked by customs officers at Albury. According to the American writer Mark Twain, the colonies' tariff system was "the most baffling and unaccountable marvel that Australasia can show". Victorian Premier James Service warned that this problem was the "lion in the way" of final federation.

Progress in the 1890s

By 1890, there was enough interest in federation for the Premiers of NSW and Victoria to call an intercolonial meeting to discuss the issue. Delegates from all colonies, plus New Zealand, met in Melbourne to attend the Australasian Federation Conference. The Conference agreed that the time was right for federation, and it called for the creation of a national convention, which should be "empowered to consider and report upon an adequate scheme for a Federal Constitution".

The 1891 Federation Convention

The 1891 Federation Convention met in Sydney to write a constitution. There were delegates from each colony, plus New Zealand, all chosen by their parliaments. A draft constitution written by a Tasmanian delegate, Andrew Inglis Clark, was a useful starting point for the delegates, and after five weeks work a constitution draft was produced. The driving force behind the work of the Convention was the chair of the Drafting Committee, Sir Samuel Griffith of Queensland, and the final draft was said to have been marked by Griffith's "terse, clear style and force of expression". The main features of the draft were the creation of a federal system, a bicameral parliament, the upper house to be named the 'Senate', and of a superior court with power to declare acts of the Parliament unconstitutional—all of which were included in the final Australian Constitution.

The 1891 draft constitution was not implemented, due largely to opposition in New South Wales, but it later served as the starting point for the Convention of 1897–98.

Popular sentiment for federation

The federation push stalled after New South Wales' refusal to deal with the draft constitution. Over the next few years activity by ordinary Australians began to emerge, seeking to push the politicians back into action. Many 'federation leagues' were formed to influence public opinion, and the first leagues were formed along the New South Wales–Victoria border, where the tariff problem was felt particularly keenly. In Victoria, the Australian Natives' Association friendly society was important in publicising the federation cause. In 1893 some border leagues organised a federation conference at Corowa (NSW) which supported a call for a new federation convention to be held with direct election of delegates and ratification of any final

constitution by referendum. The People's Federation Convention was another unofficial Federation conference, organised by the Bathurst Federation League in 1896. This meeting criticised the inadequacy of the Federal Council of Australasia, supported popular election for a Senate and suggested the 1891 draft Constitution as the basis for discussion.

This popular activity put pressure on the politicians. In 1895 the New South Wales Premier, George Reid, called a Premiers' Conference that was held in Hobart in an attempt to renew the movement to federation. The Premiers agreed with the main lines of the Corowa Conference, namely that a popularly-elected convention should be convened to write a new draft, which would then be ratified by referendum. Consequently, legislation for colonial participation in a Federation convention was passed in all colonies except Queensland.

1897–98 Federation Convention

Four years after the Corowa Conference, elections were held in four colonies for delegates to another federation convention. A Western Australian delegation was elected by the Western Australian Parliament. For Queensland, however, it seemed that the price of joining a federation would be the loss of its black (i.e. South Sea Islander) labour system, so the colony refused to take part in the 1897–98 Convention, or the referenda of 1898.

The first session of the 1897–98 Federation Convention was held in Adelaide during March and April 1897, with Edmund Barton (NSW) as leader of the Convention. The delegates used the 1891 draft Constitution as the basis of their work. After the Adelaide meeting all colonial parliaments, except Queensland's, considered the draft, and in September the Convention met in Sydney to consider the amendments proposed by the parliaments.

After the Sydney meeting of the Convention, the New South Wales Parliament increased from 50,000 to 80,000 the number of affirmative votes (of an enrolled figure of about 300,000) required in a referendum for that colony to join a federation. Premier Reid came in for harsh criticism from federalists for his support for this change, which seemed likely to defeat the constitution.

The final session of the Convention was held in Melbourne from January to March 1898. It was here that the Tasmanian Premier inserted the infamous 'Braddon Blot' designed to help the smaller colonies by limiting the amount of revenue from tariffs the Commonwealth could use for its own purposes. Tariff concessions to Western Australia were made to encourage that reluctant colony to join the federation.

The Convention eventually approved a Constitution Bill and agreed that it was to be put to the people in referenda in the various colonies in mid-1898. YES and NO campaigns were waged in New South Wales, Victoria, South Australia and Tasmania. Western Australia stood apart due to concerns about the possible harmful impact of federation upon that colony. The strongest opposition seemed to be found in New South Wales, where Premier Reid criticised the draft Constitution, but said he would still vote for it in the referendum. He quickly became known as 'Yes-No' Reid. The New South Wales Attorney-General, Jack Want, fought fiercely to defeat the Constitution: "Get within the castiron clutch of this Constitution and you are sold body and soul to these other colonies … and New South Wales is gone forever".

Despite such vociferous opposition, YES majorities were secured in all four colonies, though the New South Wales total was below the required 80,000 votes, so the referendum failed in that colony. With this result it was pointless for the other colonies to proceed, for federation without the largest colony would fail.

Final success

In an effort to avoid another failure, a special Premiers' Conference was held to consider alterations to the Constitution Bill. Dubbed the 'secret' Premier's Conference due to its being closed to the media and the public, the changes it made largely met the objections of opponents in New South Wales. One change was the decision that the federal capital would be within the borders of New South Wales, but no closer than 100 miles (160.9 km) from Sydney.

A second round of referenda was now held in 1899 in New South Wales, Victoria, South Australia and Tasmania. Western Australia still refused to participate. YES majorities were secured in all. Queensland attended the 'secret' Premiers' Conference, but announced that it would not conduct a referendum if New South Wales rejected the Constitution Bill a second time. Once the 1899 New South Wales results were known, Queensland moved to give its people the chance to have their say, and they indicated their support with a clear YES majority.

2.1 VOTES FOR AND AGAINST FEDERATION, Australian Colonies

	First vote (1898)		Second vote (1899, 1900)	
Colony	For	Against	For	Against
New South Wales	71 595	66 228	107 420	82 741
Victoria	100 520	22 099	152 653	9 805
South Australia	35 800	17 320	65 990	17 053
Tasmania	11 797	2 716	13 437	791
Queensland	..	..	38 488	30 996
Western Australia	..	..	44 800	19 691
Total	**219 712**	**108 363**	**422 788**	**68 501**

Source: Scott Bennett, Department of the Parliamentary Library.

An Australian delegation travelled to London to oversee the Constitution Bill's passage through the UK Parliament. During that time, when there were British attempts to introduce amendments, the Australian delegates strongly defended the Bill in the form that had been approved by the Australian people. The Commonwealth of Australia Constitution Act was passed by the UK Parliament on 5 July and received Royal Assent on 14 July 1900.

Delays in Western Australia, caused by the colonial Government's doubts, meant that Western Australian voters had not had a chance to vote in a referendum on the Constitution Bill before it was sent to the UK. Various local Western Australian bodies urged that a referendum be held, including a 'separation for federation' movement, based on Albany, which threatened to secede from Western Australia if the Government did not act. Western Australians eventually voted, a fortnight after the Constitution had become law in the UK. The majority came largely from votes cast on the eastern goldfields, many of which were cast by 'T'othersiders' who had come from other colonies.

The Commonwealth of Australia was proclaimed by Queen Victoria on 17 September 1900, and on 21 September the Earl of Hopetoun was appointed the first Governor-General. The Commonwealth of Australia was inaugurated on 1 January 1901 in a ceremony in Centennial Park, Sydney, that included the singing of 'Advance Australia Fair' as well as 'God Save the Queen'. Governor-General Hopetoun was sworn in, followed by the first Commonwealth Government, led by Edmund Barton.

The first Commonwealth elections were held in March 1901, and on 9 May the Duke of York opened the first Commonwealth Parliament in the Exhibition Building, Melbourne.

Following a design competition that drew 32,823 entries, a flag for the new nation was flown for the first time in Melbourne on 3 September. It caused controversy, especially in New South Wales, due to its similarity to the Victorian flag. Many Australians in fact still regarded the Union Jack as the national flag.

Despite this, the patriots' cry of "One People, One Destiny" had been achieved.

The constitutional basis of government

Australia is a constitutional democracy based on a federal division of powers. The constitutional basis of government consists of:

- the Commonwealth Constitution, including amendments made to that Constitution;
- legislation passed by the Commonwealth, State and Territory Parliaments;
- High Court judgments;
- State and Territory Constitutions, including amendments; and
- Significant conventions of responsible government that were adopted from the system of government in use in the UK (the 'Westminster' system) that are in use at both the Commonwealth and State levels of government.

Commonwealth Constitution

The national constitution is found in the *Commonwealth of Australia Constitution Act 1900 (UK)*, a British Act that became law in July 1900 and came into force on 1 January 1901.

Amendment of the written Commonwealth Constitution is by Act of Parliament followed by public referendum. Any proposed law for the alteration of the Constitution must be passed by an absolute majority of each House of Parliament (except in circumstances specified in Section 128 of the Constitution which permits a referendum to proceed if passed by only one chamber). It must also be submitted to a referendum of the electors in each State and Territory. An amendment must be approved by a majority of the voters in a majority of the States and by a majority of all voters.

Since 1901, 44 proposals have been submitted to referenda. The consent of the electors has been given in regard to eight matters:

- the election of Senators (1906);
- State debts (1910 and 1928);
- social services (1946);
- Aboriginal people (1967); and
- Senate casual vacancies, retirement age for federal judges, and the right of Territory electors to vote in constitutional referenda (all 1977).

On 6 November 1999 a vote to establish Australia as a republic was put to a national referendum. The proposal was defeated, with 54.9% of electors voting against it.

Each State and Territory has its own Constitution found in legislation. Where a law of a State is inconsistent with a law of the Commonwealth, the latter law prevails and the former law is, to the extent of the inconsistency, invalid (for State and Territory government, see below).

The Sovereign

Since 7 February 1952, the Australian Sovereign has been Queen Elizabeth the Second.

The Governor-General

The Governor-General is the representative of the Sovereign, appointed by the Sovereign on the advice of the Australian Prime Minister.

Powers and functions

The Governor-General exercises the executive power of the Commonwealth of Australia on the advice of the Prime Minister. Certain other powers and functions conferred by the Constitution include the powers to:

- appoint times for holding the sessions of the Parliament;
- prorogue Parliament;
- dissolve the House of Representatives;
- cause writs to be issued for general elections of members of the House of Representatives;
- assent in the Queen's name to a proposed law passed by both houses of the Parliament;
- choose and summon Executive Councillors, who hold office during the Governor-General's pleasure; and
- appoint Ministers of State for the Commonwealth of Australia.

In addition, the Governor-General, as the Queen's representative, is Commander-in-Chief of the Defence Forces. Many Acts of the Commonwealth Parliament provide that the Governor-General may make regulations to give effect to such Acts. The Governor-General may also be authorised by statute to issue proclamations, for example, to declare an Act in force. The Governor-General has been given power by statute to legislate for certain of the Australian Territories.

The Governor-General also has what are referred to as 'reserve powers'. These may be used without the advice of the Prime Minister, but are used only in times of political uncertainty.

Holders of the office

The present Governor-General is His Excellency the Honourable Sir William Patrick Deane, AC, KBE.

Those persons who have held the office of Governor-General from the inception of the Commonwealth of Australia until 1988 are pictured in *Year Book Australia 1988.* Pictures of all holders of the office can be found in the Government section of *Australia Now* on the ABS Internet site, *http://www.abs.gov.au*.

Commonwealth Parliament

Commonwealth legislative power is vested in the Commonwealth Parliament, comprising the House of Representatives (148 members) and the Senate (76 members).

The powers of Parliament

Apart from the constitutional requirement that all financial legislation must originate in the House of Representatives, and that the Senate cannot amend such legislation, the two houses have similar powers. The fact that the Senate can reject financial legislation makes it one of the most powerful upper houses in the world.

Australia having a federal system means that the powers of the Commonwealth Parliament are limited to areas of national importance. Among the powers granted by the Constitution are trade and commerce, taxation, postal services, foreign relations, defence, immigration, naturalisation, quarantine, currency and coinage, weights and measures, copyright, patents and trade marks. High Court decisions and Commonwealth–State agreements have seen the Commonwealth gain influence in regard to various matters including industrial relations, financial regulation, companies and securities, health and welfare, and education.

The functions of Parliament

Parliament has five primary functions:

- to provide for the formation of a government;
- to make the law;
- to provide a forum for popular representation;
- to scrutinise the actions of government; and
- to provide a forum for the alternative government.

The *formation of a government* is the most important outcome of a general election. Either the government is returned, by virtue of retaining a majority of seats in the House of Representatives, or the opposition party or coalition of parties wins a majority of seats, resulting in the formation of a new government. The Prime Minister always sits in the House of Representatives.

The Hon. J. W. Howard, MP (Liberal Party of Australia) has been Prime Minister since 1996.

More than half of Parliament's time is taken up with the *consideration of proposed legislation.* Between 150 and 250 bills are passed each year. Most bills are not contentious, either being 'machinery' legislation necessary for the orderly processes of government, or bills that propose alterations to existing legislation. Most of the bills are government bills; private members' legislation is rare. Parliamentary deliberation frequently results in amendments to the proposed legislation, often as a result of representations to Senators and Members by those affected by the legislation.

The *representation of the people* is an important role of Members of the House of Representatives and Senators. Looking after their constituents occupies a great deal of their time. The relative importance of this role may be judged by the high proportion of time spent by MPs in their electorates and away from Parliament. During the 1990s the Parliament averaged 64 sitting days per year.

The *scrutiny* function is seen most obviously in the formal periods of Question Time, in both houses, that are a part of each day's sitting. Question Time is the best-known part of parliamentary proceedings, and is attended by many of the visiting public. Less well-known is the activity of a range of parliamentary committees which are established in order that Parliament's legislative, inquiry and scrutiny functions can be carried out more thoroughly and with the benefit of expert advice. These committees undertake the scrutiny of government operations as well as frequent inquiries into a range of current issues.

In Westminster system governments, such as Australia's, the Opposition has a recognised and formal status, being recognised in the Standing Orders of the Parliament and in legislation. The Opposition is seen as the *alternative government* and typically forms a 'shadow Cabinet' of MPs who prepare themselves to take on the reins of government. The Opposition also has the role of acting as the main critic of the government and of offering to the community an alternative set of policies.

The Hon. K.C. Beazley, MP (Australian Labor Party) has been the leader of the Opposition since 1996.

Commonwealth Government

Prime Minister

After an election, the Governor-General sends for the leader of the party, or coalition, which has secured a majority in the House of Representatives, and commissions that person to assume the office of Prime Minister and to form a government. The incoming Prime Minister then goes about the process of finding members of his or her parliamentary party or coalition to serve as Ministers in the Government.

The Prime Minister has the following powers:

- nomination of the Governor-General;
- is the sole source of formal advice for Governor-General;
- advises the Governor-General when Parliament should be dissolved;
- has responsibility for setting the date for House of Representatives elections;
- allocates positions in the Cabinet; and
- chairperson of Cabinet.

The Prime Minister also frequently assumes the role of Australia's international spokesperson.

Ministers

It is customary for all Ministers to be Members of Parliament, and if a Minister is not, it is obligatory for that Minister to become an MP within three months of his/her appointment. Reshuffles of the Ministry may occur at any time between elections. Ministers are invariably members of the same party or coalition as the Prime Minister.

The 55 Commonwealth Ministries since Federation are listed in table 2.2.

In most cases, new governments are formed after general elections have been held to determine the composition of the House. A new government could also be formed on any occasion between elections if the majority party changes its leader, or loses its majority (e.g. as a result of a by-election), or is defeated in an important vote in the House.

Cabinet

In practice, Government policy is determined by the most senior Ministers meeting in a body known as Cabinet. Such meetings are chaired by the Prime Minister. The Governor-General does not attend such meetings. Cabinet is not a body that is recognised by the formal Constitution, being a conventional part of the constitutional arrangements. Despite this, Cabinet effectively controls not only the legislative programme, but also the Departments of State. In effect, therefore, Cabinet is the dominant political and administrative element in Australia's national government. Ministers not included in Cabinet are referred to collectively as the Outer Ministry.

Particulars of the Second Howard Ministry, comprising Cabinet Ministers and the Outer Ministry, are shown in table 2.3.

The Australian Public Service

The Australian Public Service provides policy advice to the Commonwealth Government and facilitates the delivery of programs to the community. The Australian Public Service is part of the broader public sector, which includes parliamentary staff, statutory authorities, a separate public service for each of the States and Territories and local government employees. As at November 1999, 1,450,600 Australians, approximately 20% of the employed work force, worked in the public sector.

There are currently eighteen departments in the Australian Public Service. Each department is managed by a chief executive officer, or Secretary, who is responsible to the relevant Minister for the efficient, effective and ethical use of resources. The Minister, in turn, takes political responsibility for the actions of the department. Each department administers particular legislation that is specified in Administrative Arrangements. The management of financial and human resources is governed by legislation such as the *Financial Management and Accountability Act 1997* and the *Public Service Act 1999*. Public servants are required to uphold the values and standards of behaviour specified in the *Public Service Act 1999*. These include responsiveness to the Government, high ethical standards, accountability, impartiality, merit in employment, integrity, courtesy, lawfulness, confidentiality and the proper use of resources. As well as answering to the relevant Minister, the Australian Public Service is accountable to the Australian community through a variety of mechanisms including parliamentary committees, administrative law, the Ombudsman and the Auditor-General.

Over the last two decades, the Australian Public Service has undergone substantial change, both in its internal management processes and in its methods of service delivery. Examples of management changes include the introduction of accrual budgeting in the 1999–2000 Budget, an emphasis on reaching performance targets, the costing of government 'outputs', the imposition of capital use charges, the devolution of responsibility to departments and more flexible employment practices. Examples of changes to service delivery include the trend towards providing information and other services on the Internet, increased contracting of service delivery to the private sector and the establishment of customer service charters.

Public resources are harnessed by the public sector to give practical effect to government policies. Traditionally, this process has been known as public administration. Increasingly, it is known as public management, reflecting the growing expectation that public sector managers will take responsibility for achieving results, as well as the increasing emphasis on efficiency.

2.2 COMMONWEALTH MINISTRIES SINCE 1901

	Ministry	Period of office	Party
1.	Barton	1 January 1901 to 24 September 1903	PROTECTIONIST
2.	Deakin	24 September 1903 to 27 April 1904	PROTECTIONIST
3.	Watson	27 April 1904 to 17 August 1904	ALP
4.	Reid-McLean	18 August 1904 to 5 July 1905	FREE TRADE–PROTECTIONIST
5.	Deakin	5 July 1905 to 13 November 1908	PROTECTIONIST
6.	Fisher	13 November 1908 to 2 June 1909	ALP
7.	Deakin	2 June 1909 to 29 April 1910	PROTECTIONIST–FREE TRADE–TARIFF REFORM
8.	Fisher	29 April 1910 to 24 June 1913	ALP
9.	Cook	24 June 1913 to 17 September 1914	LIB
10.	Fisher	17 September 1914 to 27 October 1915	ALP
11.	Hughes	27 October 1915 to 14 November 1916	ALP
12.	Hughes	14 November 1916 to 17 February 1917	NATIONALIST LABOUR
13.	Hughes	17 February 1917 to 8 January 1918	NATIONALIST
14.	Hughes	10 January 1918 to 9 February 1923	NATIONALIST
15.	Bruce—Page	9 February 1923 to 22 October 1929	NATIONALIST–CP
16.	Scullin	22 October 1929 to 6 January 1932	ALP
17.	Lyons	6 January 1932 to 7 November 1938	UAP
18.	Lyons	7 November 1938 to 7 April 1939	UAP
19.	Page	7 April 1939 to 26 April 1939	CP–UAP
20.	Menzies	26 April 1939 to 14 March 1940	UAP
21.	Menzies	14 March 1940 to 28 October 1940	UAP–CP
22.	Menzies	28 October 1940 to 29 August 1941	UAP–CP
23.	Fadden	29 August 1941 to 7 October 1941	CP–UAP
24.	Curtin	7 October 1941 to 21 September 1943	ALP
25.	Curtin	21 September 1943 to 6 July 1945	ALP
26.	Forde	6 July 1945 to 13 July 1945	ALP
27.	Chifley	13 July 1945 to 1 November 1946	ALP
28.	Chifley	1 November 1946 to 19 December 1949	ALP
29.	Menzies	19 December 1949 to 11 May 1951	LIB–CP
30.	Menzies	11 May 1951 to 11 January 1956	LIB–CP
31.	Menzies	11 January 1956 to 10 December 1958	LIB–CP
32.	Menzies	10 December 1958 to 18 December 1963	LIB–CP
33.	Menzies	18 December 1963 to 26 January 1966	LIB–CP
34.	Holt	26 January 1966 to 14 December 1966	LIB–CP
35.	Holt	14 December 1966 to 19 December 1967	LIB–CP
36.	McEwen	19 December 1967 to 10 January 1968	LIB–CP
37.	Gorton	10 January 1968 to 28 February 1968	LIB–CP
38.	Gorton	28 February 1968 to 12 November 1969	LIB–CP
39.	Gorton	12 November 1969 to 10 March 1971	LIB–CP
40	McMahon	10 March 1971 to 5 December 1972	LIB–CP
41.	Whitlam	5 December 1972 to 19 December 1972	ALP
42.	Whitlam	19 December 1972 to 11 November 1975	ALP
43.	Fraser	11 November 1975 to 22 December 1975	LIB–CP
44.	Fraser	22 December 1975 to 20 December 1977	LIB–CP
45.	Fraser	20 December 1977 to 3 November 1980	LIB–CP
46.	Fraser	3 November 1980 to 7 May 1982	LIB–CP
47.	Fraser	7 May 1982 to 11 March 1983	LIB–CP
48.	Hawke	11 March 1983 to 13 December 1984	ALP
49.	Hawke	13 December 1984 to 24 July 1987	ALP
50.	Hawke	24 July 1987 to 4 April 1990	ALP
51.	Hawke	4 April 1990 to 20 December 1991	ALP
52.	Keating	20 December 1991 to 24 March 1993	ALP
53.	Keating	24 March 1993 to 11 March 1996	ALP
54.	Howard	11 March 1996 to 21 October 1998	LIB–NPA
55.	Howard	21 October 1998	LIB–NPA

Source: Department of the Parliamentary Library.

2.3 SECOND HOWARD MINISTRY—At June 2000

CABINET MINISTERS	
Prime Minister	The Hon. J. W. Howard, MP
Minister for Transport and Regional Services and Deputy Prime Minister	The Hon. J.D. Anderson, MP
Treasurer	The Hon. P. H. Costello, MP
Minister for Trade	The Hon. M. A. Vaile, MP
Minister for the Environment and Heritage and Leader of the Government in the Senate	Senator the Hon. R.M. Hill
Minister for Communications, Information Technology and the Arts, and Deputy Leader of the Government in the Senate	Senator the Hon. R. K. R. Alston
Minister for Employment, Workplace Relations and Small Business, and Leader of the House	The Hon. P. K. Reith, MP
Minister for Foreign Affairs	The Hon. A. J. G. Downer, MP
Minister for Family and Community Services and Minister Assisting the Prime Minister for the Status of Women	Senator the Hon. J. M. Newman
Minister for Defence	The Hon. J. C. Moore, MP
Minister for Health and Aged Care	The Hon. M. R. L. Wooldridge, MP
Minister for Finance and Administration	The Hon. J. J. Fahey, MP
Minister for Education,Training and Youth Affairs and Minister Assisting the Prime Minister for the Public Service	The Hon. Dr D. A. Kemp, MP
Minister for Industry, Science and Resources	The Hon. N. H. Minchin, MP
Attorney-General	The Hon. D. R. Williams AM, QC, MP
Minister for Immigration and Multicultural Affairs and Minister Assisting the Prime Minister for Reconciliation	The Hon. P. M. Ruddock, MP
Minister for Agriculture, Fisheries and Forestry	The Hon. W. E. Truss, MP
OUTER MINISTRY	
Minister for Aboriginal and Torres Strait Islander Affairs	Senator the Hon. J. J. Herron
Assistant Treasurer	Senator the Hon. C. R. Kemp
Minister for Financial Services and Regulation	The Hon. J. B. Hockey, MP
Minister for Regional Services, Territories and Local Government	Senator the Hon. I. D. Macdonald
Minister for the Arts and the Centenary of Federation, and Deputy Leader of the House	The Hon. P. J. McGauran, MP
Minister for Employment Services	The Hon. A. J. Abbott, MP
Minister for Community Services	The Hon. L. J. Anthony, MP
Minister for Veterans' Affairs and Minister Assisting the Minister for Defence	The Hon. B. C. Scott, MP
Minister for Aged Care	The Hon. B. K. Bishop, MP
Special Minister of State	Senator the Hon. C. M. Ellison
Minister for Sport and Tourism and Minister Assisting the Prime Minister for the Sydney 2000 Games	The Hon. J. M. Kelly, MP
Minister for Justice and Customs	Senator the Hon. A. E. Vanstone
Minister for Forestry and Conservation, and Minister Assisting the Prime Minister	The Hon. C. W. Tuckey, MP
Parliamentary Secretary to Cabinet	Senator the Hon. W. D. Heffernan
Parliamentary Secretary (Transport and Regional Services)	Senator the Hon. R. L. D. Boswell
Parliamentary Secretary to the Minister for the Environment and Heritage	The Hon. S. N. Stone, MP
Parliamentary Secretary to the Minister for Communications, Information Technology and the Arts, and Manager of Government Business in the Senate	Senator the Hon. I. G. Campbell
Parliament Secretary to the Minister for Defence	Senator the Hon. E. Abetz
Parliamentary Secretary to the Minister for Health and Aged Care	Senator the Hon. G. E. J. Tambling
Parliamentary Secretary to the Minister for Finance and Administration	The Hon. P. N. Slipper, MP
Parliamentary Secretary to the Minister for Education, Training and Youth Affairs	The Hon. P. M. Worth, MP
Parliamentary Secretary to the Minister for Industry, Science and Resources	The Hon. W. G. Entsch, MP
Parliamentary Secretary to the Minister for Agriculture, Fisheries and Forestry	Senator the Hon. J. M. Troeth
Parliamentary Secretary to the Minister for Employment, Workplace Relations and Small Business	The Hon. M. T. Brough, MP
Parliamentary Secretary to the Minister for Foreign Affairs, and Parliamentary Secretary to the Minister for Immigration and Multicultural Affairs	Senator the Hon. K. C. L. Patterson

Commonwealth elections

Franchise

Any Australian citizen 18 and over, or British subject who was on the Commonwealth Roll as at 25 January 1984, is qualified to enrol and vote at Commonwealth elections. Residence in an electorate for a period of one month before enrolment is necessary to enable a qualified person to enrol. Enrolment and voting are compulsory for all eligible persons.

Parliamentary terms

Members of the House of Representatives are elected for a maximum term of three years, though elections may be called earlier. Senators have fixed terms of six years. Normally half the Senate retires every three years, and elections for the Senate are usually held at the same time as elections for the House of Representatives, though they need not be.

At times of disagreement between the House of Representatives and the Senate, both houses may be dissolved and an election called for both houses. Six of the thirty-nine Commonwealth elections have been double dissolution elections.

Table 2.4 shows the number and terms of all parliaments since Federation.

2.4 COMMONWEALTH PARLIAMENTS

Number of Parliament	Date of opening	Date of dissolution
First	9 May 1901	23 November 1903
Second	2 March 1904	5 November 1906
Third	20 February 1907	19 February 1910
Fourth	1 July 1910	23 April 1913
Fifth	9 July 1913	30 July 1914(a)
Sixth	8 October 1914	26 March 1917
Seventh	14 June 1917	3 November 1919
Eighth	26 February 1920	6 November 1922
Ninth	28 February 1923	3 October 1925
Tenth	13 January 1926	9 October 1928
Eleventh	6 February 1929	16 September 1929
Twelfth	20 November 1929	27 November 1931
Thirteenth	17 February 1932	7 August 1934
Fourteenth	23 October 1934	21 September 1937
Fifteenth	30 November 1937	27 August 1940
Sixteenth	20 November 1940	7 July 1943
Seventeenth	23 September 1943	16 August 1946
Eighteenth	6 November 1946	1 October 1949
Nineteenth	22 February 1950	19 March 1951(a)
Twentieth	12 June 1951	21 April 1954
Twenty-first	4 August 1954	4 November 1955
Twenty-second	15 February 1956	14 October 1958
Twenty-third	17 February 1959	2 November 1961
Twenty-fourth	20 February 1962	1 November 1963
Twenty-fifth	25 February 1964	31 October 1966
Twenty-sixth	21 February 1967	29 September 1969
Twenty-seventh	25 November 1969	2 November 1972
Twenty-eighth	27 February 1973	11 April 1974(a)
Twenty-ninth	9 July 1974	11 November 1975(a)
Thirtieth	17 February 1976	8 November 1977
Thirty-first	21 February 1978	19 September 1980
Thirty-second	25 November 1980	4 February 1983(a)
Thirty-third	21 April 1983	26 October 1984
Thirty-fourth	21 February 1985	5 June 1987(a)
Thirty-fifth	14 September 1987	19 February 1990
Thirty-sixth	8 May 1990	8 February 1993
Thirty-seventh	4 May 1993	29 January 1996
Thirty-eighth	30 April 1996	31 August 1998
Thirty-ninth	10 November 1998	—

(a) A dissolution of both the Senate and the House of Representatives.

Source: Department of the Parliamentary Library.

Electorates

For the purpose of House of Representatives elections each State or Territory is divided into single-member electorates corresponding in number to the number of members to which the State or Territory is entitled. In Senate elections the whole State or Territory constitutes a single electorate.

Redistributions of House of Representatives electorates must be held at least every seven years. A redistribution must take into account current and projected enrolments, community of economic, social and regional interests, means of communication and travel, physical features and area, and existing electorate boundaries. Within each State and Territory the electorates must, as far as possible, be equal in numbers of electors. There is usually a variation in size of electorates from one State or Territory to another.

The Electoral Commissioner determines the representation entitlements of the States and Territories during the thirteenth month after the first meeting of a new House of Representatives. Determinations are based on the latest population statistics as provided by the Australian Statistician. The representation entitlements of the States and Territories at the 1999 determination are shown in table 2.5, which also shows the total size of the House of Representatives at the time of the next election. Tasmania has a constitutional entitlement to five members of the House of Representatives based on it being a State at the time of Federation in 1901. The Australian Capital Territory and the Northern Territory have gained representation since 1901, and have a guaranteed representation of one member of the House of Representatives.

Method of election

Elections for the House of Representatives are by the use of the alternative vote (known in Australia as preferential voting).

Senate elections are conducted using the single transferable vote form of proportional representation.

1998 election

First preference votes cast for the major political parties in each State and Territory at the 1998 election for each House of the Commonwealth Parliament are shown in table 2.6.

The numbers of electors enrolled are shown in table 2.7

The state of the parties in the Commonwealth Parliament at July 2000 is shown in table 2.8.

2.5 REPRESENTATION ENTITLEMENTS(a)

State/Territory	Seats no.
New South Wales	50
Victoria	37
Queensland	27
Western Australia	15
South Australia	12
Tasmania	5
Australian Capital Territory	2
Northern Territory	2
Total	**150**

(a) 1999 Determination.

Source: Department of the Parliamentary Library.

2.6 COMMONWEALTH PARLIAMENTARY ELECTIONS, Votes Recorded—3 October 1998

HOUSE OF REPRESENTATIVES

	NSW	Vic.	Qld	SA	
First preference votes					
Australian Labor Party	1 489 021	1 261 289	719 743	319 267	
Liberal Party	1 131 545	1 053 990	615 153	389 382	
National Party	293 126	77 385	199 185	4 796	
Country Liberal Party	—	—	—	—	
Pauline Hanson's One Nation	332 510	105 798	285 983	90 773	
Australian Democrats	154 496	171 091	80 003	93 905	
The Greens	98 647	59 383	47 440	4 576	
Unity—Say No to Hanson	57 666	29 265	—	—	
Christian Democratic Party	38 023	3 793	11 243	3 521	
Others	116 110	80 687	34 625	19 771	
Formal votes	3 711 144	2 842 682	1 993 375	925 991	
Informal votes	1 554 859	103 524	68 659	44 074	
Total votes recorded	*3 866 003*	*2 946 205*	*2 062 034*	*970 065*	

	WA	Tas.	NT	ACT	Aust.
First preference votes					
Australian Labor Party	377 545	150 384	38 469	98 588	4 454 306
Liberal Party	397 836	117 377	—	59 424	3 764 707
National Party	13 596	—	—	—	588 088
Country Liberal Party	—	—	36 014	—	36 014
Pauline Hanson's One Nation	96 708	7 553	7 401	9 895	936 621
Australian Democrats	41 364	10 024	4 658	14 394	569 935
The Greens	52 674	17 091	2 753	8 145	290 709
Unity—Say No to Hanson	321	—	—	—	87 252
Christian Democratic Party	8 336	—	—	—	64 916
Others	54 395	5 048	1 642	4 237	316 515
Formal votes	1 042 775	307 477	90 937	194 683	1 109 063
Informal votes	45 509	9 819	3 951	5 743	436 138
Total votes recorded	*1 088 284*	*317 296*	*94 888*	*200 426*	*11 545 201*

...continued

2.6 COMMONWEALTH PARLIAMENTARY ELECTIONS, Votes Recorded—3 October 1998—*continued*

	SENATE				
	NSW	**Vic.**	**Qld**	**SA**	
First preference votes					
Australian Labor Party	1 452 560	1 153 100	654 623	303 299	
Liberal-National Party	1 375 563	1 076 844	—	—	
Liberal Party	—	—	570 692	383 637	
National Party	—	—	190 662	4 445	
Country Liberal Party	—	—	—	—	
Pauline Hanson's One Nation	361 009	117 048	297 245	91 910	
Australian Democrats	275 910	279 806	156 451	117 619	
The Greens	81 612	70 872	42 264	20 895	
Christian Democratic Party	58 079	13 881	28 826	9 598	
Unity—Say No to Hanson	61 607	20 603	9 487	—	
Senator Harradine Group	—	—	—	—	
Others	89 385	111 006	53 460	15 413	
Formal vote	3 755 725	2 843 160	2 003 710	946 816	
Informal votes	128 596	111 686	62 859	27 424	
Total votes recorded	*3 884 321*	*2 954 846*	*2 066 569*	*974 240*	

	WA	**Tas.**	**NT**	**ACT**	**Aust.**
First preference votes					
Australian Labor Party	368 878	128 377	38 259	83 867	4 182 963
Liberal-National Party	—	—	—	—	2 452 407
Liberal Party	408 748	104 268	—	61 385	1 528 730
National Party	13 429	—	—	—	208 536
Country Liberal Party	—	—	36 063	—	36 063
Pauline Hanson's One Nation	110 294	11 655	8 657	9 621	1 007 439
Australian Democrats	68 095	12 107	5 119	32 833	947 940
The Greens	61 063	17 905	4 232	6 385	305 228
Christian Democratic Party	10 264	945	—	923	122 516
Unity—Say No to Hanson	2 271	—	—	—	93 968
Senator Harradine Group	—	24 254	—	—	24 254
Other	21 036	8 866	672	2 021	301 859
Formal votes	1 064 078	308 377	93 002	197 035	11 211 903
Informal votes	29 354	9 704	1 887	3 952	375 462
Total votes recorded	*1 093 432*	*318 081*	*94 889*	*200 987*	*11 587 365*

Source: Department of the Parliamentary Library.

2.7 COMMONWEALTH PARLIAMENTARY ELECTION OF 3 OCTOBER 1998, Electors Enrolled

State/Territory	no.
New South Wales	4 076 081
Victoria	3 081 632
Queensland	2 188 024
South Australia	1 013 989
Western Australia	1 149 619
Tasmania	330 121
Northern Territory	105 048
Australian Capital Territory	209 536
Australia	12 154 050

Source: Department of the Parliamentary Library.

2.8 STATE OF THE PARTIES, Commonwealth Parliament—July 2000

	no.
House of Representatives	
Australian Labor Party	66
Liberal Party	64
National Party	16
Independent	2
Total	*148*
Senate	
Australian Labor Party	29
Liberal Party	31
National Party	3
Country Liberal Party	1
Australian Democrats	9
Greens	1
Pauline Hanson's One Nation	1
Independent	1
Total	*76*

Source: Department of the Parliamentary Library.

2.9 GOVERNORS OF THE STATES—June 2000

State	Governor
New South Wales	His Excellency the Honourable Gordon Samuels, AC, QC
Victoria	His Excellency the Honourable Sir James Gobbo, AC, QC
Queensland	His Excellency Major-General Peter Arnison, AO
Western Australia	His Excellency Lieutenant-General John Murray Sanderson, AC, AM
South Australia	His Excellency Sir Eric Neal, AC, CVO
Tasmania	His Excellency the Honourable Sir Guy Green, AC

Source: Department of the Parliamentary Library.

State government

The fact of Australia having a federal system of government means that significant powers are held by the State and Territory Governments. Each State experienced a period of colonial self-government prior to the achievement of Federation.

State Governors

The Governor is the representative of the Sovereign, appointed by the Sovereign on the advice of the relevant State Premier. The Governor exercises the executive power of his or her State on the advice of the Premier. Other powers and functions are similar to the powers exercised at the Commonwealth level by the Governor-General.

In addition, Governors have been invested with various statutory functions by State Constitutions and the *Commonwealth Australia Act 1986*, as well as under the Acts of the Parliaments of the States. Governors may administer the prerogative of mercy by the reprieve or pardon of criminal offenders, and may remit fines and penalties due to the Crown in right of their State.

In the performance of his/her functions generally, the Governor of a State acts on the advice of Ministers of State for that State.

The Governor also has what are referred to as 'reserve powers'. These may be used without the advice of the Premier, but are used only in times of political uncertainty.

State Parliaments

Five of the six Australian States have a bicameral Parliament. In Queensland there is a single house. The lower houses in New South Wales, Victoria, Queensland and Western Australia are entitled Legislative Assembly. In South Australia and Tasmania the term is House of Assembly. The title of all upper houses is Legislative Council.

The members of the Parliaments of each State are elected by the residents of that State using either the alternative vote (preferential voting) or the single transferable vote variant of proportional representation.

The state of the parties in each of the State and Territory Parliaments is set out in table 2.12.

The extent of State legislative powers is defined by the Commonwealth and State Constitutions, and includes education, police, public health, public transport, agriculture, roads and the overseeing of local government.

State Governments

Each State is governed by a Ministry headed by a Premier. The State Cabinet, chaired by the Premier, is the centre of political and administrative power in each State.

Each State has a formal Opposition, with the same role as at the Commonwealth level, headed by an Opposition Leader.

Tables 2.10 and 2.11 set out the State Premiers and Opposition Leaders.

2.10 PREMIERS, States—June 2000

State	Premier
New South Wales	The Hon. R. J. Carr, MP (ALP)
Victoria	The Hon. S.P. Bracks, MP (ALP)
Queensland	The Hon. P. Beattie, MP (ALP)
Western Australia	The Hon. R. Court, MP (LP)
South Australia	The Hon. J.W. Olsen, MP (LP)
Tasmania	The Hon. J.A. Bacon, MP (LP)

Source: Department of the Parliamentary Library.

2.11 OPPOSITION LEADERS, States—June 2000

State	Opposition Leader
New South Wales	K.A. Chikarovski, MP (LP)
Victoria	The Hon. D. Napthine, MP (LP)
Queensland	The Hon. R.E. Borbidge, MP (NP)
Western Australia	G.I. Gallop, MP (ALP)
South Australia	The Hon. M. Rann, MP (ALP)
Tasmania	The Hon. S.D. Napier, MP (LP)

Source: Department of the Parliamentary Library.

2.12 STATE OF THE PARTIES, States and Territories—July 2000

State/Territory	no. of seats
NEW SOUTH WALES	
Legislative Assembly	
Australian Labor Party	55
Liberal Party	20
National Party of Australia	13
Independent	5
Total	*93*
Legislative Council	
Australian Labor Party	16
Liberal Party	9
National Party of Australia	4
Christian Democratic Party	2
Greens	2
Australian Democrats	1
Pauline Hanson's One Nation	1
Others	7
Total	*42*
VICTORIA	
Legislative Assembly	
Australian Labor Party	44
Liberal Party	35
National Party	6
Independent	3
Total	*88*
Legislative Council	
Australian Labor Party	24
Liberal Party	14
National Party	6
Total	*44*
QUEENSLAND	
Legislative Assembly	
Australian Labor Party	45
National Party of Australia	23
Liberal Party	6
City Country Alliance	6
Independent	6
Total	*89*

...continued

2.12 STATE OF THE PARTIES, States and Territories—July 2000 —*continued*

State/Territory	no. of seats
SOUTH AUSTRALIA	
House of Assembly	
Liberal Party	24
Australian Labor Party	21
National Party	1
Independent	1
Total	*47*
Legislative Council	
Liberal Party	10
Australian Labor Party	6
Australian Democrats	3
Independent	3
Total	*22*
WESTERN AUSTRALIA	
Legislative Assembly	
Liberal Party	29
Australian Labor Party	18
National Party	6
Independent	4
Total	*57*
Legislative Council	
Liberal Party	14
Australian Labor Party	11
National Party	3
Greens	3
Australian Democrats	2
Independent	1
Total	*34*
TASMANIA	
House of Assembly	
Australian Labor Party	14
Liberal Party	10
Greens	1
Independent	1
Total	*25*
Legislative Council	
Australian Labor Party	4
Independent	11
Total	25
NORTHERN TERRITORY	
Legislative Assembly	
Country Liberal Party	18
Australian Labor Party	7
Total	25
AUSTRALIAN CAPITAL TERRITORY	
Legislative Assembly	
Liberal Party	6
Australian Labor Party	6
Greens	1
Independent	4
Total	*17*

Source: Department of the Parliamentary Library.

Territory government

Self-governing

The Australian Capital Territory and the Northern Territory are self-governing polities with powers almost matching those of the original States. The Northern Territory has been working towards full Statehood, though a referendum on the question was rejected by Northern Territory voters in 1998. Norfolk Island controls its own treasury and raises revenue under its own system of laws. Generally, Commonwealth laws do not apply to Norfolk Island unless expressed to do so, but where any Norfolk Island legislation is in conflict with ordinances made by the Governor-General, such legislation is deemed null and void. Norfolk Islanders may enrol for Commonwealth elections in the electoral division they nominate, with some exceptions.

The Northern Territory and Norfolk Island both have an Administrator of the Territory, appointed by the Governor-General (table 2.13).

2.13 ADMINISTRATORS, Territories—June 2000

Territory	Administrator
Northern Territory	His Honour Dr Neil Raymond Conn, AO
Norfolk Island	His Honour Anthony J. Messner

Source: Department of the Parliamentary Library.

The Australian Capital Territory has neither Administrator nor Governor.

Each Territory has an elected Legislative Assembly, with a wide range of powers. Each Territory has a government headed by a Chief Minister (table 2.14). The Northern Territory and the Australian Capital Territory have an Opposition headed by an Opposition Leader (table 2.15).

2.14 CHIEF MINISTERS, Territories—October 2000

Territory	Chief Minister
Northern Territory	The Hon. D. G. Burke, MLA (CLP)
Australian Capital Territory	The Hon. G. Humphries, MLA (LP)
Norfolk Island	G. C. Smith

Source: Department of the Parliamentary Library.

2.15 OPPOSITION LEADERS, Territories—June 2000

Territory	Opposition Leader
Northern Territory	S. J. Stirling, MLA (ALP)
Australian Capital Territory	J. Stanhope, MLA (ALP)

Source: Department of the Parliamentary Library.

Non self-governing

Jervis Bay Territory, and the external territories of the Cocos (Keeling) Islands, Christmas Island, Coral Sea Islands and Ashmore and Cartier Islands make up the non self-governing Territories of Australia.

The resident communities in each of Jervis Bay Territory, the Cocos (Keeling) Islands and Christmas Island are provided with an extensive range of government services. Each of the Cocos (Keeling) Islands and Christmas Island has an elected local government, and residents may vote in Commonwealth Parliamentary elections in the electoral division of Lingiari. Residents of Jervis Bay are enrolled in the electoral division of Fraser, ACT.

Local government

Local government has a limited constitutional position in Australia, being organised under State or Territory legislation upon broadly similar lines across Australia. The main variation is the existence of various councils in the Northern Territory that are based on rural Aboriginal communities. There are no local councils in the Australian Capital Territory, where the Territory Government has direct responsibility for local services. Local government in Australia is unlike that in many other political systems, for it provides an unusually narrow range of services.

Each State and the Northern Territory has a number of local government areas, known variously as cities, towns, municipalities, boroughs, shires or districts. The generic local body is the council. In October 1999 there were 730 local councils. Most councillors and aldermen are elected by local residents, though councils may be dismissed by State Governments and occasionally are.

Within each local government area various local services are provided, though there are many variations between States as well as between urban and rural councils. The Brisbane City Council is responsible for the provision of services across most of Brisbane; by contrast, many small rural councils provide a relatively small number of services. Among the local responsibilities are the management of health, sanitary and garbage services, road, street and bridge construction, water supply and sewerage, museums, fire brigades, harbour services and local libraries. The scope of local government duties differs a great deal around the nation, for in all States many of these duties are performed either directly by the State Government or

through semi-government authorities, known in Australia as statutory authorities. The provision of household water, for instance, is typically undertaken by a statutory authority operating under State legislation.

Political parties

The party system

An Australian party system had begun to develop during the last years of the colonial period in the 1890s, to the extent that most seats in the first Parliament were won by candidates from just three major groups. The outline of the modern system can be seen as early as 1909 when a fusion of the major non-Labor parties formed the first Liberal Party. This was confirmed in the election in the following year, which saw the election dominated by the Liberal and Australian Labor Parties. In 1922 the Country Party won a significant number of seats and shared in a coalition government, and since that time the Australian party system has been dominated by the contest between Labor and a coalition of the Liberal and National (formerly Country) Parties. Many minor parties have contested House of Representatives elections, but have not seriously threatened the dominance of the three major parties.

Since 1949 the use of proportional representation for Senate elections has given minor parties a realistic chance of winning Senate seats, and the major parties have rarely controlled the upper house since the election of 1964.

Parties and Parliament

The idea that Parliament 'controls' Ministers, as well as government policy and the departments and statutory bodies which implement these policies, is a concept which had more relevance in the nineteenth century than it does today. Stable majority party government in the twentieth century is perhaps the main reason for the decline in absolute parliamentary control as well as for the decline in the influence of Parliament relative to that of the Executive.

The impact of parties can be seen clearly in the operations of each house of Parliament, particularly in the legislative process. Many questions and queries may be raised in the House of Representatives, and amendments are often moved. However, because governments enjoy a majority in the House, questions may be avoided, amendments cannot be forced, and whether or not the Opposition's views are accepted depends on the wishes of the government of the day.

It is a different story in the Senate, where no government has enjoyed a majority since 1981. If the government wants legislation to be passed by the Senate it often has to agree to amendments proposed by the Opposition and minor parties. It is for this reason that the Senate is far more active than the House in sending proposed legislation to committees.

National Anthem and colours of Australia

A national song poll was held on 21 May 1977. Voting was preferential and, after the distribution of preferences, 'Advance Australia Fair' became the national song of Australia.

His Excellency, the Governor-General of the Commonwealth of Australia, issued the following Proclamation on 19 April 1984:

I, SIR NINIAN MARTIN STEPHEN, Governor-General of the Commonwealth of Australia, acting with the advice of the Federal Executive Council, hereby declare:

(a) that the anthem 'God Save The Queen' shall henceforth be known as the Royal Anthem and be used in the presence of Her Majesty The Queen or a member of the Royal Family;

(b) that the National Anthem shall consist of the tune known as 'Advance Australia Fair' with the following words:

Australians all let us rejoice,
For we are young and free,
We've golden soil and wealth for toil;
Our home is girt by sea;
Our land abounds in nature's gifts
Of beauty rich and rare,
In history's page, let every stage
Advance Australia Fair.
In joyful strains then let us sing,
Advance Australia Fair.

Beneath our radiant Southern Cross
We'll toil with hearts and hands;
To make this Commonwealth of ours
Renowned of all the lands;
For those who've come across the seas
We've boundless plains to share;
With courage let us all combine
To Advance Australia Fair.
In joyful strains then let us sing,
Advance Australia Fair.

(c) that the Vice-Regal Salute to be used in the presence of His Excellency the Governor-General shall consist of the first four bars and the last four bars of the tune known as Advance Australia Fair;

(d) that the National Anthem shall be used on all official and ceremonial occasions, other than occasions on which either the Royal Anthem or the Vice-Regal Salute is used; and

(e) that green and gold (Pantone Matching System numbers ll6C and 348C as used for printing on paper) shall be the national colours of Australia for use on all occasions on which such colours are customarily used.

Reference notes

The Australian Constitution is reproduced in Year Book Australia from time to time, the latest being the 1998 edition.

In *Year Book Australia 1924* the names are given of each Ministry up to the Bruce–Page Ministry together with the names of the successive holders of portfolios therein. *Year Book Australia 1953* contains a list which covers the period between 9 February 1923, the date on which the Bruce–Page Ministry assumed power, and 31 July 1951, showing the names of all persons who held office in each Ministry during that period. The names of members of subsequent Ministries are listed in issues of *Year Book Australia, 1953 to 1975–76* inclusive, and in successive issues from 1980.

For further details of referendums see *Year Book Australia 1966*, pages 66–68, *Year Book Australia 1974*, pages 90–91, *Year Book Australia 1977–78*, pages 72–73 and *Year Book Australia 1986*, pages 55–56.

Particulars of voting at Senate elections and elections for the House of Representatives up to 1996 appear in earlier issues of Year Book Australia. Full details are contained in the Election Statistics issued by the Electoral Commissioner following each election.

Bibliography

Australian Electoral Commission 1999, *Behind the scenes. The Australian Electoral Commission's 1998 Federal Election Report*, Ausinfo, Canberra.

Carter J. 2000, *Parliamentary Government in Australia*, 4th ed., Parliamentary Education Office, Canberra.

Department of the Parliamentary Library 1999, *Parliamentary Handbook of the Commonwealth of Australia*, 28th edition, Canberra.

Internet sites

AusInfo, *http://www.ausinfo.gov.au*

Australian Electoral Commission, *http://www.aec.gov.au*

Parliament of Australia, *http://www.aph.gov.au*

—Department of the Parliamentary Library, *http://www.aph.gov.au/library*

—Hansard, *http://www.aph.gov.au/hansard*

—Parliamentary Education Office, *http://www.peo.gov.au*

Women and government in Australia

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Introduction

In 1902 Australia became the first country in the world where most women had the right both to vote and to stand for the national parliament. Women had gained the right to vote for parliament in New Zealand in 1893, but were not able to stand as candidates until after the First World War. But although Australian women gained these political rights very early, they did not succeed in entering the federal parliament until four decades later. Entry into the higher reaches of government took even longer. Although the suffragists had spoken eloquently about the need for women to take their share in "housekeeping the state", it was more than sixty years before the first woman achieved ministerial responsibility for a federal department—appropriately the Ministry of Housing. It was almost another 20 years before the first woman became Secretary to a Commonwealth Department. For most of the century women's careers in the Commonwealth Public Service had been truncated by the bar on employment or recruitment of married women. Women were also notable for their absence for most of the century from government-appointed bodies. This article provides an overview of the 20th century in terms of women's entry into government.

Early hopes

The first election in which women were able to vote for an Australian parliament was in South Australia in 1896. *The Adelaide Observer* (2 May 1896) was impressed by the refining influence of women voters on the electoral process, and inspired to reproduce these verses written in anticipation of the event:

> *Lovely woman, hesitating*
> *Round the booths in sweet dismay*
> *Her gentle bosom palpitating*
> *Lest she cast her vote away*
>
> *And when she glides in graceful, pretty,*
> *To vote in her most charming frock*
> *The poll clerks in suburb and city*
> *Will thrill with an electric shock.*

Subsequently, South Australian delegates to the Constitutional Convention insisted on a clause in the Constitution (§41) that would prevent South Australian women voters being denied the Commonwealth franchise. The resultant disparities in the federal franchise made inevitable the provisions for uniform suffrage in the *Commonwealth Franchise Act 1902* despite the fears of Sir Edward Braddon that it would lead to husbands being left to cook their own dinners and mind the baby (CAPD IX 23 April 1902: 11937). These provisions were not quite uniform, however. For example, the federal franchise did not become uniform for Indigenous Australians until the amendment of the Electoral Act in 1962.

Women in South Australia had already voted for the election of delegates to the Constitutional Convention in 1897, some of them for Catherine Helen Spence, Australia's first woman political candidate. In both

South Australia and Western Australia women voted in the referenda on federation. The other States lagged behind in terms of women's political rights, but the granting of these rights at the federal level had a galvanising effect (table C3.1).

Australian women promptly stood for the new federal parliament in the 1903 election. Of these the suffragist Vida Goldstein was the most famous, standing as a Victorian candidate for the Senate, but two other women stood for the Senate in NSW and one for the House of Representatives. In her Manifesto to the Electors of Victoria, Goldstein argued that the women's interests could only be effectively protected by women MPs and that the increasing volume of social legislation made it particularly important for women to be present as ''representatives of the home''. She also stood on a platform of equal pay and equal employment opportunity for women in the new Commonwealth Public Service. Despite rumours that she had unsound views on marriage, Goldstein attracted large audiences for her election meetings, for the first time often dominated by women. Although unsuccessful, she polled over 50,000 votes and went on to stand for federal parliament four more times. A federal electorate was named in her honour in 1984.

While none of the women candidates for the federal parliament were successful in 1903, or indeed for another 40 years, the fact that Australian women were exercising their political rights was an inspiration to women campaigning for the suffrage elsewhere. Australian suffragists joined the struggle in the 'mother country'. Adelaide-born Muriel Matters became known as the first woman to give a speech in the House of Commons—while chained to the grille of the Ladies' Gallery in 1908. The following year she floated over Westminster on the day of the state opening of parliament, in an airship inscribed 'Votes for Women', scattering handbills over the side.

Federal parliament also attempted to influence the course of events in the UK. In 1909, a motion put forward by Prime Minister Alfred Deakin concerning the positive effects of women's suffrage in Australasia was unanimously passed in both houses. The resolution read in part: "That Australasian experience convinces this House that to adopt Woman Suffrage is simply to apply to the political sphere that principle of Government that secures the best results in the domestic sphere, the mutual co-operation of men and women for the individual and general welfare" (CAPD LIV: 7017).

In 1910 the Parliament of Australia again tried to bring pressure on the British Prime Minister, Asquith, through a resolution passed in both houses and cabled to him. It spoke of the beneficial results produced by women's suffrage, including the more orderly conduct of elections. It ended with the plea that "Because the reform has brought nothing but good, though disaster was freely prophesied, we respectfully urge that all nations enjoying representative government would be well advised in granting votes to women" (CAPD LIX: 6300). As well as being cabled to the British Prime Minister, the resolution and associated speeches were promptly republished in London by the Woman's Press under the title *Australia's Advice*.

C3.1 THE INTRODUCTION OF WOMEN'S POLITICAL RIGHTS IN AUSTRALIA

Parliament	Right to vote(a)	Right to stand	First elected lower house	First elected upper house
Federal	(b)1902	1902	1943	1943
State				
South Australia	(c)1894	1894	1959	1959
Western Australia	1899	1920	1921	1954
New South Wales	1902	1918	1925	(d)1952
Tasmania	1903	1921	1955	1948
Queensland	1905	1918	1929	. .
Victoria	1908	1923	1933	1979

(a) The dates for the right to vote at State level refer to equal rights for women and men, but not necessarily universal rights. In most cases, property qualifications limited the franchise and eligibility for the upper house. (b) Women in SA and WA were able to vote in the 1901 federal election. (c) The Constitution Amendment Bill 1894 was not proclaimed until 1895. (d) Two women had been appointed to the upper house in 1931 when it was an appointive body.

Source:Sawer and Simms 1993..

In 1911 many Australasian politicians travelled to London for the coronation of George V. Mrs Fisher, the wife of the Australian Prime Minister Andrew Fisher, marched in a huge coronation suffrage procession behind the striking Commonwealth of Australia banner that is now displayed in Parliament House in Canberra. It depicted Australia as a young woman pleading with Britannia to "Trust the women, mother, as I have done".

The right to stand but not to sit

In most countries, women entered parliament soon after gaining the right to stand. Finland was the second country in the world where women gained this right (1906), and already in the following year 19 women were elected to the Eduskunta. Only New Zealand and Norway were like Australia in having a significant gap, but nothing like the forty years women had to wait to gain a seat in the national parliament.

A handful of women were elected to State parliaments before the Second World War, but the major parties remained resistant to the idea of women candidates in anything but seats that were safe for the other side. When the first woman was elected to parliament in 1921, Edith Cowan in Western Australia, the *Age* editorial was congratulatory but expressed its fears that her example might lead other women to stand for parliament, meaning neglected homes sacrificed on the altar of political ambition (*Age* 15 March 1921). During her campaign she had been accused of heartless neglect of her husband and children, although her youngest child was thirty at the time.

Cowan included in her 'maiden speech' examples of the way in which the absence of women had resulted in defective legislation and policy. She suggested that were the Minister for Railways forced to parade the streets of Perth for the whole of one afternoon, with a heavy infant on one arm and a bag of groceries on the other, it might make him more sensitive to the plight of mothers unable to bring prams to town because of the shilling charge for them on the train. During her term in parliament Cowan succeeded in having playgrounds established in her seat of West Perth and baby health centres elsewhere, as well as making some progress on juvenile justice issues. Her crowning achievements, however, were two private member's bills. The first was the *Administration Act Amendment Act 1922*, which dealt with the inheritance rights of mothers. It made her the first woman in the British Empire to author a successful private member's bill—the second was Lady Astor in the UK with her *Intoxicating Liquor (Sale to Persons under 18) Act 1923*.

Edith Cowan's second successful private member's bill became the *Women's Legal Status Act 1923*. As introduced, it would have prevented anyone being disqualified by sex or marriage from exercising any public function, from holding any civil or judicial office or practising law or any other profession. The bill was amended by the Premier, Sir James Mitchell, so that marriage remained an allowable ground of exclusion from the professions or public life (for women). The Premier was concerned over the consequences for the family if wives were no longer economically dependent on their husbands nor available to look after the family (WAPD 69: 1375–76). Nonetheless the bill was a breakthrough in terms of allowing women to practise law and other professions in Western Australia.

In South Australia, the pioneer of women's political rights, no women were elected to the State parliament until 1959, a gap of about 65 years. Even then an unsuccessful candidate for Liberal and Country League pre-selection brought a suit in the Supreme Court against the returning officer for allowing two women to nominate for the Legislative Council. The major ground for the challenge was the interpretation of the word 'person' in the South Australian Constitution. The defence lawyers included Don Dunstan (later Labor Premier) and the finding was that women were indeed persons. The last male monopoly of this kind was the Victorian Legislative Council, where the first women were only elected in 1979.

In the 1990s the 'under-representation of women' had become part of the international agenda. As a slogan it gained power from multiple levels of meaning, encompassing the representation of interests, the representativeness of the legislature and the equal right to act as a representative. Underpinning it were international treaties such as the United Nations (UN) Convention on the Elimination of All Forms of Discrimination against Women, and

international platforms such as that adopted at the United Nations Fourth World Conference on Women held in Beijing in 1995. The Beijing Platform for Action nominates the sharing of power and decision-making as one of its 12 critical areas of concern. All over the world, organisations such as the European Union have taken up the issue of the 'democratic deficit' caused by the under-representation of women in political decision-making. The Inter-Parliamentary Union has developed its own "Plan of Action to correct present imbalances in the participation of men and women in political life" (1994), and the Commonwealth Parliamentary Association has created a Commonwealth Women Parliamentarians Group to focus on the same issue.

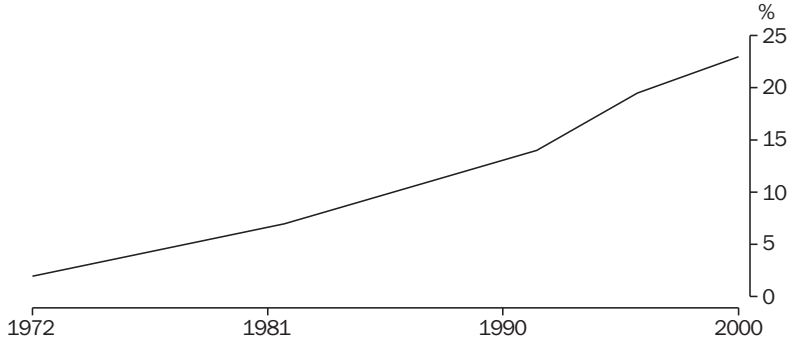
In Australia the increase in activity around parliamentary representation of women was signalled in 1992 by the formation of the non-government Women into Politics Coalition. The following year the Commonwealth-State Ministers' Conference on the Status of Women commissioned research on the representation of women in parliament, and inquiries were also set up in the federal and South Australian parliaments. Their reports added to the growing volume of action plans and strategies to remove gender imbalances in parliamentary representation. Suffrage centenaries in South Australia (1994) and Western Australia (1999) provided occasion for reflection on how far women still had to travel to become equal partners in government. In 1994 Labor women committed their party to achieving 35% representation of women in all its parliamentary parties by the year 2002, while Liberal women set up a Liberal Women's Forum that provided training and support for potential parliamentary candidates.

The inquiries pointed out that the design of parliamentary institutions assumed that parliamentary representatives are not at the same time primary carers for family members. Recommendations were made for family-friendly sitting hours and parliamentary sessions aligned with school terms as well as childcare centres, facilities that have become standard in overseas parliaments with significant female representation.

It was also generally agreed that the privileging of adversarial styles of politics, commonly found in Westminster systems where two teams face each other across the chamber, discriminated against women as well as contributing to community disenchantment. Most women parliamentarians aspire to the transformation of existing parliamentary norms into a more consensus-based politics (Black and Phillips 2000). This would also enable them to play a more effective role in parliament. As the Australian Government said when reporting to the UN five years after the Beijing Conference: "Women have a right and a responsibility to participate in the decision-making processes that shape the nation" (Office of the Status of Women 2000).

This focus on the issue of representation led to an acceleration of what had been quite a slow rate of increase of women in Australian parliaments (graph C3.2). The major parties began to field more women in winnable seats while minor parties such as the Australian Democrats and the Greens had, from their formation, fielded a relatively high number of women candidates. From its formation in 1977 until overtaken by the Greens in 1990, the Australian Democrats fielded both a larger number and a higher proportion of women candidates than any other political party for the House of Representatives. In 1990 the Democrats were overtaken by Greens in terms of the proportion of candidates who were women, although not in terms of the number of women candidates (table C3.3). In 1998 the Democrats were overtaken by both Greens and the ALP in terms of the number of women candidates as well as the proportion of candidates who were women (table C3.4).

C3.2 WOMEN IN AUSTRALIAN PARLIAMENTS(a)—1972–2000



(a) Combined data for Federal, State and Territory parliaments.

Source: Department of the Parliamentary Library.

C3.3 PARTY AFFILIATION OF WOMEN CANDIDATES, House of Representatives—1972–98(a)

Year	ALP	Lib.	NP	AP/LM/AD	Greens(b)
1972	4	3	—	14	—
1974	3	5	1	27	—
1975	6	3	1	8	—
1977	15	2	1	22	—
1980	23	5	1	30	—
1983	20	10	1	25	—
1984	18	14	9	36	—
1987	26	12	4	44	1
1990	19	18	6	39	14
1993	26	21	6	33	29
1996	30	(c)34	2	50	46
1998	51	31	5	42	57

(a) Selected parties only. (b) In this table and table C3.4 this covers all Green parties, including the Western Australian Greens and the United Tasmania Group. (c) Including Pauline Hanson who was disendorsed after ballot papers were printed.

Source: Australian Electoral Commission Nominations Details.

C3.4 GENDER BREAKDOWN, House of Representatives Nominations: Selected Parties—1998

	Males	Females	Females
Parties	no.	no.	%
Greens(a)	66	57	46.3
ALP	97	51	34.5
Democrats	106	42	28.4
Liberals	103	31	23.1
National Party	27	5	15.6
Pauline Hanson's One Nation	121	18	12.9
Abolish Child Support	10	1	9.1

(a) In this table and table C3.3, this covers all Green parties, including the Western Australian Greens and the United Tasmania Group.

Source: Australian Electoral Commission Nominations Details.

The proportion of women in the different State and Territory legislatures varies considerably (table C3.5). In 2000 the ACT had the lowest proportion of women, with women forming only 12% of members of the Legislative Assembly. This was unexpected in the jurisdiction with the highest proportion of voters with tertiary education and the highest proportion of women in the workforce. Some attributed it to the shift from a party list form of proportional representation to the Hare-Clark system, as before the latter was adopted the ACT had the highest proportion of women legislators (35% after the 1992 election).

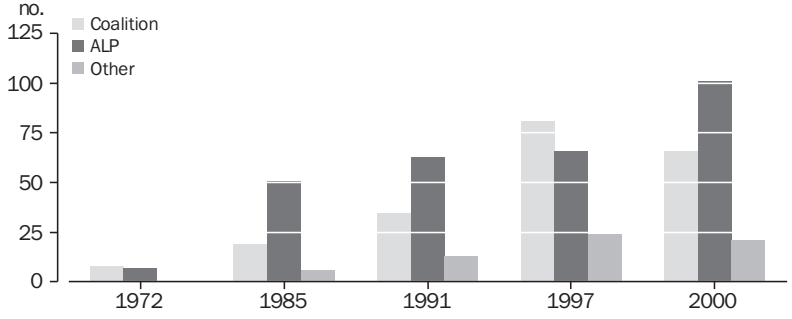
The party composition of women's representation has varied over this period, mostly due to changes in the electoral tide (graph C3.6). The first women to enter Australian parliaments were mostly from non-Labor parties. By the end of the century, however, the ALP had a higher proportion of women than the Coalition in almost all its parliamentary parties (table C3.7). The one exception was the ACT, where there were no Labor women in the Legislative Assembly.

C3.5 GENDER OVERVIEW OF AUSTRALIAN POLITICS—30 August 2000

	Females	Males	Females
	no.	no.	%
Commonwealth Parliament			
House of Representatives	34	114	23.0
Senate	22	54	28.9
Total	*56*	*168*	*25.0*
State/Territory Parliaments			
New South Wales	27	108	20.0
Victoria	34	98	25.8
Queensland	17	72	19.1
Western Australia	20	71	22.0
South Australia	19	50	27.5
Tasmania	11	29	27.5
Australian Capital Territory	2	15	11.8
Northern Territory	4	21	16.0
Total	*134*	*464*	*22.4*
Local government	1 511	5 960	25.3
ATSIC Regional Councils	116	271	30.0

Source: Department of the Parliamentary Library; Aboriginal and Torres Strait Islander Commission (ATSIC).

C3.6 PARTY AFFILIATION OF WOMEN IN AUSTRALIAN PARLIAMENTS(a)—May 1972 to May 2000



(a) Combined data for Federal, State and Territory parliaments.

Source: Department of the Parliamentary Library.

C3.7 COMPOSITION OF AUSTRALIAN PARLIAMENTS, By Party(a) and Gender—30 August 2000(b)

Total Parliament(c) by jurisdiction	Males no.	Females no.	Females %
Commonwealth (3.10.98)			
ALP	69	26	27.4
LPA	72	24	25.0
NPA	17	2	10.5
AD	5	4	44.4
GRN	1	—	0.0
Other	1	—	0.0
IND	3	—	0.0
Total	*168*	*56*	*25.0*
NSW (27.3.99)			
ALP	55	16	22.5
LPA	24	5	17.2
NPA	15	2	11.8
AD	1	—	0.0
GRN	1	1	50.0
Other	7	1	12.5
IND	5	2	28.6
Total	*108*	*27*	*20.0*
VIC (18.9.99)			
ALP	35	22	38.6
LPA	50	10	16.7
NPA	11	1	8.3
AD	—	—	—
GRN	—	—	—
Other	—	—	—
IND	2	1	33.3
Total	*98*	*34*	*25.8*
QLD (16.6.98)			
ALP	33	12	26.7
LPA	8	1	11.1
NPA	21	2	8.7
AD	—	—	—
GRN	—	—	—
Other	6	—	0.0
IND	4	2	33.3
Total	*72*	*17*	*19.1*
WA (14.12.96)			
ALP	23	8	25.8
LPA	36	7	16.3
NPA	8	1	11.1
AD	1	1	50.0
GRN	1	2	66.7
Other	—	—	—
IND	2	1	33.3
Total	*71*	*20*	*22.0*
SA (11.10.97)			
ALP	18	12	40.0
LPA	27	5	15.6
NPA	—	1	100.0
AD	2	1	33.3
GRN	—	—	—
Other	1	—	0.0
IND	2	—	0.0
Total	*50*	*19*	*27.5*

For footnotes see end of table.

...continued

C3.7 COMPOSITION OF AUSTRALIAN PARLIAMENTS, By Party(a) and Gender—30 August 2000(b)
continued

Total Parliament(c) by jurisdiction	Males no.	Females no.	Females %
TAS (29.8.98)			
ALP	13	5	27.8
LPA	8	2	20.0
NPA	—	—	—
AD	—	—	—
GRN	—	1	100.0
Other	—	—	—
IND	8	3	27.3
Total	*29*	*11*	*27.5*
ACT (21.2.98)			
ALP	6	—	0.0
LPA	5	1	16.7
NPA	—	—	—
AD	—	—	—
GRN	—	1	100.0
Other	—	—	—
IND	4	—	0.0
Total	*15*	*2*	*11.8*
NT (30.8.97)			
ALP	5	2	28.6
LPA	16	2	11.1
NPA	—	—	—
AD	—	—	—
GRN	—	—	—
Other	—	—	—
IND	—	—	—
Total	*21*	*4*	*16.0*
All Parliaments			
ALP	257	103	28.6
LPA	246	57	18.8
NPA	72	9	11.1
AD	9	6	40.0
GRN	3	5	62.5
Other	15	1	6.3
IND	30	9	23.1
Total	**632**	**190**	**23.1**

(a) Includes parties formed after election of Ind. member, resignations from parties, and Ind. ALP in Tas. Legislative Council. (b) Includes any by-election results and any casual vacancies filled since the most recent general election, as shown, in each jurisdiction. (c) Dates shown beside jurisdictions are for the latest general election.

LEGEND: ALP—Australian Labor Party; LPA—Liberal Party of Australia, includes Country Liberal Party in NT; NPA—National Party of Australia; AD—Australian Democrats; GRN—Greens (including Western Australian Greens); Other—includes: Better Future for our Children, Pauline Hanson's One Nation, City Country Alliance Queensland, CPQ (Country Party Queensland), Christian Democratic Party, Shooters' Party (John Tingle), Independent–No Pokies, Outdoor Recreation Party, RLS (Reform the Legal System), Unity Party; IND—Independent.

Source: Department of the Parliamentary Library.

Australia currently ranks 22nd internationally, in terms of the representation of women in its national parliament (lower house only). The leading countries in terms of women's parliamentary representation are Sweden (42.7% of seats), followed by Denmark (37.4), Finland (36.5), Norway (36.4), The Netherlands (36.5), Iceland (34.9), Germany (30.9) and at last in our own geographical region, New Zealand with 30.8% (Inter-Parliamentary Union 25 August 2000).

Australia would do better on international rankings if there was a composite figure for the national parliament. Australia has been unusual in having a popularly elected upper house and one where women have been better represented than in the lower house. An important factor is the electoral system used since the passage of the *Representation Act 1948*. This is known as the single transferable vote (STV), a form of proportional representation first used for parliamentary elections in Tasmania. International research (Rule & Zimmerman 1994) suggests that multi-member electorates with proportional representation facilitate the parliamentary representation of women, while women are generally disadvantaged by systems based on single-member electorates, as in the House of Representatives. All the countries in which women constituted over 30% of parliamentarians in August 2000 used proportional representation to elect their members of parliament.

The STV form of proportional representation was popularised in Australia in the nineteenth century by Catherine Helen Spence through her journalism, public lecture tours and candidacy for the Constitutional Convention on a platform of 'effective voting'. It was largely due to her "unwearied advocacy by word and pen" that the Hare-Clark system (known at the time as the Hare-Spence system) was introduced in Tasmania in 1896. Women's organisations such as the Australian Federation of Women Voters campaigned for many decades for the more general adoption of STV in Australia.

While generally speaking the Australian evidence has supported the proposition that women are disadvantaged by electoral systems based on single-member electorates, such disadvantage can be neutralised through mechanisms such as quotas. Elections in the United Kingdom and South Australia in 1997 showed that the adoption of quotas by a major party can have a significant effect on representation, resulting in the South Australian lower house, with its single-member electorates, gaining a higher proportion of women than the upper house elected through proportional representation. The gap between the House of Representatives and the Senate in the proportion of women has narrowed in recent years, with women constituting 23% of the House of Representatives and 29% of the Senate in August 2000.

While the presence of women in parliaments has been increasing, the diversity of women in the community is still far from represented. The first women born in non-English speaking countries began to be elected to Australian parliaments in the 1980s, but there are still no women from countries that have been important sources of our current population, such as Greece or Viet Nam. There are still no Indigenous women in Australian parliaments.

Women in positions of political leadership

Although women aspired to partnership with men in housekeeping the state, it was only in the last quarter of the twentieth century that progress towards this goal was achieved. Dame Enid Lyons, widow of the pre-war Prime Minister Joe Lyons, was appointed to Cabinet by Sir Robert Menzies in 1949. However she was given no portfolio and, as Vice President of the Executive Council, she said her major duty was to pour the tea. Dame Annabelle Rankin, known for her mothering role as Government Whip in the Senate, did not achieve Cabinet status but did become Minister for Housing in 1966.

The arrival of a new wave of the women's movement at the end of the 1960s, the creation of new organisations such as Women's Electoral Lobby and the consciousness-raising of International Women's Year in 1975 were to change forever the view that the absence of women from government was something entirely unremarkable. At the federal level, Dame Margaret Guilfoyle became the first woman to be a Cabinet Minister with portfolio responsibilities, first as Minister for Social Security (1975–80) and then as Minister for Finance (1980–83). Senator Susan Ryan became the first woman to serve in a Labor Cabinet, first as Minister for Education (1983–87) and then as Special Minister of State (1987–88). In her role as Minister Assisting the Prime Minister on the Status of Women she introduced the Commonwealth's *Sex Discrimination Act 1984*, briefly earning herself the title of 'Australia's feminist dictator'.

From the 1980s women also started achieving positions of party leadership. Not surprisingly, this first happened in a relatively new party, established after the arrival of the

more recent wave of the women's movement. The first woman to lead a parliamentary party was Senator Janine Haines, who became Leader of the Australian Democrats in 1986. Subsequently three other women have led the party, Senators Janet Powell (1990–91), Cheryl Kernot (1993–97) and Meg Lees (1997–), leading to campaign slogans such as 'the party that puts women first'.

Women have also now achieved leadership positions in the older political parties. The first woman to attend a Premiers' Conference as head of government was Rosemary Follett, who attended in 1989 as Chief Minister of the Australian Capital Territory. Carmen Lawrence became Premier of Western Australia (1990–93) and Joan Kirner Premier of Victoria (1990–92). In 1995 Kate Carnell defeated Rosemary Follett to become the first Liberal woman to head an Australian government, a position she held until October 2000. By then there were three women Leaders of the Opposition, in NSW, Tasmania and the Northern Territory, but no other woman head of government.

Cabinet decision-making lies at the heart of responsible government and, as remarked by Dame Margaret Guilfoyle, that is where women need to be if they are to have any real effect. Women have been increasing their presence in Australian Cabinets, most notably at the State level. One milestone was the inclusion of five women in the Western Australia Cabinet announced by Dr Carmen Lawrence in February 1990—31% of Cabinet. By September 2000 women constituted over 20% in all but one State Cabinet, and they constituted 44% of the Victorian Cabinet (table C3.8).

At the federal level, there has always been a woman in Cabinet over the last 25 years, except in 1989–90 when there was none and except in 1996–97 when there were two. In 2000 women formed 6% of Cabinet and 13% of the ministry (table C3.9). In addition women constituted 4 out of 12 Parliamentary Secretaries. Looking at the Opposition, women were 19% of the Shadow Ministry and one of the seven Parliamentary Secretaries to Shadow Ministers.

When women first entered State Cabinets after the Second World War they were almost invariably allocated 'nurturing' portfolios such as health, education and welfare. By the 1990s the range of portfolios held by women had become diverse. Except in Victoria, however, they were still under-represented in economic roles.

C3.8 STATE AND TERRITORY GOVERNMENTS, Number and Percentage of Women in Cabinet—September 2000

State/Territory Cabinets	Males no.	Females no.	Females %
New South Wales	17	3	15
Victoria	10	8	44
Queensland	14	4	22
Western Australia	16	2	11
South Australia	12	3	20
Tasmania	7	3	30
Australian Capital Territory	4	1	20
Northern Territory	9	1	10

Source: Department of the Parliamentary Library.

C3.9 FEDERAL GOVERNMENT, Ministry and Shadow Ministry by Gender—September 2000

	Males	Females	Females
	no.	no.	%
Cabinet	16	1	6
Outer Ministry	10	3	23
Ministry as a whole	*26*	*4*	*13*
Shadow Ministry	26	5	19

Source: Department of the Parliamentary Library.

The gender stereotyping observable in ministerial roles also applied to women's roles in Parliamentary Committees. For example, in the federal parliament the first committee to be chaired by a woman was the Senate Select Committee on Medical and Hospital Costs, chaired by Senator Ivy Wedgwood. In 1970, when the new Legislative and General Purpose Standing Committees were created in the Senate, she became Chair of the Standing Committee on Health and Welfare. The first all-woman committee in the federal parliament was the Senate Select Committee on Private Hospitals and Nursing Homes, established in 1981 and chaired first by Senator Shirley Walters and then, after the change of government, by Senator Pat Giles.

Women have also occupied leadership positions as presiding officers in parliament. Anne Levy was appointed President of the Legislative Council in South Australia in February 1986, a few hours ahead of Joan Child being appointed Speaker of the House of Representatives. In 1996 Senator Margaret Reid became President of the Senate and in 1999 Dr Meredith Burgmann became President of the Legislative Council in NSW.

Unlike Australia's close neighbour New Zealand, where there have been two women Prime Ministers and two women Governors-General, in Australia neither position has yet been filled by a woman. However women have filled the position of Governor in two States—the first being Dame Roma Mitchell, appointed Governor of South Australia in 1991, and the second being Leneen Forde, sworn in as Governor of Queensland in 1992.

Women in local government

Women's entry into local government was also very late in comparison with countries such as the United Kingdom, where women were more active at this level than in parliamentary politics. Although the first woman official was elected in 1919 (table C3.10), forty years later (1960) women's representation had reached only 1%, despite the efforts of the Australian Local Government Women's Association, established in 1951. Unlike other countries, the functions of local government in Australia remained for most of the twentieth century restricted largely to "roads, rates and rubbish". Local government was not involved in the provision of education, health and welfare, the areas which attracted women into local government in other countries. Another barrier to women's participation in local government was the existence of property qualifications that restricted both the franchise and eligibility for local government election, disqualifying more women than men, even though formal sex barriers had been removed.

In Australia, the pattern of women's eligibility to be political candidates tended to be in the reverse order from that in other countries—with these rights coming first at the national level. This sequence in the acquisition of rights, together with the allocation of functions between the tiers of government peculiar to Australia, helped delay the entrance of women to local government. This in turn affected women's participation at other levels of government, as local government is the level easiest to combine with family responsibilities as well as providing a pathway to a parliamentary career.

In the 1970s new organisations such as Women's Electoral Lobby and Women Active Politically began targeting local government for action on issues such as childcare and the environment. The proportion of women in elected local government positions began rising—to just over 6% in 1980, 13% in 1986, and over 25% in 2000 (table C3.11). Women's representation continued to lag behind in rural areas, however. Concern over continuing under-representation of women led to renewed campaigns supported by federal and State Governments in the 1990s.

In Victoria women's and local government organisations began work on two projects: the Victorian Local Government Women's Charter and the Victorian Local Government Women's Participation Project. The Charter encouraged Councils to take steps such as providing a carers' allowance and revising sitting times. The Participation Project provided mentors and training for women candidates and popularised slogans such as "Don't get mad…Get elected". The Project set up an electronic tally room for the 2000 elections and was able to report an increase in women's participation in rural and regional councils from 18% to 22%. While before the election there had been 11 councils with no women, afterwards there were only three (Women's Tally Room 2000).

The first woman to become mayor in Australia was Lilian Fowler in 1938, who directed her energies in the cramped inner-Sydney municipality of Newtown towards issues such as children's playgrounds and low-rise public housing. Today a federal electorate is named in her honour. In the 1980s women began to hold the position of Lord Mayor in the capital cities for the first time, including Sallyanne Atkinson (Brisbane 1985–91), Doone Kennedy (Hobart 1986–96), Lecki Ord (Melbourne 1987–88) and Winsome McCaughey (Melbourne 1988–89). A familiar dilemma from the time of Lilian Fowler onward was who was to fill the role of mayoress, traditionally associated with charity work. In some cases it was an adult daughter, while in others a husband was pressed into this unfamiliar role. Today, women are still less likely to become a mayor of a rural than a metropolitan council, and the proportion of mayors who are women also varies between States (table C3.12).

C3.10 WOMEN AND LOCAL GOVERNMENT IN AUSTRALIA

State	Right to vote(a)	Right to stand	First elected
South Australia	1861	1914	1919
Western Australia	1876	1919	1920
Victoria	1903	1914	1920
Queensland	1879	1920	1925
City of Brisbane	1924	1924	1949
Tasmania			
Rural	1893	1911	1957
Hobart City Council	1893	1902	1952
Launceston City Council	1894	1945	1950
New South Wales			
Sydney City Council	1900	1918	1963
Municipalities and Shires	1906	1918	1928

(a) The dates for the right to vote refer to equal rights for women and men but not universal rights. In most cases, property qualifications limited the local government franchise and eligibility for election.

Source: Smith 1975.

C3.11 WOMEN AS LOCAL COUNCILLORS(a)

	August 2000				
	Females	Total	Females	1994	1980
	no.	no.	%	%	%
New South Wales	449	1 752	25.6	20.2	7.8
Victoria	157	594	26.4	20.0	6.9
Queensland	328	1 160	28.3	21.2	3.7
Western Australia	308	1 409	21.9	19.6	4.3
South Australia	208	760	27.4	21.6	6.8
Tasmania	61	285	21.4	16.4	5.8
Australia	1 511	5 960	25.3	20.5	6.2

(a) Includes the Mayor.

Source: Department of the Parliamentary Library.

C3.12 WOMEN AS MAYORS—August 2000

	Females	Total	Females
	no.	no.	%
New South Wales	26	171	15.2
Victoria	15	78	19.2
Queensland	19	124	15.3
Western Australia	26	144	18.0
South Australia	17	67	25.4
Tasmania	6	29	20.7
Australia	**109**	**613**	**17.8**

Source: Department of the Parliamentary Library.

The Aboriginal and Torres Strait Islander Commission has 35 Regional Councils, elected by Aboriginal and Torres Strait Islander people who are enrolled on the Commonwealth electoral roll. There have been four elections since the establishment of ATSIC in 1989. In the last election, in October 1999, women formed a record 34% of candidates and 30% of those elected as Councillors. This compared with the 1996 election when women were 23% of those elected. Former ATSIC Chair, Lowitja O'Donoghue, had campaigned to increase the number of Aboriginal women standing for election.

Women in the Australian Public Service

One of the important ways in which women can contribute to public decision-making is through public service employment. When the Commonwealth Public Service was created for the new Commonwealth of Australia, however, the concept of equal employment opportunity was far from accepted. Despite lobbying by women's organisations, those designing the new public service, such as the First Public Service Commissioner, D.C.McLachlan, believed women's role should largely revolve around their special aptitude for typing. It was not envisaged that women would fill administrative positions in the service, although there was no formal bar to this. A number of women clerical officers were transferred from colonial public services to the new federal service and even enjoyed equal pay with their male colleagues, although these early gains were short lived. From 1903 women were not permitted to take the entrance examination for the clerical division, but were still permitted to apply for promotion to it from the general division where they were employed as typists and telephonists. From 1915 this loophole was closed and the number of women in the clerical division continued to dwindle at the same time as preference for returned soldiers was introduced.

To some extent these developments were made inevitable by the provision in the *Commonwealth Public Service Act 1902* that every female officer was "deemed to have retired from the Commonwealth service upon her marriage"—the marriage bar that was to remain in place for over 60 years. In an era when most women married, it meant that women were not considered useful candidates for the clerical division, from which it was possible to rise to the senior positions in the Service.

In 1918 McLachlan was appointed as Royal Commissioner to inquire into the administration of the Public Service. His Report contained a section on the employment of women in which he justified the continuing restrictions on their employment and noted with satisfaction that with few exceptions, the only female officers in the clerical division were those inherited from the States. He did recommend, however, that junior clerical positions be made available to women in the records branches of departments, thus releasing 'promising youths' from duties that were purely routine and improving their scope for advancement (RCPSA 1920: 77). Commissioner McLachlan observed that women suffered physiological handicaps, so that the limits of their usefulness was reached at a comparatively early age when they filled positions ordinarily filled by men in the Public Service: "While they may stand the pressure and strain of work for a time, usually reaction follows with accompanying nervous break-down" (RCPSA 1920: 76).

This rationale for restricting women to routine rather than career positions was still influential at the time of the Second World War. R.S. Parker wrote in his 1942 review of public service recruitment that there was some evidence that women were "more adaptable to monotonous work than men", so their employment in a separate class would free up officers "capable of and destined for more responsible tasks" (Parker 1942: 223).

Women were finally admitted to the clerical division of the Commonwealth Public Service in 1949, but the marriage bar continued to restrict opportunities. Single women were denied training because of the assumption that it would be wasted when they had to resign on marriage. Married women were able to return as temporary staff members, particularly as typists as this work was regarded as unsuitable for men. However as temporary employees, married women were unable to occupy supervisory positions and forfeited their superannuation rights.

The prolonged struggle to lift the marriage bar, following the recommendation of the Boyer Committee on Public Service Recruitment in 1958, was a turning point for women's public sector employment. The issue was already a political hot potato in 1961, when Cabinet decided not to lift the ban but, in the context of a forthcoming election, to tell parliament that they had not yet come to a conclusion (Cabinet Minute 24 October 1961). In 1966 Australia became almost the last democratic country to lift the ban, which by this time had blighted the careers of many women, forcing others to "live in sin" (Sawer 1997).

Other milestones were the Australia's ratification of ILO Convention No 111—Discrimination (Employment and Occupation) in 1973, and the setting up of the Royal Commission on Australian Government Administration (the Coombs Commission). As part of its inquiries, the Coombs Commission published a discussion paper on the employment of women under the eloquent title *Sexism in Public Service* (RCAGA 1975). By this time women constituted 28% of Australian Public Service staff and 24% of permanent staff.

In 1974 over half of the women were employed in three occupations—as telephonists (17%), typists and steno-secretaries (16%) and clerical assistants (24%). There was no career structure for the women-only occupations. The peak of a career for most steno-secretaries was Grade 2, reached in their early twenties. Few could aspire to the next grade, as secretary to a head of department. Of the 1,143 Second Division officers (equivalent to today's Senior Executive Service), only four were women, including Marie Coleman who headed the newly created Social Welfare Commission. No woman had yet headed a Commonwealth department, and this was not to occur for another decade when Helen Williams was appointed Secretary of the Department of Education in 1985.

At this time a number of steps were taken to address the dramatic horizontal and vertical sex segregation of the Australian Public Service, revealed in the Coombs Commission Report. *The Maternity Leave (Australian Government Employees) Act 1973* provided for three months paid leave and for the total leave period to be extended to 12 months. At the end of 1972 the Commonwealth Conciliation and Arbitration Commission had brought down its equal pay for work of equal value decision, and this was implemented in the Service the following year. At the time, women were paid 75% of the pay of male officers doing the same work, so equal pay substantially increased their earnings. Upper age limits for recruitment into clerical and other positions, that had discriminated against women re-entering the workforce, were abolished and the Public Service Board repealed restrictions creating 'men only' and 'women only' jobs. Towards the end of 1975, as a direct result of the evidence given to the Coombs Commission concerning systemic discrimination in the Service, an Equal Employment Opportunity Section was created in the Board to develop and implement EEO programs.

After a decade of patchy progress, the development of such programs became mandatory for all departments under §22B of the *Public Service Reform Act 1984*. The Public Service Board also more than doubled the intake of women into the executive development scheme. At the same time statutory provision was made for permanent part-time employment, intended to facilitate the balancing of work and family responsibilities without losing the career benefits of permanent employment. Flexible patterns of employment to accommodate family needs remained elusive, however, and it was mainly women who took advantage of

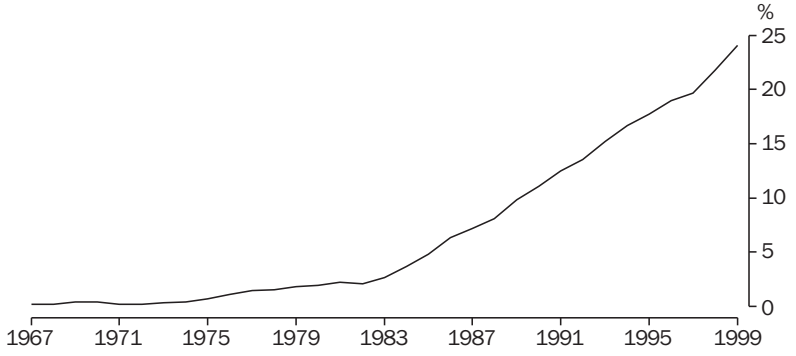
the new provisions. By 1999 only 6% of permanent positions were filled on a permanent part-time basis, with women filling 86% of these.

After 25 years of equal employment opportunity programs, the Australian Public Service now looks quite different from the picture presented in *Sexism in Public Service*. In June 1999 the proportion of permanent officers who were women had doubled to 48%. Women form a majority at all levels up to ASO6, while men form a majority of those from ASO6 upwards. Women now constitute 24% of the Senior Executive Service (SES), as contrasted with 0.3% of the Second Division in 1974. The steep rise from the 1980s can be seen in graph C3.13. In 1998–99 over 36% of new appointments to the SES were of women.

Pat Turner became the first Aboriginal woman to head a federal agency when she was appointed Chief Executive Officer of the Aboriginal and Torres Strait Islander Commission (1994–98). Another prominent Indigenous public servant, Dawn Casey, was responsible for the establishment of the Council for Aboriginal Reconciliation. In December 1999 she was appointed Director of the National Museum of Australia. Women have also been representing Australia overseas in increasing numbers. In 2000, women filled 11 out of the 79 Head of Mission or Head of Post positions, including very visible positions such as Australian Ambassador to the UN. A woman, Professor Erh-Soon Tay, was also appointed in 1998 as President of Australia's Human Rights and Equal Opportunity Commission.

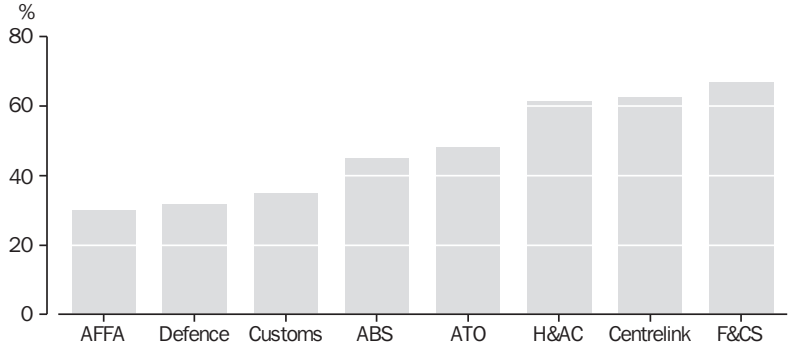
There continued to be a very uneven distribution over the Service, however, with women still concentrated in the human service areas. Looking at agencies with over 3,000 staff (graph C3.14), women constituted over 65% of permanent staff in the Department of Family and Community Services and over 60% in Centrelink and the Department of Health and Aged Care, but only 30% of staff in Agriculture, Fisheries and Forestry–Australia. Although the numbers and seniority of women had increased, their distribution had changed little from that 25 years before. In 1974 women had constituted under 12% of permanent staff of the Departments of Agriculture, Transport, and Housing and Construction, but over 50% of staff in the Departments of Health, Education and Social Security.

C3.13 WOMEN IN THE SENIOR EXECUTIVE SERVICE, June 1967 to June 1999



Source: Australian Women's Year Book 1997 (4124.0), p. 124; Public Service and Merit Protection Commission (PSMPC).

C3.14 PROPORTION OF PERMANENT STAFF WHO WERE WOMEN, Agencies Exceeding 3,000 Permanent Staff—June 1999



Source: APS Statistical Bulletin 1998–99, PSMPC.

At the State level, women were more visible as heads of department than at the federal level in the 1990s, with women achieving high-profile positions such as head of the Department of Premier and Cabinet in Victoria. In NSW the number of women who were CEOs of departments and statutory bodies rose from 8 to 19 between 1995 and 2000.

Women on boards and committees

An index commonly used to measure the participation of women in public life is their representation on government-appointed boards and committees. Australian women were notably absent from such bodies for most of the twentieth century. The appointment of Mildred Muscio, President of the National Council of Women, to the Royal Commission on Child Endowment in 1927 was exceptional. She submitted a minority report, along with John Curtin, calling for its immediate introduction. The appointment of Mrs Claude Couchman, later Dame Elizabeth Couchman, to the board of the new Australian Broadcasting Commission in 1932 was another remarkable event. She served for ten years, at which point statutory provision was made for one of the five Commissioners always to be a woman (*Australian Broadcasting Act 1942*).

For the most part, however, Australian governments remained unconvinced of the need for women's participation in public decision-making. This was true even during the Second World War, when the Government was mobilising women for the war effort. In its first 12 months the Curtin Government set up 67 boards and committees with 387 members, of which only one was a woman (CAPD, House of Representatives 6 May 1942: 966). The one woman was appointed to the Women's Employment Board, established to determine wages where women were brought into male jobs.

When Norman MacKenzie was commissioned in 1958 by the Social Science Research Council of Australia to inquire into the role of women in professional and public life in Australia, he was surprised at the general absence of women from government-appointed bodies. In 1951 there had been only seven women on the 121 Commonwealth government bodies he surveyed. By 1960 this number had only increased by one. There was a similar pattern at the State level—for example no women on the public library boards of NSW, Victoria, Queensland or South Australia. One State premier offered the explanation that a board needed no more than one woman member "to put a woman's view", but to have just one woman on a board might lead to embarrassing situations (MacKenzie 1962: 251).

Since the 1970s there has been greater realisation that if full advantage is to be taken of the talent available in the community and if community perspectives are to be adequately reflected, women need to participate along with men on government bodies. A number of strategies have been established to ensure that women are not overlooked. At the Commonwealth level

there is: a whole-of-government monitoring system called 'Appoint'; a pilot executive search program established in 1998; and an early warning system to ensure that departments are provided with names for forthcoming vacancies on boards. In the first six months of 2000 the Commonwealth Government appointed 152 women to its boards, taking the proportion of board members up to 32.2%. In 1995 the figure had been 30.5%. State and Territory Governments also had strategies in place to promote gender balance on boards and committees. The ACT had led the way since 1989, when Chief Minister Rosemary Follett established a target of 50% for government bodies. Her successor, Kate Carnell, continued to promote gender balance, with women making up 44% of membership by September 2000. The South Australian Government also had a target of 50% representation of women on government boards and committees.

Women were less in evidence in the upper echelons of the private sector, but there was some progress. Women constituted 4% of non-executive directors and board members in 1995. By 2000 this had risen to 10% for non-executive directors and 8% for board members (Korn/Ferry International 2000).

Conclusion

A hundred years after Federation not all the aspirations of the suffragists have been met. Women have taken up the rights and responsibilities of citizenship and have entered government, overcoming a range of obstacles. They have not, however, succeeded in making the kind of difference to politics which was both desired and feared at the time of Federation, when it was thought that women would be a purifying influence on public life and create a new and more moral world.

References

Aboriginal and Torres Strait Islander Commission, *1999 Regional Council Elections—Elected Councillors.*

Black, David and Phillips, Harry 2000, *Making a Difference: Women in the Western Australian Parliament 1921–1999,* Parliament of Western Australia, 2000.

CAPD [Commonwealth of Australia Parliamentary Debates].

Korn/Ferry International 2000, *Annual Report on Boards of Directors in Australia and New Zealand*.

MacKenzie, Norman 1962, *Women in Australia: A Report to the Social Science Research Council of Australia,* F.W.Cheshire, Melbourne.

Office of the Status of Women 2000, *Implementation of the Beijing Platform for Action—Australian Government Response*.

Parker, R.S. 1942, *Public Service Recruitment in Australia,* Melbourne University Press.

RCAGA [Royal Commission on Australian Government Administration] 1975, *Sexism in Public Service: The Employment of Women in Australian Government Administration*, Discussion Paper No. 3, by K. Taperell, C. Fox & M. Roberts, Australian Government Publishing Service, Canberra.

RCPSA [Royal Commission on Public Service Administration] 1920, *Report*, printed for the Government of the Commonwealth of Australia by Albert J. Mullett, Government Printer for the State of Victoria, Melbourne.

Rule, Wilma and Zimmerman, Michael (ed.) 1994, *Electoral Systems in Comparative Perspective: Their Impact on Women and Minorities,* Greenwood Press, Westport, Connecticut.

Sawer, Marian 1997, *Removal of the Commonwealth Marriage Bar: A Documentary History,* University of Canberra, Centre for Research in Public Sector Management.

Sawer, Marian & Simms, Marian 1993, *A Woman's Place: Women and Politics in Australia*, Allen & Unwin, 2nd edn.

Smith, Viola 1975, Women *in Australian Parliaments and Local Government: Past and Present,* Australian Local Government Women's Association, NSW–ACT Branch, Canberra.

WAPD [Western Australia, Parliamentary Debates].

Internet sites

Australian Electoral Commission, *http://www.aec.gov.au/history/women/main.htm*

Commonwealth Parliamentary Library, Parliament of Australia, *http://www.aph.gov.au/library/parl/hist/women.htm*

Inter-Parliamentary Union, *http://www.ipu.org*

Office of the Status of Women, *http://osw.dpmc.gov.au*

Parliament of Victoria, *http://www.parliament.vic.gov.au/women.html*

State Library of South Australia, *http://www.slsa.sa.gov.au/int_pubs/women*

Women's Electoral Lobby, *http://www.wel.org.au/links/wompol.htm*

Women's Tally Room, *http://www.results.aust.com*

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Introduction

Australia's international relations are driven by its core national interests—the security of the Australian nation and the economic wellbeing of the Australian people.

Important elements of Australia's international relations are the priority accorded to the Asia Pacific, and especially to the countries of East Asia, the strengthening of bilateral relationships with the United States, Japan, Indonesia and China, the commitment to further international trade liberalisation, and strong support for the World Trade Organization (WTO) and Asia Pacific Economic Cooperation (APEC). Australia has global interests which require broad international engagement, and the priority Australia attaches to its relationships with the countries of the Asia Pacific does not diminish the important interests Australia pursues in the Americas, Europe and elsewhere.

In addition to maintaining and developing strong bilateral relationships, Australia's international interests are advanced through participation in regional or global institutions and forums. For example, the negotiation of multilateral trade agreements enhances access to foreign markets for Australian exports. Australia also has a strong national interest in helping to guard against the spread of nuclear weapons, especially in the Asia-Pacific region. It has therefore been active globally and regionally in support of the development of, and adherence to, international non-proliferation and disarmament regimes.

Our international relations are also shaped by economic globalisation and the revolution in international communications. Globalisation offers opportunities for internationally competitive economies, but also brings challenges for political and economic management. It has profound implications for trade and economic policy. It blurs the division between foreign and domestic policy, increases competitive pressures in markets, and makes globally based trade rules and disciplines even more important. But while globalisation reduces the effective room for manoeuvre of national governments in some policy areas, law-making is still the prerogative of national governments and the nation state remains the primary force in international relations.

Relations with Asia have a profound influence on Australian foreign and trade policy. Australia's engagement with the countries of Asia is extensive and has been built over many decades, despite the more recent economic downturn in the region. We engage with our region for a number of reasons. What happens in our own region will affect us more deeply and more quickly than events that occur in most other areas of the world. Australia has substantial trade and economic interests at stake in the region. Even with the effects of the East Asian economic crisis, East Asia takes more than 50% of all our exports, and even more is transported through the region to markets elsewhere in the world. Australia continues to seek closer engagement with Asia because of the profound benefits that flow from our relations with countries of the region and the realisation of our mutual interests.

Australia's credentials and place in the international system

In its international relations, Australia uses its assets—economic, strategic and cultural—as well as an international reputation as a responsible, constructive and practical country. The values which Australia brings to its international relations are the values of a liberal democracy. These have been shaped by national experience and given vigour through cultural diversity. They include the rule of law, freedom of the press, the accountability of the government to an elected parliament, and a commitment to a 'fair go'.

In terms of Gross Domestic Product, Australia ranks fourteenth in the world. We have a modern industrial economy with a sophisticated manufacturing and services base. And the Australian economy has been performing strongly, especially through the challenge of the East Asian financial crisis. Over the past decade, Australia has had the fifth fastest growing economy in the Organisation for Economic Cooperation and Development (OECD), outperforming the United States, Canada and most of the European Union.

Australia has a strong skills base, high quality education and training institutions, advanced physical infrastructure, and adoption and usage rates for information technology which are among the highest in the world. Our strong civil institutions underpin a free society and encourage free enterprise. Australia's cultural diversity gives Australian society a vigour and capacity to adapt rapidly to new opportunities. It is also a rich source of language and other skills which help us do business in a global economy.

Australia's defence capability is significant in regional terms. Australia has a broadly based alliance relationship with the United States, whose strategic engagement and commitment underwrite the stability of East Asia. Australia also shares a close and expanding partnership with Japan, the most powerful economy in East Asia.

Australia's bilateral relationships

As a nation with global interests, Australia deals with countries in many regions. Each relationship engages Australian interests in different ways. Each is significant, and Australia does not seek to ascribe a strict hierarchy of importance to them.

This is not to suggest that the interests Australia pursues with each country are equally important, or that Australia devotes equal resources to each of them. The countries which most substantially engage Australia's interests are those which are influential in their own right in shaping Australia's strategic environment, as well as being significant trading and investment partners. Foremost among these are the three major powers and largest economies of the Asia-Pacific region—the United States, Japan and China—and Australia's largest neighbour, Indonesia. Significant Australian interests are also engaged in Australia's relationships with the Republic of Korea, the other states of the Association of South East Asian Nations (ASEAN) and, in the South Pacific, New Zealand and Papua New Guinea.

United States

Australia shares a relationship with the United States based on a strong commitment to democracy, security and an open trading system. The relationship complements and reinforces Australia's practical commitment to the Asia Pacific, as well as strengthening the engagement of the United States in the region, an engagement which has assumed great importance as the countries of the Asia Pacific, particularly those in East Asia, continue to undergo change.

These shared strategic interests and values are underpinned by the dynamic trade and investment links between Australia and the United States. The United States is Australia's second largest trading partner and largest source of investment, as well as a key regional and global partner in achieving more open markets through the WTO and APEC. People-to-people ties, including educational and cultural links, are extensive and wide-ranging, with over 600,000 business visitors and tourists travelling between Australia and the United States each year.

Japan

Japan occupies a vital strategic position in North-East Asia and continues to play a primary economic and political role in our immediate region. Australia works hard to encourage close dialogue with Japan on a wide range of economic, political and strategic issues and the development, to the extent possible, of policies which are mutually reinforcing. Japan continues to be Australia's major trading partner, accounting for some 16% by value of our total trade (exports plus imports) in 1999. It is a significant investor in Australia and our largest source of in-bound tourism.

Australia's partnership with Japan reflects the broad alignment of Australian and Japanese strategic, political and economic interests in the Asia-Pacific region. Agreement to hold annual Prime Ministerial Summits was reached in April 1997, and a Partnership Agenda was endorsed at the 14th Australia Japan Ministerial Committee meeting in August 1997. Like Australia, Japan supports the long-term strategic engagement of the United States in the Asia-Pacific region and recognises the fundamental contribution that it makes to regional stability. Japan also shares our interest in advancing the APEC forum as the primary vehicle for economic cooperation in the Asia Pacific region.

China

China's importance to Australia grows along with China's increasing economic, political and strategic engagement with the Asia-Pacific region and the global economy. China's relations with the countries of the Asia-Pacific region are critically important to the maintenance of regional peace and security. In particular, China's relations with Japan and the United States play a vital role in shaping the security context for the entire region. It is in Australia's national interest to actively encourage and support Chinese participation in dialogue and cooperation on regional security issues. The visit to Australia by Chinese President Jiang Zemin in September 1999 represented an important milestone in Australia's relations with China.

The trade and investment relationship between Australia and China is expanding. China is Australia's fourth-largest merchandise trade partner. China's entry into the WTO will open up new opportunities for Australia both in terms of

greater market access for Australian business and by encouraging China to further integrate into the global economy and abide by international trade rules.

Mutual economic and trade interests are increasingly underpinned by the strengthening of broader bilateral ties including cultural, educational, scientific and people-to-people links. With different cultures and traditions, Australia and China do not always share the same view, but regular dialogue and government-to-government exchanges have been established on a range of issues—from human rights to security issues—in a bid to discuss differences of opinion. The one-China policy will continue to be a fundamental element of the bilateral relationship within which Australia pursues important economic and trade interests with Taiwan.

Indonesia

Indonesia is undergoing a historic transition to a more democratic, less centralised political system. Australia recognises the significance of this process and the prospect it holds over the longer term for a closer and more broadly based relationship between our two countries. Australia will continue to work steadily to rebuild a constructive relationship with Indonesia that is based on mutual respect, supports improved governance and the growth of democratic institutions, recognises Indonesia's strategic weight in regional affairs, and maximises the mutual benefits from bilateral cooperation in a wide range of practical areas.

Australia's relationship with Indonesia has undergone a period of strain over developments in East Timor and it has not been possible to quarantine the bilateral relationship entirely from negative fallout. However, Australia maintains links with key players in Indonesia and the relationship remains strong in many areas despite these short-term political pressures. Australia is continuing a large-scale bilateral program of economic, technical and humanitarian assistance to Indonesia.

East Timor

Indonesia agreed with Portugal in May 1999 to allow a UN-run consultation which would give the East Timorese the right to choose autonomy or to reject it, leading to separation from Indonesia. The UN-organised ballot held on 30 August 1999 resulted in a decisive vote for independence. Violence broke out shortly after, and Australia, with the mandate of the United Nations Security Council and with Indonesia's agreement, led a multinational force, INTERFET, to East Timor to help stabilise the situation. The Indonesian People's Consultative Assembly voted in October 1999 to allow East Timor to separate from Indonesia. Authority was subsequently transferred to the United Nations, and a United Nations Peacekeeping Force took over from INTERFET. East Timor is currently a United Nations-administered territory. Australia continues to cooperate closely with the United Nations and the East Timorese to assist the future development of East Timor. We are a major aid donor to East Timor.

The Republic of Korea

The Republic of Korea (ROK) is one of Australia's most important regional partners, reflecting our complementary economic structures, shared middle-power status and common interests in the Asia-Pacific region. Korea was Australia's fifth largest trading partner in 1999. Australia has a vital interest in rapprochement on the Korean Peninsula and welcomed the historic June 2000 summit meeting between the two Korean leaders. Working closely with key regional partners, we seek to promote stability in North Asia through increased bilateral dialogue with North Korea. Australia's resumption of diplomatic relations with North Korea, announced in May 2000, will enable us to promote broader regional stability.

Association of South East Asian Nations (ASEAN)

ASEAN is the key regional political institution in South-East Asia and has been instrumental in promoting regional political harmony and stability for over 30 years. Australia values greatly its close relationship with ASEAN as a grouping, and with its member states (Brunei Darussalam, Burma, Cambodia, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand and Viet Nam). Australia's relations with ASEAN cover trade and investment, as well as cooperation in the technical, cultural, defence and educational fields. Australia is also actively involved in the ASEAN Regional Forum, which promotes regional security dialogue and confidence building, as well as the ASEAN Post-Ministerial Conference.

The South Pacific

The South Pacific region, in which Australia has been closely involved for a long time, has been undergoing a period of uncertainty and change, with political crises in Fiji and Solomon Islands. These problems have been produced by a combination of traditional communal frictions, colonial-era decisions and

mistakes, and the global pressures which bear especially heavily on small, isolated states. They are problems which will not be solved easily or quickly. Australia currently provides over $500m annually to the independent countries of the region in development assistance—more than any other donor—and, along with New Zealand, maintains an extensive diplomatic network in island capitals.

A shared background and experience, and a multi-faceted relationship, incline Australia naturally towards a unique partnership with New Zealand, which is Australia's third-largest export market.

Australia has a long-standing, close relationship with Papua New Guinea (PNG), whose location makes it of strategic importance to Australia. Pursuing a constructive and productive bilateral relationship is a high priority for Australia and we will continue to support a process of sustainable economic development in PNG, aimed at enhancing its self-reliance.

Australia's engagement in the South Pacific will remain both broad and deep, and Australia will continue to support local efforts both to advance development and, where necessary, restore stability, in cooperation with those other countries and institutions which have their own long-term relationships with the region.

India

India has growing strategic and economic importance in global and regional affairs and is an important dialogue partner for Australia in a range of international forums. Prime Ministerial and Ministerial visits to India in 2000 have strengthened our bilateral ties, which are already rich in cultural and sporting areas. Australia's future focus will be on expanding further the bilateral trade and economic relationship.

Europe

Australia has close ties with many of the countries of Europe. We share important social, cultural, historical and political experiences. Europe is a leading participant in key forums such as the Group of Eight (G8), the OECD and the WTO. As one of the key economic centres of the world, Europe is important to Australia's trading interests. Europe as a single market is the largest foreign investor in Australia. The United Kingdom is the second largest single country investor in Australia and is Australia's second largest destination for outward investment.

The key central and south-eastern European markets for Australia are Poland, Hungary, the Czech Republic and Romania, while the smaller transition economies—Slovenia, the Slovak Republic and Bulgaria—also offer some trade opportunities for Australia. Membership of European institutions—the EU and the North Atlantic Treaty Organisation (NATO)—by these central and eastern European countries would lead to them becoming more important bilateral partners for Australia.

Canada and Latin America

The close historical and cultural ties Australia has with Canada will continue to be the basis for an active trade and investment relationship, and close cooperation on international issues. In Latin America, our efforts are focused on expanding Australia's trade and investment relations. The size and diversity of the markets in the region offer significant opportunities for Australian exporters and investors. As well as supporting the efforts of individual Australian businesses in Latin America, Australia pursues a productive relationship with Latin American countries on a range of international political issues.

The Middle East and Africa

Australia has growing commercial interests in the Middle East, a significant destination for Australian agriculture, services and manufactures exports. Australia's most significant relationship in Africa is with South Africa, which is a growing market for Australia's commercial interests and provides a base for trade with all the countries of the Southern African Development Community.

Australia's security interests

Australia's national security and its economic interests are inextricably linked to the security and stability of a broad region which encompasses South-East Asia, the South-West Pacific and Eastern Indian Ocean. It also includes North-East Asia, because the security of South East Asia cannot be separated from the rest of East Asia and because of the direct consequences of instability in North-East Asia for Australia's wellbeing. Any threat to the security of East Asia—from tensions to the extreme of war—would have immediate and adverse effects on Australia's national security and our major export markets. The potential for developments in the Asia Pacific to affect Australia's security and economic interests is the basis for the high priority that Australia places on ensuring regional stability.

The key components of Australia's security strategy are maintaining a strong national defence capability, the security alliance with the United States, developing bilateral defence and security relationships with the countries throughout the Asia Pacific, and strengthening multilateral security links in the region, especially the ASEAN Regional Forum (ARF).

Regular bilateral security dialogues with countries in the Asia Pacific, and with key partners beyond the region, provide an opportunity to share views on a wide range of regional and global security issues, promote transparency and reinforce Australia's commitment to working cooperatively with regional countries on security issues. Australia has increased the number of countries with which it has such dialogues, as part of its long-term strategy of promoting shared security perceptions in the Asia Pacific region.

The ARF is an important means of encouraging a sense of strategic community in a region where there is little history of inclusive multilateral approaches to security or defence. It complements the central role of bilateral links in dealing with global and regional security issues, and has an important role in encouraging regional support for international regimes against the proliferation of weapons of mass destruction and their missile delivery systems. One of the features of the ARF in 2000 was the participation for the first time of the Democratic People's Republic of Korea (DPRK). Australia has been very much part of the process of seeking to engage the DPRK more constructively with the regional and international community. Australia announced the re-establishment of diplomatic relations with the DPRK in May 2000.

Australia is working in the ARF to develop norms of regional behaviour aimed at avoiding conflict and settling disputes. Australia is encouraging the ARF to take a more central role in discussing and managing issues that threaten stability or confidence, and is taking an active role in expanding the ARF's confidence-building agenda and moves to develop its capacity for preventive diplomacy.

Global issues can also have significant security implications for Australia. The risk of global conflict diminished considerably with the end of the Cold War, but other potential threats remain. Developments in Europe, the Middle East and South Asia have the potential to disrupt global security. Serious instability in other parts of Asia, such as continuing tensions between India and Pakistan, could have implications for the security of the Asia Pacific.

Australia has made a major contribution to the significant progress in establishing international regimes to prevent the proliferation of nuclear, chemical and biological weapons and of missiles. Australia's future efforts will be concentrated on ensuring that these regimes are implemented and remain effective and, where necessary, are strengthened. Considerable effort is being devoted to initiatives to bolster the international legal regime against biological weapons. Australia will continue to encourage adherence to the international regime banning the use, stockpiling, production and transfer of anti-personnel landmines. These efforts will continue to be complemented by Australia's commitment to practical measures such as landmine clearance, victim assistance and mine clearance technology programs.

Australia's economic interests

Australia's economic wellbeing and growth depend on a competitive domestic economy and access to foreign markets. Trade policy, industry policy and microeconomic reform go hand in hand to provide Australian business with the competitive foundations and opportunities to thrive in an increasingly globalised marketplace.

As with Australia's security interests, Australia's economic interests are most closely engaged in the Asia-Pacific region. In 1999–2000, 53% of Australia's merchandise exports went to East Asian countries and 73% to APEC members, the destination also for over half of Australia's foreign direct investment. East Asian markets are, and will remain, important for Australia.

Australian trade policy combines an integrated set of bilateral, regional and multilateral efforts aimed at achieving the best possible market access outcomes for Australian business and advancing Australia's commercial interests. To this extent, Australia's trade strategies focus on reducing barriers to Australian goods, services and investment in foreign markets, developing those markets, and promoting Australia as a supplier of goods, services and investment.

The main regional and multilateral forums are APEC and the WTO. Other practical steps, such as developing closer links between Australia's

economic relations agreement with New Zealand (Closer Economic Relations or CER) and the ASEAN Free Trade Area, are also being pursued.

Significant as the Asia Pacific is for Australian business, Australia's trading interests are global, as therefore are its trade policy and market development activities. The WTO is of particular significance to Australia because it is the major forum for global trade liberalisation and, through its rules and disciplines, provides a predictable and more transparent environment for business, and a means of resolving trade disputes. Australia is, and will continue to be, an active player in the WTO, including as an advocate for continued global market opening and as the leader of the Cairns Group of agricultural fair traders.

The failure of the Ministerial-level meeting of the WTO in Seattle in December 1999 to reach agreement to launch a new round of multilateral trade negotiations was a setback. The launch of a new round was, and remains, a major trade policy focus for Australia. Despite the disappointing outcome, Australia achieved strong developing country support for ambitious agriculture reform proposals, and previously mandated agriculture and services negotiations were subsequently begun. Australia will continue its efforts to build consensus in the international community for the launch of a new round. In the longer term, Australia's objectives in the WTO are to ensure that the system remains relevant to the needs of Australian business by extending the rules and disciplines to new areas of importance; to focus the WTO work program on key market access issues; to seek to make world trade in agriculture free from distortion by subsidies and domestic support; and to increase access for Australia's exports of agricultural products.

The strong Asia Pacific orientation of Australia's trade and the importance of liberalising and facilitating trade in the region help to make APEC the most significant regional forum in which Australia participates. APEC economies committed themselves, in the Declaration by Leaders in Bogor in 1994, to free and open trade and investment by 2010 for industrialised economies and by 2020 for developing economies. Australia remains committed to this goal, the implementation of which, if met, would bring considerable long-term benefits for Australia and the region. Australia is working in the short and medium term to ensure substantial progress in the liberalisation programs of individual APEC economies.

Attention to financial sector issues has been given added impetus as economies undertake reform and restructuring following the advent of the East Asian economic crisis. There has also been increased recognition of the importance of direct business participation in APEC activities. This not only helps ensure that APEC is tackling the most important impediments to trade, investment and economic growth in the region, but can be a powerful force in encouraging APEC economies to push ahead with difficult reform decisions.

APEC's contribution, however, goes beyond trade and investment, and economic and technical cooperation issues. It is the only regional forum which brings together leaders from across the Asia Pacific. These meetings contribute to habits of consultation and dialogue, and the development of personal relationships, which strengthen trust and confidence among regional countries.

Australia's engagement with the United Nations (UN) system

Australia pursues important national interests in the bodies that comprise the UN system. These interests are engaged primarily in the General Assembly and its committees as well as specialised agencies like the World Health Organization (WHO), and affiliated organisations such as the International Atomic Energy Agency.

The UN is important to Australia in the core areas of international security and disarmament, environment, human rights and development assistance. Australia plays a strong role in these and other UN areas such as agriculture, refugees, health and meteorology. Australia has also been active in ensuring the acceptance of arms control treaties, such as the Comprehensive Test Ban Treaty, by the UN General Assembly, and in international environmental negotiations. The emphasis in the latter is on working towards international action which contributes to sustainable development, while protecting Australia's national interests.

An ongoing priority for Australia is the reform of the UN so that it can effectively manage growing demands with static or declining real resources. One element of the reform program is improved efficiency and effectiveness; the UN must undergo the fiscal discipline and adjustment to which many governments have already been subject. Another element is the need to re-examine the current group system within the

UN so that it better reflects the interests of all members. In line with Australia's broader desire for reform of the UN, the Government decided in 2000 to review Australia's participation in the UN treaty committee system.

Australia's human rights policy

In pursuing human rights objectives, Australia gives priority to practical efforts that can directly improve the human rights situation on the ground. These include development cooperation programs, assisting in establishing national human rights institutions, encouraging bilateral, regional and multilateral discussion of human rights issues, and working to develop and strengthen the effectiveness of regional and international human rights institutions and instruments.

In mid-1998, Australia established a Centre for Democratic Institutions at the Australian National University in Canberra, with the mission "to harness the best of Australia's democratic experience in support of developing countries' needs for good governance". The Centre's core business is to design and deliver short, intensive, high-level training programs in support of the democratic process and the strengthening of civil society.

Role of DFAT in Australia's international relations

The Department of Foreign Affairs and Trade (DFAT) is the principal source of advice to the Government on foreign and trade policy issues and is the agency primarily responsible for implementing the Government's foreign and trade policies.

Its aim is to advance the interests of Australia and Australians internationally.

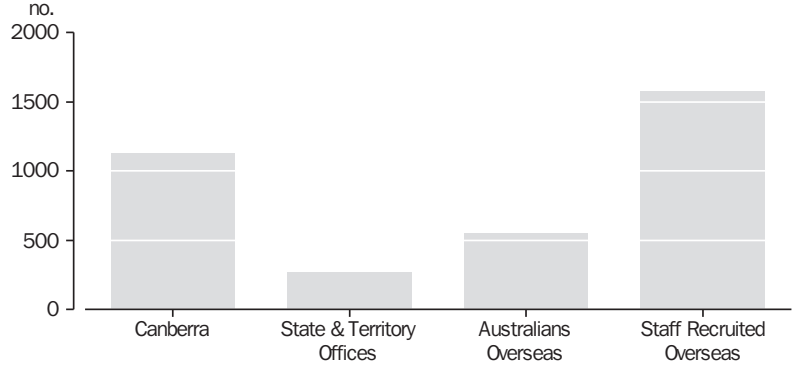
Its goals are to:

- enhance Australia's security;
- contribute to growth in Australia's economy, employment and standard of living;
- assist Australian travellers and Australians overseas;
- strengthen global cooperation in ways that advance Australia's interests; and
- foster public understanding of Australia's foreign and trade policy and to project a positive image of Australia internationally.

Location and number of DFAT staff

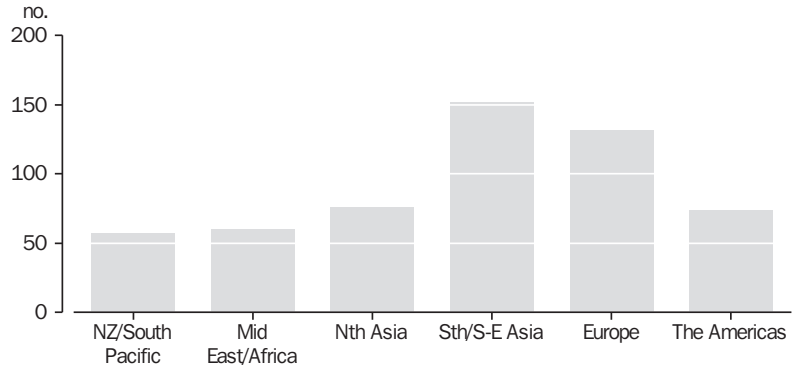
Graph 3.1 shows the location of DFAT staff. Graph 3.2 shows the number of Australia-based DFAT staff overseas by broad region.

3.1 LOCATION OF DFAT STAFF—January 2000



Source: Department of Foreign Affairs and Trade.

3.2 AUSTRALIA-BASED DFAT STAFF OVERSEAS, By Region—January 2000



Source: Department of Foreign Affairs and Trade.

Services to the Australian community

The principal international services provided to the Australian community are consular and passport services provided by the Department of Foreign Affairs and Trade. The department provides 24-hour consular and passport services to Australians travelling overseas and their families in Australia through its network of overseas missions and honorary consulates, a consular operations centre and consular cooperation arrangements with other countries. These services include assisting Australians who are hospitalised, imprisoned or require welfare assistance overseas; helping family members when Australian travellers die or go missing; and, when required, coordinating evacuations from international trouble spots. Consular services are now available to Australians at 152 points world-wide. Through media briefings and regularly updated travel advisories, Australian travellers are kept informed about international developments, including potential trouble spots, and the extent to which the Australian Government can assist them. The department is also responsible for implementing bilateral consular agreements with Canada and China.

The department is responsible for providing secure travel documents to eligible Australians under the authority of the *Passports Act 1938*. Passport services are provided through passport offices located in Australia's major cities and diplomatic and consular missions overseas.

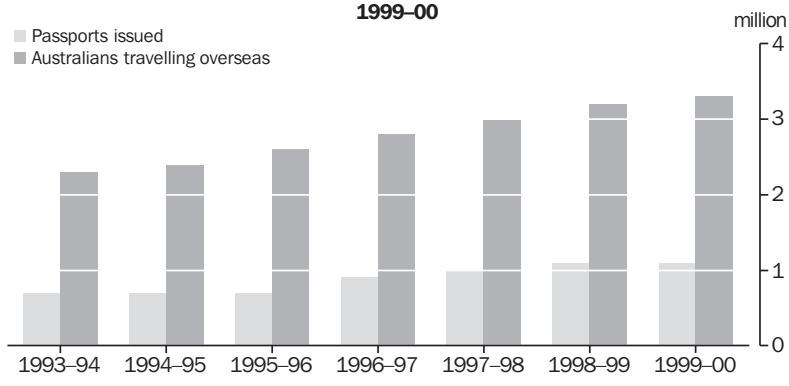
Access to passport information is available through the Australian Passport Information Service, which operates seven days a week including after hours, and interview services are provided through Australia Post and its network of 1,600 outlets throughout Australia. While Australia is already a world leader in providing secure passport services, the department is working to improve the service still further.

As graph 3.3 shows, in 1999–2000 an estimated 3.3 million Australians travelled abroad (a 3.3% increase from 1998–99), and DFAT issued 1.14 million passports (an increase of 5.4% from the previous year). During 1999–2000 the department provided consular assistance to 20,741 Australians in difficulty (a 3% increase from the previous year) and notarial services to a further 45,420 Australians. Graph 3.4 shows the number of Australians travelling, by broad region of destination, in 1998–99.

Public information services

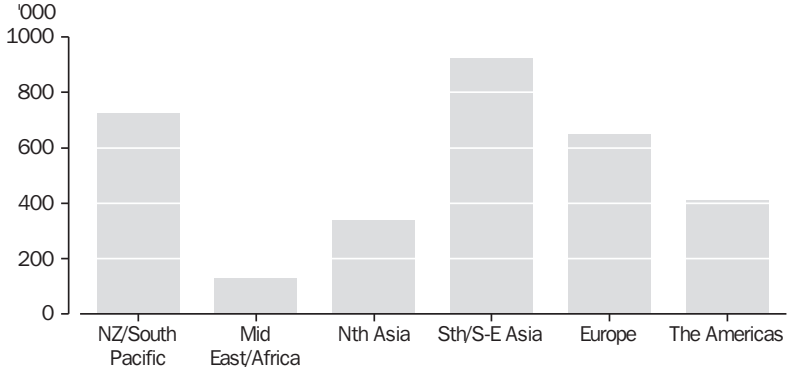
The Department of Foreign Affairs and Trade provides a wide range of information services to the Australian public, and promotes Australia and Australians overseas. The department's public diplomacy objectives are to ensure that Australians are kept informed about Australia's foreign and trade policies, and have the opportunity to contribute to them, and to promote an accurate, positive and up-to-date image of Australia internationally.

3.3 AUSTRALIANS TRAVELLING OVERSEAS AND PASSPORTS ISSUED—1993–94 to 1999–00



Source: Deptartment of Foreign Affairs and Trade.

3.4 AUSTRALIAN TRAVELLERS, Numbers by Destination Region—1998–99



Source: Department of Foreign Affairs and Trade.

Much information about Australia's foreign and trade policy can be accessed through the DFAT website, *http://www.dfat.gov.au*. The department also produces hard copy publications on many foreign and trade policy issues, which are available from the department or from Commonwealth Government bookshops. Departmental officials provide a large number of media briefings on issues of the day. Key information available from the department electronically is listed in the section *Further references*.

The image other countries have of Australia influences judgements about a multitude of issues, including the quality of Australian goods and services, investment and tourism decisions, and Australia's credibility as an international partner. It is therefore very important that the image of Australia received by other countries is contemporary and positive. While Australia benefits from a generally positive image internationally, DFAT promotes better understanding of some of the less well known aspects of modern Australia, including our technical capabilities, record of innovation and achievement in science and industry, and our cultural diversity.

The Sydney 2000 Olympics provided a unique opportunity to promote Australian capabilities and to update international perceptions about Australia. Through the international media, targeted business and dignitary visits programs, international conferences, sports marketing linkages and other opportunities, Australia's hosting of the Olympics was used to advance Australia's international interests.

Australia's overseas aid program

The Australian aid program aims to advance our national interest by assisting developing countries to reduce poverty and achieve sustainable development. Australian aid focuses on providing practical, well-targeted development assistance to the Asia-Pacific region and responding selectively to needs in South Asia, Africa and the Middle East.

The role of the Australian Agency for International Development (AusAID)

The Australian Agency for International Development administers the majority of Australia's aid program, mainly through Country and Global Programs. Country Programs provide direct bilateral assistance to partner countries, while Global Programs include humanitarian and emergency assistance, contributions to multilateral development banks and international organisations, support for Australian non-government organisations, and funding for public information and development research.

AusAID is an administratively autonomous agency within the Foreign Affairs and Trade portfolio. The Agency's principal organisational functions are: to provide professional policy advice and support to the Government on aid policy, program directions and international development issues; and to develop and implement programs of assistance in partnership with partner countries.

AusAID's central office is in Canberra, with presences in most States. To oversee the implementation of aid projects in countries, AusAID supports officers in 24 Australian diplomatic missions, employing a combination of Australian citizens and locally engaged staff. Actual delivery of the aid program is entirely outsourced, principally to Australian contracting firms, NGOs and international development institutions.

In 1999–2000 the Australian Government provided $1.65b[1] in official development assistance (ODA) (table 3.5). This was an increase of almost $150m on the estimated figure, primarily due to an additional $60m for East Timor, $12m for the Heavily Indebted Poor Countries Initiative, and $48m for expenditure on Kosovar and East Timorese evacuees in Australia. Country Program assistance totalled $902.5m and Global Programs $479.5m. Other expenditure included the costs of administering the aid program, known as departmental costs ($69.4m).

Australia's official development assistance in 2000–01 is estimated at $1.6b. ODA as a percentage of Gross National Product is expected to be 0.25%, which is above the latest average of donor countries of 0.24%. Country Programs expenditure is estimated to be $916.9m and Global Programs $497.5m.

Although AusAID administers most of Australia's development cooperation, other government agencies also contribute to overall ODA expenditure. For example, expenditure by the Australian Centre for International Agricultural Research (ACIAR) is expected to be $44.7m in 2000–01. In addition, other Commonwealth and State government expenditure on ODA related activities is estimated at $135m in 1999–2000, and $85.1m in 2000-01.

The cost of providing aid management and administration in 2000–01 is estimated at $67.9m.

Country programs

Nearly 60% of Australia's overseas development assistance ($916.9m out of $1,600.3m in 2000–01) is provided on a country or regional program basis, focusing primarily on Papua New Guinea, the Pacific and East Asia. Development needs are also addressed in South Asia, Africa and the Middle East. Details of Australian aid flows are set out in table 3.5.

1 Most figures presented here are in cash terms. Details on the difference between accrual expenses and cash payments are available in the budget paper *Australia's Overseas Aid Program 2000–01*.

3.5 ESTIMATED TOTAL AUSTRALIAN AID FLOWS, By Recipient Country/Region—2000–01

Region/Country	$m
Papua New Guinea	323.7
Pacific	
Fiji	22.3
Vanuatu	18.1
Solomon Islands	19.7
Samoa	14.5
Tonga	11.7
Kiribati	9.7
Other and regional	48.7
Total Pacific	*144.9*
East Asia	
Indonesia	120.5
East Timor	65.0
Viet Nam	73.2
Philippines	63.1
China	57.5
Cambodia	37.9
Thailand	24.6
Laos	20.4
Other and regional	25.4
Total East Asia	*487.6*
Other regions	
Bangladesh	37.4
India	19.3
Sri Lanka	11.2
Nepal	7.7
Pakistan	4.4
Africa	74.0
Other and regional	54.6
Total other regions	*208.7*
World unallocated	435.5
Total Official Develpment Assistance	**1 600.3**

Source: AusAID.

Individual country and regional programs are normally based on three-year strategy documents, which articulate how the program will facilitate poverty reduction and promote sustainable development. Strategies relate the priority sectors for the Australian aid program to the broader developmental needs of the parties, country or region. They also take into account Australia's resources, skills and experience in delivering aid.

The five priority sectors for Australia's aid program are health, education, infrastructure, agriculture and rural development, and governance, with gender issues and the environment as major crosscutting concerns. Within this framework, development assistance programs comprise a range of activities. These include the provision of Australian goods and services, training and academic student scholarships, food aid and support for non-government organisations (NGOs).

For the majority of partner countries, the nature and effectiveness of Australia's assistance is reviewed annually against the background of individual country strategies, usually during high-level consultations with partner governments. By continually reviewing its assistance, Australia is able to adjust the aid program to respond to changing development needs of partner governments. For example a major feature of the 2000–01 aid budget is Australia's contribution towards the reconstruction and rebuilding of East Timor as a democratic and independent country (see the article *East Timor—reconstruction and development*). Additional support to individual countries and regions is provided through a range of international organisations and community programs (see *Global programs).*

Papua New Guinea

PNG receives the largest share of the Australian aid program, with total flows in 2000–01 estimated to reach $323.7m, including country program assistance of $300.0m. This represents one-fifth of the total Australian development cooperation program, reflecting the significance of the relationship between the two countries and PNG's formidable development challenges and needs.

The new Treaty on Development Co-operation between Australia and PNG came into effect on 1 July 2000. The new Treaty links performance more closely to future funding decisions. A new Incentive Fund will provide greater flexibility in enabling PNG organisations such as community groups, provincial governments and the private sector to seek direct funding. Efforts are being made to increase PNG participation in the delivery of the aid program, where possible providing funding for relevant PNG agencies to undertake aid activities.

Australia's assistance to PNG will focus on the jointly agreed priority sectors of education and training, health and infrastructure, as well as renewable resources and governance. A special program to assist the peace process for Bougainville will continue.

South Pacific

The Pacific Island Countries (PICs) continue to be a high priority for the aid program.

These small, vulnerable and isolated countries face unique constraints to development. With relatively small domestic economies and resource bases, many PICs have subsistence-based economies and most rely on the public sector as the major

contributor to the cash economy. Many PICs are remote from markets and have few exports.

The long-term objective of Australia's assistance to the Pacific is to help countries in the region to achieve the maximum possible level of self-reliance.

Australia's Pacific Islands Development Strategy 1999–01 sets out five principal outcomes for Pacific island countries that the aid program will work towards: better governance; stronger economic growth; greater capacity; better service delivery; and environmental integrity.

In 2000–01, Australian aid to the Pacific Island Countries will total an estimated $144.9m, making Australia one of the largest donors to the region. In addition to supporting economic reform and governance, the focus of assistance continues to be health, education and renewable resources. The development effects and implications for the aid program of ethnic unrest in Fiji and Solomon Islands are being reviewed.

East Asia

The East Asia region is one in which many countries until recently experienced rapid and sustained economic growth. Following the financial crisis of the late 1990s, bilateral and regional programs are addressing immediate needs and helping to underpin long-term recovery in the region. The crisis highlighted the need for an increased focus on strengthening governance and social protection in the region. Australia's program to East Asia is estimated to total $487.6m in 2000–01, including bilateral country program assistance of $368.6m, and has a particular focus on governance and economic activities.

Assistance to Viet Nam, Cambodia and Laos PDR, three of the world's poorest nations, concentrates on poverty reduction through targeted interventions in areas such as health, mine clearance, education and training, rural development, and governance and institutional strengthening.

Indonesia has started to recover from the East Asian financial crisis. However, major challenges still lie ahead as the new Government implements its economic and civil reform programs. Australia's development cooperation program with Indonesia aims to contribute to poverty reduction, sustainable recovery and democratisation in Indonesia. The program focuses on two core areas: activities to promote good governance, through the development of effective, transparent and accountable institutions of government and civil society; and activities to address the needs of vulnerable communities and provide for sustainable improvements in their quality of life, including through improved services, measures to improve the productivity and financial security of the poor, and activities to assist areas affected by communal violence and civil unrest.

Australia's development assistance program to the Philippines focuses on reducing poverty in the southern part of the country, especially Mindanao. This region contains approximately 30% of the country's poor. Through the aid program Australia is also supporting the recently established peace process in Mindanao where there has been conflict for over two decades. The program includes assistance in the areas of rural incomes, health, education and the environment. Support for the Philippine Government's economic and social reform agenda is provided through assistance in governance and to social safety net programs.

Thailand is another of the East Asian countries that was severely affected economically and socially by the financial crisis. Australia's aid program to Thailand had been due to cease in 2000–01. However, it will now continue, focusing on problems in the banking and finance system, promotion of good economic governance and mitigation of the negative effects of the financial crisis, especially on the poor and disadvantaged.

China continues to face major development challenges, with over 200 million people living in poverty. China has embarked on an ambitious program of government restructuring, rationalisation of state-owned enterprises and financial sector reform. Australia is supporting this program through technical advice and training. Australian aid is also being provided in areas relating to human rights. At the same time, the aid program is assisting in education, improving basic health services and improving environmental and natural resource management and rural development.

Australia also assists the countries of South East Asia to enhance economic integration, and address regional economic management issues and trans-boundary development challenges. The Asia Regional programs have focused on economic governance, social safety nets, reducing the spread of HIV/AIDS, illicit drugs, and trafficking in women and children.

East Timor—reconstruction and development

The East Timorese are among the world's poorest people. Violence following the August 1999 ballot left most of the territory's infrastructure destroyed, the agricultural cycle severely disrupted and nearly three-quarters of the population displaced. With peace restored, East Timor faces great challenges in its move to an independent and peaceful state. A massive international humanitarian relief effort is addressing immediate needs in areas such as food, health and shelter, and has helped the return of many displaced people.

As a close neighbour, Australia is strongly committed to East Timor's reconstruction and long-term development. As the focus moves from relief to reconstruction and development, the challenges facing East Timor remain enormous. Building the capacity of the East Timorese to govern a stable and democratic independent East Timor will underpin the aid program. Bilateral assistance in 2000–01 will complement the UN Transitional Administration (UNTEAT) operations and the programs of other aid donors by focusing on:

- restoring basic services and improving service delivery in the key sectors of health, education, and water supply/sanitation;
- helping to develop simple, effective and self-sustaining government and administration in East Timor;
- strengthening productive sectors of the economy, especially agriculture;
- assisting the process of reconciliation and peace building; and
- supporting multinational reconstruction and development efforts, including through continued engagement and coordination with other donors.

Consistent with Australia's capacity to assist and East Timor's development needs, the Australian Government has committed $150m ($100m of which is additional funding) over the next four years towards the reconstruction of East Timor.

South Asia

Despite the financial turmoil in East Asia, most economies of South Asia have performed steadily over the last few years. However, economic growth is still not high enough to make any significant impact on poverty in a region which contains nearly 40% of the world's poor and has the world's worst social indicators. South Asia is diverse in terms of size, population concentration, culture, socioeconomic conditions and political characteristics.

In 2000–01, total Australian aid to South Asia is estimated at $90.4m, including country program assistance of $55.4m. Australia's aid program to the region focuses on four priority areas: strengthening the capacity of governments to deliver basic social services; reducing the spread of HIV/AIDS; supporting activities that build peace and uphold human rights; and assistance aimed at improving natural resource management and rural development in selected geographic areas.

Africa and the Middle East

Africa continues to face major development challenges. For the Middle East, Australia supports the peace process through continuing assistance for the humanitarian needs of over 3.5 million Palestinian refugees in the region.

The geographic focus of Australian aid to Africa centres on South Africa and Mozambique, with more limited activities in south and east African countries. Regional programs have been increased substantially.

Global programs

Multilateral organisations

Australia's aid support for multilateral agencies extends the reach of the aid program. Multilateral agencies perform a range of valuable humanitarian, technical, policy dialogue and coordination functions. For example, they improve donor coordination by providing leadership on major global issues such as climate change and HIV/AIDS. The multilateral response to the crisis in East Timor illustrates how international organisations are able to marshal

resources and coordinate large-scale responses, complementing the inputs of individual countries.

Australia supports a range of development banks, United Nations and Commonwealth development agencies and international health and environment agencies as set out in table 3.6.

Australia and other donors have a strong interest in ensuring that multilateral agencies are effective, efficient and adequately resourced. Equitable burden sharing among donors is important.

Emergency and humanitarian programs

In partnership with multilateral agencies, recipient governments and non-government organisations, Australia aims to deliver prompt, effective and coordinated humanitarian and emergency assistance to those exposed to human suffering and material destruction as a result of disasters and emergencies. Emergency and humanitarian aid provides flexibility for the Government to respond to these unexpected and pressing crises, and also to contribute to protracted relief operations.

Emergency assistance

Australia stands ready to respond to natural disasters, such as earthquakes, cyclones, and floods. In addition to rapid response to emergencies, this involves reducing vulnerability, promoting solutions to root causes and facilitating the smooth transition from relief to rehabilitation and development. Australia will continue to focus on those in most need, with a particular emphasis on countries in the Asia-Pacific region.

The scale and nature of these crises around the world makes it impossible to respond in every case. The need for external support in the wake of the ethnic unrest in the Solomon Islands and the crisis in East Timor clearly highlight the importance of Australia's emergency assistance in the Asia-Pacific region. Indonesia has started to recover from the economic crisis, but a number of serious humanitarian situations continue to require Australian assistance.

3.6 GLOBAL PROGRAMS(a)—2000–01(b)

Contribution to multilateral organisation/global program	$m
Multilateral development banks	
International Development Association (IDA)	113.4
Asian Development Fund (ADF)	120.2
International Fund for Agricultural Development	1.5
Heavily Indebted Poor Countries Initiative (HIPC)	11.5
Total	*246.6*
United Nations organisations	
UN Development Programme (UNDP)	7.0
UN Childrens Fund (UNICEF)	4.8
World Food Programme (WFP)	43.7
UN Population Fund (UNFPA)	2.2
International Atomic Energy Agency (IAEA)	1.5
UN Drug Control Program (UNDCP)	0.8
UN Environment Program (UNEP)	0.6
UN Fund for Women (UNIFEM)	0.4
Total	*61.8*
Emergency and humanitarian programs	108.2
Commonwealth organisations	10.6
International health programs	11.1
International environment programs	10.9
Non-government organisations and volunteer programs	44.1
Development education and public information	3.0
Academic and research program	1.3
Total global programs	**497.5**

(a) Including core contributions to multilateral organisations.
(b) Estimates.

Source: AusAID.

Other humanitarian aid

Support for refugees, internally displaced people and other vulnerable groups will continue through contributions to the UN system (particularly the UN High Commission for Refugees and World Food Programme), the International Committee of the Red Cross and NGOs. This will include support for land mine action programs, health services, water supplies, sanitation and resettlement assistance and human rights monitoring. Opportunities for peace building will also be supported.

The emergency and humanitarian program will fund around 130,000 tonnes of food aid in response to emergency and protracted relief operations. This food aid will assist the most vulnerable communities and will be channelled primarily through the World Food Programme to meet ongoing humanitarian relief activities in such countries as the Democratic Peoples Republic of Korea, Cambodia, Indonesia, Bangladesh and Sri Lanka. This humanitarian food aid will assist in meeting approximately half of Australia's obligations under the Food Aid Convention (FAC) for 2000–01.

Non-government organisation (NGO) activities and volunteer programs

Non-government organisations

Non government organisations are an effective way of providing Australian aid to developing countries. NGOs have particular strengths in engaging local communities and promoting grass roots participation in aid activities. Through their strong links with communities in developing countries and partnerships with local organisations, NGOs are well placed to strengthen civil society, create a better environment for development activities and increase the potential for long-term sustainable impacts.

The AusAID–NGO Cooperation Program (ANCP) supports NGO development activities that contribute to poverty alleviation. Under this scheme, Australia supplements funds provided to the community, increasing the effectiveness of NGO activities and enabling NGOs to respond to their own regional and sectoral priorities.

Total Australian government development assistance channelled through both Australian and overseas NGOs in 2000–01 will be approximately $112.8m. This includes $25.2m for the ANCP.

Volunteer programs

The Australian Youth Ambassadors for Development (AYAD) Program aims to strengthen mutual understanding between Australians and the people of the Asia-Pacific region, and make a positive contribution to development. The program places Australians between 18 and 30 years of age on development projects to exchange skills with local counterparts. Youth Ambassadors bring back to Australia a practical appreciation of the cultures, economies and development needs of the countries in the Asia-Pacific region.

The AYAD Program partners with a broad range of organisations in Australia who nominate and support young Australians as Youth Ambassadors. In 2000–01 the AYAD Program will continue to develop partnerships with Australian organisations from business, education, community and government sectors, and plans to place 240 Youth Ambassadors on assignment in developing countries.

The Australian aid program also contributes to a range of existing volunteer programs. Australian Volunteers International, the AESOP Business Volunteers, the Paulian Lay Missionary Society and Interserve are examples of organisations that enable Australian volunteers to work in developing countries. Total expenditure on these volunteer programs in 2000–01 is expected to be $12.8m.

Public information and development education

Australians have a right to know how their support is assisting developing countries. Public information and development education activities play a key role in meeting this obligation and also in building support for the aid program.

Outreach seminars disseminate information about the aid program and development issues to a wide range of people in the community. Seminars are also held to inform industry and business groups and potential contractors of opportunities to become involved in the aid program. The school-based Global Education Program is a major component of the Development Education Program. It concentrates on the professional development of teachers and the production of materials to support the teaching of Global Education in primary and secondary schools. A free quarterly magazine and a wide range of publications, targeted at both experts and the general Australian audiences, are prepared and distributed each year. In addition, AusAID's Internet site provides essential technical, business and general information to a fast increasing Australian and international audience.

Estimated expenditure on public information and development education in 2000–01 is $2.3m.

Development research and seminar support

Research undertaken through the AusAID Development Research Program guides AusAID's policy and program development and enhances the Australian community's understanding of development cooperation issues. In 1999–2000, the program supported a range of projects focused on aid issues in the Asia-Pacific region, provided core funding for the research functions of the National Centre for Development Studies of the Australian National University and supported the publication of the journal *Asia-Pacific Economic Literature* published by the centre.

Research sponsored by the program on the social impacts of the Asian financial crisis on children led to Australian commencement of a three-year, $5m social protection facility for East Asia. The facility will help developing economies in East Asia improve social programs and safety nets. The program is also supporting the development

of poverty reduction guidelines by the OECD Development Assistance Committee.

The International Seminar Support Scheme (ISSS) assists developing country participants to attend international development-orientated seminars in Australia and overseas. Through their participation, ISSS helps to develop knowledge, technical expertise, networks and policies relevant to the reduction of poverty and achievement of sustainable development. Applications for seminar support are assessed on the degree to which they provide tangible and practical development related outcomes. In 2000–01, $750,000 will be provided to the scheme.

Australian Centre for International Research (ACIAR)

The recovery from the East Asian financial crisis and from the severe droughts of 1997–98 in many Asia Pacific countries has highlighted the critical importance of agricultural development, both for supplying dietary needs and as a potential source of income. ACIAR has a unique and important role on behalf of the Australian Government in promoting collaborative research partnerships that improve agricultural and natural resources management in developing countries. ACIAR's work contributes to more productive and sustainable systems of agriculture, fisheries and forests, and to improved rural livelihoods.

ACIAR's mandate is to mobile Australia's research capacity to help solve the agricultural research problems of developing countries. ACIAR's outcome is to develop international agricultural research partnerships that reduce poverty, improve food security and enhance natural resources management in developing countries and Australia.

ACIAR continues to build strong programs of agricultural research with its developing country partners in support of their rural development. These partners have worked hard to maintain their project commitments in the face of the financial crisis in South-East Asia, recognising the crucial role of agriculture in sustaining their recovery from the crisis.

In 2000–01 ACIAR will support more than 150 bilateral research projects in 27 countries, with a primary focus in the Asia-Pacific region. Under its multinational program, ACIAR will support 19 International Agricultural Research Centres (IARCs) through grants that link them to Australia's agricultural research organisations. Approximately three-quarters of ACIAR's research and development budget is spent on bilateral programs and one-quarter on multilateral programs.

In response to a recent external review, ACIAR is building stronger linkages to other donors through closer collaboration. Expenditure by ACIAR under the aid program in 2000–01 is expected to be $44.7m.

A short history of Australian aid

The Australian aid program has undergone considerable changes over the past fifty years. Change has occurred in the administration of the program, its focus, the major countries receiving Australian aid and the type of aid provided.

Australia's aid activities began before World War II when grants, generally below $100,000, were made to Papua New Guinea. In 1950 Commonwealth Foreign Ministers met in Colombo and launched the Colombo Plan, which was concerned with aid to South and South-East Asia. Under the Plan, Australia provided a diverse range of activities such as education scholarships, technical cooperation, training and staffing assistance to countries of the region.

In 1952 joint activities in other countries began, with aid targeted at low income member countries of the British Commonwealth. Papua New Guinea, which was being administered by Australia at the time, was the major recipient of Australian aid, along with India.

After the mid 1950s, aid decisions continued to be strongly influenced by political considerations, but as more countries became fully independent, and with changing international perceptions, the motives underlying the Australian aid program began to change. Due to Australia's historical links to Papua New Guinea, aid to this country remained at two-thirds of the total aid program. In the 1960s South-East Asia gradually gained more

importance than South Asia, with Indonesia overtaking India as the second largest recipient of aid. Progressively Australian aid became no longer tied to countries that were members of the British Commonwealth.

Today Papua New Guinea, the South Pacific and East Asia (in particular Indonesia, Viet Nam and the Philippines) feature prominently in Australia's aid program, as shown in table 3.5.

Initially Australian aid was composed predominantly of bilateral assistance. In the 1960s cooperation between donor countries became established as a range of development agencies were formed, including the OECD's Development Assistance Committee (DAC), a number of new United Nations agencies and the Asian Development Bank (ADB). In the early 1970s about 7% of Australian aid was provided to multilateral organisations, whereas now over a quarter of Australian aid is allocated to them.

Originally the aid program was administered by several government departments, including the Department of External Territories, the Department of Foreign Affairs and the Departments of Education and Treasury, reflecting the ad hoc nature of the program. In the early 1970s, in recognition of the need for stronger policy direction and coordination, along with Papua New Guinea achieving independence, a single government agency was set up to administer the aid program. First known as the Australian Development Assistance Agency (ADAA) then the Australian Development Assistance Bureau and later as the Australian International Development Assistance Bureau, it has evolved into the Australian Agency for International Development (AusAID).

Over the past twenty years, several reviews of the Australian aid program have been undertaken. In 1984 the Minister for Foreign Affairs commissioned the Jackson Review. The Review led to a stronger focus on partnerships with recipient countries through a country program approach. Instead of selecting individual projects, country programs were developed which considered the development priorities of recipient governments and Australia's capacity to assist. Cooperative relationships were established, with both recipient and donor governments involved in the planning and implementation of country programs. The three agreed principal objectives for aid stemming from the Jackson Review were humanitarian assistance, support for Australia's strategic interests and promotion of Australia's commercial position. In addition the then Government decided on a geographic focus on Papua New Guinea, the South Pacific and South-East Asia, as well as a new sectoral focus including agriculture, infrastructure development, health, population planning and urban development.

In 1996 the Simons Review was commissioned by the Minister of Foreign Affairs. This led to the adoption of a single clear objective for the aid program: to advance Australia's national interest by assisting developing countries to reduce poverty and achieve sustainable development. The Government decided that Papua New Guinea, the Pacific and East Asia would continue to be high priorities for Australian assistance. It was also decided that health, education, rural development and governance would be the priority sectors, in addition to two issues that cut across the development process: the promotion of gender equity and the maximisation of environmental sustainability. The Government's response to the Simons Review strengthened the partnership approach emphasised in the Jackson Review, noting that effective partnerships with developing countries formed the core of Australia's aid program.

Apart from understanding the need for a better-targeted and focused aid program there was also a significant emphasis, in the Government's response to the Simons Review, on improving the quality of the program. This included support for a more vigorous focus on defining strategic and program objectives as well as on allowing better performance measurement and reporting on aid quality.

The network of Australian diplomatic and consular missions overseas

DFAT manages an extensive network of Australian diplomatic and consular missions abroad (tables 3.7 to 3.10), supporting Australia's international interests and providing consular and passport services. The department's central office is in Canberra and it also maintains offices in all of the State capitals and in Darwin, as well as Newcastle and Thursday Island.

3.7 AUSTRALIAN EMBASSIES, HIGH COMMISSIONS, CONSULATES AND MULTILATERAL MISSIONS MANAGED BY DFAT(a)—July 2000

Country	Post
Argentina	Buenos Aires
Austria	Vienna
Bangladesh	Dhaka
Barbados	Bridgetown
Belgium	Brussels
Brazil	Brasilia
Brunei	Bandar Seri Begawan
Burma	Rangoon
Cambodia	Phnom Penh
Canada	Ottawa
Chile	Santiago de Chile
China, Peoples Republic of	Beijing
	Guangzhou
	Hong Kong
	Shanghai
Croatia	Zagreb
Cyprus	Nicosia
Denmark	Copenhagen(b)
Egypt	Cairo
Federated States of Micronesia	Pohnpei
Fiji	Suva
France	Paris
Germany	Berlin
Greece	Athens
Hungary	Budapest
India	New Delhi
Indonesia	Bali
	Jakarta
Iran	Tehran
Ireland	Dublin
Israel	Tel Aviv
Italy	Rome
Japan	Tokyo
Jordan	Amman
Kenya	Nairobi
Kiribati	Tarawa
Korea, Republic of	Seoul
Laos	Vientiane
Lebanon	Beirut
Malaysia	Kuala Lumpur
Malta	Valetta
Mauritius	Port Louis
Mexico	Mexico City
Nepal	Kathmandu
Netherlands	The Hague
New Caledonia	Noumea
New Zealand	Wellington
Nigeria	Lagos
Pakistan	Islamabad
Papua New Guinea	Port Moresby
Philippines	Manila

For footnotes see end of table. ...continued

3.7 AUSTRALIAN EMBASSIES, HIGH COMMISSIONS, CONSULATES AND MULTILATERAL MISSIONS MANAGED BY DFAT(a)—July 2000—*continued*

Country	Post
Poland	Warsaw
Portugal	Lisbon
Russia	Moscow
Samoa	Apia
Saudi Arabia	Riyadh
Singapore	Singapore
Solomon Islands	Honiara
South Africa	Pretoria
Spain	Madrid
Sri Lanka	Colombo
Sweden	Stockholm
Switzerland	Geneva
Thailand	Bangkok
Tonga	Nuku'alofa
Turkey	Ankara
United Arab Emirates	Abu Dhabi
United Kingdom	London
United States of America	Honolulu
	Los Angeles
	New York
	Washington
Vanuatu	Port Vila
Vatican City	Vatican City(c)
Venezuela	Caracas
Viet Nam	Hanoi
	Ho Chi Minh City
Yugoslavia	Belgrade
Zimbabwe	Harare

(a) The Department of Foreign Affairs and Trade manages the Australian Mission in Dili. This is expected to become an embassy when the UN-administered territory of East Timor becomes an independent State. In Taipei, the Australian Chamber of Commerce and Industry maintains an office, the staff of which includes employees on leave without pay or seconded from the Department of Foreign Affairs and Trade, Austrade, the Department of Education, Training and Youth Affairs, and the Department of Immigration and Multicultural Affairs. (b) To be opened in the second half of 2000. (c) Embassy to the Holy See.

Source: Department of Foreign Affairs and Trade.

3.8 MULTILATERAL MISSIONS

	Post
OECD	Paris
UN	Geneva
	New York
	Vienna
WTO	Geneva

Source: Department of Foreign Affairs and Trade.

3.9 CONSULATES MANAGED BY AUSTRADE

Country	Post
Brazil	Sao Paulo
Canada	Toronto
Germany	Frankfurt
India	Mumbai
Italy	Milan
Japan	Fukuoka
	Nagoya
	Osaka
	Sapporo
	Sendai
New Zealand	Auckland
Peru	Lima
Romania	Bucharest
Turkey	Istanbul
United Arab Emirates	Dubai
United States of America	Atlanta
	San Francisco

Source: Department of Foreign Affairs and Trade.

3.10 CONSULATES HEADED BY HONORARY CONSULS

Country	Post
Angola	Luanda
Bolivia	La Paz
Brazil	Rio de Janeiro
Bulgaria	Sofia
Canada	Vancouver
Colombia	Bogota
Czech Republic	Prague
Ecuador	Guayaquil
Estonia	Tallin
Finland	Helsinki
Former Yugoslav Republic of Macedonia	Skopje
French Polynesia	Papeete
Greece	Thessalonika
Indonesia	Balikpapan
	Kupang
	Medan
Korea, Republic of	Pusan
Latvia	Riga
Lithuania	Vilnius
Malaysia	Kota Kinabalu
	Kuching
	Penang
Mexico	Guadalajara
	Monterrey
Mozambique	Maputo
Norway	Oslo
Pakistan	Karachi
Papua New Guinea	Lae
Russia	Vladivostok
Slovenia	Ljubljana
South Africa	Durban
Spain	Barcelona
	Seville
Thailand	Chiang Mai
Ukraine	Kiev
United Kingdom	Edinburgh
United States of America	Boston
	Denver
	Houston
	Miami
Uruguay	Montevideo

Source: Department of Foreign Affairs and Trade.

The Department of Foreign Affairs and Trade over the century—a chronology

1901	The Departments of Trade and Customs, and External Affairs are among the seven foundation departments of the Australian Federal Government in 1901. The Department of External Affairs is initially responsible for immigration and territories, with external affairs largely conducted by the United Kingdom.
1903–11	Trade Commissioners are appointed to Europe and the 'Far East' by Prime Ministers Deakin and Reid and the Victorian Government.
14 Nov 1916	The Department of External Affairs is abolished, with functions adopted by the Prime Minister's Department.
1919	Cabinet approves resolution of Commonwealth Board of Trade that "An Australian Trade Commissioner should be immediately appointed in Egypt and anywhere else in the Near or Far East and other places where opportunities for trade appear to offer". Board recommends appointment of trade commissioners to the East Indies, Mesopotamia, China, Japan, India, South Africa, South America and Siberia.
1921	Department of External Affairs is re-established. Its main responsibility is to handle matters associated with Australia's membership of the League of Nations.
1 Oct 1924	R.G. Casey is established in London as Liaison Officer. He has unrestricted access to classified Foreign Office and Cabinet information and communicates with the External Affairs Branch within the Prime Minister's Department as well as maintaining direct communication with Prime Minister Bruce.
1925	Australia signs a trade agreement with Canada.
Mar 1926	The term of A.E. Hyland as Director of Trade Publicity in the United Kingdom (1926–39) sees a new professional approach to publicity and a marked increase in sales of Australian produce in the United Kingdom. Government funds for this activity are supplemented by the exporting industries themselves.
1930	L.R. Macgregor takes over as 'Trade Commissioner' in Canada—he also performs some diplomatic and consular functions.
1933–34	The Trade Commissioner Act creates an overseas service and regulates its operation. Trade Commissioners appointed to Shanghai, Tokyo and Batavia.
19 Nov 1935	W.R. Hodgson becomes the first Secretary of the fully separated Department of External Affairs, which becomes a separate foreign office and—from 1939—administers an overseas diplomatic service.
1939	Department of Information is established in Acton, Australian Capital Territory, the first institutionalised effort to promote Australia internationally
1939	At the outbreak of WWII the Department has 29 permanent staff. Overseas representation comprises an officer attached to the British Embassy in Washington and another who liaises with the Foreign Office in London.
1 Feb 1940	The first Legation opens in Washington DC under R.G. Casey. Raised to an Embassy on 19 July 1946.
28 Mar 1940	The first High Commission is established at Ottawa under Sir William Glasgow.
19 Nov 1940	Legation at Tokyo opens under Sir John Latham. (Closed on 8 December 1941 and reopened with a Political Advisor (B.C. Ballard) on 4 November 1945. Raised to a Mission on 1 April 1947 and to an Embassy on 28 April 1952.)
1 Sep 1941	An Official Representative (V.G. Bowden) established at Singapore. Post evacuated on 14 February 1942, reopened as a Commission on 2 December 1945.
10 Dec 1941	A post is established at Dili under D. Ross. Evacuated in June 1942 and reopens as a Consulate on 1 Jan 1946 (C. Eaton). Closed 31 August 1971. Reopens in June 1999.
1943	Diplomatic Cadet Scheme commences. First intake includes three women and nine men.
2 Jan 1943	Legation at Moscow opens under J. Slater. Raised to Embassy on 16 February 1948.
15 Dec 1943	High Commission at Wellington opens under T.G. D'Alton.
23 Mar 1944	High Commission at New Delhi opens under Sir Ivan Mackay.
1945	At the end of WWII the Department of External Affairs has grown to 106 permanent staff, of which 39 are diplomats serving overseas. The immediate post-war years bring a rapid expansion of posts, with nearly 30 new diplomatic missions opened between 1945 and 1950.

1946-47	Trade Commissions established at Paris, Bombay, London, Ottawa, Washington, Vancouver, Santiago, Johannesburg, Canton, San Francisco and Hong Kong.
Jan 1950	Australia expands its aid projects overseas under the Colombo Plan.
1951	By May 1951, the Department of External Affairs has 7 Embassies, 7 High Commissions, 5 Legations, 4 Consulates-General, one Commission, 2 Consulates, and 4 Missions. There are 80 diplomatic staff overseas and 62 in Canberra. In addition there are 35 non-diplomatic staff overseas (plus 298 locally engaged staff) and 227 officers in Australia. There are 6 female diplomatic officers in Canberra and 6 overseas.
1963	First External Affairs trainee of non-English speaking background is recruited. The Trade Commissioner Trainee Scheme commences.
1964	The Department of External Affairs establishes separate Consular and Administration streams.
1966	By January 1966, the Department of External Affairs has 48 missions abroad, including 25 Embassies and 11 High Commissions. It employs 1,558 officers, 602 of whom were in Australia, 316 were overseas and 640 were 'exempt' staff (locally employed and casuals).
1970	The Department changes its name from the Department of External Affairs to the Department of Foreign Affairs.
1971	The first woman to be appointed Head of Mission, Dame Annabelle Rankin, is appointed High Commissioner to New Zealand.
	1974—The first female career diplomat to be appointed Head of Mission, Ruth Dobson, is appointed Ambassador to Denmark.
	1977—Ros McGovern becomes the first woman in the Department of Foreign Affairs to enter the Senior Executive Service.
1 Nov 1972	The Department of Foreign Affairs takes over responsibility for relations with the United Kingdom from the Prime Minister's Department.
1973	The Australian Development Assistance Agency (ADAA) is established. Commences operations on 1 December 1973 and is confirmed as a statutory authority in December 1974.
	The ADAA is incorporated into the Department of Foreign Affairs in 1976 and renamed the Australian Development Assistance Bureau (ADAB). Becomes an autonomous bureau within the Department in 1984. Name changes to Australian International Development Assistance Bureau (AIDAB) in 1987 and to AusAID in 1995.
1974	The Department of Foreign Affairs is reorganised. The new structure reflects issues rather than just geography.
1975	The Department of Foreign Affairs takes over the passport function from the Department of Labor and Immigration.
1983	Full-time Ambassador for Disarmament is appointed in Geneva.
1987	The Departments of Foreign Affairs and Trade, and Promotion Australia are amalgamated as part of broader machinery of government changes. Some 2,300 Foreign Affairs, 350 Trade and 140 Promotion Australia staff are involved in the merger.
	The Australian Trade Commission (Austrade), placed initially in the Industry, Technology and Commerce portfolio, moves to the Foreign Affairs and Trade portfolio in 1991.
1989	Ambassador for the Environment appointed.
2000	Department of Foreign Affairs and Trade staff number about 1,950; AusAID more than 500. DFAT operates 82 posts around the world.

Further references

Much information about Australia's foreign and trade policy can be accessed through the DFAT website, *http://www.dfat.gov.au*. The Department also produces hard copy publications on many foreign and trade policy issues, which are available from the Department (Tel: +61 (02) 6261 1111) or from Commonwealth Government bookshops. Documents of general interest that can be found on the website include:

—*Department of Foreign Affairs and Trade Annual Report 1999–2000*.

—*Department of Foreign Affairs and Trade Corporate Plan 2000–2002*.

—*Trade Outcomes and Objectives Statement 2000*.

—*Portfolio Budget Statements 2000–2001*.

—*Hints for Australian Travellers*.

—*In the National Interest: White Paper on Australia's Foreign and Trade Policy*.

More detailed information about Australia's bilateral relationships can be found at *http://www.dfat.gov.au/geo/fs*

For specific trade and investment information see *http://www.dfat.gov.au/facts/index* and *http://www.tradewatch.dfat.gov.au*

For publications by the East Asian Analytical Unit see *http://www.dfat.gov.au/eaau*

For a list of DFAT statistical publications see *http://www.dfat.gov.au/publications/statistics*

For consular and passport information see *http://www.dfat.gov.au/travel/index*

For information on Australia's international treaty commitments see *http://www.austlii.edu.au/au/other/dfat*

For information on Australia's human rights policy see *http://www.dfat.gov.au/hr*

For information on Australia's international environmental activities see *http://www.dfat.gov.au/environment*

Related Internet sites

Australian Agency for International Development (AusAID), *http://www.ausaid.gov.au.* AusAID's site contains a range of information, including:

—hot topics, *http://www.ausaid.gov.au/hottopics*

—country information, *http://www.ausaid.gov.au/country*

—publications, *http://www.ausaid.gov.au/publications*. The site also contains the report of the committee of review on the Australian overseas aid program (the Simons Report), at *http://www.ausaid.gov.au/publications/pdf/simons/all.pdf*

Australian Centre for International Agricultural Research, *http://www.aciar.gov.au*

Australian Safeguards and Non-proliferation Office, *http://www.asno.dfat.gov.au*

Australian Trade Commission (Austrade), *http://www.austrade.gov.au*. There are separate home pages geared to Australian users, *http://www.austrade.gov.au/Australian* and international users, *http://www.austrade.gov.au/international*

Business in APEC, *http://www.bizapec.gov.au*

Export Finance and Insurance Corporation (EFIC), *http://www.dfat.gov.au/trade/export_finance_policy*

4 Defence

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Introduction

This chapter profiles the role and activities of Australia's defence organisation, features a short article on the evolution of Australia's strategic defence policy, and presents an overview of Defence personnel numbers and expenditure, including information on defence expenditure over the last century.

Australia's defence in 2001

The ADF's role in East Timor

The end of the twentieth century has seen the Australian Defence Force (ADF) undertake, in East Timor, Australia's largest overseas deployment since Viet Nam some thirty years ago. The ADF first deployed to East Timor in September 1999 to evacuate United Nations personnel from Dili. Soon after, the ADF returned to play the lead role in the five month long International Force East Timor (Interfet) operation. Subsequently, the ADF has been a key part of the United Nations Transitional Administration East Timor (UNTAET) peacekeeping force.

Australia contributed 5,500 troops to the multinational force, with an additional 4,400 from the other 21 contributing nations. Preparing, deploying and supporting those ADF units involved a concerted effort by thousands of others back in Australia. Moreover, the involvement in East Timor was not just a military operation, but a major humanitarian effort involving a myriad United Nations agencies and non-government organisations.

The ADF's role in East Timor is not over, with over 1,600 personnel currently deployed as part of the UNTAET peacekeeping force. Much work remains until East Timor makes the transition from United Nations administration to full independence. Until then, the ADF will continue to work with the other nations in the UNTAET peacekeeping force to provide security and confidence for the people of East Timor.

Defence relationships

Australia's contribution to international activities through the ADF's high level of participation in peacekeeping operations, particularly in East Timor, has served to strengthen Australia's defence relationships. The management of Australia's defence relationships in South East Asia was tested and highlighted during the Interfet deployment. Australia's defence relationship with Indonesia contributed directly to Interfet's safe and successful initial deployment, while those with Thailand, the Philippines, Singapore and Malaysia gave those countries the confidence and capability to operate under Australian command.

Defence relations with European countries and those in other regions were expanded to include increased dialogue and cooperation on regional issues, especially East Timor. Dialogue between senior Australian and Indian defence officials concerning the resumption of defence relations took place in early 2000, and this dialogue continues. The defence relationship with Pakistan remains suspended pending the restoration of democracy in that country. Relations with North Asia have improved steadily. Defence relations are highlighted by strategic dialogue, high-level visits and an increase in Service to Service contact. Those with the Middle East continued to be constructive, with training and education programs being undertaken with Gulf States.

Defence relations with the United States and New Zealand were pursued through a wide range of activities and exchanges. Australia's network of bilateral and multilateral defence relationships throughout the South West Pacific region continued to influence the regional strategic environment in which ADF operations may be required, and to provide opportunities for enhancing ADF capabilities through a range of international activities. The Defence Force remains well positioned to support Bougainville initiatives, and to provide timely support to the Government on the crises in Fiji and the Solomon Islands.

Evolution of Australia's strategic defence policy

Australia's leading role in East Timor is testimony to how far Australia's defence has come over the past century. For the first time in Australia's military history, at the behest of the United Nations (UN Security Resolution 1264 (1999)) Australia took the responsibility to put together a UN-mandated multinational force and to lead that force. Such a leading role would have been unthinkable in the early part of the last century, when Australian governments of all political persuasions took a back seat on defence and security matters. By and large, they took the view that Australia was an indefensible continent—at least with the resources at Australia's disposal. Australia needed and sought the protection of more powerful friends prepared to defend it. To secure this protection, Australian troops were committed all around the world, initially in support of British and, later, American operations. At the time, decisions to fight for broader causes elsewhere were rational—based on assessments by governments of the day that this was in Australia's national interest. Certainly, Australia's unique strategic circumstances, together with the relatively small size and the then limited capabilities of our armed forces, restricted the range of choices possible on defence and security matters.

The post-Viet Nam era heralded a significant shift in Australian defence thinking. The 1976 Defence White Paper was the first to set out a self-reliant defence policy for Australia, and the 1987 Defence White Paper added substance to this concept of self-reliance. Defence policy no longer rested primarily on attracting the protective attention of powerful friends. When it came to defending its territory, Australia would, for most credible contingencies, not rely on allied combat forces—although we would welcome their assistance and rely on their logistical, intelligence and diplomatic support. Concentrating on the defence of Australia was to be neither at the expense of, nor to the exclusion of, other national security interests with our allies and regional friends.

More recently, particularly since the *Strategic Review 1997—Australia's Strategic Policy*, Defence policy has been based on a more outward-looking focus than reflected in the earlier White Papers, recognising that Australia's security and future prosperity are increasingly dependent on that of the wider region. Our involvement in East Timor reflects this approach.

Now, at the start of the twenty-first century, the development of Australian strategic policy is at a crossroads. The Government and people of Australia expect the Australian Defence Force to respond to a wide range of tasks, from supporting the community in times of need, such as after natural disasters, through peacekeeping to peace enforcement. However, increasing costs and budgetary pressures have led the Australian Government to the realisation that it must make a number of critical decisions about the future role and shape of the Australian Defence Force. The rapid change in Australia's strategic environment, along with enormous social, economic and technological changes nationally and internationally, has also brought to the forefront questions about Australia's future security, in the wider sense, and where military capability fits into that future.

The Government is addressing these questions by conducting a fundamental review of defence policy to take account of these changes. In June 2000 the Government launched the *Defence Review 2000 Public Discussion Paper*, a precursor to the Defence White Paper due to be released in late 2000. A major aspect of the review includes a public consultation program to listen to the views of the Australian community. The intention is to extend the debate on the associated fundamental national policy issues beyond the usual select handful of defence specialists. The feedback from the public consultation process will, in turn, be reported to the National Security Committee of Cabinet so that it can be taken into account during preparation of the White Paper.

The White Paper will be the first major review of defence policy since the 1986 Dibb review.

A well-articulated strategy for how to go forward is fundamental if Australia is to have the type of Australian Defence Force it needs in order to

meet all future challenges that lie ahead in this century. Importantly, the Government of the day must have available to it appropriate military options to secure Australia's strategic objectives. This White Paper will provide the basis for force structuring and preparedness and for resourcing the defence establishment. It is intended to deliver a strategically appropriate and financially sensible policy direction that will shape defence force structure and activities well into the future.

Defence personnel

Table 4.1 provides a summary of personnel estimates for 1999–2000 and 2000–01. The planned permanent ADF strength for 2000–01 is 50,929, almost the same as the estimated actual for 1999–2000 of 51,018. The Government's undertaking to increase the number of Service personnel for the ADF's involvement in East Timor is expected to result in an increase of 2,373 ADF personnel in 2000–01. However, continuing problems for the Navy in achieving its planned staffing levels, and personnel savings measures in non-combat areas, largely offset this increase.

Civilian personnel numbers are expected to decrease from an estimated actual of 16,323 in 1999–2000 to 15,755 in 2000–01, a reduction of 568. This reflects the impact of the market-testing of support functions and the transfer of Military Compensation Rehabilitation Scheme staff to the Department of Veterans' Affairs, which will perform this function in future. This decrease is also a result of Defence Reform Program reductions, which are partly offset by the greater use of civilians to perform some functions and continued recruitment of base-level and graduate entrants.

In 1999–2000 Defence recruited 74% of the full-time target for the Australian Defence Force, and 31% of the part-time target. Outcomes for the three Services were mixed. Recruiting for the ADF remains difficult due to continuing shrinkage of the primary target group of 17–24 year olds, changes in career perceptions and lifestyle expectations, increased competition in the market place for quality applicants and the current relatively high rate of job availability in the community.

ADF combat personnel

The proportion of ADF personnel identified as combat and combat-related was 63% at June 2000 compared to 42% in 1996 (graph 4.2). The increase has resulted from a combination of factors. While experiencing an overall reduction in personnel, the Navy has maintained the personnel numbers in the combat force to the detriment of the non-combat/enabling force, leading to shortages of staff to fill shore billets. As a result of Government decisions to enhance the sustainability of the force and the East Timor commitment, the Army has increased its combat force by over 2,500 of the additional 3,000 personnel numbers allocated. Similarly, the Air Force has increased its combat force by 500 of the additional 555 personnel numbers allocated.

Table 4.3 sets out the numbers of permanent personnel in the Defence organisation from 1959–60 to 1999–2000, and estimated for 2000–01.

Defence expenditure

Summary of the 2000–01 Budget

The total Defence departmental appropriation was $12.2b for 2000–01, 1.8% of Gross Domestic Product (GDP). Total Defence funding from all sources for 2001–01 is $19.4b, including a capital use charge of $4.6b and the cost of superannuation for former military personnel of $1.7b. Including East Timor costs, Defence departmental appropriations are $304m higher than estimated actual expenditure in 1999–2000.

Defence has been provided with increased funding in the 2000–01 Budget and the 2001–04 Forward Estimates to address a number of specific funding priorities, including increasing the capabilities of the Collins class submarine, improving the capabilities of the Reserves, maintaining the ADF's capability to sustain a highly ready Army and meeting its Olympic Games commitments. At the same time, the Government has maintained base-level Defence funding in real terms in the 2000–01 Budget and 2001–04 Forward Estimates.

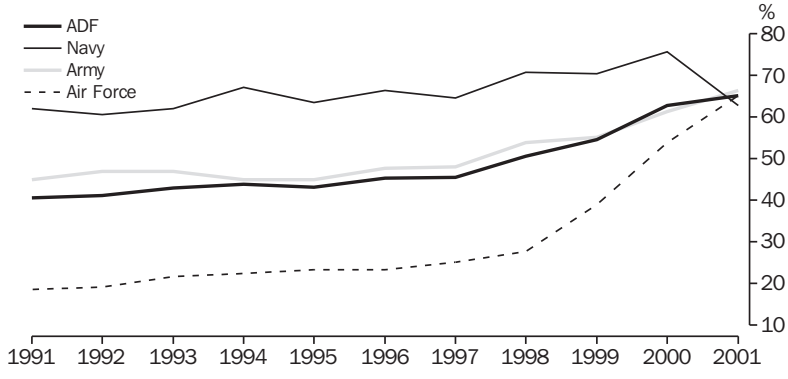
4.1 DEFENCE PERSONNEL ESTIMATES—1999–2000 and 2000–01

Staffing category	1999–00 Estimated actual(a) no.	2000–01 Budget estimate no.	Change %
Permanent forces			
Navy	12 901	12 717	–1.4
Army	24 072	24 677	2.5
Air Force	14 045	13 535	–3.6
Total permanent forces	*51 018*	*50 929*	*–0.2*
Reserves			
Navy	1 803	1 803	—
Army	23 455	22 872	–2.5
Air Force	2 042	2 031	–0.5
Total reserves	*27 300*	*26 706*	*–2.2*
Civilian	16 265	15 725	–3.3
Trust Account staff	58	30	–48.3
Total Civilian	*16 323*	*15 755*	*–3.5*
Total staffing	**94 641**	**93 390**	**–1.3**

(a) Average strength over the year.

Source: Department of Defence.

4.2 PERCENTAGE OF ADF PERSONNEL IN COMBAT ROLES



Source: Department of Defence.

The budget includes $3.3b of expenditure on capital equipment and facilities. Until the release of the White Paper, the number of projects that are to be approved and brought to contract in 2000–01 has been restricted. However, the amount planned to be spent on new major capital equipment in 2000–01 remains relatively constant due to high levels of approval and commitment carried forward from previous years. New projects approved by the Government in the 2000–01 budget include:

- ground infrastructure for military satellite communications;
- aircraft self-protection—collaboration with the United States; and
- Nulka missile decoy system for surface combatants—support arrangements.

4.3 DEFENCE PERMANENT PERSONNEL, Service and Civilian—1959–60 to 2000–01

Year	Navy	Army	Air Force	Army National Service	Civilian
	no.	no.	no.	no.	no.
1959–60	10 529	20 829	15 743	. .	n.a.
1960–61	10 648	19 878	15 592	. .	n.a.
1961–62	11 026	20 985	15 815	. .	n.a.
1962–63	11 597	21 944	15 840	. .	n.a.
1963–64	12 485	22 681	16 564	. .	n.a.
1964–65	13 428	23 534	17 720	1 780	25 512
1965–66	14 633	24 583	19 358	8 119	27 564
1966–67	15 764	25 721	20 130	15 743	29 844
1967–68	16 924	27 152	21 564	15 792	31 568
1968–69	16 758	28 044	22 712	16 007	32 632
1969–70	17 089	28 305	22 642	16 208	34 111
1970–71	16 997	28 107	22 539	15 662	35 167
1971–72	16 890	29 326	22 720	11 947	35 842
1972–73	17 215	31 151	22 717	2 839	37 000
1973–74	16 141	30 197	21 119	38	33 862
1974–75	16 094	31 514	21 546	. .	32 811
1975–76	15 993	31 430	21 351	. .	31 847
1976–77	16 390	31 988	21 703	. .	31 551
1977–78	16 298	31 833	21 689	. .	31 377
1978–79	16 582	31 813	21 803	. .	30 613
1979–80	16 961	32 321	22 249	. .	30 488
1980–81	17 298	32 898	22 322	. .	30 366
1981–82	17 598	32 876	22 711	. .	20 374
1982–83	17 198	33 072	22 512	. .	24 074
1983–84	16 692	32 278	22 672	. .	24 606
1984–85	16 059	32 460	22 863	. .	(a)40 345
1985–86	15 538	31 834	22 841	. .	39 937
1986–87	15 803	32 311	22 558	. .	38 010
1987–88	15 647	31 971	22 560	. .	35 818
1988–89	15 641	31 896	22 468	. .	32 502
1989–90	15 652	30 894	22 279	. .	24 400
1990–91	15 786	30 789	22 055	. .	24 412
1991–92	15 549	30 733	21 893	. .	23 750
1992–93	15 294	30 064	20 780	. .	22 558
1993–94	14 776	27 802	18 642	. .	20 724
1994–95	14 702	26 483	17 456	. .	20 188
1995–96	14 473	26 746	17 240	. .	19 830
1996–97	14 377	25 682	16 705	. .	19 042
1997–98	14 206	25 196	16 172	. .	17 664
1998–99	13 661	24 169	15 065	. .	16 641
1999–00 (est)	12 901	24 072	14 045	. .	16 323
2000–01 (est)	12 717	24 677	13 535	. .	15 755

(a) The large increase reflects the transfer of 14,982 personnel following integration of the former Department of Defence Support into the Department of Defence.

Source: Department of Defence.

Defence expenditure over the century

Table 4.4 presents a time series, over the whole of the last century, of the size of defence expenditure (in current prices), and of its percentage of GDP and of Commonwealth sector outlays.

4.4 DEFENCE EXPENDITURE, Size, Percentage of GDP and of Commonwealth Sector Outlays—1901–02 to 2000–01

Year	Defence expenditure(a) $m	GDP %	Share of C'wlth Outlays %	Year	Defence expenditure(a) $m	GDP %	Share of C'wlth Outlays %
1901–02	1.9	0.4	8.4	1951–52	318.9	4.2	14.9
1902–03	1.5	0.4	6.2	1952–53	430.6	5.0	19.9
1903–04	1.7	0.4	7.3	1953–54	355.5	3.8	17.2
1904–05	1.9	0.4	8.3	1954–55	355.1	3.6	15.7
1905–06	1.9	0.4	8.0	1955–56	381.4	3.5	15.8
1906–07	2.1	0.4	8.2	1956–57	377.0	3.2	13.8
1907–08	2.7	0.5	9.0	1957–58	370.2	3.1	13.0
1908–09	2.1	0.4	7.3	1958–59	378.6	2.9	12.5
1909–10	3.1	0.5	9.7	1959–60	387.2	2.7	12.8
1910–11	6.0	0.9	14.7	1960–61	396.3	2.6	11.5
1911–12	8.2	1.1	19.3	1961–62	406.2	2.6	10.7
1912–13	8.7	1.1	18.8	1962–63	428.1	2.5	10.7
1913–14	9.5	1.1	19.9	1963–64	520.9	2.8	11.9
1914–15	8.9	4.6	58.3	1964–65	583.0	2.4	12.9
1915–16	9.5	9.5	58.1	1965–66	711.0	2.5	14.1
1916–17	9.0	12.5	62.1	1966–67	912.0	2.4	16.2
1917–18	7.4	12.4	61.8	1967–68	1 065.0	2.5	17.1
1918–19	7.1	11.6	57.1	1968–69	1 100.0	2.5	16.6
1919–20	7.1	7.5	48.2	1969–70	1 044.0	2.4	14.2
1920–21	11.3	4.3	33.2	1970–71	1 091.0	2.4	13.5
1921–22	12.5	2.1	18.5	1971–72	1 157.0	2.5	12.8
1922–23	8.5	0.8	8.6	1972–73	1 225.0	2.6	12.1
1923–24	13.5	1.0	9.4	1973–74	1 268.0	2.4	10.4
1924–25	10.5	0.6	6.0	1974–75	1 558.0	2.4	8.7
1925–26	16.3	1.0	7.5	1975–76	1 759.0	2.3	8.0
1926–27	11.4	0.7	5.2	1976–77	2 071.0	2.4	8.5
1927–28	17.1	1.0	6.7	1977–78	2 248.0	2.4	8.4
1928–29	10.5	0.6	4.2	1978–79	2 456.0	2.3	8.4
1929–30	9.5	0.6	2.9	1979–80	2 839.0	2.3	8.9
1930–31	8.0	0.6	2.4	1980–81	3 347.0	2.4	9.2
1931–32	6.9	0.6	2.9	1981–82	3 886.0	2.5	9.4
1932–33	6.9	0.5	2.9	1982–83	4 501.0	2.6	9.1
1933–34	8.2	0.6	2.9	1983–84	5 056.0	2.6	8.8
1934–35	11.4	0.8	4.2	1984–85	5 657.0	2.6	8.7
1935–36	14.4	0.9	6.1	1985–86	6 333.0	2.6	8.9
1936–37	16.0	0.9	6.9	1986–87	6 823.0	2.6	9.0
1937–38	19.6	1.1	7.9	1987–88	6 967.0	2.3	8.8
1938–39	28.8	1.5	11.5	1988–89	7 295.0	2.1	8.8
1939–40	108.7	5.3	33.0	1989–90	7 913.0	2.1	9.0
1940–41	319.0	14.7	61.7	1990–91	8 480.0	2.2	8.8
1941–42	596.8	23.4	70.6	1991–92	8 731.0	2.3	8.5
1942–43	998.8	34.0	71.6	1992–93	9 703.0	2.4	8.9
1943–44	886.1	29.7	61.6	1993–94	9 746.0	2.3	8.5
1944–45	704.7	24.2	54.8	1994–95	9 731.0	2.1	8.0
1945–46	644.3	21.4	58.5	1995–96	10 011.0	2.0	7.9
1946–47	243.2	7.5	25.3	1996–97	9 999.0	1.9	7.8
1947–48	143.2	3.6	15.0	1997–98	10 415.0	1.9	8.6
1948–49	122.1	2.7	10.9	1998–99	11 010.0	1.9	8.7
1949–50	108.5	2.0	8.7	1999–00	11 908.0	1.9	n.a.
1950–51	182.0	2.6	10.2	2000–01	12 211.0	1.8	n.a.

(a) In current prices.

Source: Department of Defence.

4.5 DEFENCE OUTLAYS AS A PROPORTION OF GDP, Selected Countries—1990 to 2000

	Australia	USA	UK	Singapore	Indonesia	NZ
Year	%	%	%	%	%	%
1990	2.1	5.1	3.9	5.1	1.5	n.a.
1991	2.2	5.0	4.0	4.9	1.5	1.6
1992	2.3	4.6	3.8	5.1	1.4	1.4
1993	2.4	4.3	3.6	4.6	1.3	1.2
1994	2.3	3.8	3.4	4.3	1.3	1.1
1995	2.1	3.7	3.1	4.6	1.3	1.2
1996	2.0	3.5	3.0	4.3	1.3	1.1
1997	1.9	3.3	2.9	4.5	1.4	1.1
1998	1.9	3.1	2.8	4.9	1.0	1.0
1999	1.9	2.9	2.7	5.1	1.1	1.1
2000 (est)	1.8	3.2	2.5	4.5	1.1	1.0

Source: Department of Defence.

Defence expenditure—international comparisons

Table 4.5 shows defence outlays as a proportion of GDP in trend terms over the last decade, for a selection of countries.

Based on current estimates and projections of defence expenditure by a range of countries (table 4.6 and graph 4.7), Australia is not among the big spenders on defence in terms of percentage of GDP. In our region, only the Philippines, Indonesia and New Zealand spend a smaller proportion of their GDP on defence than Australia.

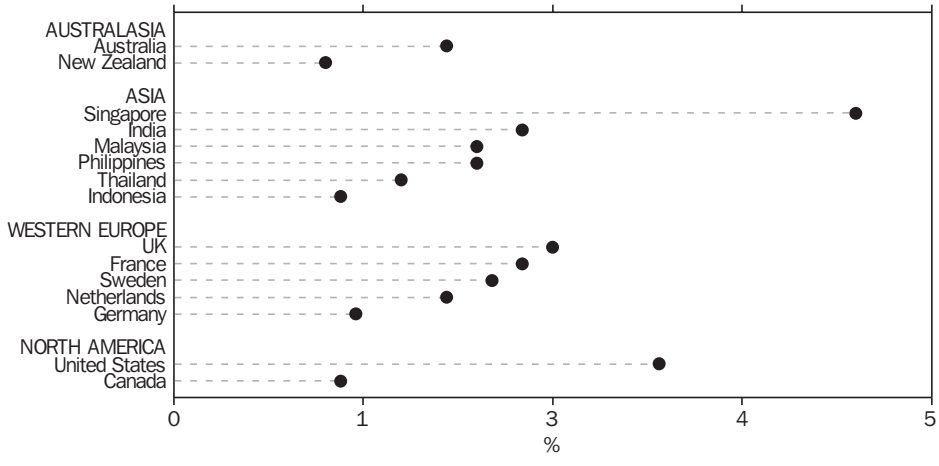
4.6 DEFENCE OUTLAYS AS A PROPORTION OF GDP, Selected Countries(a)

Country	%
Singapore(d)	4.5
United States(d)	3.2
United Kingdom(c)	2.5
France(b)	2.3
India(d)	2.3
Sweden(b)	2.1
Malaysia(d)	2.0
Philippines(d)	2.0
Australia(d)	**1.8**
Netherlands(b)	1.8
Thailand(c)	1.5
Germany(b)	1.2
Canada(c)	1.1
Indonesia(d)	1.1
New Zealand(c)	1.0

(a) Most recent year available. (b) 1998. (c) 1999. (d) 2000.

Source: Department of Defence.

4.7 DEFENCE OUTLAYS AS A PROPORTION OF GDP, Selected Countries(a) by Country Group



(a) Most recent year available.

Source: Department of Defence.

4.8 DEFENCE OUTLAYS, By Category—1988–89 to 2000–01

Year	Personnel %	Operating outlays %	Capital outlays %
1988–89	43.2	29.1	27.7
1989–90	41.5	30.6	27.9
1990–91	40.8	31.8	27.4
1991–92	41.5	31.9	26.5
1992–93	34.3	37.8	28.0
1993–94	38.0	33.6	28.4
1994–95	36.9	33.9	29.2
1995–96	37.8	34.4	27.8
1996–97	38.8	34.1	27.1
1997–98	38.0	34.9	27.1
1998–99	35.0	36.0	29.0
1999–00	40.7	35.1	24.1
2000–01	42.0	31.8	26.2

Source: Department of Defence.

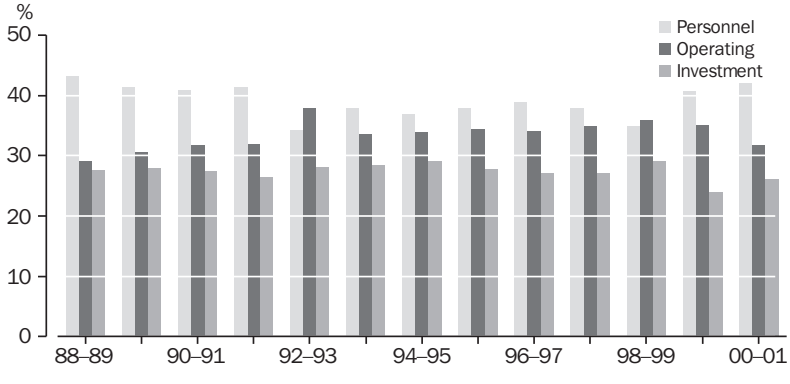
Defence expenditure—major categories

Table 4.8 and graph 4.9 show defence outlays by major category (personnel, operating outlays and capital outlays) as a proportion of total defence outlays between 1988–89 and 1999–2000, and estimated for 2000–01.

Capital equipment outlays—in Australia and overseas

Table 4.10 shows the expenditures (in current prices) on major capital equipment in Australia and overseas for the years 1986–87 to 1999–2000 and budgeted for 2000–01. Graph 4.11 shows the proportions of expenditure in Australia and overseas over these years.

4.9 DEFENCE OUTLAYS, By Category—1988–89 to 2000–01



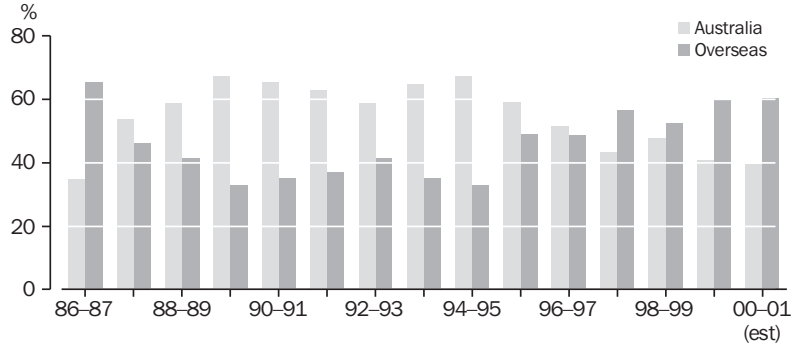
Source: Department of Defence.

4.10 MAJOR CAPITAL EQUIPMENT EXPENDITURE, Australia and Overseas—1986–87 to 2000–01

Year	Australia $m	Overseas $m	Total $m	Australia %
1986–87	712	1 343	2 055	34.6
1987–88	933	800	1 733	53.8
1988–89	1 045	734	1 779	58.7
1989–90	1 282	626	1 908	67.2
1990–91	1 400	747	2 147	65.2
1991–92	1 400	824	2 224	62.9
1992–93	1 387	975	2 362	58.7
1993–94	1 528	826	2 354	64.9
1994–95	1 603	785	2 388	67.1
1995–96	1 264	877	2 141	59.0
1996–97	1 118	1 055	2 173	51.4
1997–98	993	1 300	2 293	43.3
1998–99	1 375	1 521	2 896	47.5
1999–00 (est)	962	1 408	2 370	40.6
2000–00 (est)	1 039	1 597	2 636	39.4

Source: Department of Defence.

4.11 MAJOR CAPITAL EQUIPMENT EXPENDITURE, Australia and Overseas—1986–87 to 2000–01



Source: Department of Defence.

Bibliography

Department of Defence:

—*Annual Report 1999–2000*. A report from the Secretary and the Chief of the Defence Force to the Minister of Defence on program performance and achievement of program objectives in 1999–2000.

—*Defence Our Priorities*. A document outlining Defence's mission, vision and goals.

—*Portfolio Budget Statements 2000–01*. A Budget-related paper that provides details of estimated outlays for Defence and forecasts performance in meeting specified outcomes.

Internet site

Department of Defence, *http://www.defence.gov.au*

—*Annual Report 1999–2000* (see above), *http://www.defence.gov,au/budget/99-00dar.htm*

—*Defence Service Charter*. A document explaining Defence's service standards is at *http://www.defence.gov.au/charters/welcome.html*

—*Portfolio Budget Statements 2000–01* (see above), *http://www.defence.gov.au/budget/00-01pbs.htm*

—*Strategic Policy 97*. A document establishing the future direction for Defence planning in the 21st century is at *http://www.defence.gov.au/minister/sr97/welcome.html*

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Introduction

Population statistics are measures of the size, growth, composition and distribution of the population as well as the components that shape population change. Although population statistics are not in themselves indicators of wellbeing, they underpin the discussion of a wide range of issues relating to the population, including immigration, multiculturalism, ageing and population sustainability.

The changing size and distribution of Australia's population have implications for service provision and delivery in areas such as health, education, housing and the labour market. Population trends underlie many social changes and assist in the planning of all areas of social and economic policy.

The principal source of data on the Australian population is the Census of Population and Housing, which has been conducted at five-yearly intervals since 1961. The most recent census was in 1996, and some results from it are included in this chapter.

See also the Centenary Article *A century of population change in Australia* following this chapter.

The census, the Constitution and democracy

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From the beginnings of white settlement in 1788, the Australian colonies collected statistics about the size and character of their populations. Better knowledge about populations, it was thought, would make for more effective government. At first this did not mean more democratic government. The original 'census' was simply a round-up or 'muster' of the convict population. The main purpose of these musters was to estimate the quantities of food and other supplies that were required to support the new colony. Musters tended to concentrate only on parts of the total population—convicts, free settlers or landowners—and only within certain areas of the colony.

Then the idea of collecting useful, broader information grew. In 1828, the first full census of New South Wales was held. From the mid-19th century on, most Australian colonies had regular censuses. Around this time, democratic rights to vote and stand for parliament began to be extended. As the population of citizens expanded and demands upon governments grew, it became increasingly important to keep track of numbers of people in electorates and to have a record of social and economic trends.

The first inter-colonial statistical conference took place in 1861. Twenty years later, the first simultaneous census was held across Australia. By the end of the 19th century, the census was associated with ways of calculating representation in the Parliament, in addition to assisting government decision making about the allocation of resources. The Australian colonies were among the most statistically advanced in the world, and were consulted by American and European authorities. History tells us that Australians were relaxed about participating in the census. Levels of trust and confidence in the uses of statistics were high.

In 1891 the first draft Commonwealth Constitution was written at a Federal Convention in Sydney. It was assumed from the

start that census-collecting would be one of the functions of the new nation. This assumption was never challenged, either in 1891 or at the second Federal Convention, in 1897–98. In 1901 the new Commonwealth acquired the constitutional power to make laws concerning the 'census and statistics', through section 51 (xi) of the Constitution.

The only debate in the Conventions over the census concerned whether to include tribal Aborigines in a calculation of the population of the Commonwealth. The debate concluded with section 127 of the Constitution which said that, 'in reckoning' the numbers of the people of the Commonwealth or of a State, the 'Aboriginal natives' should not be counted. This did not mean that no records of the Aboriginal people were kept. The section was introduced principally so that the numbers of Federal politicians per State, as well as per capita Commonwealth grants, would be based on the total population of Europeans and assimilated part-Aboriginal people. This section was removed from the Constitution following a referendum in 1967.

The census and statistics found their way into other parts of the Constitution. Because the populations of the States are very uneven, it is important to have an equitable way of determining the number of Members in the House of Representatives to which each State is entitled. Section 24 of the Constitution sets out the means of calculating an individual State's 'quota', using 'the latest statistics of the Commonwealth'. Using statistics in this way, and making sure that only the most up-to-date information is employed, underpins the relationship between statistics and the processes of representative democracy. It affirms the principle that representation should be fair and personal. It assists governments in responding to the needs of electorates.

Section 24 is one of the most important sections in the Constitution. It requires the House of Representatives to be 'directly chosen' by the people. These words, the High Court has found, provide a guarantee of representative democracy and free political communication throughout Australia. This guarantee is assisted by the use of statistical information in ensuring that representation is apportioned fairly.

For the first decade after Federation, the States continued to collect census statistics individually. The first Commonwealth collection took place in 1911, following the establishment in 1905 of the Commonwealth Bureau of Census and Statistics and the position of Commonwealth Statistician. This work received international attention. Australia was an early pioneer of democracy. It was also a pioneer in population statistics. Their link is an important part of Australia's history and stands as one of the building-blocks of our constitutional system.

Population size and growth

This section examines the size, growth, distribution and age structure of the Australian population. There is an emphasis on the change over time, especially changes in the growth rate of the population.

As shown in table 5.1, Australia's resident population at June 1999 was just under 19 million, an increase of 1.3% over the previous year. The slightly higher growth rate in 1998–99 was mainly due to a resurgence in net overseas migration. The preliminary estimate of net overseas migration was 117,300 persons, 36% higher than in the previous year (86,400).

The growth rate in Australia for the 12 months to June 1999 was the same as the overall world growth rate of 1.3%. The growth rates for Japan (0.2%), Germany (0.3%) the United Kingdom (0.3%) and New Zealand (0.5%) were well below that of Australia, while Singapore (3.5%), Hong Kong (2.6%) and Papua New Guinea (2.5%) experienced growth rates above that of Australia. These growth rates are shown in table 5.2.

5.1 ESTIMATED RESIDENT POPULATION AND COMPONENTS OF POPULATION CHANGE(a)—1994–99

							Population		
Year ended 30 June	Births(a)	Deaths(a)	Natural increase(a)	Net permanent and long-term movement	Category jumping(b)	Net overseas migration(c)	At end of period	Increase	Increase
	'000	'000	'000	'000	'000	'000	'000	'000	%
1994	258.3	123.5	134.8	67.4	–20.8	46.5	17 854.7	187.6	1.06
1995	258.2	126.2	132.0	93.0	–12.9	80.1	18 071.8	217.0	1.22
1996	250.4	126.4	124.0	109.7	–5.5	104.1	18 310.7	238.9	1.32
1997	253.7	127.3	126.4	94.4	–7.3	87.1	18 524.2	213.4	1.17
1998	249.1	129.3	119.9	79.2	7.2	86.4	18 730.4	206.2	1.11
1999	247.7	128.6	119.1	96.5	20.9	117.3	18 966.8	236.4	1.26

(a) Numbers of births and deaths are on a year of occurrence basis for final data and will therefore differ from the Births and Deaths sections of this chapter. Births and deaths data are on a year of registration basis for data relating to the latest year, which are preliminary. (b) An adjustment for the effect of persons whose duration of stay (category) differs from their stated intentions, entailing a reclassification from short-term to permanent/long-term or vice versa. (c) Sum of the net permanent and long-term movement plus category jumping.

Source: Australian Demographic Statistics (3101.0).

5.2 POPULATION SIZE AND RATE OF GROWTH FOR SELECTED COUNTRIES

	Population as at June		
	1998	1999	Rate of growth
Country	million	million	%
Australia	18.7	19.0	1.3
China	1 239.1	1 250.5	0.9
Germany	82.3	82.6	0.3
Hong Kong (SAR of China)	6.8	7.0	2.6
India	981.7	997.9	1.7
Indonesia	217.4	221.1	1.7
Japan	126.1	126.3	0.2
Korea	46.6	47.0	1.0
New Zealand	3.8	3.8	0.5
Papua New Guinea	4.7	4.8	2.5
Singapore	3.9	4.0	3.5
Taiwan	21.8	22.0	0.8
United Kingdom	59.2	59.4	0.3
United States of America	270.6	273.1	0.9
World	**5 924.6**	**6 002.5**	**1.3**

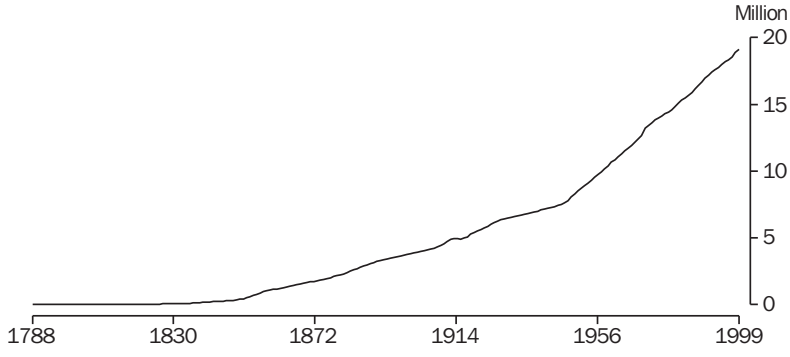
Source: Australian Demographic Statistics (3101.0); Statistics New Zealand, National Population Estimates; US Bureau of the Census, International Data Base.

Population size

Australia's population of 19 million at August 1999 was around 2 million greater than in 1989 and over 15 million more than the 1901 population of 3.8 million. Graph 5.3 shows the growth in Australia's population since 1788. The main component of Australia's population growth has been natural increase (the difference between births and deaths) which, since the beginning of the twentieth century, has contributed about two-thirds of the total growth. Net overseas migration has also contributed to natural increase through the Australian-born children of migrants. Components of population growth are discussed in more detail in the next section.

Table 5.4 shows that the growth in population has not occurred evenly across the States and Territories. At Federation, South Australia had nearly twice the population of Western Australia, which in turn had only marginally more people than Tasmania. However in 1982 Western Australia surpassed South Australia as the fourth most populous State. In 1999 Western Australia had 4.0 times as many people as Tasmania and 1.2 times as many people as South Australia.

5.3 POPULATION OF AUSTRALIA



Source: Official Year Book of the Commonwealth of Australia 1901–1910; Australian Demographic Trends (3102.0); Australian Demographic Statistics (3101.0).

5.4 POPULATION, Australia's States and Territories—1901 to 1999

	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	**Aust.**
As at 30 June	'000	'000	'000	'000	'000	'000	'000	'000	**'000**
1901	1 361.74	1 203.00	502.28	356.07	188.57	171.7	4.77	. .	**3 788.12**
1909	1596.70	1 259.46	572.18	387.79	263.52	189.24	3.54	. .	**4 272.44**
1919	1 996.36	1 473.9	723.17	468.49	319.64	204.43	4.77	2.36	**5193.10**
1929	2 502.63	1 768.58	899.79	572.37	421.06	216.50	4.46	8.49	**6 393.88**
1939	2 748.39	1 878.48	1 018.01	596.56	470.04	237.42	6.28	12.57	**6 967.75**
1949	3 092.62	2 142.99	1 159.12	679.31	532.19	267.06	13.39	21.39	**7 908.07**
1959	3 759.83	2 785.91	1 468.24	920.90	712.07	339.38	24.09	46.07	**10 056.48**
1969	4 441.19	3 385.04	1 763.09	1 139.33	954.85	384.89	72.96	121.66	**12 263.01**
1979	5 111.13	3 886.41	2 214.77	1 301.11	1 246.61	420.76	114.15	220.80	**14 515.73**
1989	5 776.28	4 320.16	2 827.64	1 419.03	1 578.43	455.26	161.18	276.43	**16 814.42**
1999	6 411.68	4 712.17	3 512.36	1 493.07	1 861.02	470.26	192.88	310.17	**18 966.79**

Source: Australian Demographic Statistics (3101.0); Australian Demographic Trends (3102.0).

Population growth

Population growth results from natural increase and net overseas migration (net permanent and long-term arrivals and departures plus an adjustment for category jumping).

Australia's population grew from 3.8 million at the turn of the century to 19 million in 1999. The second half of the century has seen higher rates of growth than the first due to strong natural increase, with the post World War II baby boom and falling death rates, as well as increased net overseas migration. Natural increase has been the main source of the growth since the turn of the century, contributing two-thirds of the total increase between 1901 and 1999.

Net overseas migration, while a significant source of growth, is much more volatile, fluctuating under the influence of government policy as well as political, economic and social conditions in Australia and the rest of the world.

The yearly growth rates due to natural increase and net overseas migration from 1901 to 1999 are shown in graph 5.6.

In 1901 the average annual rate of natural increase was 14.9 per 1,000 population. It varied considerably over the next 30 years and by the mid-1930s the rate was 7.1 per 1,000. In the post war years the baby boom, and the immigration of many young people who then had children in Australia, increased Australia's birth rate and the rate of natural increase. Natural increase was over 13 per 1,000 population every year from 1946 to 1962.

Million milestones

Australia's population was estimated to have reached 19 million during August 1999—five times the population of 1901 (3.8 million). From European settlement in 1788 it took 70 years for the population of Australia to reach one million. An additonal million people were added by 1877. Subsequent millions were added in progressively shorter time intervals, with the six million mark reached in 1925. The Great Depression and WWII slowed the population growth to the seventh and eighth million as fertility and migration declined. Following WWII, the baby boom and post-war migration program increased population growth. Since 1949, when the population reached 8 million, each successive million has been added in around 4 to 5 years. The seventeenth million reached in 1990 was the fastest million added, being attained in just 3 years and nine months.

In mid 2004 the population is projected to reach the 20 million mark—4 years and nine months after the 19 million milestone in 1999. The interval between following millions is projected to increase in the 21st century as population growth slows from the ageing population and sustained lower fertility.

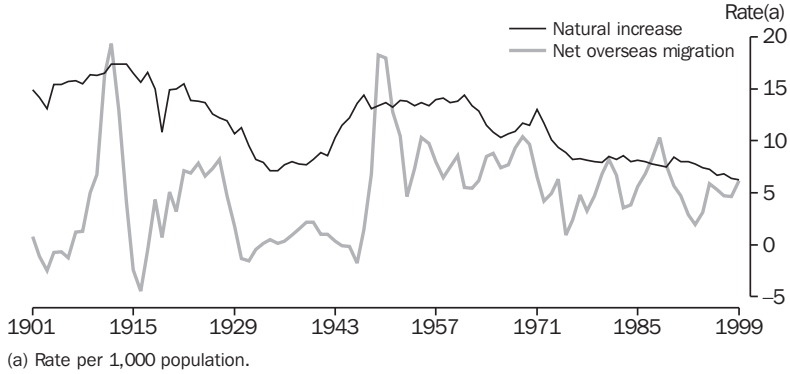
5.5 AUSTRALIAN POPULATION GROWTH—Time Between Successive Millions(a)(b)

Year	Millions	Years/months from previous million
1858	1	70/0
1877	2	19/0
1889	3	12/0
1905	4	16/0
1918	5	13/0
1925	6	7/0
1939	7	14/0
1949	8	10/11
1954	9	4/9
1959	10	4/7
1963	11	4/7
1968	12	4/8
1972	13	4/9
1976	14	5/0
1981	15	5/7
1986	16	4/8
1990	17	3/9
1995	18	5/0
1999	19	4/5
2004	20	4/9
2009	21	5/5
2015	22	5/10
2021	23	6/4
2029	24	7/3
2040	25	11/8

(a) Aboriginal people were not included in population estimates prior to 1961. (b) Years after 1999 are based on Population Projections, series II.

Source: Official Year Book of the Commonwealth of Australia 1901–1910; Australian Demographic Trends (3102.0); Australian Demographic Statistics (3101.0); Population projections 1999–2101 (3222.0).

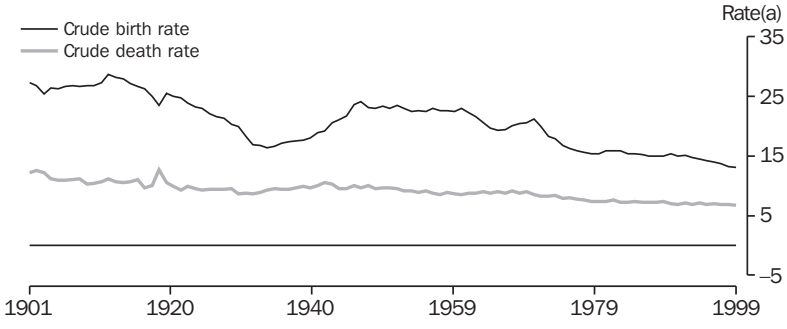
5.6 COMPONENTS OF POPULATION GROWTH



(a) Rate per 1,000 population.

Source: Australian Demographic Statistics (3101.0); Australian Demographic Trends (3102.0).

5.7 COMPONENTS OF NATURAL INCREASE



(a) Rate per 1,000 population.

Source: Australian Demographic Statistics (3101.0); Australian Demographic Trends (3102.0).

Since 1962, falling fertility has led to a fall in the rate of natural increase. In 1971 the rate of natural increase was 13 per 1,000 population; a decade later in 1981 it was 8.5. In 1996 the rate of natural increase fell below 7 for the first time, with the downward trend continuing in the late 1990s. ABS population projections indicate that continued low fertility, combined with the increase in deaths from an ageing population, will result in natural increase falling below zero sometime in the mid 2030s.

Since 1901, the crude death rate has fallen from about 12.2 deaths per 1,000 population to 6.8 in 1999. Crude birth and death rates from 1901 to 1999 are shown in graph 5.7.

Aboriginal and Torres Strait Islander population

There are no accurate estimates of the population of Australia before European settlement. Many estimates were based on post-1788 observations of a population already reduced by introduced diseases and other factors. In 1930 the anthropologist Radcliffe-Brown postulated a minimum figure of 300,000. In 1980 L.R. Smith estimated the absolute minimum pre-1788 population at 315,000. Other estimates have put the figure at over 1 million, while recent archaeological finds suggest that a population of 750,000 could have been sustained.

Whatever the size of the Indigenous population before European settlement, it declined dramatically under the impact of new diseases, repressive and often brutal treatment, dispossession, and social and cultural disruption and disintegration (*Year Book Australia 1994*). The decline of the Indigenous population continued well into the twentieth century.

In the last 20 years, changing social attitudes, political developments, improved statistical coverage, and a broader definition of Indigenous origin have all contributed to the increased likelihood of people identifying as being of Aboriginal or Torres Strait Islander origin. This is reflected in the large increases in the number of people who are identified as Indigenous in each Census, increases in excess of those which can be attributed to natural increase in the Indigenous population. If there is no future change in Indigenous identification, the Indigenous population is projected to be 469,000 in 2006. On the other hand, if the change in propensity to identify as Indigenous between the 1991 and 1996 Censuses continues then the Indigenous population is projected to reach 649,000 in 2006—an increase of over 50% over the 1996 estimate. Table 5.8 shows the distribution of the Indigenous population between 1901 and 1996, and the projections for 2001.

Graph 5.9 shows the very young age structure of the Indigenous population. In 1996, the median age of the Indigenous population was 20 years, compared with 34 years for the total population. With 40% of the population aged under 15, and 3% aged over 65, the Indigenous population of 1996 had a younger age structure than that of the total Australian population at the beginning of this century.

5.8 ESTIMATES OF THE INDIGENOUS POPULATION—At 30 June

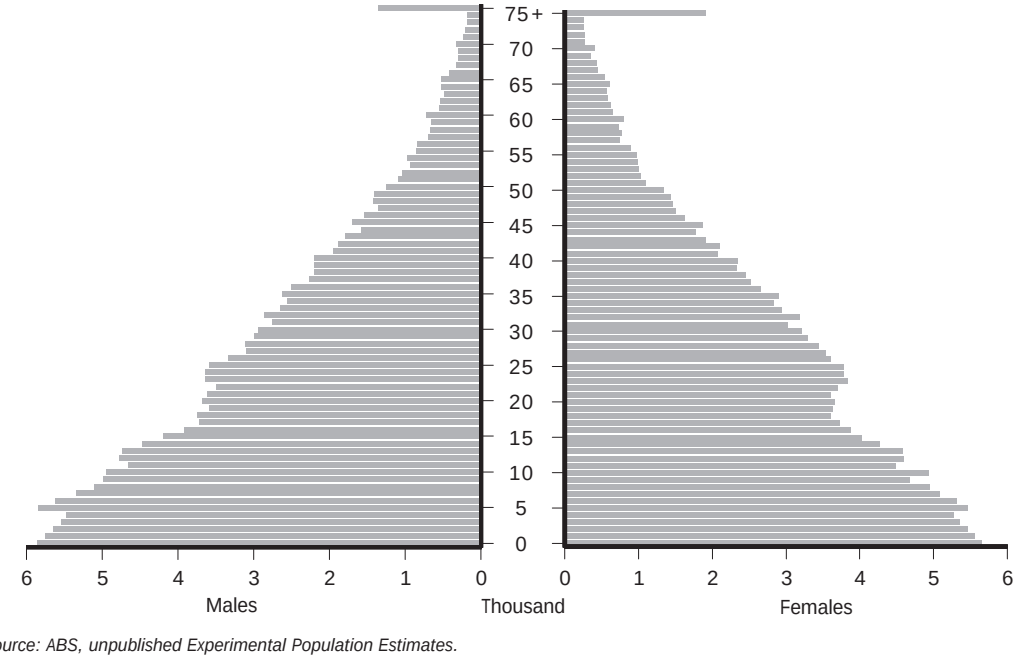
	1901(a)		1991(b)		1996(c)		2001(d)	
State/Territory	no.	%	no.	%	no.	%	no.	%
New South Wales	7 434	8.0	75 020	26.5	109 925	28.5	121 142	28.4
Victoria	652	0.7	17 890	6.3	22 598	5.9	24 586	5.8
Queensland	26 670	28.6	74 214	26.2	104 817	27.2	118 749	27.8
South Australia	5 185	5.6	17 239	6.1	22 051	5.7	24 313	5.7
Western Australia	30 000	32.1	44 082	15.6	56 205	14.6	61 505	14.4
Tasmania	157	0.2	9 461	3.3	15 322	4.0	16 644	3.9
Northern Territory	23 235	24.9	43 273	15.3	51 876	13.4	56 364	13.2
Australian Capital Territory	. .	. .	1 616	0.6	3 058	0.8	3 589	0.8
Australia(e)	**93 333**	**100.0**	**282 979**	**100.0**	**386 049**	**100.0**	**427 094**	**100.0**

(a) Estimates in 1901 based on separate State Censuses. WA number was estimated without an enumeration of the Indigenous population. (b) Estimate based on the 1991 Census of Population and Housing. (c) Estimate based on the 1996 Census of Population and Housing. (d) Projection based on low series, which assumes no further increase in propensity to identify as Indigenous from 1996. (e) Includes Jervis Bay.

Source: Experimental Estimates of the Aboriginal and Torres Strait Islander Population (3230.0); Experimental Projections of the Aboriginal and Torres Strait Islander Population (3231.0); Population Issues, Indigenous Australians (4708.0).

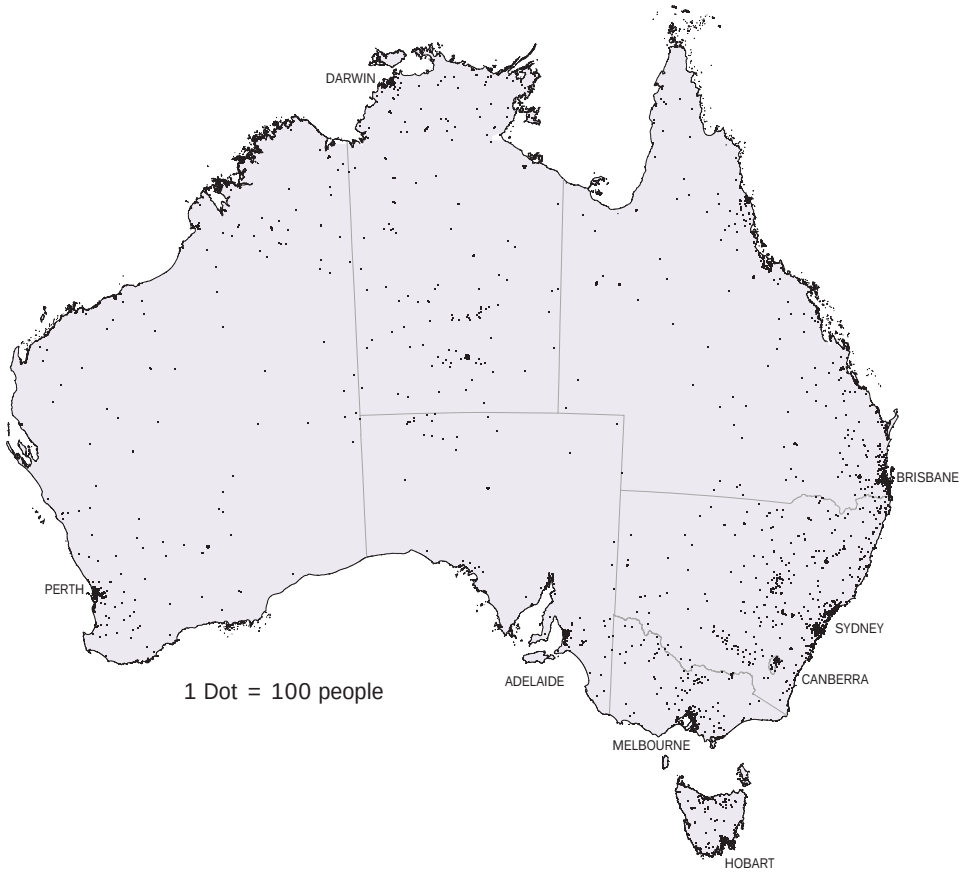
This age structure is largely a product of high fertility and high mortality among the Indigenous population. During the 1960s Indigenous women had, on average, about six children each. By the 1980s this had fallen to about three children each, compared to 1.9 for all Australian women. The high mortality is reflected in life expectancy at birth, which for Aboriginal and Torres Strait Islanders in 1991–96 was about 57 years for males and 62 years for females—around 20 years less than the respective life expectancies of all males and females in Australia in 1996–98.

5.9 AGE STRUCTURE OF THE INDIGENOUS POPULATION-1996



Source: ABS, unpublished Experimental Population Estimates.

5.10 DISTRIBUTION OF INDIGENOUS POPULATION(a)—1996



(a) Represents a random distribution within Statistical Local Area boundaries.

Source: 1996 Census of Population and Housing.

While most of the total Australian population is concentrated along the east and (to a lesser extent) the south west coasts, the Indigenous population is much more widely spread. About 90% of Australia's total population are contained within the most densely settled 2.6% of the continent. About 90% of Australia's Indigenous population live in areas covering 25% of the continent. This partly reflects the higher level of urbanisation among the non-Indigenous population than the Indigenous population. However, Indigenous people are also much more likely to live in very remote areas than the rest of the population. Just over half of the continent contains 0.3% of the total population, and 3.1% of the Indigenous population (see maps 5.10 and 5.15).

Population projections

The ABS has published projections of the Australian population to the year 2101, based on a combination of assumptions concerning future levels of births, deaths and migration. Three main series of projections have been produced, based on differing levels of these variables.

Series I assumes an annual net overseas migration gain of 110,000, high net internal migration gains and losses for States and Territories, and a total fertility rate of 1.75 babies per woman by 2008–09, then remaining constant. Series II assumes an annual net overseas migration gain of 90,000, medium net internal migration gains and losses for States and Territories, and a total fertility rate falling to 1.6 babies per woman by

2008–09, then remaining constant. Series III assumes an annual net overseas migration gain of 70,000, generally small net internal migration gains and losses for States and Territories, and a total fertility rate falling to 1.6 births per woman in 2008–09, then remaining constant. All series assume that the 1986–96 rate of improvement in life expectancy of 0.30 years per year for males and 0.22 years for females continues for the next five years and then declines gradually, resulting in life expectancy at birth of 83.3 years for males and 86.6 years for females in 2051. After this it is assumed to remain constant.

Graph 5.11 shows that Australia's population is projected to grow from 19 million in 1999 to around 19.4 million in 2001 and between 24.1 and 28.2 million in 2051. By 2101 the population is projected to rise to between 22.6 and 31.9 million. The rate of population growth is projected to vary at different times during the projection period, with a clear long-term declining trend from 1.2% in 1998–99 to between 0.0% and 0.4% by 2050–51 and to between –0.1% and 0.2% by 2100–01. The reason for this slowing in growth is mainly a projected decline in the natural increase (births minus deaths) of the population. This decline is largely a result of the increasing number of deaths occurring in a rapidly ageing population as well as the low and declining fertility.

The populations of most States and Territories are expected to increase over the projection period, with the largest increase in the Northern Territory (between 36% and 163%), followed by Queensland (between 53% and 106%) and Western Australia (between 44% and 87%) (table 5.12). These levels of increase are well above the national average of between 27% and 49%.

Tasmania and South Australia are the only States or Territories where the population is projected to decline under each projection series. Tasmania's population is projected to decline by between 7% and 51% by 2051, from 470,300 in 1999 to between 435,700 and 231,300 in 2051. South Australia's population is projected to be between 1,477,100 and 1,410,500 persons in 2051, a decline of between 1% and 6% from its 1999 level of 1,493,100.

These projections are summarised in table 5.12.

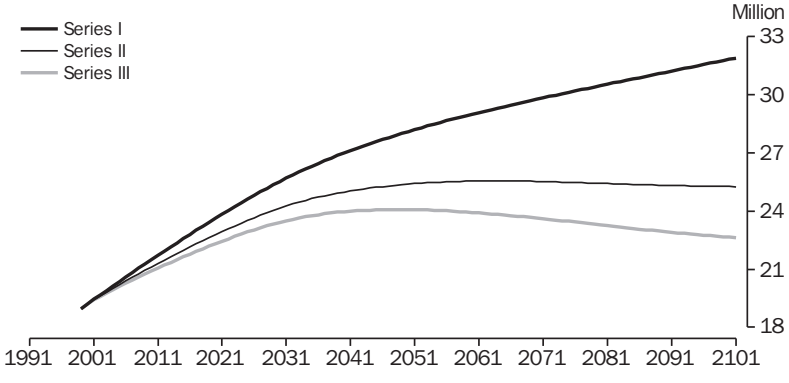
The projections show that the ageing of the population, already evident, is set to continue. The 1999 median age of 34.9 years is projected to increase to between 43.6 and 46.5 years in 2051 and between 44.0 and 46.6 years in 2101.

The age structure of the population will change noticeably by 2101. Graph 5.13 shows a heavier concentration in the ages 50 years and over and smaller increases or slight declines in the younger ages.

The proportion of the population aged 65 and over is expected to increase substantially, from 12% in 1999 to between 24% and 27% in 2051 and to between 25% and 28% in 2101. The proportion aged 85 and over is expected to almost quadruple, from 1.3% in 1999 to around 5% in 2051 and around 6% in 2101.

Table 5.14 summarises changes from 1901 to 1999, and projections to 2101, in population size, age structure, and proportion living in capital cities.

5.11 PROJECTED POPULATION OF AUSTRALIA—as at 30 June



Source: Population Projections Australia, 1999 to 2101 (3222.0).

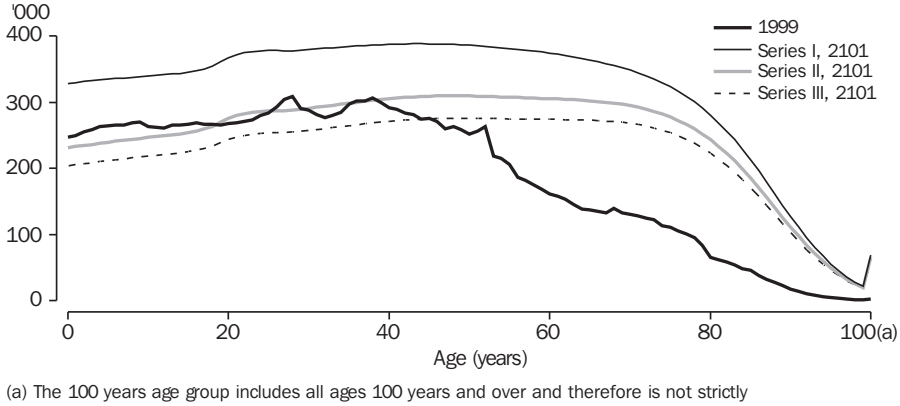
5.12 ACTUAL AND PROJECTED POPULATION—As at 30 June

	1999	2021			2051		
	Actual	Series I	Series II	Series III	Series I	Series II	Series III
Capital city/balance of State	'000	'000	'000	'000	'000	'000	'000
Sydney	4 041.4	5 143.2	5 039.7	4 986.9	6 215.8	5 857.8	5 704.7
Balance of New South Wales	2 370.3	2 696.0	2 560.7	2 493.7	2 785.8	2 390.0	2 206.0
Total New South Wales	*6 411.7*	*7 839.2*	*7 600.4*	*7 480.6*	*9 001.6*	*8 247.8*	*7 910.7*
Melbourne	3 417.2	4 101.6	4 081.8	4 177.5	4 492.6	4 393.2	4 638.8
Balance of Victoria	1 295.0	1 324.9	1 337.3	1 371.5	1 135.5	1 154.0	1 238.3
Total Victoria	*4 712.2*	*5 426.5*	*5 419.1*	*5 549.0*	*5 628.1*	*5 547.2*	*5 877.1*
Brisbane	1 601.4	2 364.4	2 215.5	2 083.3	3 311.0	2 864.1	2 510.9
Balance of Queensland	1 910.9	2 824.7	2 593.2	2 453.0	3 917.9	3 237.2	2 862.8
Total Queensland	*3 512.3*	*5 189.1*	*4 808.7*	*4 536.3*	*7 228.9*	*6 101.3*	*5 373.7*
Adelaide	1 092.9	1 142.2	1 172.3	1 221.2	1 031.1	1 102.2	1 228.6
Balance of South Australia	400.2	421.3	390.5	367.7	392.0	308.3	248.5
Total South Australia	*1 493.1*	*1 563.5*	*1 562.8*	*1 588.9*	*1 423.1*	*1 410.5*	*1 477.1*
Perth	1 364.2	1 929.5	1 817.5	1 725.2	2 565.4	2 231.5	1 981.8
Balance of Western Australia	496.8	682.6	650.7	611.0	912.3	806.3	692.7
Total Western Australia	*1 861.0*	*2 612.1*	*2 468.2*	*2 336.2*	*3 477.7*	*3 037.8*	*2 674.5*
Hobart	194.2	202.0	187.1	169.0	186.7	146.2	99.7
Balance of Tasmania	276.1	283.1	254.9	239.3	249.0	173.1	131.6
Total Tasmania	*470.3*	*485.2*	*442.0*	*408.2*	*435.7*	*319.3*	*231.3*
Darwin	88.1	145.4	129.3	104.5	242.8	192.2	121.2
Balance of Northern Territory	104.8	163.2	135.8	123.2	263.9	177.4	141.8
Total Northern Territory	*192.9*	*308.6*	*265.1*	*227.7*	*506.7*	*369.6*	*263.0*
Total Australian Capital Territory	*310.2*	*397.9*	*356.5*	*309.6*	*489.3*	*371.7*	*248.3*
Total Capital Cities	*12 109.6*	*15 426.2*	*14 999.7*	*14 777.2*	*18 534.7*	*17 158.9*	*16 534.0*
Total States and Territories Balance(a)	*6 854.1*	*8 395.8*	*7 923.1*	*7 659.4*	*9 656.4*	*8 246.3*	*7 521.7*
Total Australia(b)	**18 966.8**	**23 825.9**	**22 926.4**	**22 440.2**	**28 194.7**	**25 408.5**	**24 059.0**

(a) Excludes balance of ACT. (b) Includes Other Territories.

Source: Population Projections Australia, 1999 to 2051 (3222.0).

5.13 AGE STRUCTURE OF THE POPULATION



(a) The 100 years age group includes all ages 100 years and over and therefore is not strictly comparable with single year ages in the rest of the graph.

Source: Population Projections Australia, 1999 to 2101 (3222.0); Population by Age and Sex (3201.0).

5.14 POPULATION, Summary Indicators—1901–2101

Indicator	1901	1947	1971	1999	2021(a)	2051(a)	2101(a)
Total population ('000)	3 773.8	7 579.4	13 067.3	18 966.8	22 926.4	25 408.5	25 254.1
Proportion of population aged							
0–14 years (%)	35.1	25.1	28.7	20.7	16.1	14.4	14.4
15–64 years (%)	60.8	66.8	63.0	67.1	65.5	59.6	58.6
65–84 Years (%)	3.9	7.7	7.8	11.0	16.3	21.0	21.3
85+ Years (%)	0.1	0.4	0.5	1.3	2.1	5.1	5.7
Males per 100 females	110.1	100.4	101.1	99.1	99.2	98.8	99.4
Median age (years)	22.5	30.7	27.5	34.9	41.2	46.0	46.1
Proportion living in capital cities (%)	36.8	51.2	63.2	63.8	65.4	67.5	n.a.

(a) Series II population projections.

Source: Census of the Commonwealth of Australia, 1911; Australian Demographic Bulletin, 1947; Australian Demographic Statistics (3101.0); Population Projections 1999 to 2101 (3222.0).

Population distribution

Most of Australia's population is concentrated in two widely separated coastal regions. By far the largest of these, in terms of area and population, lies in the south-east and east. The smaller of the two regions is in the south-west of the continent. In both coastal regions the population is concentrated in urban centres, particularly the State and Territory capital cities. Half the area of the continent contains only 0.3% of the population, and the most densely populated 1% of the continent contains 84% of the population. The distribution of Australia's population is shown in map 5.15.

While New South Wales remains the most populous State, with 6.4 million people at June 1999, the fastest growth has occurred in the Northern Territory and Queensland, with increases of 11.3% and 10.2% respectively in the five years to 1999. In contrast, the population of South Australia grew by just 1.8% over the same period and Tasmania declined by 0.6% (see table 5.16).

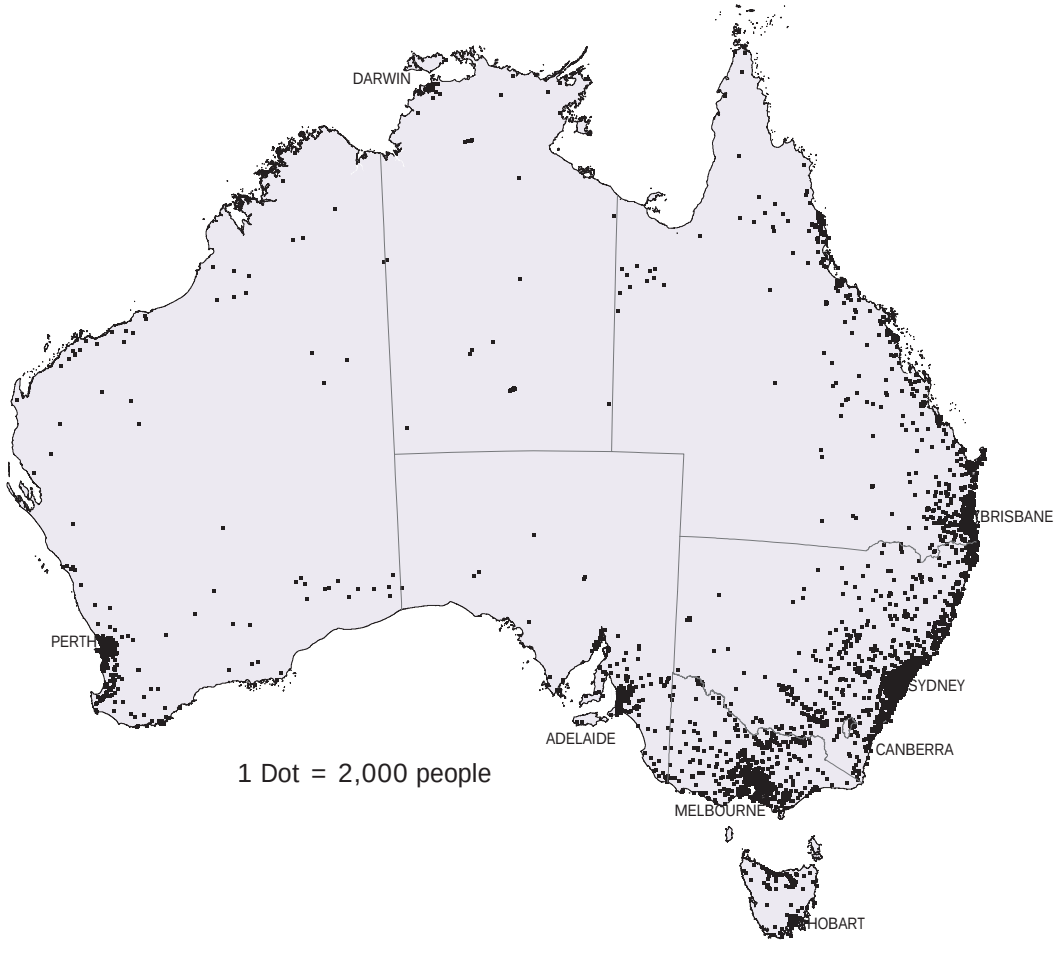
The main factor changing the distribution of Australia's population is internal migration. During 1998–99, 358,400 people moved from one State or Territory to another, a similar level to the previous financial year. In 1998–99 only Victoria, Queensland and Western Australia recorded net interstate migration gains. Tasmania's population declined by about 1,400 people, as natural increase in the State was offset by continued net interstate loss (see table 5.17).

Table 5.18 sets out the estimated resident population in the major population centres at June 1994 and 1999. About 70% of Australia's population growth between 1994 and 1999 occurred in the capital cities, the most significant increases being on the outskirts of these metropolitan regions. Of all the capital cities, Sydney and Melbourne had the largest growth in the five years to 1999, with increases of 272,000 and 204,000 people respectively. The fastest capital city population growth over the 1994–99 period occurred in Darwin, by an average of 2.2% per year. Brisbane and Perth had the next fastest growth rates, with average annual growth rates of 1.9% and 1.8% respectively. While much of the capital city growth has tended to occur on the urban fringes of the capitals, spectacular growth rates in the inner city areas have been a dramatic feature within Australia's two largest capitals. From 1994 to1999 the inner city Local Government Area (LGA) of Sydney grew by an average of 19% per year (population of 22,800 in 1999) while the LGA of Melbourne (population of 47,500 in 1999) had annual average growth of 5.9%.

Other major population centres experiencing significant population increases between 1994 and 1999 were the Sunshine Coast and the Gold Coast–Tweed (each experiencing average annual growth of 4.0%), while Cairns and Kalgoorlie–Boulder increased by an average 3.1% and 2.8% per year respectively. Rapid population growth was also recorded in most LGAs elsewhere along the Queensland and New South Wales coastline and in some LGAs in the south-west corner of Western Australia.

Some areas of Australia have experienced significant population decline in recent years. While some of the population declines have occurred in established suburbs within capital cities and major urban centres, the fastest population decline has occurred in rural areas. Most of this decline has been caused by net migration loss. Such population loss is associated with technological, social and economic changes in rural areas, and industry restructuring in local economies.

5.15 POPULATION(a) DISTRIBUTION, AUSTRALIA—1999



(a) Estimated resident population.

Source: Regional Population Growth, Australia 1998–99 (3218.0).

5.16 ESTIMATED RESIDENT POPULATION, By State and Territory

As at 30 June	NSW '000	Vic. '000	Qld '000	SA '000	WA '000	Tas. '000	NT '000	ACT '000	Aust. '000
1994	6 060.2	4 487.6	3 187.1	1 466.1	1 703.0	472.9	173.4	301.5	17 854.7
1995	6 127.0	4 517.4	3 265.1	1 469.4	1 733.8	473.7	177.6	304.8	18 071.8
1996	6 204.7	4 560.2	3 338.7	1 474.3	1 765.3	474.4	181.8	308.3	18 310.7
1997	6 272.8	4 605.2	3 397.1	1 479.7	1 797.9	473.5	186.9	308.0	18 524.2
1998	6 333.5	4 654.9	3 453.5	1 486.4	1 829.1	471.7	189.9	308.1	18 730.4
1999	6 411.7	4 712.2	3 512.4	1 493.1	1 861.0	470.3	192.9	310.2	18 966.8

Source: Australian Demographic Statistics (3101.0).

5.17 POPULATION GROWTH RATES

Year ended 30 June	NSW %	Vic. %	Qld %	SA %	WA %	Tas. %	NT %	ACT %	Aust. %
NATURAL INCREASE									
1994	0.74	0.73	0.84	0.55	0.86	0.66	1.69	1.10	0.76
1995	0.70	0.70	0.82	0.54	0.87	0.63	1.66	1.08	0.74
1996	0.66	0.63	0.77	0.51	0.80	0.53	1.59	1.00	0.69
1997	0.69	0.63	0.77	0.47	0.80	0.52	1.50	0.99	0.69
1998	0.63	0.60	0.73	0.45	0.76	0.44	1.51	0.92	0.65
1999	0.62	0.56	0.71	0.44	0.78	0.52	1.49	1.01	0.64
NET OVERSEAS MIGRATION									
1994	0.37	0.24	0.17	0.14	0.40	0.04	0.11	–0.14	0.26
1995	0.59	0.43	0.33	0.20	0.62	0.07	0.27	0.04	0.45
1996	0.78	0.57	0.40	0.25	0.71	0.08	0.32	0.13	0.58
1997	0.60	0.46	0.38	0.21	0.69	0.05	0.30	–0.02	0.48
1998	0.56	0.45	0.41	0.23	0.71	0.02	0.34	–0.03	0.47
1999	0.84	0.58	0.50	0.20	0.87	–0.05	0.56	0.07	0.63
NET INTERSTATE MIGRATION									
1994	–0.20	–0.65	1.44	–0.27	0.23	–0.45	–0.51	–0.14	. .
1995	–0.22	–0.49	1.26	–0.48	0.30	–0.56	0.22	–0.16	. .
1996	–0.24	–0.28	1.00	–0.42	0.23	–0.55	0.18	–0.22	. .
1997	–0.19	–0.10	0.60	–0.31	0.35	–0.77	0.98	–1.04	. .
1998	–0.22	0.03	0.53	–0.22	0.26	–0.84	–0.23	–0.88	. .
1999	–0.23	0.09	0.50	–0.19	0.10	–0.78	–0.49	–0.39	. .
TOTAL POPULATION GROWTH(a)									
1994	0.92	0.34	2.49	0.37	1.51	0.27	1.55	0.73	1.06
1995	1.10	0.66	2.45	0.22	1.81	0.16	2.41	1.10	1.22
1996	1.27	0.95	2.25	0.33	1.82	0.16	2.42	1.13	1.32
1997	1.10	0.99	1.75	0.37	1.85	–0.20	2.78	–0.08	1.17
1998	0.97	1.08	1.66	0.46	1.74	–0.38	1.62	0.01	1.11
1999	1.23	1.23	1.70	0.45	1.74	–0.31	1.55	0.69	1.26

(a) Differences between the total growth rate and the sum of natural increase and net migration rates arise from retrospective adjustments (which are made after each Census) to eliminate any intercensal discrepancy.

Source: Australian Demographic Statistics (3101.0).

In 1911, 43% of Australians lived in rural areas. This proportion fell steadily, and 14% of the population lived in rural areas by 1976. Between 1976 and 1991 the decline appeared to have halted, and the proportion of people living in rural areas increased slightly (see graph 5.19). This may have been due to people moving to rural areas surrounding the cities, but still working in the city. However, the 1996 Census showed that, once again, the rural population had decreased as a proportion of the total population.

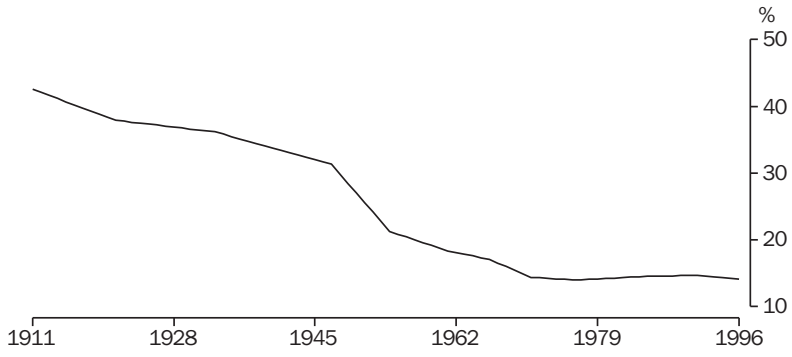
5.18 ESTIMATED RESIDENT POPULATION IN MAJOR POPULATION CENTRES—As at 30 June(a)

Major population centre	1994 '000	1999 '000	1994–99(b) %
Capital City Statistical Division			
Sydney	3 769.6	4 041.4	1.4
Melbourne	3 213.0	3 417.2	1.2
Brisbane	1 455.2	1 601.4	1.9
Adelaide	1 071.7	1 092.9	0.4
Perth	1 246.3	1 364.2	1.8
Hobart	194.5	194.2	0.0
Darwin	79.0	88.1	2.2
Canberra	301.1	309.9	0.6
Other			
Newcastle(c)	454.2	479.3	1.1
Gold Coast–Tweed(c)	321.9	391.2	4.0
Canberra–Queanbeyan(c)	337.4	348.6	0.7
Wollongong(c)	250.5	262.6	0.9
Sunshine Coast(c)	142.2	172.9	4.0
Geelong(c)	151.6	156.1	0.6
Townsville(c)	119.2	127.2	1.3
Cairns(c)	97.8	114.0	3.1
Launceston(c)	98.2	98.2	0.0
Albury–Wodonga(c)	91.1	94.3	0.7
Toowoomba City(d)	85.8	87.2	0.3
Ballarat(c)	78.5	81.1	0.6
Burnie–Devonport(c)	79.2	78.1	–0.3
Bendigo(c)	73.6	76.6	0.8
La Trobe Valley(c)	77.3	74.4	–0.8
Bathurst–Orange(c)	70.7	73.8	0.9
Mackay(c)	58.0	64.9	2.3
Rockhampton(c)	64.3	64.3	0.0
Hastings(e)	54.2	61.3	2.5
Coffs Harbour(e)	54.7	59.7	1.8
Wagga(e)	55.8	56.3	0.2
Bundaberg(c)	52.0	55.8	1.4
Greater Taree(e)	43.3	44.1	0.4
Mildura(c)	40.3	43.4	1.5
Lismore(e)	43.5	43.3	–0.1
Shepparton(c)	40.7	42.3	0.8
Gladstone(c)	35.7	39.1	1.9
Dubbo(e)	35.6	37.5	1.0
Tamworth(e)	35.9	35.9	0.0
Kalgoorlie/Boulder(e)	27.8	31.9	2.8

(a) Based on 1999 Statistical Local Area boundaries. (b) Average annual growth rate. (c) Statistical District. (d) Statistical Subdivision. (e) Statistical Local Area.

Source: Australian Demographic Statistics (3101.0).

5.19 RURAL POPULATION, Percentage of Total Population



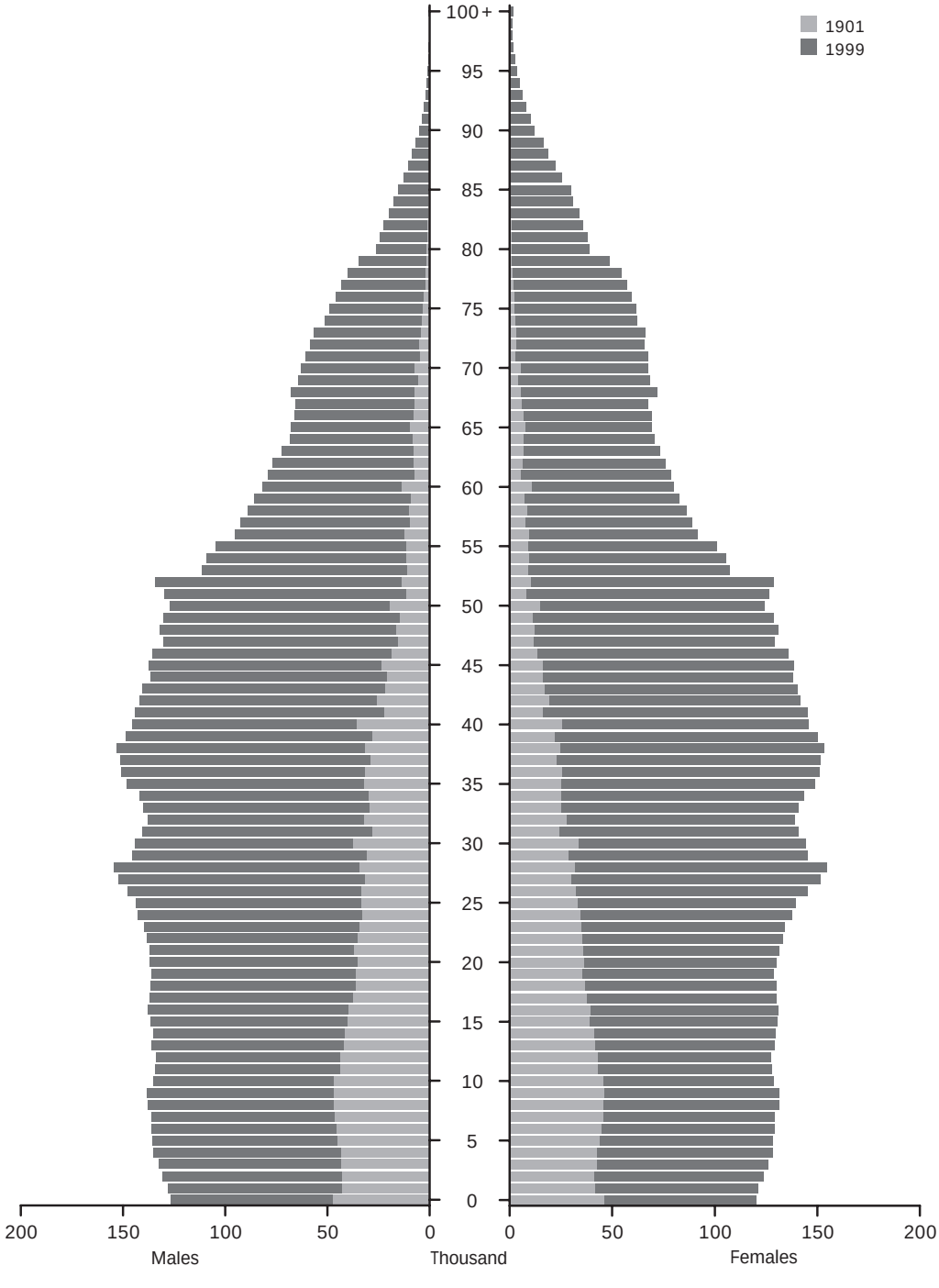
Source: Unpublished data, Census of Population and Housing.

Population age-sex structure

Since the turn of the century the population at all ages has grown significantly, but it has also aged. This is illustrated in graph 5.20 for the years 1901 and 1999.

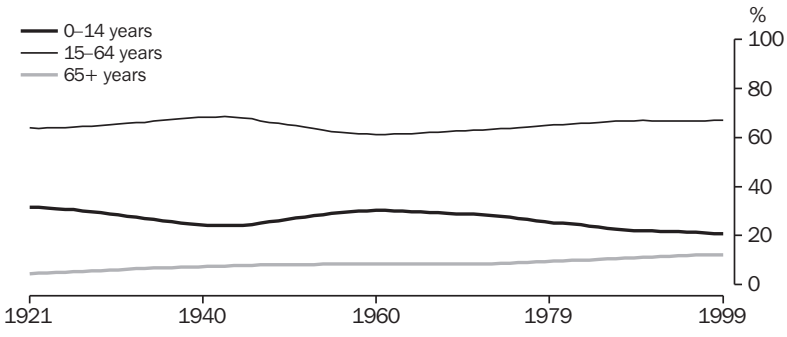
Since the first half of this century, Australians have been having smaller families, which is reflected in a fall in the proportion of children. In 1901, 35% of the population were aged under 15. By 1999, this proportion had fallen to around 21%. Conversely, the proportion of the population aged 65 and over has increased markedly. In 1901, 4% of the population were aged 65 and over, but by 1999 this proportion had increased to 12%. These features are shown in graph 5.21.

5.20 PROFILE OF AUSTRALIA'S POPULATION, By Age- 1901 and 1999



Source: Census of the Commonwealth of Australia, 1911; Population by age and sex, Australian States and Territories (3201.0).

5.21 PROPORTION OF POPULATION IN AGE GROUPS



Source: Australian Demography (Commonwealth Bureau of Census and Statistics); Australian Demographic Statistics (3101.0).

Births

In 1903, when the crude birth rate was lower than it had ever been before, the Royal Commission on the Decline in the Birth-rate and on the Mortality of Infants in New South Wales was appointed. It reported in 1904 and concluded that "...the cause or causes of the Decline of the Birth-rate must be a force or forces over which the people themselves have control...". In other words, couples were limiting the size of their families.

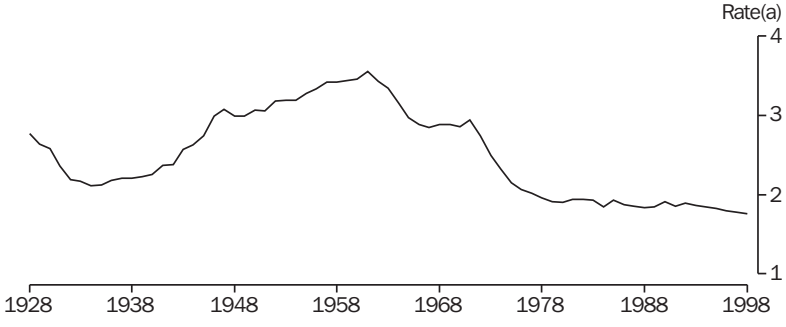
At the turn of the century there were 117 births per 1,000 women of child bearing ages (15–44 years). This gives a total fertility rate of approximately 3.5 babies per woman. By 1924 the total fertility rate was 3.0 and falling.

In 1934, in the Great Depression, the total fertility rate fell to 2.1 babies per woman. It then increased during the second half of the 1930s, as women who had deferred childbearing in the Depression years began to have children. Fertility increased through World War II and the 1950s, and peaked in 1961 when the total fertility rate reached 3.6 babies per woman (see graph 5.22).

After the 1961 peak, the total fertility rate fell rapidly, to 2.9 babies per woman in 1966. This fall can be attributed to changing social attitudes, in particular a change in people's perception of desired family size, facilitated by the contraceptive pill becoming available.

During the 1970s the total fertility rate dropped again, falling to below replacement level in 1976, where it has remained since. This fall was more marked than the fall in the early 1960s and has been linked to the increasing participation of women in education and the labour force, changing attitudes to family size, lifestyle choices and the greater access to abortions.

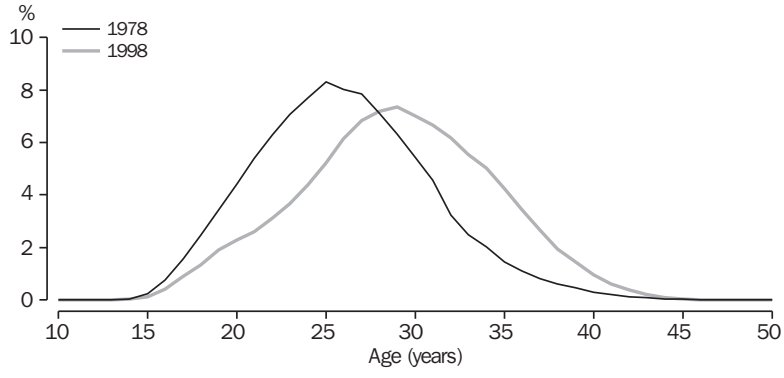
5.22 TOTAL FERTILITY RATE



(a) Average number of babies per woman according to the age-specific fertility rates for each year.

Source: Australian Demographic Trends (3102.0); Births, Australia (3301.0).

5.23 AGE DISTRIBUTION OF WOMEN HAVING BABIES



Source: Births, Australia (3301.0).

Women are starting childbearing later in life. The median age at childbearing has increased from 26.3 years in 1978 to 29.5 years in 1998. In 1978, women aged 25 years had the most births, with 8.3% of all births occurring at this age. By 1998 the births peak occurred in 29 year old women, with 7.3% of all births. In the last 20 years there has been a fall in the proportion of total births to teenage mothers, from 8.5% in 1978 to 4.7% in 1998. Similarly, the proportion of women having children at the ages of 40 years and above has increased from 0.8% to 2.3% in the last twenty years as women have continued to have children later in life (see graph 5.23).

Table 5.24 brings together summary measures of fertility for Census years between 1901 and 1986, and individual years between 1990 and 1998.

5.24 SELECTED SUMMARY MEASURES OF FERTILITY

	Registered births			Ex-nuptial births(c)
Year ended 31 December	no.	Crude birth rate(a)	Total fertility rate(b)	%
1901	102 945	27.2	n.a.	n.a.
1911	122 193	27.2	n.a.	5.8
1921	136 198	25.0	3.12	4.8
1947	182 384	24.1	3.08	4.0
1954	202 256	22.5	3.19	4.0
1961	239 986	22.8	3.55	5.1
1966	223 731	19.3	2.88	7.4
1971	276 361	21.6	2.87	9.3
1976	227 810	16.2	2.06	10.2
1981	235 842	15.8	1.94	13.3
1986	243 408	15.2	1.87	16.8
1990	262 648	15.4	1.91	21.9
1991	257 247	14.9	1.85	23.0
1992	264 151	15.1	1.89	24.0
1993	260 229	14.7	1.86	24.9
1994	258 051	14.5	1.85	25.6
1995	256 190	14.2	1.82	26.6
1996	253 834	13.9	1.80	27.4
1997	251 842	13.6	1.78	28.1
1998	249 616	13.3	1.76	28.7

(a) Per 1,000 population. (b) The number of children a woman would bear during her lifetime if she experienced current age-specific fertility rates at each age of her reproductive life. (c) Proportion of total live births.

Source: Australian Demographic Trends (3102.0); Births, Australia (3301.0)

Deaths

In the period 1901–10, the average life expectancy of a new-born boy was 55.2 years and that of a new-born girl 58.8 years. By 1996–98, a new-born boy had a life expectancy of 75.9 years and a new-born girl 81.5 years. This represented an increase in life expectancy of 21 years for boys and 23 years for girls. Graph 5.25 shows the changes in life expectancy for males and females between 1881–90 and 1996–98.

The increase in life expectancy is mainly due to fewer deaths of young children, particularly in the first year of life (infant mortality). The high mortality rates among infants during the period 1901–10 (about 1 in 10 died in the first year of life) kept the average life expectancy at birth low. Children who survived these early years then had life expectancies nearer to those currently experienced. For example, the life expectancy of a five year old boy improved by 14 years between 1901–10 and 1996–98, compared to 21 years improvement for a new-born boy.

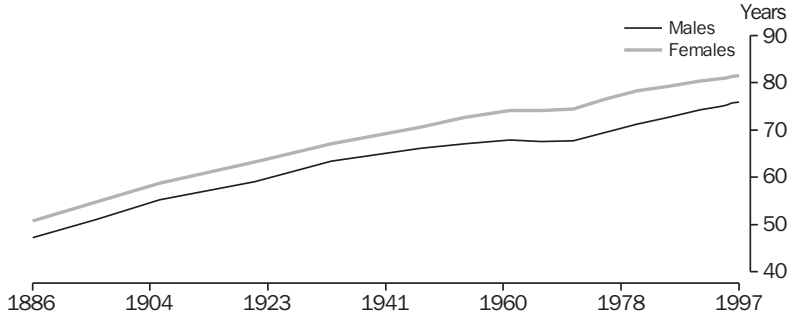
The reduction in mortality in the early part of this century has been attributed to improvements in living conditions, such as better water supply, sewage system, food quality and health education. The continuing reduction in mortality in the latter half of the century has been attributed to improving social conditions and advances in medical technology such as mass immunisation and antibiotics.

The past two decades in particular have seen further increases in life expectancy. These increases are due in part to lower infant mortality, fewer deaths among young adults from motor vehicle accidents and fewer deaths among older men from heart disease. The reduction in the number of deaths from heart disease has been related to behavioural changes, such as dietary improvements, reduced smoking and increased physical activity.

Females experience an average life expectancy about six years longer than males. At the beginning of the century, the difference between male and female life expectancy was about four years, but increased to nearly seven years by the early 1970s. This was largely due to the significant declines in heart disease, stroke and respiratory disease mortality among women, combined with the slight decline in male life expectancy from accidents among males aged 15–24 years and from heart disease among 45–84 year old males. However, the life expectancy gap between males and females has narrowed in recent years (from 6.7 years in 1970–72 to 5.7 years in 1996–98). This can be attributed to the large reductions in death rates of males aged 45 years and over, and particularly to the reduction in heart disease deaths among males.

Australians have an average life expectancy which compares well with that experienced in other developed nations. Among the countries shown in table 5.26, the life expectancy at birth of Australian males and females (76 and 82 years respectively) was exceeded only by that in Japan, and matched by Hong Kong. Life expectancy in Australia was higher than in New Zealand, the United Kingdom and the United States of America.

5.25 LIFE EXPECTANCY AT BIRTH



Note: The years shown are the mid-points in ranges of years, e.g. 1886 is the mid–point of the range 1881–90 and 1997 is the mid–point of the range 1996–98.

Source: Deaths, Australia (3302.0).

5.26 LIFE EXPECTANCY AT BIRTH, Selected Countries—1998

Country	Males years	Females years
Australia(a)	75.9	81.5
China	68.1	72.3
Germany	74.1	80.3
Hong Kong (SAR of China)	76.0	81.5
India	62.5	63.3
Indonesia	63.7	67.5
Japan	76.9	83.0
Korea	69.0	76.2
New Zealand	74.3	79.9
Papua New Guinea	57.6	59.1
Singapore	75.1	79.5
United Kingdom	74.7	80.0
United States of America	73.5	80.2

Source: Deaths Australia, 1998 (3302.0); Human Development Report 2000 (United Nations Development Programme).

The standardised death rate removes the effect of different age structures of the population on the crude death rates. Over the last 20 years, the standardised death rate in Australia has fallen by one-third (table 5.27).

Of the States and Territories, the Northern Territory has had the highest standardised (and crude) death rate in the country for the last two decades. This can largely be attributed to high death rates among the Indigenous population. In 1998 Indigenous persons made up 28% of the Northern Territory population, but accounted for 48% of its deaths. The Australian Capital Territory had the lowest standardised death rate in 1998, 10% below the national rate.

Table 5.28 brings together summary measures of mortality for Census years between 1901 and 1986, and individual years between 1990 and 1998.

5.27 STANDARDISED DEATH RATES(a)

	1978			1988			1998		
State/Territory	Males	Females	Persons	Males	Females	Persons	Males	Females	Persons
New South Wales	12.1	7.1	9.2	10.2	6.1	7.9	7.7	4.7	6.0
Victoria	11.8	6.8	8.9	9.5	5.6	7.3	7.4	4.6	5.8
Queensland	11.7	6.9	9.0	9.6	5.5	7.3	7.8	4.7	6.1
South Australia	11.6	6.4	8.6	9.4	5.4	7.1	7.7	4.7	6.0
Western Australia	11.1	6.6	8.6	9.5	5.4	7.2	7.4	4.5	5.8
Tasmania	12.3	7.4	9.5	10.2	6.2	8.0	8.1	5.0	6.3
Northern Territory	12.7	10.9	11.9	13.2	9.2	11.2	9.8	7.8	8.9
Australian Capital Territory	10.9	7.3	9.1	8.8	5.3	6.8	6.6	4.6	5.4
Australia	11.8	6.9	9.0	9.8	5.8	7.5	7.6	4.7	6.0

(a) Deaths per 1,000 standard population. The standard population used is the June 1991 population.

Source: Deaths, Australia (3302.0).

5.28 SELECTED SUMMARY MEASURES OF MORTALITY

Year ended 31 December	Registered deaths no.	Crude death rate(a)	Infant mortality rate(b)	Life expectancy at birth: Males years	Life expectancy at birth: Females years
1901	46 330	12.2	103.6	55.2	58.8
1921	54 076	9.9	65.7	59.2	63.3
1933	59 117	8.9	39.5	63.5	67.1
1947	73 468	9.7	28.5	66.1	70.6
1954	81 805	9.1	22.5	67.1	72.8
1961	88 961	8.5	19.5	67.9	74.2
1966	104 521	9.0	18.7	67.6	74.2
1971	110 650	8.7	17.3	67.8	74.5
1976	112 662	8.0	13.8	69.6	76.6
1981	109 003	7.3	10.0	71.2	78.3
1986	114 981	7.2	8.8	72.7	79.2
1990	120 062	7.0	8.2	73.9	80.1
1991	119 146	6.9	7.1	74.4	80.4
1992	123 660	7.1	7.0	74.5	80.4
1993	121 599	6.9	6.1	75.0	80.9
1994	126 692	7.1	5.9	75.0	80.9
1995	125 133	6.9	5.7	75.0	80.8
1996	128 719	7.0	5.8	75.2	81.1
1997	129 350	7.0	5.3	75.6	81.3
1998	127 202	6.8	5.0	75.9	81.5

(a) Per 1,000 population. (b) Per 1,000 live births.

Source: Australian Demographic Statistics (3101.0).

International migration

Overseas migration has always played an important role in changing Australia's population. Between 1994 and 1999, 1.3 million people arrived in Australia intending to stay for one year or more (table 5.29). This includes permanent (settler) arrivals, Australian residents returning from an overseas trip of 12 months or more, and overseas visitors intending to stay 12 months or more in Australia. About 827,000 people left Australia for overseas on a permanent or long term basis in five year period June 1994–99, including Australian residents emigrating or going overseas for 12 months or more, and overseas visitors leaving Australia after staying for 12 months or more.

Because population estimates include permanent and long-term movers and exclude short-term movers, adjustments are required for the net effect of changes in travel intention from short-term to permanent/long-term and vice versa. For example, an Australian resident may state on departure an intention to stay abroad for less than 12 months (a short term movement). If this resident remains overseas for 12 months or more, he or she has changed travel category from short to long-term and is regarded as a category jumper. Estimates for category jumping ensure that the estimated population reflects the population who are usually resident in Australia.

Over the last 30 years there has been a significant change in the source countries of permanent arrivals. In the 1960s the top six countries of birth represented 81% of all settler arrivals to Australia, including 51% born in the United Kingdom and Ireland. In the 1990s, 52% came from the top six countries, with 12% born in the United Kingdom and Ireland (table 5.30).

In 1998–99, 84,100 people arrived in Australia intending to settle. The majority of these (59%) arrived as part of the Migration Program. Another 10% arrived as part of the Humanitarian Program, while 29% were eligible to settle in Australia because of their New Zealand citizenship. The remaining 1% were in other categories such as overseas-born children of Australian citizens.

5.29 NET OVERSEAS MIGRATION COMPONENTS—Five Years Ended 30 June

	1984	1989	1994	1999
	no.	no.	no.	no.
Arrivals				
Permanent (settlers)	471 292	572 421	496 404	433 789
Long-term				
Australian residents	275 864	272 529	321 143	390 707
Overseas visitors	156 594	201 293	296 080	475 131
Permanent and long-term arrivals	*903 750*	*1 046 243*	*1 113 627*	*1 299 627*
Departures				
Permanent departures	111 532	100 524	143 294	152 641
Long-term				
Australian residents	242 968	258 486	326 606	374 690
Overseas visitors	108 707	135 684	225 164	299 552
Permanent and long-term departures	*463 208*	*494 694*	*695 064*	*826 883*
Category jumping	5 084	55 056	–62 313	2 286
Net overseas migration	445 626	606 605	356 250	475 030

Source: Migration, Australia (3412.0).

The number of visas issued to prospective settlers varies significantly from year to year. So too does the balance between the types of visas issued. Skilled migration is a very volatile component of the migration intake. Table 5.31 shows that, in the six years to 1998–99, the Skilled Migration composition ranged from 18% in 1993–94 to 34% in 1997–98. Of the skilled migrants in 1998–99, 27% came from Europe (especially the United Kingdom and Ireland), while 20% came from North East Asia. Africa and South East Asia also contributed a relatively high proportion of skilled immigrants to Australia, with 18% and 17% of the total intake respectively.

In 1998–99, 26% of settlers came as part of the family component of Australia's immigration program. The birthplaces of these immigrants partly reflect past migration patterns. About 25% were born in South East Asia, with another 24% born in Europe.

Of settlers arriving as part of the Humanitarian Program, 54% came from Europe, mostly from Bosnia-Herzegovina and Croatia. A quarter of immigrants on humanitarian visas had been born in North Africa and the Middle East.

5.30 COUNTRY OF BIRTH OF SETTLER ARRIVALS

Country	'000	%
1965–69		
United Kingdom and Ireland	361.6	50.4
Greece	67.0	9.3
Italy	63.2	8.8
Yugoslavia	38.5	5.4
Germany	18.3	2.5
Malta	16.5	2.3
1975–79		
United Kingdom and Ireland	142.6	35.8
New Zealand	22.6	5.7
Lebanon	21.7	5.4
Yugoslavia	15.5	3.9
Greece	10.5	2.6
USA	10.1	2.5
1985–89		
United Kingdom and Ireland	113.3	19.0
New Zealand	83.0	13.9
Viet Nam	36.7	6.2
Philippines	35.0	5.9
Hong Kong (SAR of China)	24.9	4.2
South Africa	16.7	2.8
1995–99		
New Zealand	74.4	17.1
United Kingdom and Ireland	53.6	12.3
China	35.0	8.0
Former Yugoslav Republics	29.3	6.7
South Africa	20.1	4.6
Hong Kong (SAR of China)	16.2	3.7

Source: Australian Demography (Commonwealth Bureau of Census and Statistics); Australian Immigration—Consolidated Statistics, No. 10, 1978; Overseas Arrivals and Departures, Australia (3401.0).

5.31 SETTLER ARRIVALS, By Eligibility Category

Eligibility category	1993–94 no.	1994–95 no.	1995–96 no.	1996–97 no.	1997–98 no.	1998–99 no.
Family	33 580	37 078	46 458	36 490	21 142	21 501
Skilled	12 794	20 210	20 008	19 697	25 985	27 931
Humanitarian	11 350	13 632	13 824	9 886	8 779	8 790
New Zealand	9 616	13 618	16 234	17 501	19 393	24 680
Other	2 428	2 890	2 615	2 178	2 028	1 241
Total	**69 768**	**87 428**	**99 139**	**85 752**	**77 327**	**84 143**

Source: Department of Immigration and Multicultural Affairs.

Asia-born arrivals

Over the last two decades, the countries of Asia (South-East Asia, North-East Asia and Southern Asia regions) have become an increasingly important source of both settler and long-term visitor arrivals.

Before 1980 the number of settlers from Asia was small. With the final dismantling of the White Australia Policy in the early 1970s and acceptance of refugees from the Viet Nam war, the number of migrants from Asia began to increase.

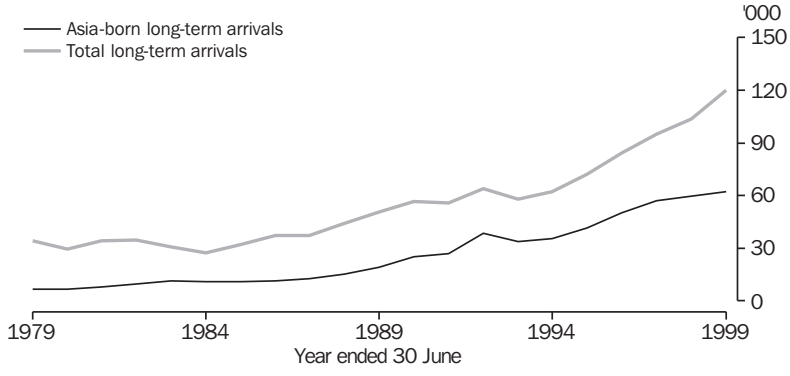
Generally, the level of permanent arrivals from Asia has followed the patterns of total permanent arrivals, reflecting the constraints of the Migration and Humanitarian Programs. The number of Asia-born arrivals has fluctuated markedly, peaking between 1988–89 (55,700) and 1990–91 (60,900) (see graph 5.32). In 1998–99, a total of 21,800 settlers born in Asia (26% of all settler arrivals) arrived in Australia.

Graph 5.33 shows that levels of long-term visitor arrivals from Asia have increased greatly over the last ten years, after being very low during the 1970s and early 1980s. Arrivals in 1998–99 (53,500 or 45% of all long-term visitor arrivals) were almost nine times as high as in 1978–79 and three times as high as in 1988–89. The main reason for this growth has been the increasing number of students travelling to Australia from Asia for educational purposes. In 1998–99, almost three-quarters (72%) of all Asia-born long-term visitor arrivals were for education.

5.32 ASIA-BORN SETTLER ARRIVALS

Source: Migration, Australia (3412.0); Unpublished data, Overseas Arrivals and Departures.

5.33 LONG-TERM ARRIVALS OF THE ASIA-BORN



Source: Migration, Australia (3412.0); Unpublished data, Overseas Arrivals and Departures.

Country of birth

Since the end of World War II the population increased rapidly due to high levels of migration, and the proportion of the population born overseas increased from 10% in 1947 to 24% at June 1999 (table 5.34). As well as this increase, there has been a diversification of the population. In 1947, 81% of the overseas born population came from the main English speaking countries (the United Kingdom and Ireland, New Zealand, South Africa, Canada and the United States), mainly from the United Kingdom and Ireland.

By June 1999, only 39% of the overseas born population had been born in the main English speaking countries.

For the last few decades, the Italian, Greek and Dutch born populations in Australia have been declining. There were large flows of people from these countries after World War II, and relatively little migration more recently. As these populations age, they experience high numbers of deaths. There are also significant numbers of people returning to their countries of birth in their retirement.

5.34 MAIN COUNTRIES OF BIRTH OF THE POPULATION

	1901(a)	1947(a)	1954(a)	1961(a)	1971(a)	1981(b)	1991(b)	1999(b)
Country	'000	'000	'000	'000	'000	'000	'000	'000
United Kingdom and Ireland	67.9	541.3	664.2	755.4	1 088.3	1 175.7	1 244.3	1 227.2
New Zealand	2.6	43.6	43.4	47.0	80.5	175.7	286.4	361.6
Italy	0.6	33.6	119.9	228.3	289.5	285.3	272.0	244.6
Former Yugoslav Republics	n.a.	5.9	22.9	49.8	129.8	156.1	168.0	208.4
Viet Nam	n.a.	n.a.	n.a.	n.a.	0.7	43.4	124.8	175.2
Greece	0.1	12.3	25.9	77.3	160.2	153.2	147.4	140.2
Germany	3.8	14.6	65.4	109.3	110.8	115.2	120.4	123.5
China	n.a.	6.4	10.3	14.5	17.6	26.8	84.6	156.8
Hong Kong (SAR of China)(c)	n.a.	n.a.	n.a.	n.a.	n.a.	16.3	62.4	62.0
Netherlands	n.a.	2.2	52.0	102.1	99.3	100.5	100.9	92.7
Philippines	n.a.	0.1	0.2	0.4	2.6	15.8	79.1	116.9
Total overseas	85.8	744.2	1 286.5	1 778.8	2 579.3	3 111.0	3 965.3	4 482.0
Australia	290.8	6 835.2	7 700.1	8 729.4	10 176.3	11 812.3	13 318.8	14 484.8
Total population	**377.4**	**7 579.4**	**8 986.5**	**10 508.2**	**12 755.6**	**14 923.3**	**17 284.0**	**18 966.8**

(a) Census counts. (b) Estimated resident population. (c) Includes Macao.

Source: Australia in Profile (2821.0); Estimated Resident Population by Country of Birth, Age and Sex, Australia (3221.0); Migration, Australia (3412.0).

5.35 FIRST AND SECOND GENERATION AUSTRALIANS—1996

Country	Overseas born(a) '000	Second generation Australians '000	Total '000
United Kingdom and Ireland	1 124.0	1 522.9	2 647.0
Italy	238.2	333.9	572.1
New Zealand	291.4	200.0	491.4
Former Yugoslav Republics	175.4	131.3	306.7
Greece	126.5	153.9	280.5
Germany	110.3	139.3	249.6
Netherlands	87.9	142.5	230.4
Viet Nam	151.1	46.8	197.8
China	111.0	40.2	151.2
Total population	**3 901.9**	**3 595.3**	**7 497.2**

(a) The population identified in this table is based on Census counts, and not the estimated resident population; it therefore has slightly lower levels than the total overseas-born population in table 5.34.

Source: Unpublished data, 1996 Census of Population and Housing.

Preliminary population estimates for 1999 identified 24% of the population as overseas born. The 1996 Census showed that a further 27% of persons born in Australia had at least one overseas born parent, that is, they were second generation Australians. The variety and size of second generation populations reflect past migration and intermarriage patterns. In long established migration groups, such as those from the United Kingdom and Ireland, and from northern and southern Europe, second generation Australians form more than half the total birthplace group. In more recently arrived groups, such as those born in Viet Nam, second generation Australians form a smaller part of the birthplace group. This is illustrated in table 5.35.

Marriages and divorces

Marriages

The crude marriage rate in Australia (the annual number of registered marriages per 1,000 population) has fluctuated since 1901. Broadly, the crude marriage rate has followed the pattern of prevailing economic and social conditions. It has fallen in times of depression or recession (e.g. in the 1930s), and increased in other times such as the immediate post-war years of the early 1920s and late 1940s. Marriage rates have also increased during times of war. The 1999 crude marriage rate of 6.0 marriages per 1,000 population has increased slightly from 1997, which at 5.8 per 1,000 population was the lowest rate on record. The highest crude marriage rate ever recorded was 12.0 per 1,000 in 1942.

The crude marriage rate has been declining since 1970. This decline in the marriage rate can be mainly attributed to changes in attitudes to marriage and living arrangements that have occurred since then.

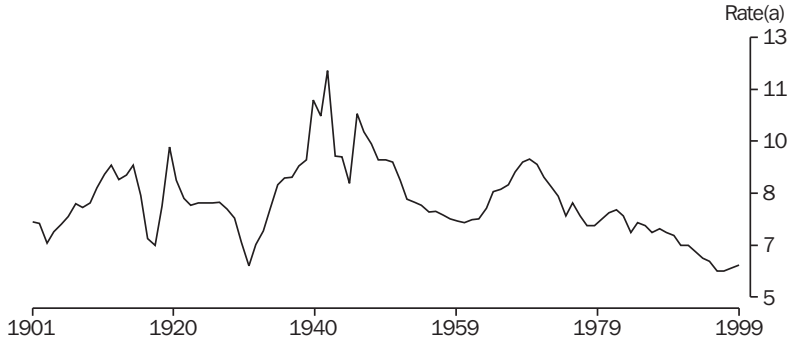
The fluctuations in the crude marriage rate between 1901 and 1999 are shown in graph 5.36.

Recent trends show that Australians are marrying later. The median ages of brides and bridegrooms at first marriage have increased from 21.1 and 23.4 years respectively in 1971 to 26.4 and 28.2 years in 1999 (graph 5.37). Part of this increase can be attributed to the increasing incidence of de facto marriages. Another factor is that young people are staying in education longer.

In 1999, 65% of marriages had a groom older than the bride, and 23% of brides were older than grooms. However, there was a strong tendency for couples to be about the same age, with 44% of couples being within two years of each other, and only 8% being more than 10 years apart in age (graph 5.38).

Table 5.39 brings together summary measures of marriages for Census years between 1901 and 1986, and individual years between 1990 and 1999.

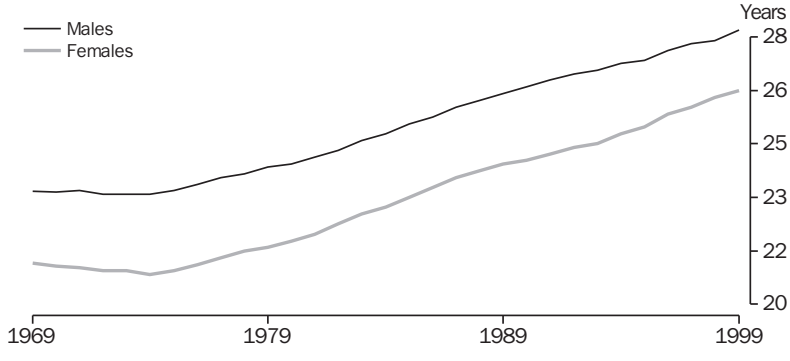
5.36 CRUDE MARRIAGE RATE



(a) Rate per 1,000 population.

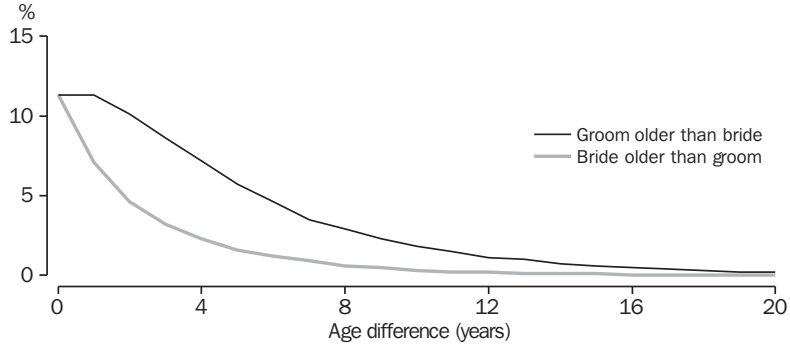
Source: Australian Social Trends (4102.0); Marriages and Divorces, Australia (3310.0).

5.37 MEDIAN AGE AT FIRST MARRIAGE



Source: Marriages and Divorces, Australia (3310.0).

5.38 BRIDE AND GROOM AGE DIFFERENCE AT MARRIAGE, Percentage of all marriages—1999



Source: Marriages and Divorces Australia (3310.0).

5.39 SELECTED SUMMARY MEASURES OF MARRIAGES

Year ended 31 December	Registered marriages no.	Crude marriage rate(a)	Median age at marriage: Bridegroom years	Median age at marriage: Bride years
1901	27 753	7.3	n.a.	n.a.
1921	46 869	8.6	27.7	24.5
1933	46 595	7.0	27.0	23.7
1947	76 457	10.1	26.0	23.0
1954	71 229	7.9	25.6	22.6
1961	76 686	7.3	24.9	21.8
1966	96 061	8.3	24.2	21.5
1971	117 637	9.2	23.8	21.4
1976	109 973	7.9	24.9	22.2
1981	113 905	7.6	25.9	23.3
1986	114 913	7.2	27.3	24.9
1990	116 959	6.9	28.2	25.9
1991	113 869	6.6	28.4	26.0
1992	114 752	6.6	28.7	26.3
1993	113 255	6.4	28.8	26.4
1994	111 174	6.2	29.0	26.6
1995	109 386	6.1	29.2	26.8
1996	106 103	5.8	29.6	27.2
1997	106 735	5.8	29.7	27.5
1998	110 598	5.9	29.8	27.7
1999	114 316	6.0	30.1	27.9

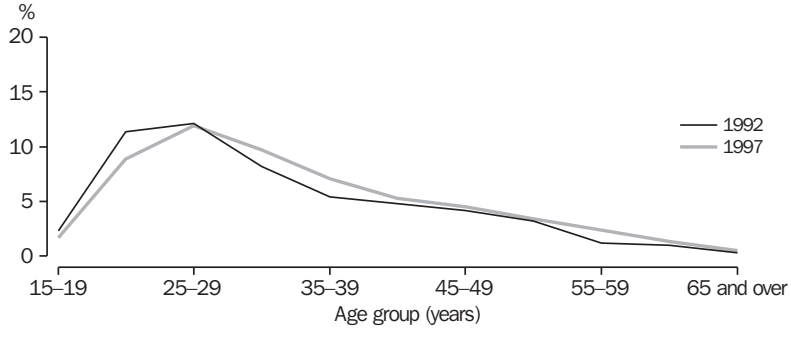
(a) Per 1,000 population.

Source: Australian Demographic Statistics (3101.0); Marriages and Divorces, Australia (3310.0).

De facto marriages

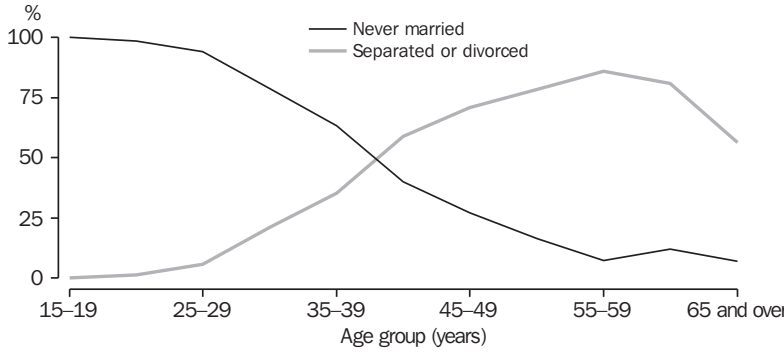
Between 1992 and 1997, the number of people in de facto marriages rose by 6.4% from 710,800 to 756,500 people. In 1997, de facto partners represented 9.1% of all persons living in couple relationships (up from 8.5% in 1992) and 5.3% of persons aged 15 years and over (the same as in 1992). The proportion in de facto marriages peaked among people aged 25–29. It was also high in the adjacent age groups and then fell away to lower levels with increasing age (graph 5.40). Of all de facto partners in 1997, 56% were aged 20–34.

5.40 DE FACTO PARTNERS IN THE POPULATION



Source: Unpublished data, 1992 Survey of Families in Australia; 1997 Family Characteristics Survey.

5.41 PERSONS IN DE FACTO RELATIONSHIPS—1997



Source: Family Characteristics, Australia (4442.0).

De facto partnering has arisen as an alternative living arrangement following separation, divorce or widowhood. Some couple relationships, such as that between a boyfriend and girlfriend who live together but do not consider their relationship to be marriage-like, are classified as de facto.

Of all people in de facto relationships in 1997, 69% had never been in a registered marriage, and 29% were either separated or divorced. The likelihood of being never married was higher among those aged under 35, counterbalanced by higher proportions of separated and divorced de facto partners aged 35 and over (graph 5.41). In 1997, 46% of de facto couples had children, compared with 39% in 1992.

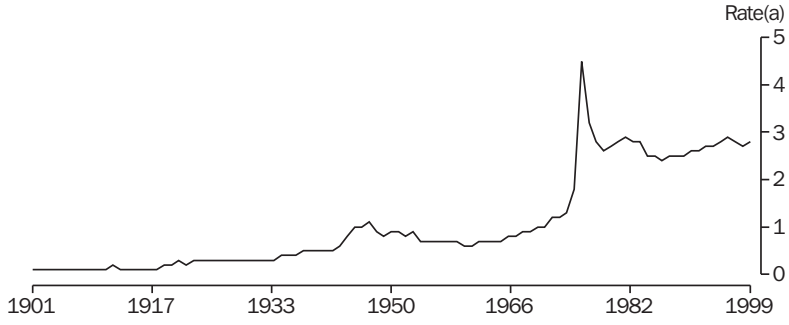
Divorces

For most of this century there has been a slow but steady rise in the numbers of divorces granted each year, increasing from annual averages of 0.1 divorces per 1,000 population between 1901 and 1910 to 0.8 per 1,000 between 1961 and 1970. However, the most important factor involved in the higher divorce rates in the latter quarter of the century has been the introduction of the *Family Law Act 1975* which came into operation on 5 January 1976. This legislation allows only one ground for divorce: irretrievable breakdown of the marriage, measured as the separation of the spouses for at least one year. Following the implementation of this law, there was a large increase in the divorce rate in 1976. The rate then declined until 1979 as the backlog of applications was cleared. Since then the crude divorce rate has fluctuated between 2.4 and 2.9 divorces per 1,000 population (graph 5.42). The pattern of divorces per 1,000 married couples is very similar; in 1999 there were 12.7 divorces per 1,000 married couples.

A study of marriages from 1977 to 1994 (*Marriages and Divorces, Australia, 1994* (3310.0)) found that about 43% of all marriages are likely to end in divorce: 8% within five years of marriage, 19% within ten years, 32% within twenty years and 39% within thirty years. Remarriages following divorce have the highest risk of divorce. The probability of divorce is slightly lower for first marriages and much lower for remarriages following widowhood.

Table 5.43 brings together summary measures of divorces for Census years between 1901 and 1986, and individual years between 1990 and 1999.

5.42 CRUDE DIVORCE RATE



(a) Rate per 1,000 population.

Source: Marriages and Divorces, Australia (3310.0).

5.43 SELECTED SUMMARY MEASURES OF DIVORCES

Year ended 31 December	Divorces granted no.	Crude divorce rate(a)	Median age at date decree made absolute: Husband years	Median age at date decree made absolute: Wife years
1901	398	0.1	n.a.	n.a.
1921	1 490	0.3	n.a.	n.a.
1933	1 954	0.3	n.a.	n.a.
1947	8 705	1.1	n.a.	n.a.
1954	6 457	0.7	37.8	34.5
1961	6 712	0.6	38.7	35.9
1966	9 859	0.8	40.4	36.9
1971	12 947	1.0	37.9	34.4
1976	63 230	4.5	36.2	33.1
1981	41 412	2.8	35.5	32.8
1986	39 417	2.5	37.5	34.7
1990	42 635	2.5	38.2	35.3
1991	45 652	2.6	38.4	35.5
1992	45 729	2.6	38.7	35.9
1993	48 363	2.7	39.3	36.4
1994	48 312	2.7	39.7	36.8
1995	49 712	2.8	40.0	37.1
1996	52 466	2.9	40.2	37.4
1997	51 288	2.8	40.3	37.6
1998	51 370	2.7	40.5	37.8
1999	52 566	2.8	40.9	38.2

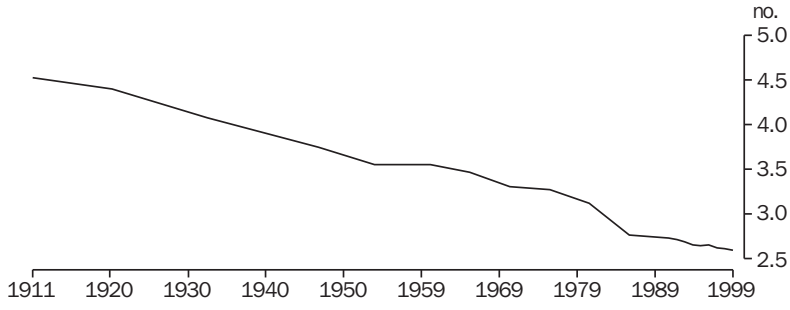
(a) Per 1,000 population.

Source: Australian Demographic Statistics (3101.0); Marriages and Divorces, Australia (3310.0).

Households and families

At June 1999 there were an estimated 7.2 million households in Australia, which were home to an estimated 18.6 million Australians or 98% of the resident population. Over the past 90 years the number of households has increased by an average 2.4% per year, compared to an average 1.6% increase per year in the population over the same period. Reflecting the disproportionate growth in households is the fall in average size of households—from 4.5 in 1911 to 2.6 in 1999 (graph 5.44). Much of the decline in the number of persons per household this century can be attributed to reductions in completed family size, and the concomitant increase in one- and two-person households over the period. The number of one-person households has grown largely from the ageing of the population, while a combination of ageing, increased childlessness among couples and an increase in the number of one-parent families has contributed to the two-person households.

5.44 AVERAGE HOUSEHOLD SIZE, Persons Per Household



Source: Year Book Australia 1988: Census of Population and Housing, 30 June 1981: Summary Characteristics of Persons and Dwellings (2443.0); Household Estimates, Australia (3229.0); Australian Demographic Statistics (3101.0).

In 1976, 60% of families were made up of couples with children. By 1996 this had fallen to 50% (table 5.45). Part of this change can be attributed to the increase in one parent families with dependent children, but most of the change is due to the increase in the proportion of couple-only families. People are having children later in life, and are living longer. They are spending more time living in couple-only families, both before they have children and after their children have left home.

Further characteristics of households and families are available from *Labour Force Status and Other Characteristics of Families, Australia* (6224.0).

Household and family projections

Household and family projections are estimates of future numbers of households and families, based on assumptions about changing living arrangements of the population. The ABS has published three series of projections for the years 1996 to 2021. These series are based on varying assumptions about trends in living arrangements. In Series A the pattern of living arrangements of individuals is the same as in 1996. In Series B and C, recent trends in the patterns of living arrangements are incorporated into the projections. In Series B the average annual rate of change in living arrangements experienced between 1986 and 1996 is applied in reducing levels (in full between 1996 and 2001, in fractions to 2011, and then held constant to 2021). In Series C the rate of change experienced between 1986 and 1996 is applied in full throughout the projection period.

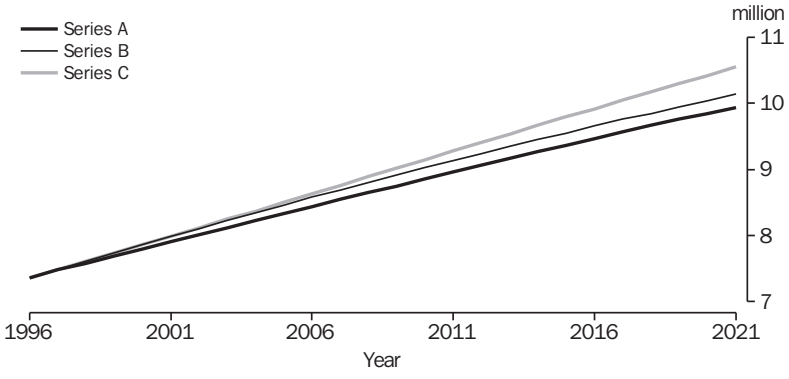
5.45 FAMILY TYPE—1976–96

	1976(a)	1981(a)	1986(a)	1991(a)	1996
Family type	%	%	%	%	%
One parent family with dependent children	6.5	8.6	7.8	8.8	9.9
Couple only	28.0	28.7	30.3	31.4	34.1
Couple with dependent children	48.4	46.6	44.8	44.4	40.6
Couple with non-dependent children only	11.1	10.0	10.9	9.5	9.0
Other families	5.9	6.0	6.2	5.9	6.4
Total	100.0	100.0	100.0	100.0	100.0

(a) Excludes caravan park dwellers.

Source: 1976–91: Australian Social Trends, 1994 (4102.0); 1996 Census of Population and Housing.

5.46 PROJECTED NUMBER OF HOUSEHOLDS—AUSTRALIA



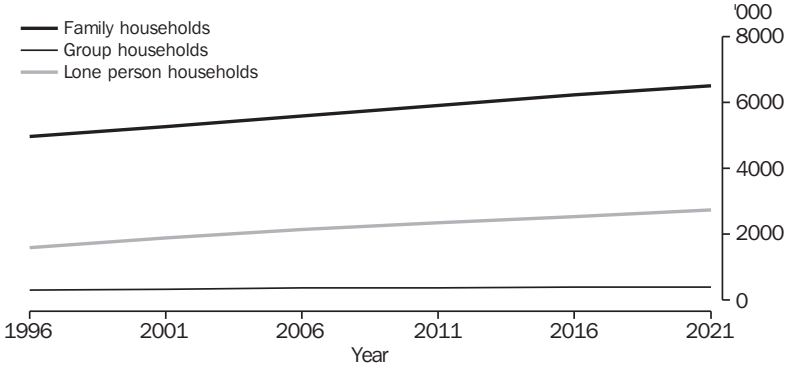
Source: Household and Family Projections, Australia, 1996 to 2021 (3236.0).

Household types

The projections show continuing growth in the number of households in Australia in the period 1996–2021. The number of households is projected to increase from 6.9 million in 1996 to between 9.4 and 10.0 million in 2021 (graph 5.46). This represents a growth in the number of households of between 38% and 46% between 1996 and 2021, compared to a projected 24% increase in the population over the same period.

The average household size in Australia is projected to decline from 2.6 persons in 1996 to between 2.2 and 2.3 persons per household in 2021. The projected decrease in average household size reflects the projected rise in the proportion of lone person households and couples without children. Lone person households are projected to grow by between 1.7% and 3.1% per year between 1996 and 2021 to comprise between one-quarter and one-third of all household types by 2021. The ageing of the population, increases in divorce and separation, and delaying marriage, are all contributing factors to the growth in lone person households (Hugo 1999). While lone person households are projected to grow the fastest of all household types, family households are projected to remain the predominant household type. Family households are projected to grow by between 0.9% and 1.2% per year over the 1996–2021 period, to comprise between 62% and 71% of all household types in 2021, compared to 73% of all households in 1996 (graph 5.47).

5.47 PROJECTED NUMBER OF HOUSEHOLDS, HOUSEHOLD TYPE—SERIES B



Source: Household and Family Projections, Australia, 1996 to 2021 (3236.0).

5.48 PROJECTED NUMBER OF FAMILIES, By Family Type, Australia

Series	1996 '000	2001 '000	2006 '000	2011 '000	2016 '000	2021 '000
Series A						
Couple families with children	2 483.8	2 660.7	2 798.2	2 902.1	2 985.7	3 054.7
Couple families without children	1 735.1	1 894.2	2 078.2	2 281.1	2 482.5	2 658.8
One-parent families	742.3	797.1	845.7	889.6	929.6	966.2
One-parent families, male parent	114.9	126.3	136.4	145.2	152.8	159.6
One-parent families, female parent	627.4	670.8	709.3	744.4	776.8	806.6
Other families	94.4	98.4	103.7	109.3	114.3	118.2
Total	*5 055.6*	*5 450.4*	*5 825.8*	*6 182.1*	*6 512.1*	*6 798.0*
Series B						
Couple families with children	2 483.8	2 448.1	2 471.4	2 513.5	2 589.8	2 654.0
Couple families without children	1 735.1	1 952.5	2 168.7	2 389.9	2 597.5	2 782.2
One-parent families	742.3	852.5	929.2	987.7	1 028.9	1 066.4
One-parent families, male parent	114.9	129.6	141.3	150.9	158.7	165.6
One-parent families, female parent	627.4	722.9	787.9	836.8	870.2	900.9
Other families	94.4	96.7	101.3	105.6	108.3	109.1
Total	*5 055.6*	*5 349.7*	*5 670.6*	*5 996.7*	*6 324.4*	*6 611.8*
Series C						
Couple families with children	2 483.8	2 448.1	2 366.3	2 252.1	2 122.6	1 988.1
Couple families without children	1 735.1	1 952.5	2 195.8	2 455.0	2 712.3	2 946.5
One-parent families	742.3	852.5	956.2	1 054.1	1 146.3	1 231.4
One-parent families, male parent	114.9	129.6	142.6	153.6	163.0	170.4
One-parent families, female parent	627.4	722.9	813.6	900.4	983.3	1 061.0
Other families	94.4	96.7	102.5	110.1	117.4	123.1
Total	*5 055.6*	*5 349.7*	*5 620.8*	*5 871.2*	*6 098.6*	*6 289.2*

Source: Household and Family Projections, Australia, 1996 to 2021 (3236.0).

Family types

Couple families with children are projected to grow slowly over the projection period, reflecting a gradual trend away from this type of family. This trend is related both to the rapid increase in couple families without children, and the increase in one-parent families, and is driven by ageing, the decline in fertility and increased marital break-up. The number of couple families is projected to either grow slowly or decline slowly, depending on the series employed. In Series A, couple families with chilren are projected to grow from 2.5 million in 1996 to around 3.1 million in 2021, while in Series C (full continuation of recent trends), couple families with children are projected to decline to 2.0 million in 2021(table 5.48).

Of all family types, couple families without children are projected to increase most rapidly over the period 1996–2021. Couple families without children are projected to grow from 1.7 million in 1996 to between 2.7 and 2.9 million in 2021, average annual growth of between 1.7% and 2.1%. In Series B and C, couple families without children are projected to surpass couple families with children as the most common family type by the year 2016.

One-parent families are projected to increase from 742,000 families in 1996 to between 966,000 and 1.2 million in 2021, representing average annual growth of between 1.1% and 2.0% over the period. Female one-parent families, which made up 85% of all one-parent families in 1996, are projected to maintain or slightly increase this proportion in 2021.

Citizenship

Until just after Federation, the various State Governments issued certificates of naturalisation. In 1904, when the *Naturalisation Act 1903* came into force, only the Federal Government issued certificates of naturalisation in the Commonwealth. Naturalisation conferred upon its recipient the rights and obligations of a British subject born in the Commonwealth. The concept of Australian citizenship was effectively introduced when the *Nationality and Citizenship Act 1948* (since renamed the *Australian Citizenship Act 1948*) came into effect on Australia Day 1949. Between that day and June 1999, 3.3 million grants of Australian citizenship were made. The number of grants has fluctuated from year to year (graph 5.49) in response to a range of factors such as changes in the size of the

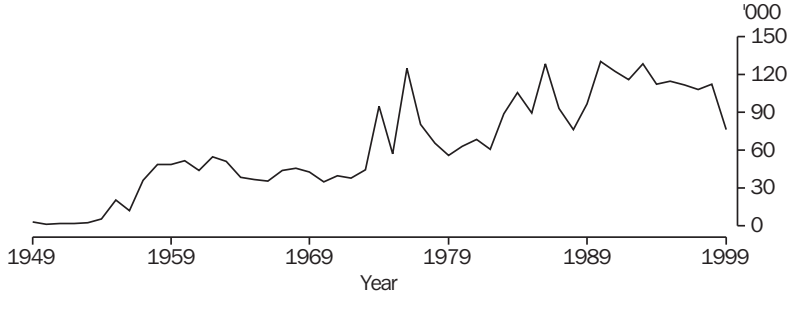
immigration intake, and the country of birth and migration category composition of that intake. For example, people who migrate to Australia under the Refugee Program or the Special Humanitarian Programs are more likely to apply for citizenship than those who migrate in the Skill Stream component of the migration program. Campaigns encouraging long established migrants to become citizens, and legislative changes during the 1970s and 1980s, are also likely to have influenced the number of applications for citizenship in particular years.

According to the Australian Citizenship Council in 2000, "Australian Citizenship allows Citizens to participate fully in the community in which they live". The Council considered "that for many Australians there is an additional dimension to the lived experience of citizenship—the sense of belonging and of commitment to the country where we have been born or where we have decided to make our home". Formally, the main responsibilities and privileges of citizenship are voting, jury service, defence of Australia if the need arises, and eligibility to apply for an Australian passport and for certain jobs (i.e. public office, Member of Parliament, defence forces). A citizen of Australia is expected to pledge loyalty to Australia, share in the beliefs of the democratic process, respect the rights and liberties of other Australians, and uphold and obey Australia's laws. Being born in Australia no longer automatically entitles a child to Australian citizenship. Today citizenship is conferred automatically only on children born to at least one parent who is a citizen or permanent resident of Australia.

Standardising gives the citizenship rates that would be expected if a given overseas-born population had the same profile of age and period of residence in Australia as the total overseas-born population (table 5.50). The standardised citizenship rate for the Greek-born population was 87%. Based on standardised rates, people born in Viet Nam had the highest rate of citizenship (90%) in 1996.

People born in the main English speaking countries, such as the United Kingdom and New Zealand, had low standardised citizenship rates. This may be because "...the shared language, and strongly similar legal, political, and industrial relations arrangements of Australia and the other Anglo-American countries lead these immigrants to feel less need to make a choice of national identity." (Evans, M. 1988).

5.49 PERSONS GRANTED CITIZENSHIP—1949–1999



(a) Data represent calendar years for 1949 to 1955 inclusive, January to June for 1956, and financial years thereafter.

Source: Department of Immigration and Multicultural Affairs, Consolidated Statistics and Annual Reports.

5.50 CITIZENSHIP RATES, By Country of Birth—1996

Country	Persons '000	Citizenship rate %	Standardised citizenship rate(a) %
Viet Nam	151.1	88.5	89.6
Former Yugoslav Republics	175.4	87.5	87.3
Greece	126.5	96.1	87.3
China	111.0	48.6	76.3
Italy	238.2	78.8	65.6
Germany	110.3	75.8	63.1
Netherlands	87.9	77.7	60.4
United Kingdom	1 124.0	60.5	57.5
New Zealand	291.4	32.3	38.3
Total overseas born	**3 901.9**	**67.8**	**67.8**

(a) The rates of citizenship that would be expected if the population had the same age and period of residence profile as the total overseas born population.

Source: Unpublished data, 1996 Census of Population and Housing.

5.51 FORMER NATIONALITY, People Granted Australian Citizenship—1998–99

Citizenship	no.	%
British	13 529	17.7
Chinese(a)	10 947	14.3
New Zealander	6 320	8.3
Vietnamese	3 083	4.0
Indian	2 695	3.5
Filipino	2 606	3.4
Bosnian-Herzegovinian	1 841	2.4
Sri Lankan	1 707	2.2
Iraqi	1 698	2.2
Fijian	1 665	2.2
South African	1 606	2.1
Chinese (Taiwan)	1 102	1.4
Lebanese	1 091	1.4
Korean	1 085	1.4
American(b)	1 083	1.4
Malaysian	1 002	1.3
Turkish	951	1.2
Cambodian	940	1.2
Iranian	876	1.1
Pakistani	734	1.0
Irish	724	0.9
Bangladeshi	637	0.8
Italian	624	0.8
Thai	590	0.8
Canadian	576	0.8
Ukrainian	467	0.6
Polish	458	0.6
Maltese	432	0.6
Egyptian	430	0.6
Portuguese (incl. Macau)	370	0.5
German	356	0.5
Afghan	333	0.4
Greek	296	0.4
Romanian	285	0.4
Chilean	279	0.4
Other nationalities	11 425	14.9
Stateless	1 044	1.4
Total	**76 474**	**100.0**

(a) People's Republic of China including Hong Kong Special Administrative Region. (b) Citizen of the United States of America including American Samoa.

Source: Department of Immigration and Multicultural Affairs, 'Immigration Update'.

In the late 1960s, former citizens of the United Kingdom and Ireland increased their take-up of Australian citizenship and represented 10% of grants of citizenship between 1965 and 1970, third after former Italian citizens (21%) and former Greek citizens (13%). In the 1970s, legislative changes concerning applications for citizenship and visa requirements affected Commonwealth citizens in Australia. Since then, the United Kingdom and Ireland have consistently been the largest source of new Australian citizens. About 32% of all citizenship grants since 1970 have been to people from these countries. Most recently, in 1998–99 around 19% were to people from these countries while 14% were to people from China (table 5.51).

Religion

In 1983, the High Court of Australia defined religion as "a complex of beliefs and practices which point to a set of values and an understanding of the meaning of existence".

At the time of European settlement, the Aboriginal inhabitants followed their own religions which were animistic in nature, involving belief in spirits behind the forces of nature and the influence of ancestral spirit beings.

During the 1800s, European settlers brought their traditional churches to Australia. These included the Church of England (now the Anglican Church), and the Methodist, Catholic, Presbyterian, Congregationalist and Baptist churches. In 1838, German Lutherans arrived in South Australia. From the 1840s onwards, groups such as Mormons, Swedenborgians, Spiritualists, Christadelphians, Seventh-day Adventists, Christian Scientists and Jehovah's Witnesses arrived in Australia.

Separation of church and state, and the freedom to exercise any religion, were principles enshrined in Section 116 of the 1900 Act to constitute the Commonwealth of Australia (Australian Constitution). With the exception of a small but significant Lutheran population of Germanic descent, Australian society in 1901 was predominantly Anglo-Celtic, with 40% of the population being Church of England, 23% Catholic, 34% other Christian and about 1.4% professing non-Christian religions. While the population had more than doubled by 1954, the denominational mix had changed little, with 38% Church of England (Anglican), 23% Catholic, 28% other Christian denominations and 0.6% non-Christian religions.

Further waves of migration helped to reshape the profile of Australia's religious diversity over subsequent decades. The impact of migration from Europe in the aftermath of World War II led to increases in affiliates of the Orthodox Churches, the establishment of Reformed bodies, growth in the number of Catholics (largely from Italian migration), and the creation of ethnic parishes among many other denominations.

More recently, immigration from South East Asia and the Middle East has expanded Buddhist and Muslim numbers considerably, and increased the ethnic diversity of existing Christian denominations. In response to the 1996 Census question, Australians' stated religious affiliations were: 27% Catholic, 22% Anglican, 22% other Christian denominations and 3% non-Christian religions. Approximately one-quarter of all Australians either stated that they had no religion or did not adequately respond to the question.

Growth in the proportion who either stated that they had no religion, or who did not state an affiliation with any religion, has been an area of substantial change. In every Census taken in Australia, a voluntary question on religious affiliation has been asked. Since 1933, the voluntary nature of the religion question has been specifically stated. In 1971, the instruction 'if no religion, write *none*' was introduced. The percentage who stated that they had no religion increased from 0.4% of the population in 1901 to almost 17% by 1996. At the same time there has been an even larger percentage point decrease in the proportion stating an affiliation with Christianity, from 96% in 1901 to 71% in 1996. Table 5.52 provides a summary of the major religious affiliations at each Census since 1901.

5.52 MAJOR RELIGIOUS AFFILIATIONS

	Religious affiliation							
	Christianity							
Census year	Anglican %	Catholic %	Other %	Total %	Other religions %	No religion %	Not stated/ inadequately described %	**Total '000**
1901	39.7	22.7	33.7	96.1	1.4	0.4	(a)2.0	**3 773.8**
1911	38.4	22.4	35.1	95.9	0.8	0.4	(a)2.9	**4 455.0**
1921	43.7	21.7	31.6	96.9	0.7	0.5	(a)1.9	**5 435.7**
1933	38.7	19.6	28.1	86.4	0.4	0.2	12.9	**6 629.8**
1947	39.0	20.9	28.1	88.0	0.5	0.3	11.1	**7 579.4**
1954	37.9	22.9	28.5	89.4	0.6	0.3	9.7	**8 986.5**
1961	34.9	24.9	28.4	88.3	0.7	0.4	10.7	**10 508.2**
1966	33.5	26.2	28.5	88.2	0.7	0.8	10.3	**11 599.5**
1971	31.0	27.0	28.2	86.2	0.8	6.7	6.2	**12 755.6**
1976	27.7	25.7	25.2	78.6	1.0	8.3	11.4	**13 548.4**
1981	26.1	26.0	24.3	76.4	1.4	10.8	11.4	**14 576.3**
1986	23.9	26.0	23.0	73.0	2.0	12.7	12.4	**15 602.2**
1991	23.8	27.3	22.9	74.0	2.6	12.9	10.5	**16 850.3**
1996	22.0	27.0	21.9	70.9	3.5	16.6	9.0	**17 752.8**

(a) Includes 'object to state'.

Source: Unpublished data, Census of Population and Housing.

5.53 RELIGIOUS AFFILIATION

	1991		1996		
	No.	Proportion	No.	Proportion	Growth
	'000	%	'000	%	%
Christianity					
Anglican	4 018.8	23.8	3 903.3	22.0	–2.9
Baptist	279.8	1.7	295.2	1.7	5.5
Catholic	4 606.7	27.3	4 799.0	27.0	4.2
Churches of Christ	78.3	0.5	75.0	0.4	–4.2
Jehovah's Witness	74.7	0.4	83.4	0.5	11.6
Lutheran	250.9	1.5	250.0	1.4	–0.4
Orthodox	474.9	2.8	497.0	2.8	4.7
Pentecostal	150.6	0.9	174.7	1.0	16.0
Presbyterian and Reformed	732.0	4.3	675.5	3.8	–7.7
Salvation Army	72.3	0.4	74.1	0.4	2.5
Uniting Church	1 387.7	8.2	1 334.9	7.5	–3.8
Other Christian	339.6	2.0	420.6	2.4	23.9
Buddhism	139.8	0.8	199.8	1.1	42.9
Hinduism	43.6	0.3	67.9	0.4	54.4
Islam	147.5	0.9	200.9	1.1	36.2
Judaism	74.3	0.4	79.8	0.4	7.6
Other religions	40.0	0.2	68.6	0.4	71.6
No religion	2 176.6	12.9	2 948.9	16.6	35.5
Not stated/inadequately described	1 762.1	10.5	1 604.7	9.0	–8.9
Total	**16 850.3**	**100.0**	**17 752.8**	**100.0**	**5.4**

Source: Unpublished data, 1991 and 1996 Censuses of Population and Housing.

While Australia's population grew by 5.4% in the five years to 1996, stated affiliations to many religions grew at a far greater rate, and others declined. Between the 1991 and 1996 Censuses there was a 35% increase in the number of people with no religion. Anglican affiliates decreased by 115,455 (2.9%) while Catholic affiliates increased by 192,299 (4.2%). However both groups decreased their proportion of total religious affiliation. Other Christian denominations which showed a decrease in affiliates were Presbyterian and Reformed (7.7%), Churches of Christ (4.2%), the Uniting Church (3.8%) and the Lutheran Church (0.4%).

The Christian groups that showed the largest percentage increases in affiliates were Pentecostal (16.0%) and Jehovah's Witness (11.6%). Affiliates of other religions, while only 3.5% of the population in 1996, have shown the largest increases since the 1991 Census. Stated affiliation to Hinduism increased by 54.5%, to Buddhism by 42.9%, to Islam by 36.2% and to Judaism by 7.6%. These changes partly resulted from trends in immigration. In 1996, 48% of those who had arrived in Australia since 1991 were affiliated to Christianity, 23% had no religion, 8% were affiliated to Buddhism, 8% to Islam and 1% to Judaism.

Table 5.53 shows the breakdown of religious groupings by the number and percentage of affiliates at the 1991 and 1996 Censuses, and the growth which occurred during that five-year period.

Languages

Languages spoken in Australia include Australian Indigenous languages, English and many other languages spoken mainly by immigrants and their children. Language was not a focus of statistical research at the turn of the century. However, early Census information on 'race and nationality' suggests that Chinese languages and German may have been the most commonly spoken languages in Australia at that time, besides English and Australian Indigenous languages (Coghlan 1904). Language experts estimate that there may have been about 250 Australian Indigenous languages at the time of European settlement, made up of a much greater number of dialects (AIATSIS1994).

By 1900, many of the Australian Indigenous languages originally spoken in south-eastern Australia would have been lost, as the local populations which spoke them had died or been displaced as a result of European settlement. However, rough estimates were that there were about 100,000 Indigenous people living in areas remote from European settlement, in Queenland,

Western Australia and South Australia (including the Northern Territory), and many languages would have been current among these people (Coghlan 1904). Over the twentieth century, European settlement of these areas continued, and the Indigenous languages surviving today are mostly spoken by people in those regions in the centre and north of Australia which are still relatively sparsely populated.

By the end of the century, increased immigration, from a greater range of source countries, had increased the proportion of the population who spoke a language other than English. In 1996, about 2.5 million people (16% of the population five years and over) spoke a language other than English at home. Over 200 languages were spoken. The leading five languages other than English were Italian, Greek, Cantonese, Arabic/Lebanese and Vietnamese. Each of these were spoken by more than 100,000 people. A further ten languages were spoken by more than 40,000 people. Most people who spoke a language other than English were born overseas (74%), while 26% were Australian-born. After Indigenous languages, Greek, Italian and Arabic had the largest proportions of Australian-born speakers, partly reflecting a greater rate of maintenance of these languages among the second generation of these language groups.

About 44,000 people spoke an Australian Indigenous language or an Australian creole (a language developed from pidgin English) in the home (table 5.54). Speakers of these languages made up 14% of Indigenous people and 0.3% of the Australian population. Some 64% of Indigenous people in the Northern Territory spoke an Indigenous language or creole at home. Speakers of 48 Australian Indigenous languages were enumerated in the Census. The two languages with the most speakers were Arrente, a central Australian language (3,468 speakers), and Dhuwal~Dhuwala, an Arnhem land language (3,219 speakers).

Within the group who spoke a language other than English at home, proficiency in English as reported in the Census varied according to age and whether or not they were Australian-born. Over 92% of 5 to 24 year olds spoke English well or very well, compared with 59% of those aged 65 years and over (table 5.55). Those born in Australia had a consistently greater proficiency in English, with close to 96% speaking English well or very well, compared to 82% overall. However, proficiency in speaking English well had increased slightly in all age groups since the 1991 Census.

5.54 PERSONS(a) WHO SPOKE A LANGUAGE OTHER THAN ENGLISH AT HOME—1996

Language spoken at home	Males '000	Females '000	Persons '000	Proportion Australian-born %	Persons as a proportion of population %
Italian	183.6	183.7	367.3	40.7	2.3
Greek	130.3	128.7	259.0	46.7	1.6
Cantonese	91.6	98.5	190.1	12.9	1.2
Arabic/Lebanese	83.7	78.3	162.0	37.8	1.0
Vietnamese	67.3	66.7	134.0	12.6	0.8
German	46.3	50.3	96.7	18.9	0.6
Mandarin	42.7	44.6	87.3	6.4	0.5
Spanish	42.2	44.6	86.9	17.6	0.5
Macedonian	34.8	33.3	68.1	34.9	0.4
Tagalog (Filipino)	26.0	41.3	67.3	5.0	0.4
Croatian	33.7	33.0	66.7	32.4	0.4
Polish	28.3	32.7	61.0	16.2	0.4
Maltese	22.4	22.3	44.7	27.9	0.3
Indigenous languages & creoles	21.8	22.4	44.2	98.9	0.3
Turkish	21.7	20.6	42.2	31.3	0.3
Netherlandic (Dutch/Flemish)	18.3	21.9	40.2	12.4	0.3
All other(b)	323.5	333.4	656.9	15.2	4.1
Total	**1 218.3**	**1 256.3**	**2 474.6**	**26.0**	**15.5**

(a) Excludes children aged under five years. (b) Excludes inadequately described languages.

Source: 1996 Census of Population and Housing.

5.55 PROFICIENCY IN ENGLISH, Persons Who Spoke a Language Other than English at Home—1996

Proficiency in English	Unit	Age group (years) 5–24	25–44	45–64	65 & over	**Total**
Total population speaking other than English at home						
Speaks English well/very well	%	92.2	84.6	74.9	59.3	**81.5**
Does not speak English well	%	6.9	13.8	21.6	28.7	**15.4**
Does not speak English at all	%	0.9	1.6	3.5	11.9	**3.1**
Total	%	100.0	100.0	100.0	100.0	**100.0**
Total(a)	no.	720 744	865 365	600 818	287 662	**2 474 589**
Australian-born population speaking other than English at home						
Speaks English well/very well	%	95.5	97.2	90.1	79.3	**95.6**
Does not speak English well	%	4.0	2.4	8.1	15.2	**3.8**
Does not speak English at all	%	0.5	0.4	1.8	5.4	**0.6**
Total	%	100.0	100.0	100.0	100.0	**100.0**
Total(b)	no.	386 155	213 885	30 553	8 240	**638 833**

(a) Includes 37,000 people who did not state how well they spoke English. (b) Includes 14,000 people who did not state how well they spoke English.

Source: 1996 Census of Population and Housing.

Bibliography

ABS publications

Australia in Profile (2821.0).

Australian Demographic Statistics (3101.0).

Australian Demographic Trends (3102.0).

Australian Demography (Commonwealth Bureau of Census and Statistics, Bulletins produced 1900–1969).

Australian Social Trends (4102.0).

Births, Australia (3301.0).

Census of Population and Housing, 30 June 1981: summary characteristics of persons and dwellings, Australia (2443.0).

Census of the Commonwealth of Australia, 3rd April 1911, Volume II (Commonwealth Bureau of Census and Statistics).

Deaths, Australia (3302.0).

Demographic Estimates and Projections: Concepts, Sources and Methods. Available in the Statistical Concepts Library on the ABS Internet site at *http://www.abs.gov.au*

Estimated Resident Population by Country of Birth, Age and Sex, Australia (3221.0).

Experimental Estimates of the Aboriginal and Torres Strait Islander Population, 30 June 1991–30 June 1996 (3230.0).

Experimental Projections of the Aboriginal and Torres Strait Islander Population, 30 June 1996–30 June 2006 (3231.0).

Family Characteristics, Australia (4442.0).

Household and Family Projections, Australia 1996–2021 (3236.0).

Household Estimates, Australia (3229.0).

Labour Force Status and Other Characteristics of Families, Australia (6224.0).

Marriages and Divorces, Australia (3310.0).

Migration, Australia (3412.0).

Official Year Book of the Commonwealth of Australia 1901–1910, No.4, 1911 (Commonwealth Bureau of Census and Statistics).

Overseas Arrivals and Departures, Australia (3401.0).

Population by Age and Sex, Australian States and Territories (3201.0).

Population Projections, Australia 1999 to 2101 (3222.0).

Regional Population Growth, Australia (3218.0).

Year Book Australia 1994 (1301.0).

Year Book Australia 1988 (1301.0).

Other publications and references

Australian Citizenship Council 2000, *Australian Citizenship for a New Century*, available on the Internet site of the Australian Department of Immigration and Multicultural Affairs (the Citizenship Council page at *http://www.immi.gov.au/citizenship/report.htm*).

Australian Institute of Aboriginal and Torres Strait Islander Studies 1994, *Encyclopedia of Aboriginal Australia*, Aboriginal Studies Press, Canberra. Also available on CD-ROM.

Bureau of Immigration, Multicultural and Population Research 1978, *Australian Immigration—Consolidated Statistics*, No. 10, AGPS, Canberra.

Coghlan, T.A. 1904, *A Statistical Account of Australia and New Zealand 1903–4*, Sydney: Govt. Printer.

Commonwealth of Australia Constitution Act, available on the Internet site of the Parliament of Australia (the Senate page at *http://www.aph.gov.au/senate/general/*). Also published in *Year Book Australia 1998* (1301.0).

Department of Immigration and Multicultural Affairs:

—*Annual Report (various years)*, DIMA, Canberra.

—1999, *Australian Citizenship, 1996 Census: Statistical Report number 26*, DIMA, Canberra.

—2000, *Fact Sheet 66. Australian Citizenship*, DIMA, Canberra.

—*Australian Immigration: Consolidated Statistics* (various nos, various years), DIMA, Canberra.

—1995, 1996, 1997, 1998, 1999, *Immigration Update*, DIMA, Canberra.

Hugo, G. 1986, *Australia's Changing Population*, Oxford University Press, Melbourne.

Hugo, G. 1999, *Demographic Trends Influencing Housing Needs and Demands In Australia*. Paper presented to AHURI Workshop on Innovation in Housing, Melbourne.

Evans, M. 1988, ''Choosing to be a citizen: the time-path of citizenship'', in *Australia International Migration Review*, Vol. 22, No. 2.

Pollard, J. H. 1986, ''Causes of Death in Australia 1971–81'', in *Journal of the Australian Population Association*, Vol. 3, No. 1, 1986, Canberra.

Statistics New Zealand, *New Zealand Demographic Trends 1998*.

Statistics New Zealand, *National Population Estimates, March 2000 quarter*.

United Nations Development Programme (UNDP) 2000, *Human Development Report 2000,* UNDP, New York, Oxford, Oxford University Press. Also available for downloading from the UNDP Internet site (see below).

United Nations 1999, *1997 Demographic Yearbook*, United Nations, New York.

U.S. Bureau of the Census, *International Data Base*, at *http://www.census.gov/ipc/www/idbnew.html*

Internet sites

Australian Institute of Aboriginal and Torres Strait Islander Studies, at *http://www.aiatsis.gov.au*

Commonwealth Department of Immigration and Multicultural Affairs, at *http://www.immi.gov.au*. The Australian Immigration Statistics page is at *http://www.immi.gov.au/statistics/*

United Nations Development Programme, at *http://www.undp.org*

A century of population change in Australia

Professor Graeme Hugo

Professor Graeme Hugo is professor of the Department of Geographical and Environmental Studies and Director of the National Key Centre in Research and Teaching in Social Applications of Geographical Information Systems at the University of Adelaide. He completed his PhD in demography at the Australian National University in 1975 and subsequently took up an appointment at Flinders University in South Australia. He has since held visiting positions at the University of Iowa, University of Hawaii, Hasanuddin University (Indonesia) and the Australian National University and has worked with a number of international organisations, as well as many Australian government departments and instrumentalities.

He is the author of over two hundred books, articles in scholarly journals and chapters in books, as well as a large number of conference papers and reports.

In 1987 Professor Hugo was elected a fellow of the Academy of Social Sciences in Australia and has been president of the Australian Population Association and was a member of the National Population Council. He was a member of the International Union for the Scientific Study of Population Committee on South-North Migration and two panels of the Australian Research Council.

Introduction

In 1901 Australia's population numbered 3,788,123. Of these people in 1999 around 4,000 were still alive, but in their lifetime the national population has increased more than five fold. Substantial change in the national population, however, has not been restricted to increasing numbers because the composition and also the spatial distribution of the Australian population was transformed over the period. Shifts in population tend to be more gradual and less sudden than economic, social and political changes and hence less dramatic. However, they are just as important in influencing Australian society. Year Book Australia has charted these shifts and indicated just how substantial and striking the changes have been in Australian demography. The present article, a companion to *Chapter 5, Population* of *Year Book Australia 2001*, summarises the major changes in population levels, composition and spatial distribution which have occurred since the publication of the first Year Book in 1908. It draws upon ABS data collections over the last century, especially those from censuses of population and housing, registration statistics, international migration statistics and, to a lesser extent, information from national surveys. Over the years there have been major changes not only in the way data have been collected and disseminated but also in the questions asked, and concepts adopted, in data collections (Paice, 1990).

Australian Year Books published over the last century represent an important national archive of the shifts which have occurred not only in the nation's demography but also in the economy and society more broadly. They chart the transition from a predominantly Anglo-Celtic to a multicultural society, from a dominance of male breadwinner families to a greater diversity of family and household types, from a country in which 41.3% lived in rural areas to one where 14% lived in such areas, and where the proportion of workers in agriculture fell from 30.2% in 1911 to 4.3% in 1996 and those in manufacturing increased from 26.4% in 1901 to 28.0% in 1954 but then fell to 12.5% in 1998–99. Australia has gone from a situation in which there were 111 men to every 100 women but now there are 99, in which 25.0% of women working outside the home has risen to 54.4% and from when women had 3.8 children on

average to an average now of 1.7. These and many more changes have been a cause and consequence of the social, economic and political change that has swept Australia over the last century.

Population size and growth

At the turn of the century Australia's population of 19,080,800 ranked it as the fiftieth largest country in the world by population. The population is currently growing at 1.2% per annum, which is close to the rate at which the world's population is increasing and well above those of most other OECD countries, as table C4.1 indicates.

The national population increased steadily in the first half century after Federation, but as the chapter's graph 5.3 shows, it increased more steeply after World War II.

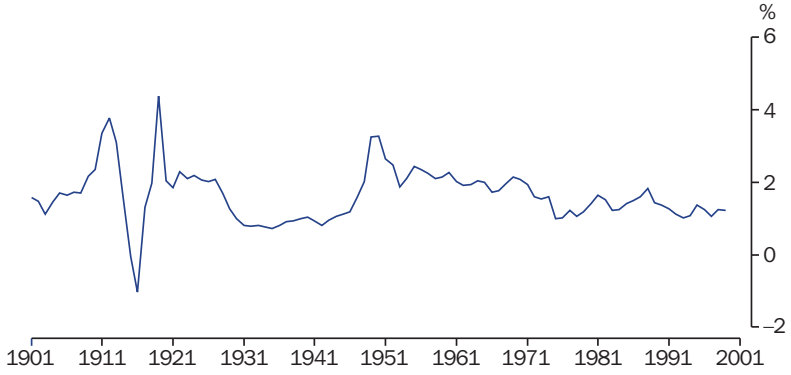
However, a different picture emerges if we examine changes in the rate of growth of the population in graph C4.2 where the fluctuations are in contrast to the steady increases depicted in graph 5.3. The two world wars and the Great Depression of the 1930s stand out as periods of low population growth while the last half century has been an era of sustained growth, albeit with rates higher in the first half of the period than in the second.

C4.1 AVERAGE ANNUAL RATES OF POPULATION GROWTH

Country/region	Year(s)	Rate per annum
World	1990–2000	1.4
World	1980–1990	1.7
Less Developed Countries	1990–2000	1.7
More Developed Countries	1990–2000	0.3
Europe and the New Independent States	1990–2000	0.1
North America	1990–2000	1.0
ESCAP Region	1999–2000	1.5
Indonesia	1998–1999	1.4
Australia	1999–2000	1.1

Source: McDevitt 1999; Population Reference Bureau 1999 and 2000; ESCAP 1999.

C4.2 AUSTRALIA, Rate of Population Growth per Annum—1901 to 1999



Source: CBCS 1912; ABS 1986; ABS Australian Demographic Statistics (3101.0), various issues.

C4.3 POPULATION GROWTH SINCE EUROPEAN SETTLEMENT, Time Elapsed Between Successive Millions—1788 to 1999

	Year and month attained		Interval since previous million attained		Average annual rate of population growth
Population	Year	Month	Years	Months	%
One million	1858	n.a.	70	n.a.	n.a.
Two million	1877	n.a.	19	n.a.	3.7
Three million	1889	n.a.	12	n.a.	3.4
Four million	1905	n.a.	16	n.a.	1.8
Five million	1918	n.a.	13	n.a.	1.7
Six million	1925	n.a.	7	n.a.	2.6
Seven million	1939	n.a.	14	n.a.	1.1
Eight million	1949	November	10	n.a.	1.3
Nine million	1954	August	4	9	2.5
Ten million	1959	March	4	7	2.3
Eleven million	1963	December	4	9	2.0
Eleven million	1963	October	. .	. . .	. .
Twelve million	1968	June	4	8	1.9
Thirteen million	1972	September	4	3	1.9
Thirteen million	1971	March	. .	. .	. .
Fourteen million	1976	March	5	0	1.5
Fifteen million	1981	October	5	7	1.2
Sixteen million	1986	August	4	10	1.3
Seventeen million	1990	February	3	6	1.6
Eighteen million	1995	March	5	1	1.2
Nineteen million	1999	August	4	5	1.2

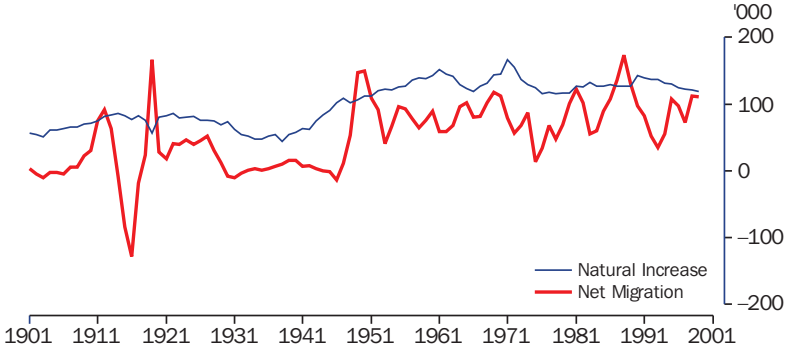
Source: Year Book Australia (1301.0), various issues; Australian Demographic Statistics (3101.0), various issues.

At the time of arrival of the first European settlers it was thought that over 300,000 indigenous people lived in Australia. It took 70 years for the population to reach a million, and table C4.3 indicates that there was a subsequent speeding up of the rate at which millions were added to the population until the slowdown of the Depression and World War II. The progression over the post-war period from seven and a half million to over 19 million at the end of the twentieth century has seen millions added at rates of between 3 years and 6 months and 5 years and seven months. (See also the chapter's article *Million milestones*.)

National population growth can be disaggregated into natural increase (births minus deaths) and net migration (immigrants minus emigrants). Graph C4.4, and the chapter's graph 5.6, indicate that net migration has been a much more volatile element in population change, with levels fluctuating between net losses in the two wars and Depression and high levels of gain before and after World War I and after World War II.

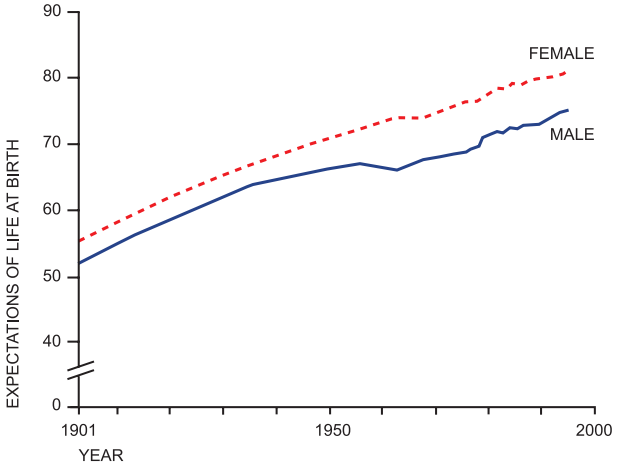
The graph shows how significantly different the second half century has been compared with the first and how important net migration has been in post-war population growth in Australia. Natural increase levels increased steeply in the early post-war years, peaking in the early 1970s, but in recent years have generally been between 120,000 and 140,000. In the last two decades the annual contribution of net migration to population growth in Australia has varied between 17.8% (1993) and 55.5% (1989). Of the last million persons added to Australia's population it is estimated that some 47% were contributed by net international migration.[1] To understand the effects of natural increase and net migration it is necessary to consider the processes of population change—mortality, fertility and migration—separately.

C4.4 NATURAL INCREASE AND NET MIGRATION, Australia—1901 to 1999



Source: CBCS Demography Bulletins; ABS 1986; ABS Australian Demographic Statistics (3101.0), various issues.

C4.5 EXPECTATIONS OF LIFE AT BIRTH, Australia—1901 to 1998



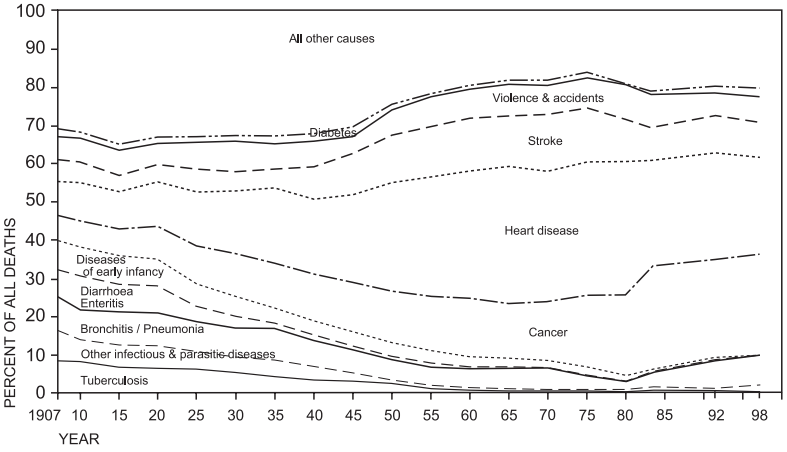
Source: Hugo 1986; ABS Deaths, Australia (3302.0), various issues.

Mortality

No achievement of Australia's twentieth century could have been greater than the fact that a baby girl born at the time of Federation could expect to live to 58.84 years of age while her counterpart a century later could look forward to 23 years more life.[2] Graph C4.5 shows the pattern of increase in life expectancy[3] over the last century; it is interesting that the gap between males and females has widened over the century from 3.7 to 8.1 years in the 1960s before converging to 5.3 years in 1998.

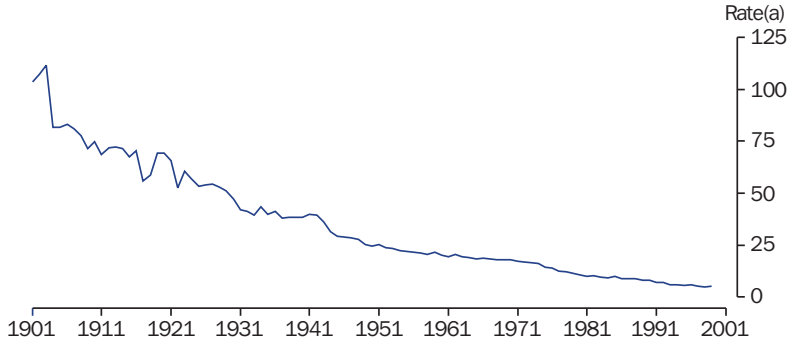
Genetic differences account for only around two years of the difference, so the remainder is explainable in terms of different patterns of lifestyle. The widening of the gap in the first decade of the century is associated with a substantial shift which occurred in the causes of death. At the time of Federation the majority of deaths occurring in Australia were caused by infectious disease. However, as graph C4.6 shows, there was an increase throughout the century in the proportion of deaths due to degenerative disease.

C4.6 CUMULATIVE CAUSE OF DEATH RATIOS, Australia—1907 to 1998



Source: CBCS Year Book of the Commonwealth of Australia, various issues; CBCS Demography Bulletins; ABS Causes of Death, Australia (3302.0), various issues.

C4.7 INFANT MORTALITY RATE, Australia—1901 to 1999



(a) Rate per 1,000 live births.

Source: CBCS 1908; ABS 1986; ABS Deaths, Australia (3302.0), various issues.

Lifestyle effects such as the effects of diet, smoking, drinking, driving etc. are much greater in degenerative causes of death than in deaths caused by infectious disease. Cancer, heart disease and stroke accounted for one in five deaths in 1901 and now account for more than two-thirds.

This transformation has been a function of many things—improved sanitation, better diets, education, improved therapeutic measures, advances in drug therapy etc. The downturn in death from stroke and heart disease in the last thirty years is evident in graph C4.6. This has been due to both lifestyle changes (reduced smoking, increased action-oriented leisure, improved diets) as well as medical advances (the infrastructure of intensive care units, heart bypass surgery, better detection of heart disease etc.). It has had the important effect of improving the life expectancy among the older population. For the century preceding the early 1970s the bulk of improvement in Australian life expectancy had come about through a decrease in infant, child and, to a lesser extent, maternal mortality. In 1901 more than 1 in 10 babies born in Australia died before they reached their first birthday. Graph C4.7, however, shows how this was drastically reduced over

the last century so that by 1999 the Infant Mortality Rate[4] had fallen from 103.6 in 1901 to 5.3 in 1999.

Perhaps there is no better indicator of the massive improvements which have occurred in the wellbeing of Australians over the last century than the fact that at the time of Federation more than 100 out of every 1,000 babies born died before their first birthday, while at the centenary of Federation it has been reduced to 5.3. The causes of this change are many—improvements in pre-natal and post-natal care, reduced unplanned fertility, development of techniques to deal with prematurity, drug development, improved diet, improved sanitation, improved birth conditions etc.

The improvements in infant mortality were a major cause of increase in life expectancy at birth. However, improvements in life expectancy at older ages were not as great. For example, the life expectancy of Australians over age 50 changed little over that period, improving 1.6 years for men and 4.2 years for women between 1870 and 1970 (Hugo 1986, 21). However, between 1970–72 and 1998 the improvement was 4.69 years for men and 4.87 years for women. This was largely a result of the reduction in death from ischaemic heart disease. What this meant was that there has been in Australia an unanticipated greater degree of survival of our elderly population. Moreover, service providers have been dealt a 'double whammy': not only have they been confronted with a situation in which there are an unexpectedly large number of older people surviving, but the survivors may be 'sicker' on average than in the past. The people 'rescued from death' by the new developments in medicine etc., who previously would have died, are generally not rescued in full health. Accordingly, the incidence of illness and disability among the elderly population has increased.

Hence table C4.8 indicates that the incidence of disability and hardship among the older population has increased in Australia between 1981 and 1998.

Fertility

The twentieth century both began and ended with widespread concern about low and declining fertility in Australia.

As graph 4.9 shows, the Total Fertility Rate[5] (TFR) was close to 4 in 1901, but this represented a decline of more than a third over the previous thirty years, and such was the concern that in August 1903 the New South Wales government appointed a Royal Commission on the Decline of the Birth Rate (Hicks 1978). The main statistical evidence examined by the committee was an essay prepared by T.A. Coghlan (1903). Almost a century later McDonald (2000, p. 19) wrote "Given the pace of fertility decline in Australia in the 1990s, we should be seriously addressing the full range of policy measures".

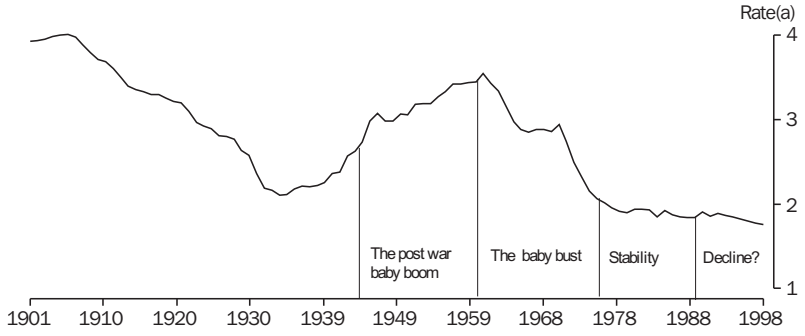
The long term fertility decline which began in most European and 'New World' nations in the 1870s continued in the early part of the century and bottomed out in the Great Depression when Australian women reached replacement levels of fertility[6] due to postponement of marriage and of childbearing in marriage. Low fertility continued throughout World War II, but the 'post-war baby boom' saw the TFR peak at 3.6 in 1961. This was a result initially of a catch-up factor among those who had delayed childbearing during the Depression and war, but it was sustained by near universal marriage, reduction in ages at marriage, low unemployment, availability of housing, reduced infecundity and immigration effects. This created a baby boom bulge in the Australian age pyramid which has had a huge influence, on not only the demography of the nation, but on the society and economy more widely, and it will continue to do so.

C4.8 PROPORTION OF POPULATION WITH DISABILITIES, Australia—1981 to 1998

	1981	1988	1993	1998
Age group (years)	%	%	%	%
65–69	33.1	41.5	39.5	40.5
70–74	38.5	48.2	53.1	49.8
75 and over	53.1	63.4	64.0	67.5
All people	**13.2**	**15.5**	**16.6**	**18.8**

Source: Australian Bureau of Statistics 1999a, 18.

C4.9 TOTAL FERTILITY RATE, Australia—1901 to 1999



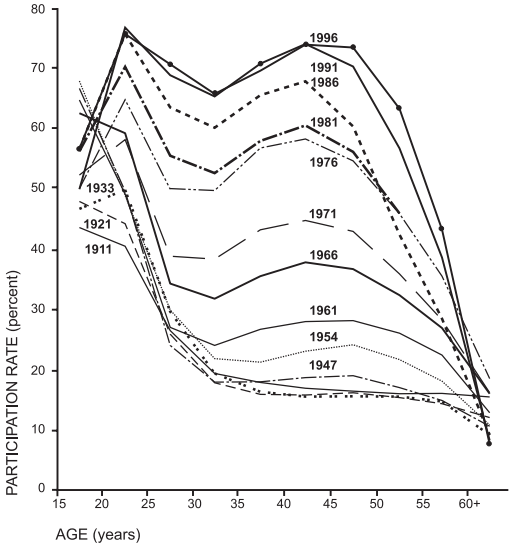
(a) Average number of babies per woman according to the age-specific fertility rates for each year.

Source: CBCS Demography Bulletins; ABS Births, Australia (3301.0), various issues.

The year 1961 heralded a major change in Australian society with the introduction of the contraceptive pill, which for the first time gave Australian women almost total control over how many children they had and when they had them. Australian fertility also began to fall precipitously at this time, but this was mainly due to a major shift in the role of women within the society which saw larger numbers work outside of the home and pursue education than had been the case previously. Associated with this came increases in age at marriage, increased divorce and increased de facto partnering. There were significant developments influencing the role of women such as the removal of gender differences in salaries for the same work and developments toward equal opportunity.

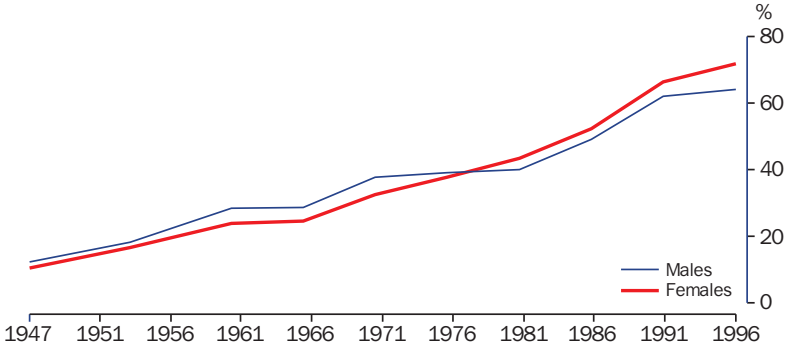
The dramatic shift in the role of women in post-war Australia is evident in graph C4.10, which also shows how female participation in the workforce outside of the home changed little between the 1911 and 1947 censuses.

C4.10 FEMALE LABOUR PARTICIPATION RATES, By Age, Australia—1911 to 1996



Source: Australian Censuses 1911 to 1996.

C4.11 PERCENTAGES OF MALES AND FEMALES AGED 15–19 IN FULL-TIME EDUCATION, Australia—1947 to 1996



Source: Australian Censuses 1947 to 1996.

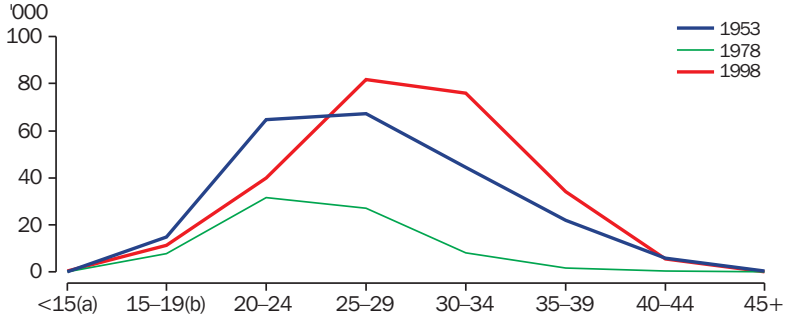
Since then, however, each post-war census until 1991 saw an upward movement in participation in most age groups, especially in the childbearing age years. Only between 1991 and 1996 was there a small decline, and this undoubtedly was due to some discouraged worker effects. Similarly, graph C4.11 shows a massive increase in participation in the upper years of secondary school and post-school education among Australian young women over the post-war period.

Indeed their levels of participation passed those of males in the mid-1970s. The trends in graphs C4.10 and C4.11 are both a cause and consequence of low fertility in Australia. There are also other factors involved. The incidence of abortion since the liberalisation of abortion laws in the seventies is important, and in recent times there has been a consistent pattern of around one in five pregnancies resulting in an abortion. Clearly it is apparent that abortion is being used as a form of contraception as well as a way of protecting the rights of women. There is thus a need for improvement in birth control education, although a 1995 survey showed that 66.7% of Australian women aged between 18 and 49 were taking some form of contraceptive (ABS 1998, 30).

Surveys indicate that Australian women on average preferred to have two children, but fertility fell in the early 1970s and stabilised around 1.8 in the late 1970s and 1980s. In many other developed countries, however, fertility continues to fall, so that in Japan, Southern Europe, most of the Germanic countries, and most European countries the TFR has fallen below 1.4 (McDonald 2000, 6). The situation in Australia in the 1990s has attracted a great deal of attention since the TFR has fallen from 1.89 in 1992 to 1.74 in 1999, a decline of 7.9%. Some have suggested that this may mean that Australia has entered a fourth post-war fertility phase which will see a decline of fertility toward those currently experienced across most of Europe (e.g. McDonald and Kippen 1999). This is despite the fact that Australian young women continue to indicate on average that they want two children. There are institutional elements in Australian society presenting barriers which prevent them achieving this. McDonald (2000) argues that women are not achieving their desired fertility because of the high cost of children, the risk of making long term commitments and the uneven nature of gender equity in contemporary Australia. He argues that the current system rewards stay-at-home mothers and mothers who work full-time, but penalises those who prefer a balanced compromise between work and home.

It is not only with respect to the numbers of children that Australian fertility has changed during the post-war period. Graph 4.12 shows the shift which has occurred in the age at which Australian women have their children.

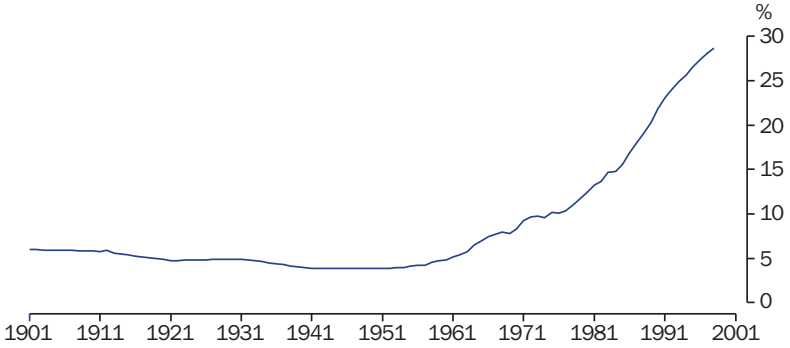
C4.12 AGE DISTRIBUTION OF WOMEN HAVING BABIES, Australia—1953, 1978 and 1998



(a) Includes those aged 15 in 1998. (b) Figure is for those aged 16–19 in 1998.

Source: CBCS 1960; ABS 1980; ABS 1999b.

C4.13 EX-NUPTUAL BIRTHS AS A PROPORTION OF ALL BIRTHS, Australia—1901 to 1998



Source: CBCS Demography Bulletins; ABS Births, Australia (3301.0), various issues.

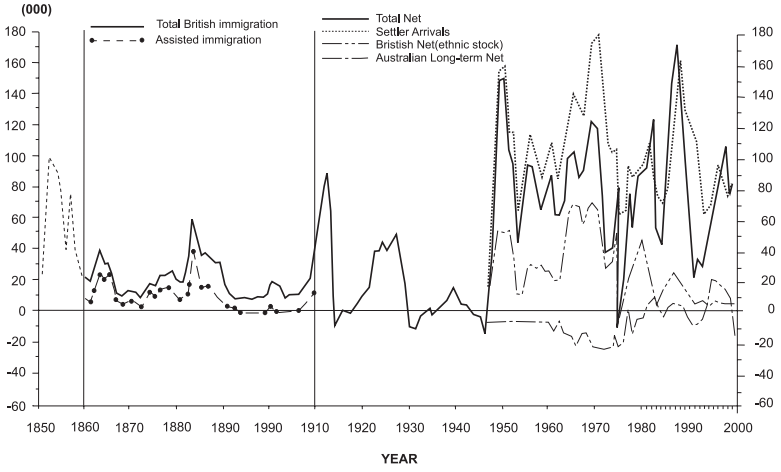
There has been a significant increase in the age of childbearing as women spend a longer period in education and in the workforce before having children. With the fall in fertility there has been a major shift in the numbers of children in families, with an increasing concentration on the two-child family. There also have been some important shifts in the proportion of Australian women who remain childless by the time they reach post-childbearing ages. Merlo and Rowland (2000) have estimated that around 30% of women born around Federation were childless, but this fell to below 10% for the women that produced the baby boom, while it is anticipated that around 20% of women currently in the reproductive age will remain childless.

There has been a shift through the century with an increasing proportion of births occurring outside marriage, as graph C4.13 indicates.

International migration

In 1901, 22.8% of Australians were born overseas; the proportion was exactly the same in 1996. However, this apparent lack of change belies the fact that international migration has not only had a massive impact, on the growth of the national population over the last century, but it has transformed the composition of the population and impinged on almost all aspects of life. The trajectory of twentieth century immigration to Australia is depicted in graph C4.14; it is apparent that the end of World War II is an important watershed in the level of movement.

C4.14 ANNUAL MIGRATION, Australia—1850 to 1999

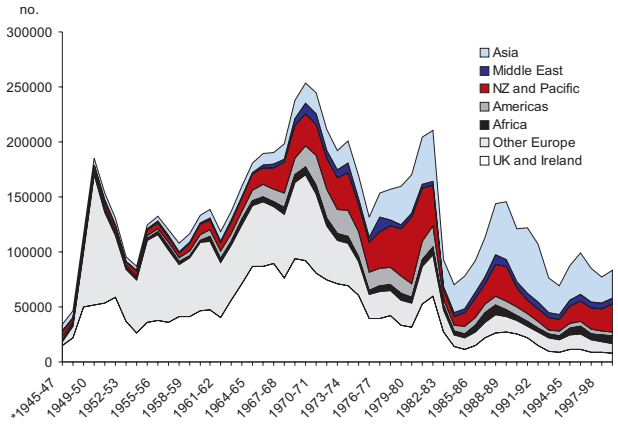


Source: Price 1979; Hugo 1986; ABS Overseas Arrivals and Departures, Australia (3401.0); DIMA 1999a.

The last fifty years have seen an unprecedentedly high and sustained influx of immigrants to Australia. However, it is not only with respect to scale that there was a parametric change in immigration in mid-century. One of the first acts of the new Commonwealth in 1901 was to pass the infamous White Australia Policy (Price 1975) which ensured that Australia's immigrants should be not only of European origin but predominantly Anglo-Celtic. In the immediate post-World War II period, however, the shortages of labour, but also an inability to attract sufficient immigrants from the British Isles and the existence of several million 'Displaced Persons' (DPs) from Eastern Europe, saw a change in policy. Australia accepted around 300,000 DPs and, despite concerns that such numbers of non-Anglo-Celtic background people would not be able to adjust, they were enormously successful. This then led to settlers being recruited from elsewhere in Western and Northern Europe, then in the 1950s from Southern Europe and in the 1960s from parts of Eastern Europe and the Middle East. Over these decades the White Australia Policy was gradually dismantled until by the mid-1970s it was totally abolished. Thereafter settlers were attracted to Australia from non-European origins, especially Asia.

Accordingly, as graph C4.15 shows, the post-war period has seen a series of phases in the composition of the stream of settlers coming to Australia.

C4.15 SETTLER ARRIVALS BY REGION OF LAST RESIDENCE, Australia—-1947 to 1999(a)



* The first marker shown related to the period July 1945 to June 1947. Thereafter the markers represent years July to June.

Source: DIMA Australian Immigration Consolidated Statistics, various issues; ABS Migration, Australia (3412.0), various issues.

C4.16 CULTURAL DIVERSITY, Australia—1901 and 1996

	1901	1996(a)
	%	%
Birthplace(b)		
Australia	77.2	77.2
New Zealand	0.7	1.7
Europe	20.0	12.9
UK and Ireland	18.0	6.6
Other	2.0	6.4
Asia	1.2	5.9
Other	0.8	2.2
Total	*100.0*	*100.0*
Religious affiliation(c)		
Christian	98.1	77.9
Anglican	40.5	24.2
Catholic	23.2	29.7
Other	34.4	24.0
Anglican	40.5	24.2
Jewish	0.4	0.5
Other affiliation	1.0	3.3
No affiliation	0.5	18.3
Total	*100.0*	*100.0*
	'000	'000
Total population	3 773.8	17 752.8
Indigenous population	93.0	386.0

(a) Excludes overseas visitors. (b) As defined and classified in 1901. Not known categories have been prorated across known categories. (c) Excludes people whose religious affiliation was not known.

Source: ABS 2000b, 7.

The United Kingdom remained the largest single source country until recently. The bulk of the remainder of settlers until the late 1960s were from elsewhere in Europe, but with the dismantling of the White Australia Policy there was a diversification of origins. Hence the twentieth century saw a transformation of Australia from an overwhelmingly Anglo-Celtic, homogeneous population in which 95.2% had been born in Australia, the

United Kingdom or Ireland, to one of the world's most multicultural societies by 1996, when 16.2% had been born elsewhere. Moreover, 19% were Australia-born persons with at least one parent born overseas and 8% had at least one parent born in a country in which English is not the main language. Table C4.16 indicates that while the country remains Christian, the proportion of the population with no religious affiliation increased substantially, as did the proportion of the population with non-Christian religions.

The impact of immigration on post-war population growth in Australia was enormous. Of the growth of 11,501,442 people between 1947 and 1999, some 7 million can be attributed to the net gain of immigrants, their children and grandchildren (Kippen and McDonald, forthcoming). However, the impact of immigration has been much more than numerical. The element of heterogeneity migrants have injected into the Australian population has been demonstrated by Price (1997), who has developed a methodology to estimate the ethnic strength[7] of various groups. His estimates shown in table C4.17 indicate that the Asian origin population has increased from 0.3% in 1947 to 6.4% in 1999 and is anticipated to increase to around 10% in 2030 if trends in the late 1990s are continued. Immigration has impinged significantly upon most aspects of Australian life and society.

For most of the twentieth century the dominant paradigm in Australian international migration has been one of permanent settlement. Motives of government immigration policies changed over the century from demographic and expanding the labour force imperatives for most of the periods of high immigration up to the 1970s to a more complex mix of the need to fill skill gaps, family reunion, humanitarian and trans-Tasman movement. Graphs C4.18a to C4.18d show that the relative size of each main category of migration has fluctuated, especially in the balance between those settling in Australia under the family migration program and those gaining eligibility in the skill category.

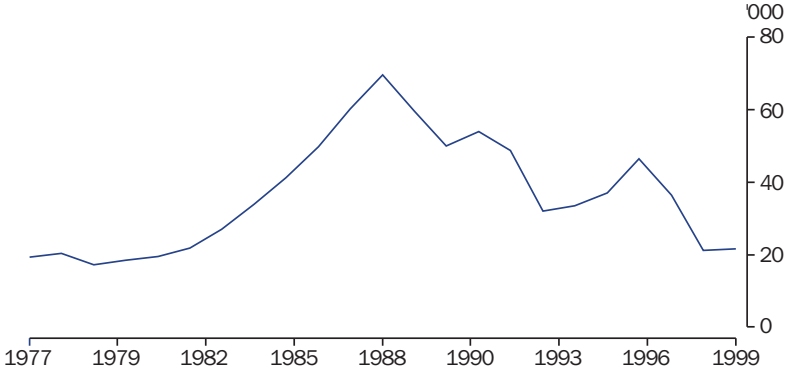
C4.17 ETHNIC STRENGTH, Australia—1947, 1987, 1999 and 2030(a)

	1947	1987	1999	2030
	%	%	%	%
Anglo-Celtics	89.8	74.6	69.9	66.3
West European	5.6	7.4	6.9	7.5
East European	0.4	3.9	4.4	4.4
South European	1.5	7.1	7.0	6.1
West Asian (Middle East)	1.5	2.1	2.5	2.6
Jewish	n.a.	n.a.	0.7	n.a.
South Asian	0.1	0.6	1.2	1.9
South-East Asian	—	1.2	2.5	4.0
East Asian	0.2	1.4	2.7	4.5
African	—	0.1	0.1	0.4
Latin American	1.0	0.3	0.1	1.0
Pacific Islander	0.1	0.3	0.5	0.6
Aboriginal/Torres Strait Islander	0.8	1.0	1.5	0.9
Total	*100.0*	*100.0*	*100.0*	*100.0*

(a) Projection based on assumed 80,000 net migration per annum.

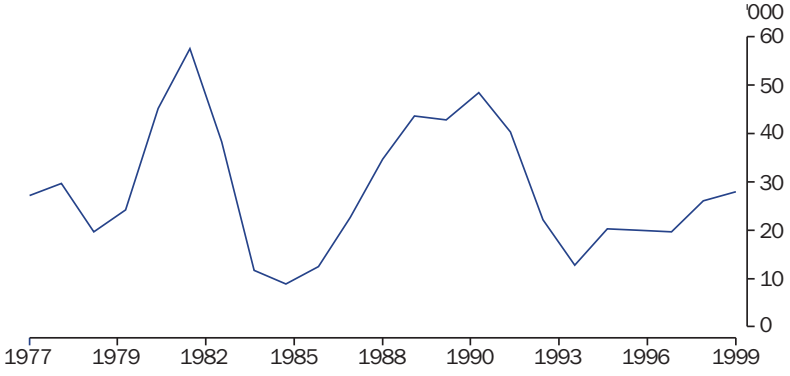
Source: Price 1989, 62; unpublished estimates of Charles Price.

C4.18a TRENDS IN INTAKE BY TYPE OF SETTLER, Family—1977 to 1999



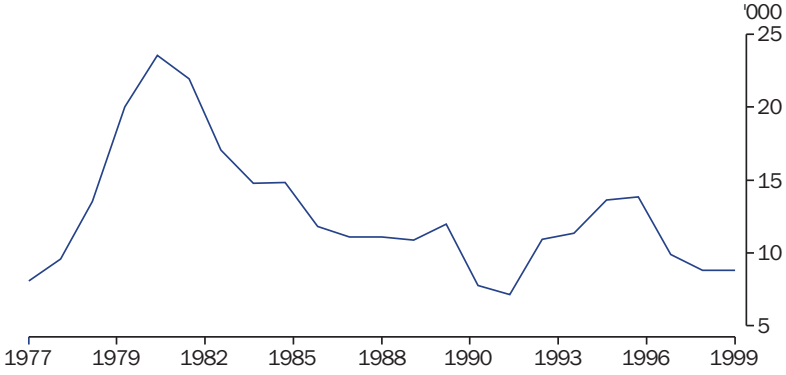
Source: DIMA Immigration Update, various issues.

C4.18b TRENDS IN INTAKE BY TYPE OF SETTLER, Skill—1977 to 1999



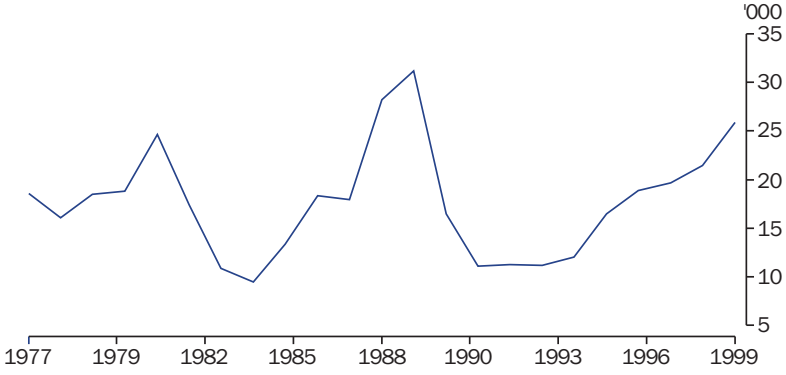
Source: DIMA Immigration Update, various issues.

C4.18c TRENDS IN INTAKE BY TYPE OF SETTLER, Humanitarian—1977 to 1999



Source: DIMA Immigration Update, various issues.

C4.18d TRENDS IN INTAKE BY TYPE OF SETTLER, Other/NZ Citizens—1977 to 1999



Source: DIMA Immigration Update, various issues.

It could be argued that during the 1990s Australia moved into a different international migration paradigm under the influence of widespread globalisation forces. This has seen not only a larger scale, but also a more complex pattern, of international population movement influencing the country (Hugo 2000). The change is reflected in trends in the three types of in-movement recognised by the Department of Immigration and Multicultural Affairs[8] between 1982–83 and 1998–99. Table C4.19 indicates that while the number of permanent arrivals has remained relatively stable, there has been a massive increase in both long term and short term movements.

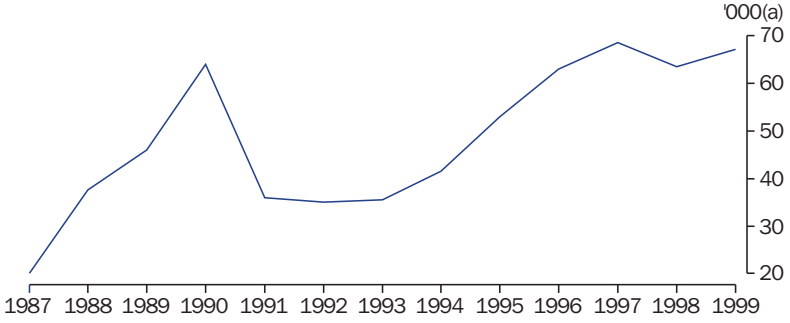
Over recent times there has been a proliferation of new visa types involving non-permanent movers, especially those involving temporary movement for work. Some of these cut across the short term and long term categories. Graphs C4.20a to C4.20d show the growth in numbers in the largest longer term movement categories.

C4.19 POPULATION MOVEMENT INTO AND OUT OF AUSTRALIA—1982–83 to 1998–99

	1982–83	1998–99	Growth 1982–99
	no.	no.	%
	ARRIVALS		
Permanent	83 010	84 143	+1.4
Long-term			
Residents	48 990	67 910	+38.6
Visitors	30 740	119 892	+290.0
Total	*79 730*	*187 802*	*+135.5*
Short-term			
Residents	1 240 800	3 191 600	+157.2
Visitors	930 400	4 288 000	+360.9
Total	*2 171 200*	*7 479 700*	*+244.5*
	DEPARTURES		
Permanent	24 830	35 181	+41.7
Long-term			
Residents	47 020	82 861	+76.2
Visitors	25 440	57 420	+125.7
Total	*72 460*	*140 281*	*+93.6*
Short-term			
Residents	1 259 100	3 188 700	+153.3
Visitors	907 500	4 279 100	+371.5
Total	*2 166 600*	*7 467 800*	*+244.7*

Source: Bureau of Immigration and Population Research 1993; DIMA 1999a.

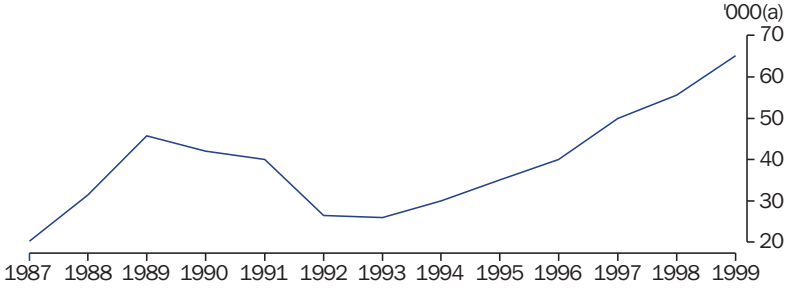
C4.20a LONG TERM MIGRATION TO AUSTRALIA BY CATEGORY, Overseas Students, Year ended 30 June—1987 to 1999



(a) Number of student visas granted offshore.

Source: DIMA Population Flows: Immigration Aspects, various issues.

C4.20b LONG TERM MIGRATION TO AUSTRALIA BY CATEGORY, Working Holiday Makers, Year ended 30 June—1987 to 1999

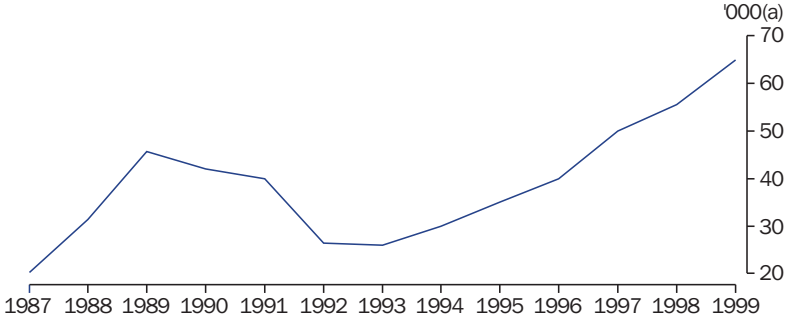


(a) Number of working holiday visas granted offshore.

Note: Data up to and including 1988–99 comprise total working holiday maker arrivals.

Source: DIMA Population Flows: Immigration Aspects, various issues.

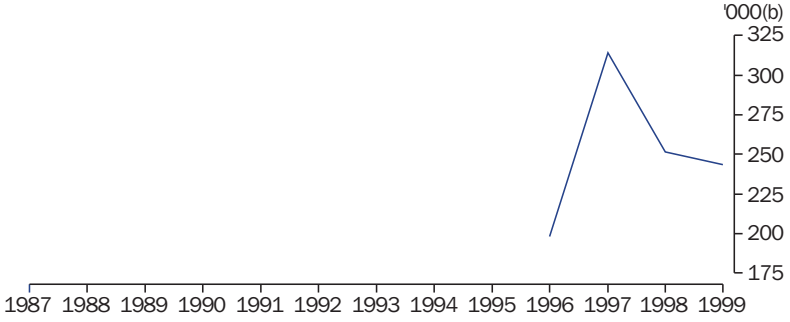
C4.20c LONG TERM MIGRATION TO AUSTRALIA BY CATEGORY, Visitors, Year ended 30 June—1987 to 1999



(a) Number of visaed visitor arrivals.

Source: DIMA Population Flows: Immigration Aspects, various issues.

C4.20d LONG TERM MIGRATION TO AUSTRALIA BY CATEGORY, Temporary Business Entrants, Year ended 30 June—1987(a) to 1999



(a) Data not available prior to 1995–96. (b) Number of temporary entry visas granted.

Source: DIMA Population Flows: Immigration Aspects, various issues.

The growth in students from overseas coming to study in Australia is evident, although the onset of the economic crisis in Asia in 1997 saw a small downturn. The Working Holiday Maker Program, which enables foreign nationals aged 18 to 30 from selected countries to work for up to 12 months, has involved a similar number of arrivals each year to the overseas student visa category. The most striking change, however, has been in the category of Temporary Business Entrants introduced in 1995, which has seen a substantial influx of short term workers in Australia. Kinnaird (1999) has estimated that in mid 1998 there were over 200,000 people in Australia temporarily who had work rights.

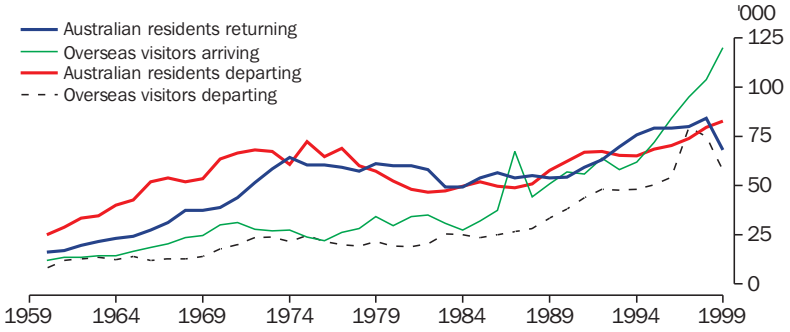
There has been a spectacular growth in short term movement, predominantly through the growth of tourism, into and out of Australia. Tourism has become one of the nation's major areas of export earnings (15.1% in 1998). At any point in time Australia's resident population is augmented by a substantial number of foreigners visiting the country (e.g. on 30 June 1999 there were 169,150, equivalent to 0.9% of the resident population).

Australia has long had an emphasis on attracting permanent settlers to the country and a strongly expressed opposition to attracting temporary and contract workers. During the labour shortage years of the 1950s and 1960s Australia's migration solution to the problem contrasted sharply with that of European nations like Germany and France when it opted to concentrate on attracting permanent migrants to meet

worker shortages rather than contract workers. However, in recent years attitudes have changed in Australia and it has been recognised that, in the context of globalised labour markets, it is essential to have mechanisms to allow non-permanent entry of workers in certain groups. Nevertheless, this entry has not been extended to unskilled and low-skilled areas and has been restricted to people with particular skills and entrepreneurs. Hence there has been an increase in people coming to Australia as short term or long term entrants and being able to work in the country.

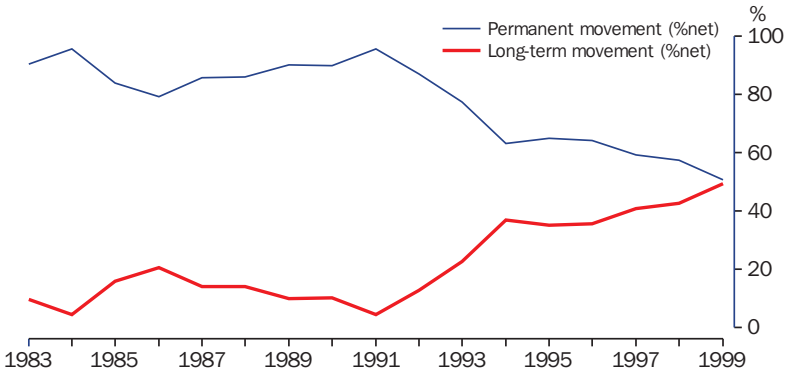
The significance of people coming to work in Australia temporarily is especially evident in the expansion of long term entrants in Australia shown in graph C4.21. This has had an impact, at least in the short term, on overall net migration gains in Australia. It will be noted from graph C4.22 that an increasing proportion of Australia's net migration gain in recent years has been from an excess of long term arrivals over long term departures, and a reducing proportion has been from an excess of settler arrivals over permanent departures.

C4.21 LONG TERM ARRIVALS AND DEPARTURES, Australia, Year ended 30 June—1960 to 1999



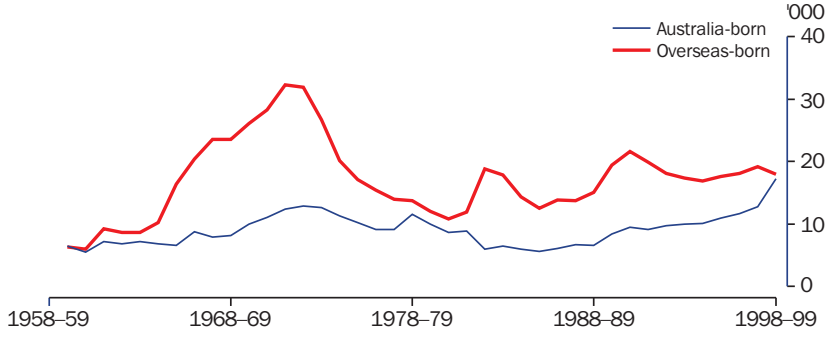
Source: DIMA, Australian Immigration Consolidated Statistics and Immigration Update, various issues.

C4.22 NET PERMANENT AND LONG TERM MOVEMENT, Australia—1983 to 1999



Source: DIMA 1999.

C4.23 PERMANENT DEPARTURES OF AUSTRALIA-BORN AND OVERSEAS BORN PERSONS, Australia—1959–60 to 1998–99



Note: Prior to 1983, overseas-born departures comprise former settler departures and Australia-born departures comprise permanent departures other than former settlers.

Source: DIMA Australian Immigration Consolidated Statistics and Immigration Update, various issues.

There is a tendency for Australia to be categorised as a purely immigration country; in fact it is also a country of significant emigration. The ratio of permanent emigration to permanent immigration has varied between 14% and 52% since 1968, but the ratio has been comparatively high in recent years. Over the post-war period there has been a close relationship between immigration and emigration trends, the latter tending to follow the former with a small time lag. This is because, as graph C4.23 indicates, former settlers have been a major part of emigration over the years.

The return migration effect has been understated in the data since a significant number of the Australia-born are the dependent children of overseas-born returnees. In 1998–99 permanent departures from Australia (35,181) reached the highest level since 1973–74 and the proportion of Australia-born (49%) was the second highest ever recorded, indicating an increasing trend for the Australian population to emigrate. It is apparent from graph C4.23 that there has been an upward trend in the numbers of Australia-born permanent departures in the 1990s, which is indicative of a greater tendency for Australia-born adults deciding to move overseas on a permanent basis associated with the globalisation of labour markets.

In recent times undocumented migration to Australia has come under increased attention. This movement is of two types:

- overstaying, whereby non-citizens enter Australia legally but overstay the term of their visa;
- clandestine entry of non-citizens who do not pass though an immigration control point or enter with forged documents.

Much is known in Australia about overstayers since there is a high quality Movement Data Base, and all persons arriving in and departing from the country are required to complete a card which facilitates matching and detection of overstayers.

Table C4.24 shows that through the 1990s around 50,000 overstayers have been identified using this matching.

C4.24 NUMBER OF OVERSTAYERS(a), Australia—1990 to 1999

Year	
1999 (December)	(b)53 131
1999 (June)	53 143
1998 (June)	50 949
1996 (December)	45 100
1995 (June)	51 307
1993 (June)	79 755
1992 (April)	81 400
1990 (April)	90 000

(a) The introduction of the bridging visa scheme on 1 September 1994 influences the figures since, prior to this time, persons who do not have a valid visa, but had come to the Department's attention and were waiting for a visa determination or to leave the country, were regarded as 'overstayers'. Subsequently these people were not considered overstayers. (b) Excludes unauthorised arrivals by air and by boat.

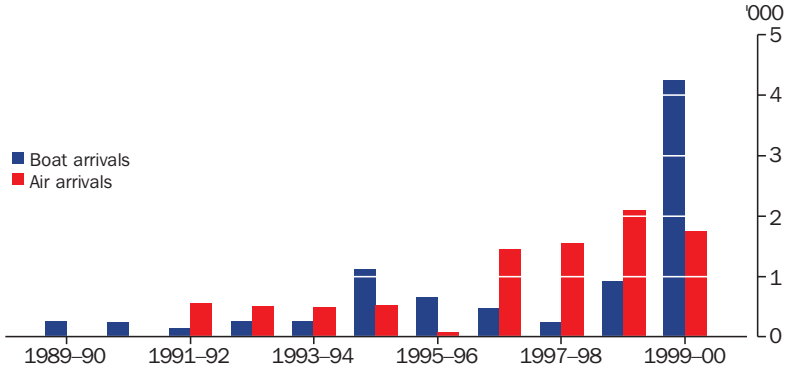
Source: DIMA 2000a.

Turning to the people who enter Australia illegally, it is clear that Australia has in recent times become a more important target for such movements. There are no data on persons who have been successful in such attempts, but there are on the numbers that have been intercepted. These can be divided into those detected arriving by air and those coming by boat. Graph C4.25 shows that in 1998–99, 2,106 people were refused entry at Australia's airports (36% more than the 1,550 in 1997–98).

In 1998–99, 926 people arrived without authority on 42 boats, compared with 157 on thirteen boats (an increase of 490%) in 1997–98. However, in 1999–2000 there has been an unprecedented increase in boat arrivals, with 75 boats and 4,174 boat people being detected. This compares with a total of 2,059 Vietnamese boat people being intercepted as part of the refugee exodus from that country between 1975 and 1989. Table C4.26 shows the escalation of movement that occurred in 1999–2000.

The recent movement has involved substantial numbers from the Middle East and Afghanistan, whereas among previously undocumented migrants those from Southern China and Cambodia dominated. It is apparent that Australia has been increasingly targeted by people smugglers who have been active in facilitating movement into North America and Europe.

C4.25 UNAUTHORISED ARRIVALS, Australia—1989–90 to 1999–2000



Source: DIMA 2000b.

C4.26 CLANDESTINE BOAT ARRIVALS DETECTED, Numbers of Boats and Persons Aboard—1989–2000

			Numbers on Board	
	Boats	Arrivals	Minimum	Maximum
Year	no.	no.	no.	no.
1989–90	3	224	26	119
1990–91	5	158	3	77
1991–92	3	78	10	56
1992–93	4	194	2	113
1993–94	6	194	4	58
1994–95	21	1 071	5	118
1995–96	14	589	4	86
1996–97	13	365	4	139
1997–98	13	157	3	30
1998–99	42	926	2	112
1999–2000	75	4 174	3	353
2000 to 25 July	2	66	30	36

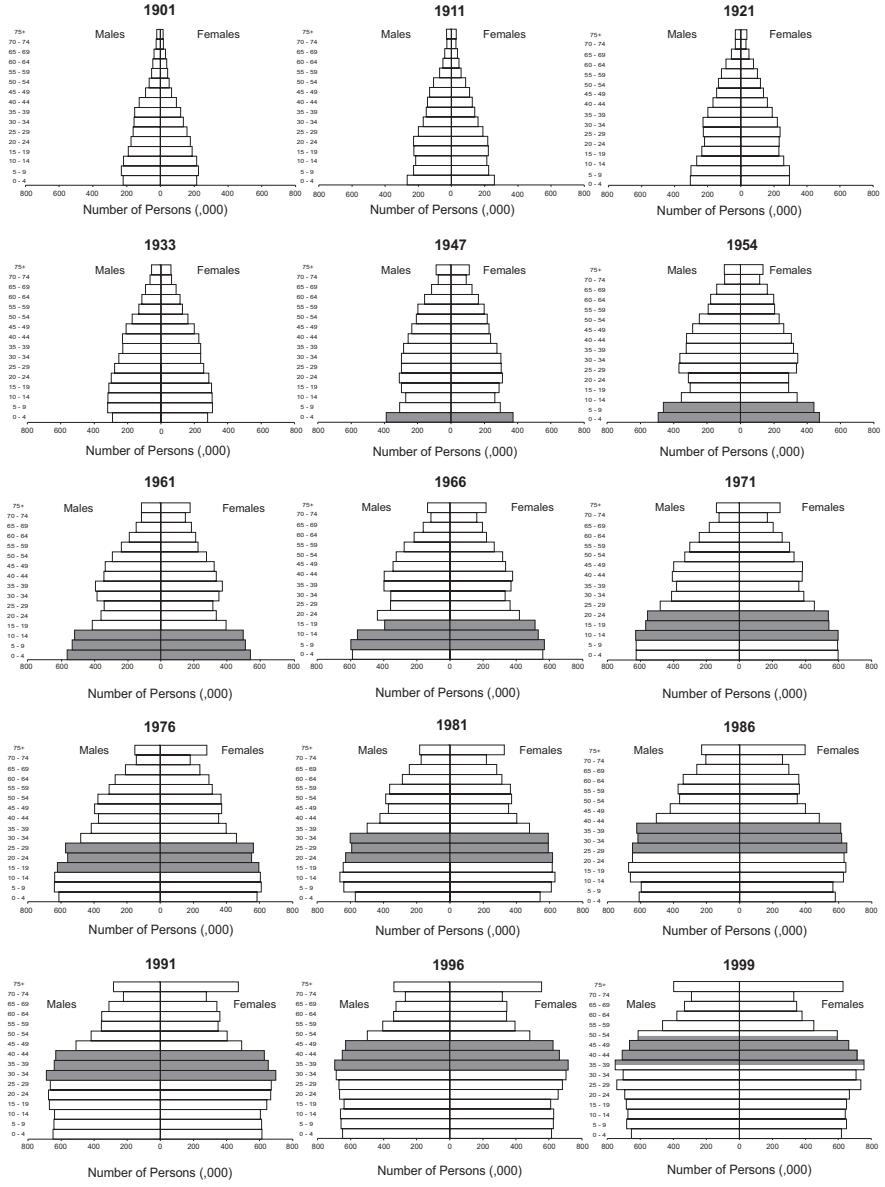
Source: DIMA 2000b.

Age and sex composition

The population of 1901 was not only less than one-fifth the size at present, but it was substantially younger and males outnumbered females, whereas the opposite is now the case.

The age structure of the population is of major significance in determining the demand for goods and services. The evolving shape of Australia's age-sex pyramid depicted in graph C4.27 testifies to these shifts.

C4.27 AUSTRALIA, Age and Sex Structure of the Population—1901 to 1999



Note: Shaded areas represent the baby boom

Source: Australian Censuses 1901–96; ABS 2000a.

In 1901 more than a third of Australians (35.1%) were less than 15 years of age; in 1999 this had fallen to a fifth (20.7%). On the other hand, the proportion aged 65 years and over more than trebled from 4.0% to 12.2% and the median age rose from 22.6 years to 34.9 years. However, the story of the twentieth century was not one of continuous ageing. Indeed, graph C4.27 shows that the low fertility years of the 1930s and 1940s saw an ageing of the population while the post-war baby boom added a substantial base to the age pyramid, producing a 'younging' of the population in the early post-war years. Since then, however, declining fertility and increased longevity have produced a progressive ageing. The progress of the post-war baby boom cohort up the Australian age pyramid is shown in the graph. This has had a huge impact in greatly increasing demand in age-specific activities like education, formation of households, numbers entering the workforce etc. and is on the threshold of greatly increasing the numbers in the retirement ages.

A less obvious, but nevertheless important, change evident in graph C4.27 is in the balance between males and females in Australia. For the first two centuries of European settlement in Australia, males have outnumbered females due to the male selectivity of immigration to Australia over much of that period. Accordingly in 1901 there were 110 males in Australia for every 100 females. However, this gap progressively closed over the century due to:

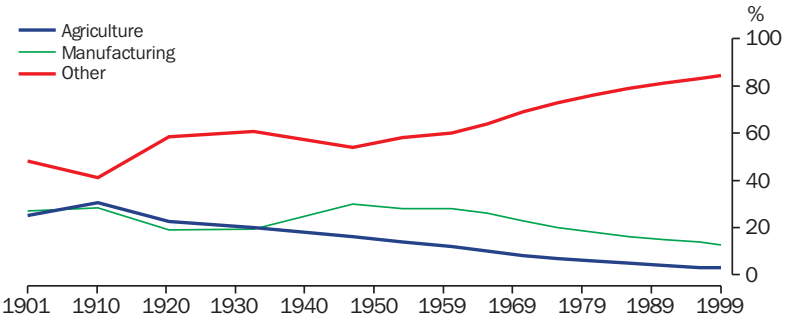
- an increase in the gap between male and female life expectancy up to the early 1970s; and
- an increasing proportion of immigrants being made up of women so that in the last three decades male settlers have been outnumbered by females.

Accordingly in the early 1980s the number of females in Australia outnumbered the number of males and by 1999 there were 99 males for every 100 females in the country. It will be noticed in graph C4.27, however, that the predominance of females is much greater in the older ages than among the young as a result of higher female longevity.

Australians at work

The issue of who works outside the home and the nature of that work has undergone profound change in the last century. Graph C4.28 shows that, whereas in 1911 almost a third of Australian workers were employed in the agricultural sector, this had fallen to 4.3% in 1996.

C4.28 PROPORTIONS OF PERSONS EMPLOYED, By Broad Industry Group, Australia—1901 to 1999



Note: Figure for 1999 is annual average for 1998–99.

Source: Australian Censuses 1901–96; ABS 2000c.

The proportion in manufacturing industry peaked at almost a third in 1966, but has subsequently fallen to 12.5%. Hence, whereas less than a half of Australians worked in the tertiary sector at the turn of the century, this sector now accounts for four out of every five workers. Indeed it is now considered appropriate to subdivide the tertiary sector between tertiary services[9] and information services.[10] The former grew from 38.5% of employment in 1947 to 42.9% in 1996 and the latter from 15.9% to 38.4%.

It was shown earlier (graph C4.10) that participation in the workforce outside the home has increased substantially for women, especially since World War II. This is underlined in table C4.29 which compares age-sex participation rates in the workforce for males and females in 1911 and 1999.

For males it will be noticed that workforce participation is lower in all age groups, reflecting the effects of increased educational participation, especially among young adults, early retirement and the introduction of invalidity and other pensions. The latter effects are especially evident among the older ages. On the other hand, female participation in the workforce is higher in all ages except the post-pension 65+ age group. The increases are especially marked in the younger working ages. This reflects a substantial shift in the role of women in Australian society.

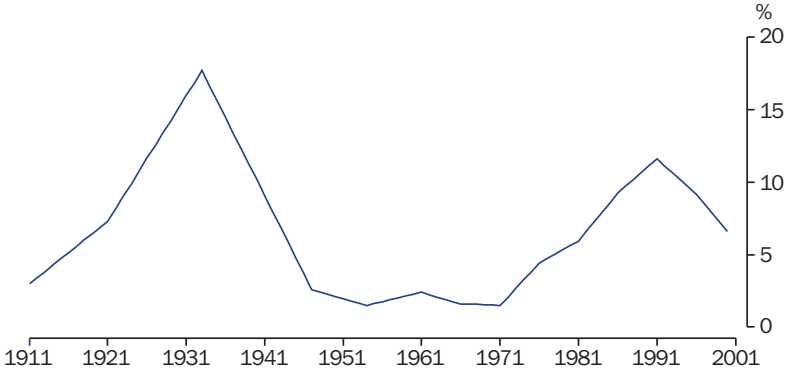
The world of work for Australians has changed in many other ways. The level of unemployment has fluctuated with economic shifts over the years, and graph C4.30 indicates that levels peaked in the Great Depression of the 1930s, although a secondary peak occurred in the early 1990s.

C4.29 LABOUR FORCE PARTICIPATION RATES, Australia—1911 and 1999

	Males		Females	
	April 1911	November 1999	April 1911	November 1999
Age group (years)	%	%	%	%
15–19	90.0	55.5	43.5	59.0
20–24	97.7	85.0	40.2	75.7
25–34	98.0	91.4	22.9	67.8
35–44	97.3	90.8	16.7	72.4
45–54	95.8	86.8	15.5	70.4
55–59	92.7	73.3	14.6	47.4
60–64	85.8	46.6	13.1	19.9
65 and over	55.3	9.7	7.9	3.4
15 and over	93.0	71.9	25.0	54.4

Source: ABS 2000b.

C4.30 PERCENTAGE OF WORKFORCE UNEMPLOYED, Australia—1911 to 2000



Source: Australian Censuses 1911 to 1996; ABS 2000d.

The increase in part-time work has become a feature of the last few decades. Unfortunately we do not have data for the entire century, but in 1966 some 9.8% of all Australians working did so on a part-time basis; by 1980 this proportion had almost doubled to 16.4%, and by 1999 it was 28.3%. Over the 1966–99 period the number of full-time jobs increased by 47.9% while the number of part-time jobs increased by 383.7%. This has been accompanied by other changes such as increased working outside the fixed hours of the former working week, less security of job tenure etc.

Education

Australian colonies were among the earliest to introduce compulsory schooling in the primary school ages in the second half of the nineteenth century. However, in 1901, 7.1% of the population aged over 5 years could not read.

C4.31 RATES OF PARTICIPATION IN EDUCATION—1911 and 1996

	1911	1999
Age group (years)	%	%
5 or younger	9.1	11.9
6–11	92.5	100.0
12–13	85.2	100.0
14–15	31.2	97.4
16–17	8.7	81.0
18–19	3.3	53.4
20 and over	0.2	12.4
All ages	**17.4**	**28.0**

Source: ABS 2000b, 8.

Moreover table C4.31 indicates that all of the children in the mandatory age groups were still not attending school in 1911. The major change in educational participation, however, has come at older ages. Few Australians remained in education after age 14 for most of the first half of the twentieth century. However, more than half of the 18 and 19 year olds, and the bulk of those aged 14–17, were in education in 1996. In 1911 only 2,465 Australians were students in university, compared with 686,267 in March 1999.

Households and families

Over the twentieth century the basic unit of social organisation in Australia has remained the family, although the family itself has undergone significant shifts in structure and functioning over the period. The increasing diversity in the Australian family cannot be captured in the century's census data since, while a 'relationship' question has been asked in each census, it was not used to assemble census data on the basis of families until relatively recently.

C4.32 GROWTH OF POPULATION AND HOUSEHOLDS, Australia—1911 to 1996

Census year	Population '000	Growth(a) %	Households(b) '000	Growth %	Mean household size(c) no.
1911(d)	4 455	. .	894	. .	4.53
1921(d)	5 436	2.01	1 107	2.16	4.40
1933(d)	6 630	1.67	1 510	2.62	4.00
1947(d)	7 579	0.96	1 874	1.55	3.75
1954(d)	8 987	2.46	2 343	3.25	3.55
1961(d)	10 508	2.26	2 782	2.48	3.55
1966	11 600	2.00	3 155	2.55	3.47
1971	12 756	1.92	3 671	3.00	3.31
1976	13 550	1.21	4 141	2.44	3.12
1981	14 576	1.47	4 668	2.43	2.98
1986	15 602	1.37	5 187	2.13	2.88
1991	16 850	1.55	5 750	2.08	2.80
1996	17 892	1.21	6 421	2.23	2.64

(a) Average annual percentage growth since previous census. (b) Heads of private occupied dwellings. (c) Population in private occupied dwellings divided by the number of private occupied dwellings. (d) Full-blood Aboriginals were excluded from censuses in 1911, 1921, 1933, 1947, 1954 and 1961, and they were not included in official results until 1971. At that time the average number of persons in households with Aboriginal heads was 5.5, well above the Australian average.

Source: Censuses quoted in Boundy 1980, 7; Australian Censuses CBCS 1911, 1921, 1933, ABS 1981, 1986, 1991 and 1996.

One dimension of change is evident in table C4.32. This indicates that households have consistently declined in average size, so that by 1996 there was an average 2.64 persons compared with 4.53 in 1911. This has been partly a function of the decline in fertility considered earlier, but also due to the fact that Australians have formed new households at a faster rate than the population has grown. The reasons for this have varied over the century, but at different times the following have been important:

- younger people have left home at an early age to set up new households, especially during times of relatively full employment;
- older people have increasingly remained in independent living situations as the century has progressed, with smaller proportions going to live with their children or enter aged care institutions;
- since the 1970s, increasing levels of divorce and separation have led to splitting of households; and
- of course fluctuations in the economy, the cost of housing and lending interest rates have also had effects.

The crucial point, however, is that the number of households has increased at a faster rate than the population, and many goods and services are consumed by households rather than individuals.

Over the century, however, it is not so much that the size of the Australian family and household has changed; rather the structure and composition have been transformed. Unfortunately this can only be quantified for the last three decades, but a number of points can be made about the Australian family in 1901:

- the male breadwinner model was dominant, with much less than one in ten married women working outside the home;
- couple and single person households were less than a quarter of households, and were made up predominantly of 'empty nest' older people and young married couples;
- extension of households was common, especially with elderly parents living with their children and grandchildren;
- more than a half of families comprised couples with dependent children, more than three-quarters of whom had only one breadwinner; and
- less than 5% of children were in single parent families, the bulk of them due to widowhood.

This situation has been transformed as we enter the twenty-first century, and the bulk of change has occurred in the last thirty

years. One trend is the increase in non-family households, predominantly single person and group households.[11] Lone person households have increased from 15.7% of all households in 1976 to 24.2% in 1999, while group households have increased from 4.1% in 1986 to 5.4% in 1999. Within families there also has been an increase in diversity, as is evident in table C4.33. There has been a decline in the proportion of families which comprise couples and children from 59.5% in 1976 to 49.6% in 1996.

Whereas in 1976, 44.1% of households had children present, this had fallen to 35.9% in 1996. It will be noted in table C4.33 that single parent families have increased their share of all families. In 1997 some 18% of children aged 0–14 lived in a single parent family. However, around one-third of Australian children can expect to spend some time in a single parent family situation during the period they are aged less than 15 years. The number of single parent families in Australia has increased rapidly, almost doubling over the 1976–96 period, while couple families with children increased by only 12.4%.

The increased diversity of family situations in which Australian children live has not been restricted to the growth of single parent families. A quarter of families with dependent children now include children who are not living with both of their birth parents. Some 4% of families with dependent children are 'blended families' including children who have different parents, and 4% of children live in couple families with a stepfather or stepmother. In 53.9% of couple families with children, both parents were working in 1996. It is disturbing to note, too, that in 14.2% of such cases both parents were not working. In more than half of single parent families (57.2%) the parent did not work, and in a further 19.2% the parent worked part-time.

Marriage and divorce

Patterns of partnering in Australia have undergone a profound change over the last century. The crude marriage rate (annual number of registered marriages per 1,000 population) has fluctuated with social and economic conditions, as indicated in the chapter's graph 5.34. Marriage rates increased in both world wars and in the post-war period, and fell during times of economic downturn, especially in the 1930s. Since 1970 the marriage rate has declined substantially as a result of changing attitudes to marriage and increased incidence of other forms of partnering.

McDonald (1982, 186) identified 1900 as an important turning point in Australian marriage patterns. Before 1900 both age at marriage and proportions marrying were similar to those prevailing in England at the time. Thereafter, however, there was a movement toward marriage at an early age and a higher proportion marrying. The latter is evident in graph C4.34, which shows a decline in the proportion of men and women aged 45–49 who had never married.

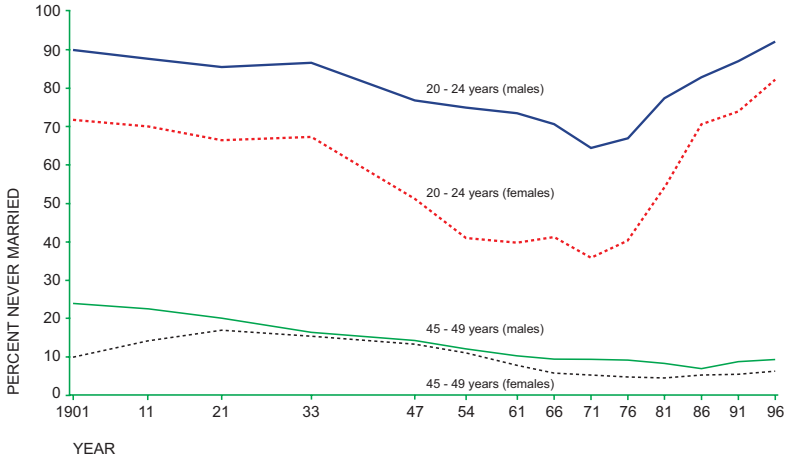
C4.33 DISTRIBUTION OF FAMILY TYPES—1976 to 1996

	1976(a)	1981(a)	1986(a)	1991(a)	1996
Family type	%	%	%	%	%
One parent family with dependent children	6.5	8.6	7.8	8.8	9.9
Couple only	28.0	28.7	30.3	31.4	34.1
Couple with dependent children	48.4	46.6	4.8	44.4	40.6
Couple with non-dependent children only	11.1	10.0	10.9	9.5	9.0
Other families	5.9	6.0	6.2	5.9	6.4
Total	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

(a) Excludes caravan park dwellers.

Source: ABS 2000c, 101.

C4.34 PERCENTAGES OF MALES AND FEMALES NEVER MARRIED, Particular Age Groups, Australia—1901 to 1996



Source: McDonald 1982; Australian Censuses of 1901, 1911, 1981, 1986, 1991 and 1996.

Graph C4.34 also indicates trends in the proportion of the 20–24 age group who were unmarried at each census. The decrease in average age at marriage in the early years of the century is reflected in a decline in the proportions never married. The Depression years saw it increase, but the post-war period saw a sharp decrease in the age at marriage, so that by the 1971 census less than 40% of Australian women aged 20–24 remained unmarried. The 1970s saw a sharp reversal of this pattern with an increase in the average age of marriage. Throughout the early post-war years the median age of brides fell from 23 in 1947 to 21.4 in 1971, while that of males fell from 26 to 23.8 years. However, thereafter it progressively increased to reach 27.7 in 1998 for females and 29.8 for males. This is a function of increased levels of alternative forms of partnering in Australian society. Consensual partnering prior to marriage is now commonplace, increasing from less than 10% in the early 1970s to more than half in the early 1990s.

De facto relationships have existed throughout the last century in Australia, but have remained undetected for much of the period partly because at the census people's conjugal status is self-reported. However, there has been a major social change over the last three decades which has seen an increase in the level and acceptance of de facto partnering. The ABS first collected data on de facto partnering in 1982 when 5% of all couples were in this category; this increased to 8.5% in 1992 and 9.1% in 1997. The proportions in such relationships are highest in the 25–29 age group and they decline with age. With the increased level of de facto partnering as well as increased incidence of single parent families, an increasing proportion of Australian births are occurring outside of marriage. In 1951–55, 4% of births were in this category. This increased to 11% in the late 1970s, 25% in 1993 and 29% in 1999. The increased diversity of partnering is reflected in an increasing incidence of same sex coupling, and this was first recognised at the 1996 census when 19,584 couples were identified in this category.

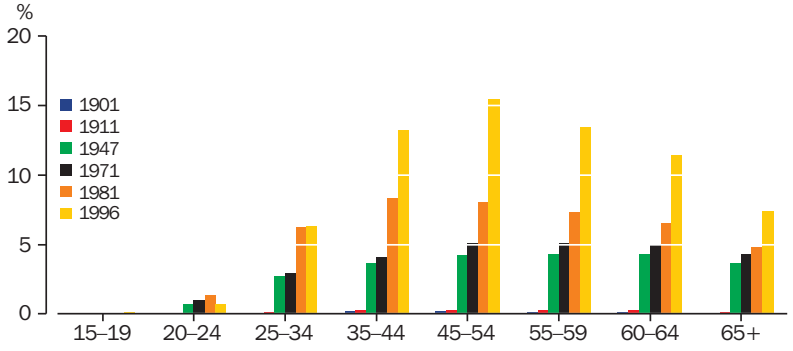
Contemporaneous with the recent changes in marriage in Australia has been a major change in divorce. For the first three-quarters of the twentieth century divorce remained at low levels. A major turning point was the passage of the *Family Law Act of 1975*, which took divorce out of the area of criminal law and allowed for divorce to occur if there were irretrievable breakdown of marriage. The chapter's graph 5.40 shows that the rates of divorce increased in the post-war period slightly, but spiked with the passage of the Family Law Act as the backlog of divorce was cleared, before stabilising at a level three times higher than previously. A study of marriages occurring between 1977 and 1994 showed that 43% of all marriages are likely to end in divorce.

The significance of divorce is underlined in graphs C4.35a and C4.35b, which show the proportions of Australian women and men at various censuses between 1901 and 1996 who were divorced or separated.

The graphs show the steep increase in the proportions of each age group who are divorced with each census.

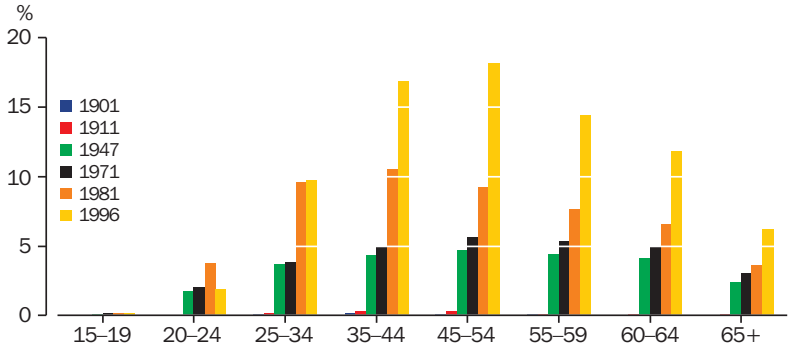
The fact that half of Australian marriages end in divorce raises the question of what happens to the people involved. Currently around a third of Australian registered marriages involve at least one previously divorced partner. Others repartner in de facto relationships rather than formally remarry; in 1996, 25.8% of people in such relationships were divorced, 8% separated and 1.3% widowed (ABS 1998, 39). However, increased levels of divorce have contributed to increasing numbers of Australians living without partners. In 1996, 4.4 million or 37% of adult Australians were living without partners, compared with 33% in 1986 (ABS 2000b, 43).

C4.35a PERCENTAGE OF WOMEN DIVORCED OR SEPARATED, By Age Group, Australia—1901 to 1996



Source: Australian Censuses 1901 to 1996.

C4.35b PERCENTAGE OF MEN DIVORCED OR SEPARATED, By Age Group, Australia—1901 to 1996



Source: Australian Censuses 1901 to 1996.

The Indigenous population

Australia's indigenous population at the time of initial European settlement has been estimated to be a minimum of 315,000 (Smith 1980) while some have suggested it could have been over 1 million. However, in 1901 their numbers had declined to an estimated 93,333 (NPI 1975, 458) as the dispossession and devastation associated with European settlement was reflected in increased mortality and decreased fertility. The numbers of Aborigines and Torres Strait Islanders continued to fall to 71,836 in 1921 and only thereafter began to increase slowly; it was only in the 1990s that the numbers passed the estimated population at the time of initial European settlement.

Table C4.36 shows the trajectory of growth of the Aboriginal and Torres Strait Islander population in recent years.

In 1996 the total counted at the census was 352,970. This represented a major increase over the 265,378 recorded at the 1991 census, and the 227,645 in 1986. There are substantial difficulties in the counting of the Indigenous population. This is partly associated with the marginal circumstances in which many live, leading to them being missed in censuses. This problem has been overcome to a degree in recent censuses through the ABS employing special procedures which undoubtedly have led to successively greater proportions of the population being counted. A greater problem relates to variations between censuses in the extent to which people do or do not identify themselves as Aboriginal in the census. Increased readiness to identify oneself as Aboriginal undoubtedly is a major factor in the rapid increase in numbers between 1981 and 1996 in the table.

The indigenous population differs from that of the remainder of the Australian population. Its age structure, depicted in the chapter's graph 5.8, is significantly younger than that of the total population, with 40% aged less than 15 years in 1996 compared with 22% of the total population. This reflects higher fertility and mortality levels among the group.

The disadvantaged nature of the Indigenous population is reflected in table C4.37 which shows that the Indigenous population's mortality and fertility rates are substantially higher than for the total population.

Indigenous people are only half as likely to live in a city with more than 100,000 people. Their participation in education is considerably lower and they are more than twice as likely to be unemployed. Their income is only half that of the remainder of the population, and double the proportion are single parent families and live in rented accommodation.

The distribution of the Indigenous population also differs substantially from that of the total population. Table C4.38 shows that there is an over-representation across northern and western Australia compared with the total population and an under-representation in the southeast.

C4.36 ABORIGINAL AND TORRES STRAIT ISLANDER POPULATIONS, Australia—1971 to 1996

Census year	Aborigines no.	Torres Strait Islanders no.	Total Indigenous population no.	Total population no.	Indigenous population as proportion of total population %	Average annual growth %
1971	106 290	9 663	115 953	12 755 638	0.9	. .
1976	144 382	16 533	160 915	13 548 448	1.2	+6.8
1981	144 665	15 232	159 897	14 576 330	1.1	–0.1
1986	206 104	21 541	227 645	15 602 156	1.5	+7.3
1991	238 657	26 721	265 378	16 849 496	1.6	+3.1
1996	314 120	28 744	(a)352 970	17 892 423	2.0	+5.9

Source: Australian censuses of 1971, 1976, 1981, 1986, 1991 and 1996; CBCS 1973.

C4.37 CHARACTERISTICS, Indigenous and Non-Indigenous Populations—1996

Indicator	Units	Indigenous	Non-Indigenous
Life expectancy			
Males	Years	56.9	75.2
Females	Years	61.7	81.1
Infant mortality	Rate per 1,000	15.2	5.0
Total fertility rate	Rate per 1,000	2.2	1.8
Aged under 30	%	68.1	43.7
Living in major urban areas	%	30.3	62.7
16 year old students	%	57.0	83.5
Bachelor degrees	%	2.0	10.4
Unemployment rate	%	22.8	9.3
Employed as labourers	%	24.3	3.7
Household income per capita	$	158	310
One parent families	%	29.6	14.5
Renting housing	%	63.8	27.1

Source: ABS 2000b.

C4.38 DISTRIBUTION, Indigenous and Non-Indigenous Populations—1996

	Indigenous		Non-Indigenous	
State/Territory	'000	%	'000	%
New South Wales	109 925.0	28.5	6 204.7	33.9
Victoria	22 598.0	5.9	4 560.2	24.9
Queensland	104 817.0	27.2	3 338.7	18.2
South Australia	22 051.0	5.7	1 474.3	8.1
Western Australia	56 205.0	14.6	1 765.3	9.6
Tasmania	15 205.0	4.0	474.4	2.6
Northern Territory	51 876.0	13.4	181.8	1.0
Australian Capital Territory	3 058.0	0.8	308.3	1.7
Total	**386 049.0**	**100.0**	**18 310.3**	**100.0**

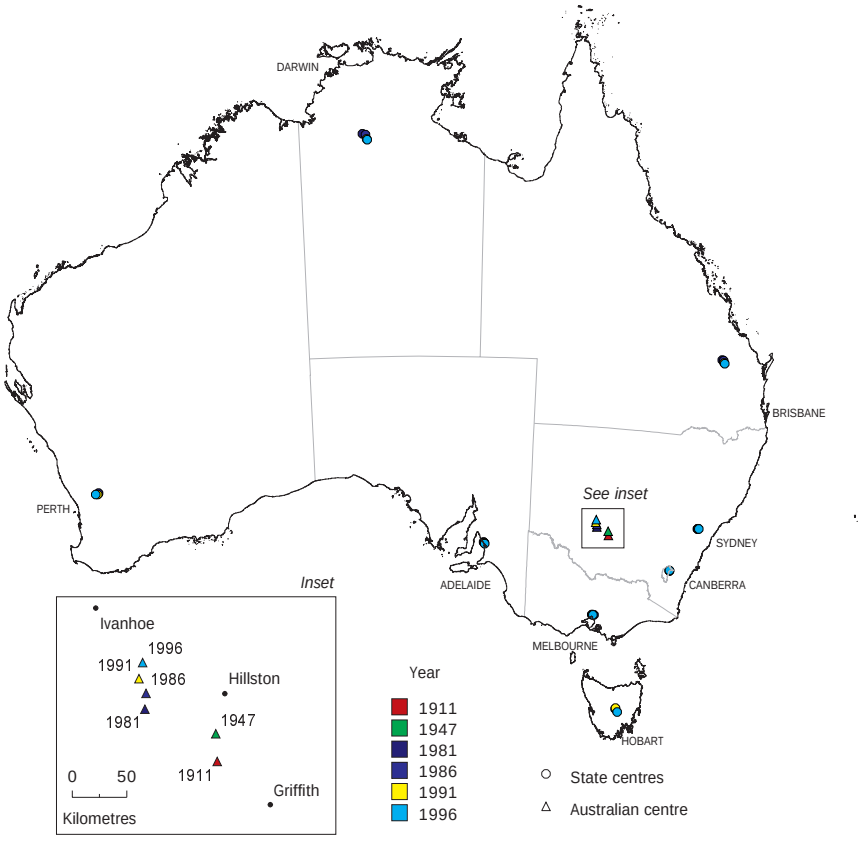
Source: ABS 2000c.

Indeed, the distribution of the indigenous population depicted in the chapter's map 5.9 represents a relatively even distribution across the continent while that of the total population is strongly concentrated.

Population distribution

While Australia's population increased more than five fold over the last century, the broad outline of the distribution of the population did not change dramatically. Writing in the middle of the century, Griffith Taylor (1947, 444) argued that most Australians would continue to live in areas closely settled by 1860. While there were substantial changes in the details of population distribution in Australia over the century, map C4.39 shows that the geographic centre of gravity[12] of the Australian population has changed little.

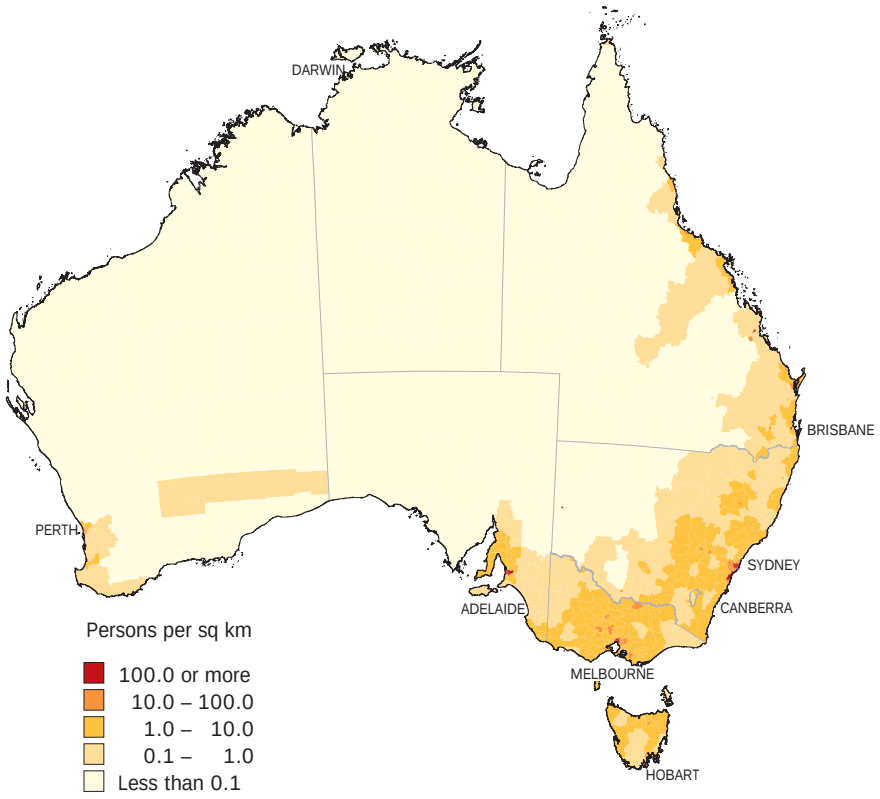
C4.39 WEIGHTED POPULATION CENTRES, Australia—1911 to 1996



Source: Australian Censuses of 1911, 1947, 1981, 1986, 1991 and 1996.

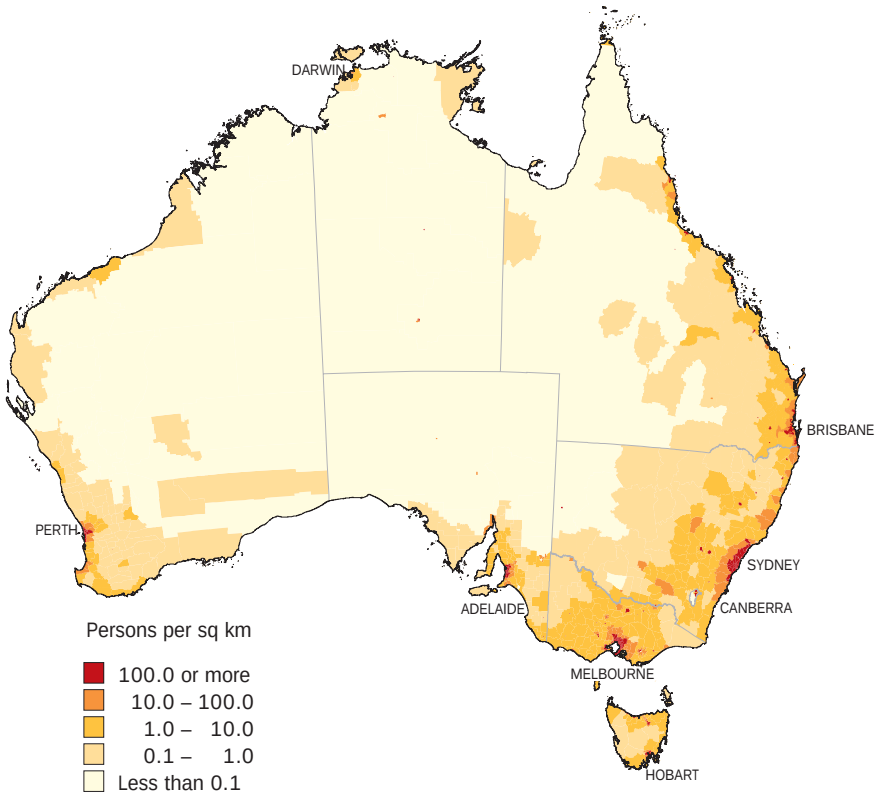
Australia's population at the beginning of the century was highly concentrated. Hence a comparison of maps C4.40a and C4.40b, which show the pattern of population density across Australia for 1901 and 1996, indicates that the most substantial increases in density have occurred in the closely settled areas along the east coast, and the southeast and southwestern corners of the continent.

C4.40a POPULATION DENSITY, Australia—1901



Source: Australian Census of 1901 based on Statistical Local Areas, 1996 edition.

C4.40b POPULATION DENSITY, Australia—1996



Source: Australian Census of 1996 based on Statistical Local Areas, 1996 edition.

Indeed, in 1996 some 68.8% of Australians lived within 20 km by road of the coast and 83.0% within 50 km.

The distribution of the national population between the various States and Territories has undergone some change over the last century, although the only change in their relative positions with respect to population size was Western Australia overtaking South Australia as the fourth most populous State in the early 1980s. Table C4.41 indicates that in the first half of the century New South Wales increased its share of the national population while that of Victoria declined.

In the post-war period the proportion in New South Wales has declined from around 40% to a third, while Victoria also, after increasing its share in the first two post-war decades, did not grow as fast as the nation as a whole. The major trend, however, has been a long term, but still limited, shift in population distribution toward the north and west. Hence over the century:

- the proportion of the national population living in New South Wales, Victoria, Tasmania and South Australia has declined (from 81.8% to 69.1%); and
- the proportion in Queensland, Western Australia, the Australian Capital Territory and the Northern Territory has increased from 18.9% to 29.9%.

A major shift in population distribution over the decade relates to the balance between numbers living in urban and rural areas. Quantifying this is made difficult by shifts in the definition of what constitutes an urban area in Australia as well as the fact that over recent decades there has been a blurring of the distinction between urban and rural areas in Australia (Hugo et al. 1997).

C4.41 POPULATION DISTRIBUTION, States and Territories—1901 to 1999

	1901	1921	1947	1961	1976	1986	1999
	PER CENT						
New South Wales	35.9	38.6	39.4	37.3	35.3	34.5	33.8
Victoria	31.8	28.2	27.1	27.9	26.9	26.0	24.8
Queensland	13.2	13.9	14.6	14.4	15.2	16.4	16.6
South Australia	9.5	9.1	8.5	9.2	9.1	8.6	7.8
Western Australia	4.9	6.1	6.7	7.0	8.4	9.1	9.8
Tasmania	4.6	3.9	3.4	3.3	2.9	2.8	2.5
Northern Territory	0.1	0.1	0.1	0.2	0.7	1.0	1.0
Australian Capital Territory	0.0	0.0	0.2	0.6	1.5	1.6	1.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	MILLION						
Total population	**3.8**	**5.4**	**7.6**	**10.5**	**13.9**	**16.0**	**19.1**

Source: Rowland 1982, 25; ABS 1988; ABS 2000a.

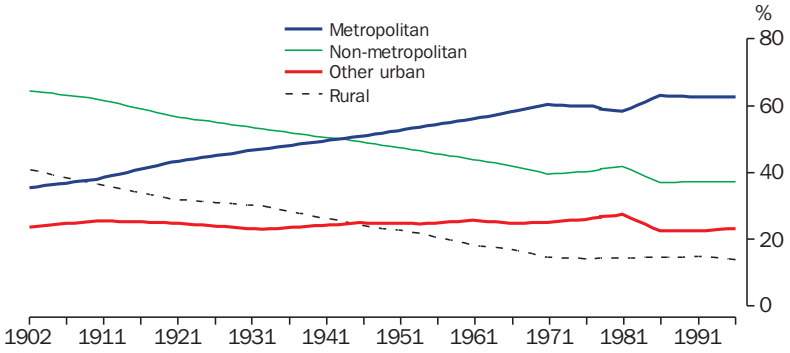
C4.42 URBANISATION, Australia—1906 and 1996

	1906		1996	
	Centres	% of total population	Centres	% of total population
Size of population centre (number of people)	no.	%	no.	%
Less than 3,000(a)	. .	48.5	. .	18.2
3,000–9,999	54	6.3	191	5.8
10,000–99,999	19	11.7	98	13.3
100,000–539,000	4	33.6	8	9.6
950,000 or more	0	0.0	5	53.1
All population centres	*(b)77*	*100.0*	*(b)302*	*100.0*
		'000		'000
Total population		4 091.5		17 892.4

(a) Includes people living in rural areas between population centres. (b) Comprising at least 3,000 people.

Source: ABS 2000b, 7.

C4.43 POPULATION DISTRIBUTION, Metropolitan, Non-metropolitan, Other Urban and Rural Sectors—1901 to 1996



Source: Bowie 1987; Australian Censuses 1986 to 1996.

Table C4.42 shows that in the early years of the century almost half of the population lived in communities of less than 3,000 people. Over the next century the number of people living in such settlements increased by 64% while those living in larger centres increased almost 10 times as fast (595%). The century was indeed one of increasing urbanisation. In 1901 Australia's largest centres of Sydney and Melbourne both had populations of around half a million persons, compared with 4,041,381 and 3,417,218 in 1999. The proportion of Australians living in major urban areas (those with 100,000 persons or more) increased from 33.6% to 62.7% over the 1906–96 period.

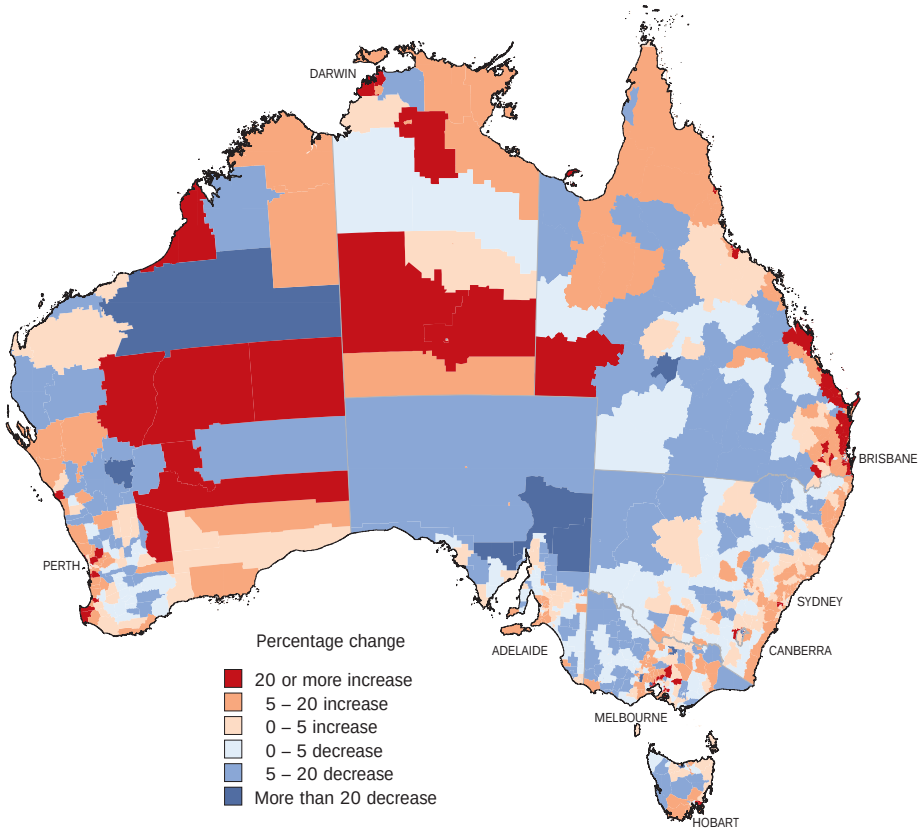
Graph C4.43 shows the changes which occurred in the proportions living in metropolitan and non-metropolitan areas over the twentieth century.

The long term tendency toward increasing concentration of the Australian population is in evidence. There is a consistent pattern of urban areas increasing their share of the total population up to 1976. At the 1933 Census 37.4% of Australians lived in rural areas, but by 1961 this proportion had halved, and in 1976 only 13.9% of the population was classified as rural. The pattern was, however, not just one of concentration in urban centres but of a growing dominance of the largest metropolitan centres. Indeed, the non-metropolitan share of the total national population progressively declined in the half century following 1921 from 57% to 36%, so that by 1971 nearly two-thirds of all Australians lived in the large metropolitan capital cities. Between 1971 and 1976 the proportion living in rural areas continued to decline (albeit marginally), but there was also

a decline in the metropolitan share of the total national population. Hence in the early 1970s the only sector to gain ground was that of the non-metropolitan urban centres. It is apparent from graph C4.43 that over the subsequent period there has been a relative stability in the proportions of Australians living in major urban areas, and indeed there has been a consistent decline in the proportion of Australians living in the largest five capitals (Sydney, Melbourne, Brisbane, Perth and Adelaide) from 57.9% in 1971 to 53.1% in 1996.

This stabilisation, however, masks considerable variation in population growth in non-metropolitan areas. While the population living in country towns increased from 2,887,299 to 4,161,498 over the 1966–96 period (44.1%), that living in rural areas increased by only 25.9% from 1,983,932 to 2,498,323. More importantly there were substantial variations between non-metropolitan areas. The patterns of population change over the 1991–96 intercensal period (map C4.44) show wide variations between regional areas with respect to population growth and decline and distinct spatial patterns of growth and decline.

C4.44 POPULATION CHANGE, Australia—1991–96



Source: Australian Cenuses of 1991 and 1996.

Overall, non-metropolitan populations grew slightly faster (6%) than was the case in metropolitan areas (5.6%). It will be noted that areas of population growth in regional Australia are strongly concentrated in certain types of areas, namely:

- the areas surrounding metropolitan areas;
- along the well watered east coast and southwest coast;
- some resort and retirement areas;
- some regional centres;
- along the Hume Highway linking Sydney and Melbourne; and
- some relatively remote areas, especially those with growing mining activities, tourism and significant indigenous populations.

On the other hand, there is also a concentration of the areas experiencing population decline:

- above all the dry farming areas of the wheat-sheep belt such as in western Victoria extending through central-western New South Wales and Queensland, the southeast, Eyre Peninsula and the mid north of South Australia, and the wheat-sheep belt of Western Australia;
- many pastoral areas in central Australia;
- certain mining areas such as Broken Hill; and
- declining industrial cities such as Whyalla in South Australia.

These patterns point to a pattern of increasing dichotomisation between coastal growth areas and inland areas of decline or stability in non-metropolitan Australia.

It is interesting, too, to examine the patterns of population change in non-metropolitan Australia according to the degree of accessibility/remoteness of particular areas. Table C4.45 shows the rates of population change in the five accessibility sectors of non-metropolitan Australia. These are shown, with the categories 'Remote' and 'Very remote' combined, in map 8.20 of the article *Housing in remote Aboriginal and Torres Strait Islander communities* in *Chapter 8, Housing*.

C4.45 AUSTRALIAN NON-METROPOLITAN AREAS, Population Growth by Level of Accessibility

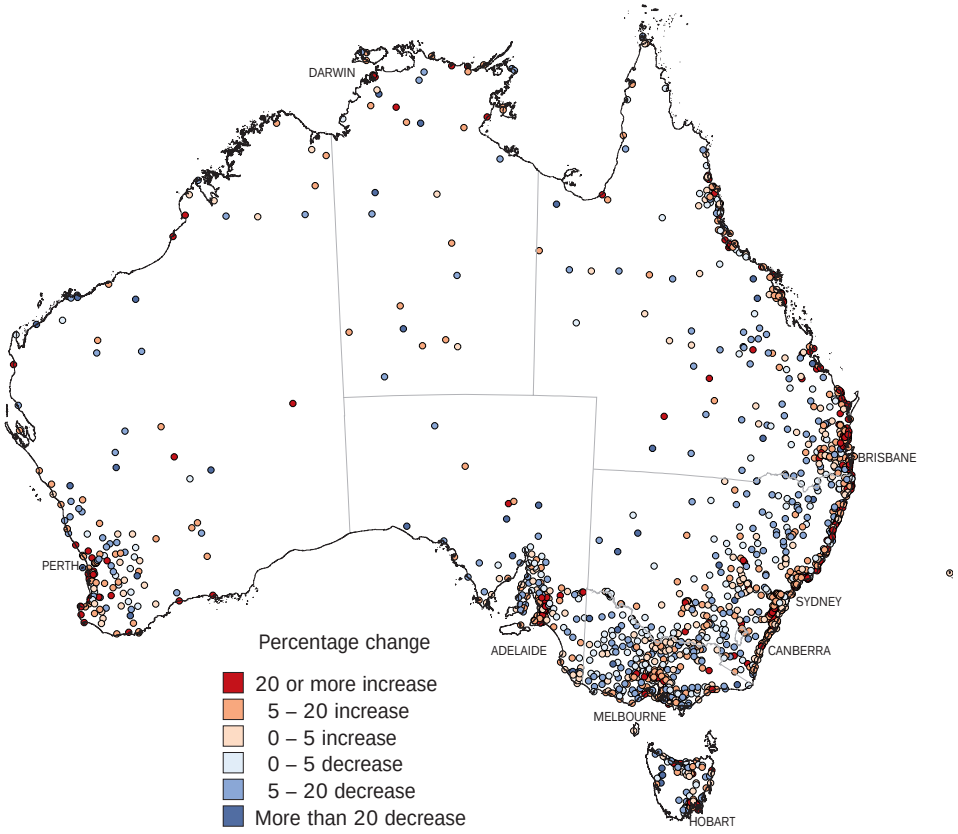
Level of accessibility	Population growth 1991–96 %	Population density Persons sq. km.
Highly accessible	6.2	77.2
Accessible	5.1	4.1
Moderately accessible	3.6	1.0
Remote	1.2	0.2
Very remote	2.9	0.0
Total Australia	**5.8**	**2.3**

Source: Glover et al. 1999.

This indicates that only in the highly accessible areas close to major cities are non-metropolitan population growth levels above the national average. There is a decline in the rates of growth with increasing distance away from the large cities, except that the very remote areas had a slightly faster growth rate than the 'remote' areas. It will also be noted that there is an association between rates of population growth and population density.

Turning to an examination of population growth trends in country towns, map C4.46 shows the location of urban areas experiencing growth and decline. Again a clear spatial pattern is in evidence.

C4.46 POPULATION GROWTH IN COUNTRY TOWNS, Australia—1991–96



Source: Australian Cenuses of 1991 and 1996.

Centres with relatively rapid growth are clustered around the nation's largest cities and strung along the eastern and southwestern coasts. On the other hand, the wheat-sheep belt area tends to have urban places which are experiencing decline. In the more remote areas there is a greater variation, both with centres experiencing growth and with those recording decline.

Population distribution patterns have undergone substantial changes within Australia's major cities over the last century. In the period prior to World War II the lateral growth of the major cities was restricted by the reach of public transport. However, increasing levels of car ownership in post-war Australia fostered the extension of low density suburbs. For the early post-war decades the bulk of population growth in major cities occurred in the outer suburbs. However, increasingly population growth is occurring in older built-up areas of the major cities.

Endnotes

1 ABS Media Release, 18 August 1999.

2 Male expectation of life at birth in 1901 was 55.2 years; that in 1998 was 75.9 years.

3 Life expectancy is defined as "the average number of years a person of a given age can expect to live if the present mortality rates at all ages for a given period is maintained over their lifetime" (Hugo 1986, 19).

4 The Infant Mortality Rate is calculated as the number of babies out of every 1,000 born in a given year who die before they reach their first birthday.

5 The Total Fertility Rate can be defined as "the number of children that will be born alive to a woman during her lifetime if she were to pass through all her childbearing years conforming to the age-specific rates of a given year" (Hugo 1986, 43).

6 i.e. TFR = 2.1.

7 Ethnic strength is derived by adding fractions of ancestry for generations.

8 The definitions are as follows:

- Permanent Residents—persons migrating to Australia and residents departing permanently.
- Long Term Movement—visitors arriving and residents departing temporarily with the intention to stay in Australia or abroad for 12 months or more, and the departure of visitors and the return of residents who had stayed in Australia or abroad for 12 months or more.
- Short Term Movement—travellers whose intended or actual stay in Australia or abroad is less than twelve months.

9 Defined as ASIC divisions D, E, F, G and L, i.e. Electricity, Gas and Water Supply, Construction, Wholesale Trade, Retail Trade, and Property and Business Services.

10 Defined as ASIC divisions H, I, J and K, i.e. Accommodation, Cafes and Restaurants, Transport and Storage, Communication Services, and Finance and Insurance.

11 Group households are defined as households consisting of two or more unrelated people where all persons are aged 15 years or over. There are no reported couple relationships, parent-child relationships or other blood relationships in these households.

12 Plane and Rogerson (1994, 31) define this as follows: "The population centroid, also called the mean centre, the mean point, the centre of gravity, or sometimes simply the centre of population. Conceptually, if the mythological Atlas were to hold up the entire area for which a centre is being computed—let's say the United States—and assuming that people were the only objects contributing to the weight (and also assuming everyone weighs the same!), the point where he would have to stand to balance the country would be the centroid".

References

Australian Bureau of Statistics, *Births, Australia* (3301.0), various issues, ABS, Canberra.

Australian Bureau of Statistics, *Deaths, Australia* (3302.0), various issues, ABS, Canberra.

Australian Bureau of Statistics, *Causes of Death, Australia* (3303.0), various issues, ABS, Canberra.

Australian Bureau of Statistics, *Migration, Australia* (3412.0), various issues, ABS, Canberra.

Australian Bureau of Statistics, *Overseas Arrivals and Departures, Australia* (3402.0), various issues, ABS, Canberra.

Australian Bureau of Statistics, *Australian Demographic Statistics* (3101.0), various issues, ABS, Canberra.

Australian Bureau of Statistics 1980, *Births, Australia 1978* (3301.0), ABS, Canberra.

Australian Bureau of Statistics 1986, *Australian Demographic Trends* (3102.0), ABS, Canberra.

Australian Bureau of Statistics 1988, *Year Book Australia 1988* (1301.0), ABS, Canberra.

Australian Bureau of Statistics 1998, *Australian Social Trends 1998* (4102.0), ABS, Canberra.

Australian Bureau of Statistics 1999a, *Disability, Ageing and Carers: Summary of Findings, 1998* (4430.0), ABS, Canberra.

Australian Bureau of Statistics 1999b, *Births, Australia 1999* (3301.0), ABS, Canberra.

Australian Bureau of Statistics 2000a, *Australian Demographic Statistics, December Quarter 1999* (3101.0), ABS, Canberra.

Australian Bureau of Statistics 2000b, *Australian Social Trends 2000* (4102.0), ABS, Canberra.

Australian Bureau of Statistics 2000c, *Year Book Australia 2000* (1301.0), ABS, Canberra.

Australian Bureau of Statistics 2000d, *Labour Force, Australia, June 2000* (6203.0), ABS, Canberra.

Boundy, J. 1980, "Housing and Housing Development". Draft chapter prepared for ESCAP (1982), mimeo.

Bowie, I.J.S. 1987, "The Urban and Non-Urban Population of Australia, 1800–1981". A Mitchell Occasional Paper in Geography, Mitchell College of Advanced Education, Bathurst, October.

Bureau of Immigration and Population Research (BIMPR) 1993, *Immigration Update, June Quarter 1992*, AGPS, Canberra.

Coghlan, T.A. 1903, *The Decline in the Birth-Rate of New South Wales and Other Phenomena of Child-Birth, An Essay in Statistics*, NSW Government Printer, Sydney.

Commonwealth Bureau of Census and Statistics (CBCS), *Demography*, various issues, Government Printer, Melbourne.

Commonwealth Bureau of Census and Statistics (CBCS), *Official Year Book of the Commonwealth of Australia*, various issues, Government Printer, Melbourne.

Commonwealth Bureau of Census and Statistics (CBCS) 1908, *Official Year Book of the Commonwealth of Australia, 1901–1907*, Government Printer, Melbourne.

Commonwealth Bureau of Census and Statistics (CBCS) 1912, *Official Year Book of the Commonwealth of Australia, 1901–1911*, Government Printer, Melbourne.

Commonwealth Bureau of Census and Statistics (CBCS) 1960, *Official Year Book of the Commonwealth of Australia, No. 46—1960*, Government Printer, Melbourne.

Commonwealth Bureau of Census and Statistics (CBCS) 1973, *The Aboriginal Population, Characteristics of the Aboriginal and Torres Strait Islander Population, Bulletin 9*, Census of Population and Housing, 30 June 1971, Reference no. 2.91, CBCS, Canberra.

Department of Immigration and Multicultural Affairs (DIMA), *Australian Immigration Consolidated Statistics*, various issues, AGPS, Canberra.

Department of Immigration and Multicultural Affairs (DIMA), *Immigration Update*, various issues, AGPS, Canberra.

Department of Immigration and Multicultural Affairs (DIMA), *Population Flows: Immigration Aspects*, various issues, AGPS, Canberra.

Department of Immigration and Multicultural Affairs (DIMA) 1999a, *Immigration Update June Quarter 1999*, AGPS, Canberra.

Department of Immigration and Multicultural Affairs (DIMA) 1999b, *Population Flows: Immigration Aspects, December 1999*, AGPS, Canberra.

Department of Immigration and Multicultural Affairs (DIMA) 2000a, *Locating Overstayers in Australia*, DIMA Fact Sheet 80, DIMA, Canberra.

Department of Immigration and Multicultural Affairs (DIMA) 2000b, *Unauthorised Arrivals by Sea and Air*, DIMA Fact Sheet 81, DIMA, Canberra.

Economic and Social Commission for Asia and the Pacific (ESCAP) 1999, *1999 ESCAP Population Data Sheet*, ESCAP, Bangkok.

Glover, J., Harris, K. and Tennant, S. 1999, *A Social Health Atlas of Australia*, Second Edition, Public Health Information Development Unit, University of Adelaide, South Australia, Open Book Publishers, Canberra.

Gray, A. 1997, "Growth of the Aboriginal and Torres Strait Islander population, 1991–2001 and beyond", CAEPR Discussion Paper No. 150, Centre for Aboriginal Economic Policy Research, The Australian National University, Canberra.

Haberkorn, G., Hugo, G., Fisher, M. and Aylward, R. 1999, *Country Matters: Social Atlas of Rural and Regional Australia*, Bureau of Rural Sciences, Canberra.

Hicks, N. 1978, *The Sin and Scandal: Australia's Population Debate, 1891–1911*, ANU, Canberra.

Hugo, G.J. 1986, *Australia's Changing Population: Trends and Implications*, Oxford University Press, Melbourne.

Hugo, G.J. 2000, "International Migration and Labour Markets in Asia: Australia Country Paper". Paper prepared for the Workshop on International Migration and Labour Markets in Asia organised by the Japan Institute of Labour (JIL) supported by the Government of Japan, Organisation for Economic Co-operation and Development (OECD) and the International Labour Office (ILO), Japan Institute of Labour, Tokyo, 26–28 January.

Hugo, G.J., Griffith, D., Rees P., Smailes, P., Badcock, P. and Stimson, R. 1997, "Rethinking the ASGC: Some Conceptual and Practical Issues", Final Report for Review of the ASGC Project, National Key Centre for Teaching and Research in Social Applications of Geographical Information Systems, University of Adelaide.

Kinnaird, B. 1999, "Working holiday makers: more than tourists—implications of the report of the Joint Standing Committee on Migration", *People and Place*, 7(1): 39–52.

Kippen, R. and McDonald, P., forthcoming, "Australia's population in 2000: the way we are and the ways we might have been", *People and Place*.

McDevitt, T.M. 1998, *World Population Profile: 1998*, US Government Printing Office, Washington, DC.

McDonald, P.F. 1982, "Marriage and divorce in Australia", pp. 183–198 in ESCAP, *Population of Australia*, Vol. 1, Country Monograph Series No. 9, United Nations, New York.

McDonald, P. 2000, "Low fertility in Australia: evidence, causes and policy responses", *People and Place*, 8(2): 6–21.

McDonald, P. and Kippen, R. 1999, "Population Futures for Australia: The Policy Alternatives". Text-for-delivery prepared for Vital Issues Seminar, Canberra, 31 March.

Merlo, R. and Rowland, D. 2000, "The prevalence of childlessness in Australia", *People and Place*, 8(2): 21–32.

National Population Inquiry (NPI) 1975, *Population and Australia: A Demographic Analysis and Projection*, two volumes, AGPS, Canberra.

Paice, J. 1990, "The 1990s—Is the Australian Census of Population and Housing Relevant?" Paper presented at the Australian Population Association Conference, Melbourne, November.

Plane, D.A. and Rogerson, P.A. 1994, *The Geographical Analysis of Population: With Applications to Planning and Business*, John Wiley, New York.

Population Reference Bureau 1999, *1999 World Population Data Sheet*, PRB, Washington.

Population Reference Bureau 2000, *2000 World Population Data Sheet*, PRB, Washington.

Price, C.A. 1975, *Australian Immigration, a Review of the Demographic Effects of Post-War Immigration on the Australian Population*, Research Report No. 2, National Population Inquiry, Australian Government Publishing Service, Canberra.

Price, C.A. 1979, *Australian Immigration: A Bibliography and Digest*, No. 4, Department of Demography, Australian National University, Canberra.

Price, C.A. 1989, *Ethnic Groups in Australia*, Australian Immigration Research Centre, Canberra.

Price, C.A. 1997, "The Asian element in Australia: 1996", *People and Place*, 5(4): 35–36.

Price, C.A. 2000, *Australians All: Who on Earth are We?*, Canberra.

Rowland, D.T. 1982, "Population growth and distribution", in *Population of Australia*, ESCAP, Volume 1, Country Monograph Series No. 9, United Nations, New York, 10–33.

Smith, L.R. 1980, *The Aboriginal Population in Australia*, Australian National University Press, Canberra.

Taylor, T.G. 1947, *Australia: A Study of Warm Environments and Their Effect on British Settlement*, Methuen, London.

6 Labour

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Introduction

The information about the labour market in Australia presented in this chapter covers a wide range of aspects of economic and community life. Labour statistics are important economic indicators—changes in measures of employment, unemployment, earnings, job vacancies and industrial disputes provide insights into the economy and the effects of labour market policy settings. Labour statistics are also very much about people—their participation in the labour force, their success in finding employment, their earnings and other benefits, their type of work and their working hours.

This chapter begins with an outline of the main sources of data on the labour market. This is followed by a profile of the labour force, which consists of people who are either employed or unemployed. More detailed data are then presented for the two groups of employed and unemployed persons. For employed persons, data are included on underemployment, where part-time workers would like to work more hours. In relation to unemployment, statistics are also presented on the number of vacant jobs available. Following these sections on people in the labour force is information about those people who are not in the labour force, including data on marginally attached workers, who would like employment but are either not looking or not available for work.

The latter part of this chapter examines characteristics and issues related to employment in more detail. This includes data on the occupation, industry and sector of employed persons, as well as their hours, earnings and benefits. Information is also presented about the industrial relations environment, relating to industrial disputes and the proportion of employees who are union members.

Labour market statistics

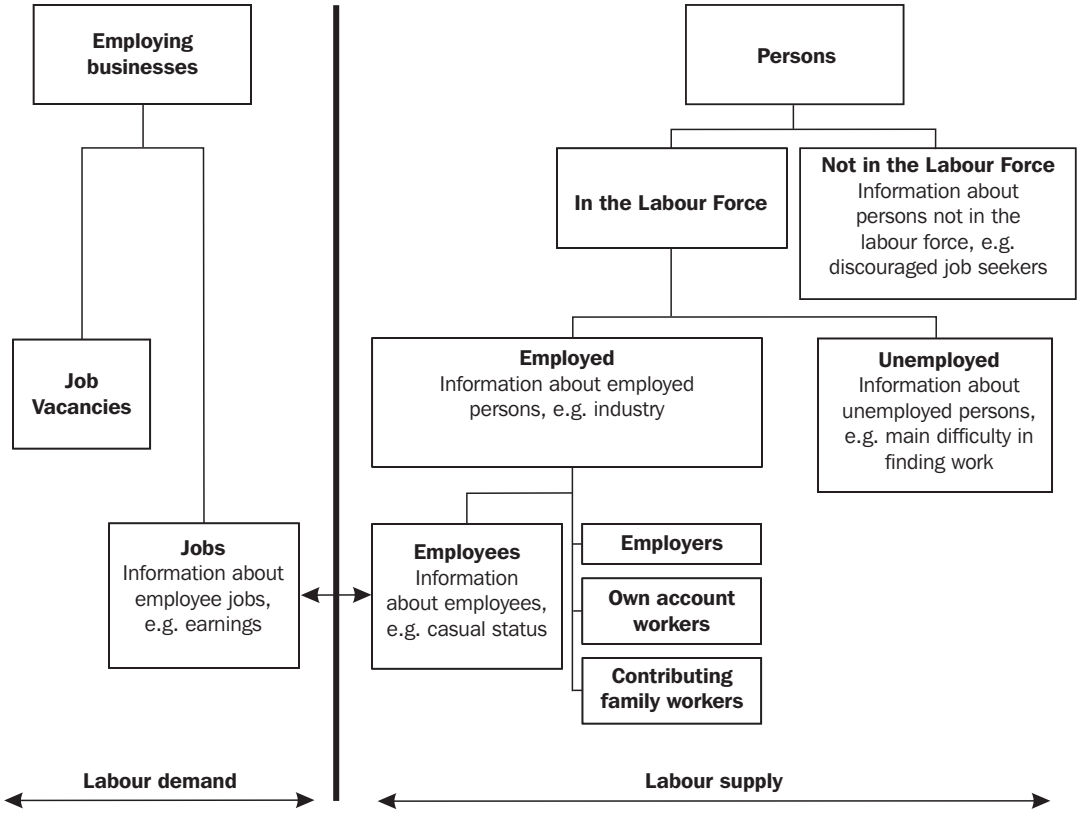
The data presented are taken from ABS surveys. A range of surveys is used to provide a picture of the Australian labour market, with some surveys collecting information from households while others collect information from businesses.

In household surveys, information is collected about persons from a sample of households. For surveys covering labour issues, this information includes demographic information, such as age and sex, as well as information about labour market experience, for example whether a person is working or looking for work. The type of information collected for a person will depend upon his or her employment situation. Household surveys provide insight into the supply of labour.

Surveys of businesses with employees obtain information about jobs, for example the number of jobs in the business or the wages and salaries paid. Business surveys provide information on the demand for labour.

The overall framework for labour market statistics is outlined in diagram 6.1. It sets the context for the discussion of the Australian labour force in the next section, and for the framework relating to labour force statistics in diagram 6.2.

6.1 THE AUSTRALIAN LABOUR STATISTICS FRAMEWORK

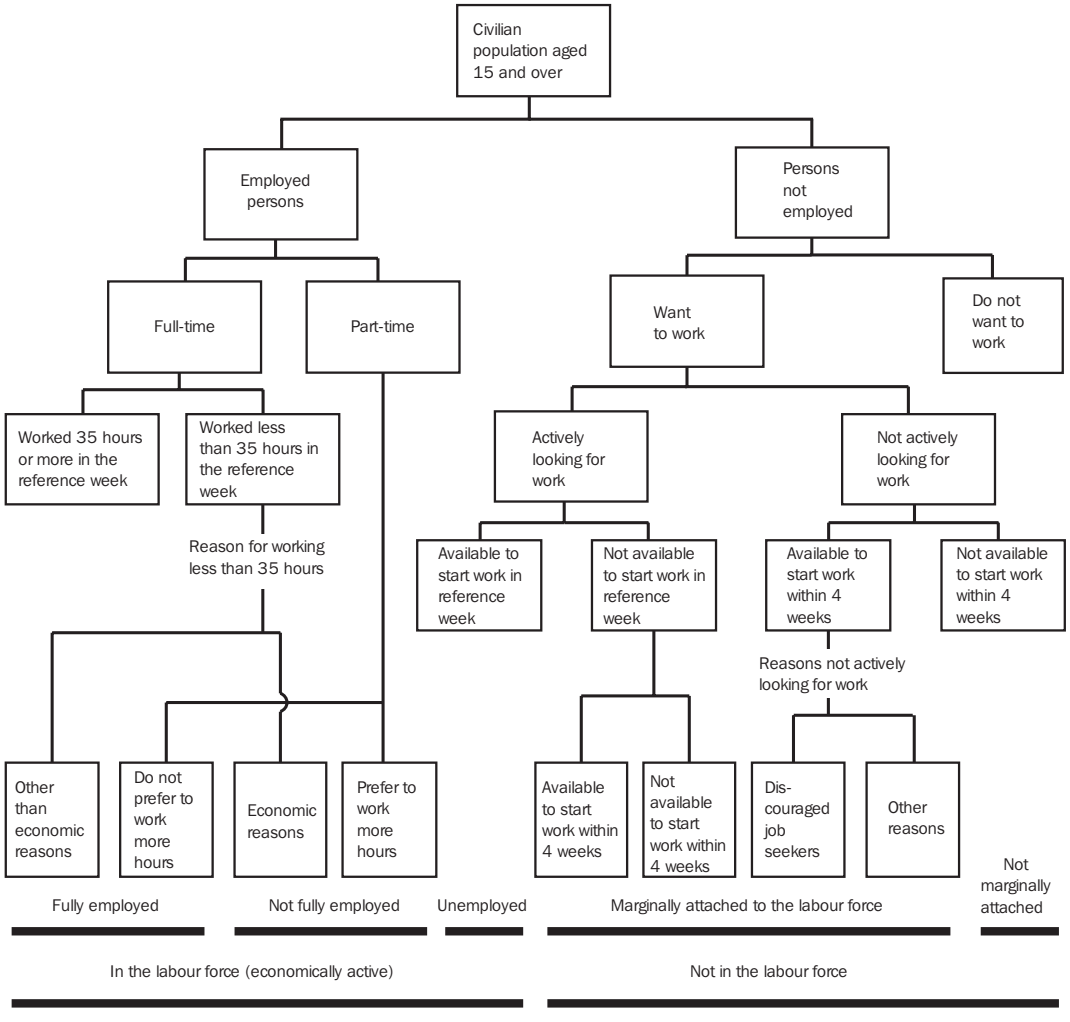


The labour force

Fundamental to the measurement of employment and unemployment is the concept of the labour force, defined as those persons aged 15 and over who, during a particular week, are either employed or unemployed. The labour force represents the key official measure of the total supply of labour available to the labour market during a given week.

This section presents statistics on the civilian labour force drawn from the monthly Labour Force Survey and supplementary surveys. The household surveys contain a series of questions to classify the population according to the framework presented in diagram 6.2. This framework is the basis for determining whether persons are employed, unemployed or not in the labour force. Further details concerning the scope, coverage and survey methods of the labour force and supplementary surveys (as well as more detailed statistics) can be found in the publications listed in the Bibliography.

6.2 THE AUSTRALIAN LABOUR FORCE FRAMEWORK



Characteristics of the labour force

The size and composition of the labour force are not static over time. Changes in the size of the labour force are caused by changes in labour force participation as well as changes in the population aged 15 and over.

Population increase has made a steady contribution to labour force growth as a result of net migration and natural increase. The contribution due to labour force participation was more variable. As table 6.3 shows, the two years of positive contribution to labour force growth, 1994–95 and 1995–96, were followed by negative contribution of 0.3 percentage points in 1996–97 and 0.5 percentage points in 1997–98. In 1999–2000 the contribution due to labour force participation was 0.4 percentage points.

6.3 LABOUR FORCE, Components of Change, Annual Average

	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
	%	%	%	%	%	%
MALES						
Percentage change in labour force	1.5	1.5	0.9	0.9	1.3	1.3
Percentage points change due to						
Population growth	1.3	1.5	1.5	1.5	1.5	1.6
Labour force participation	0.2	0.1	–0.6	–0.6	–0.3	–0.3
FEMALES						
Percentage change in labour force	3.2	2.7	1.6	1.0	1.8	2.7
Percentage points change due to						
Population growth	1.3	1.6	1.5	1.4	1.4	1.3
Labour force participation	1.9	1.1	0.1	–0.4	0.4	1.5
PERSONS						
Percentage change in labour force	2.2	2.0	1.2	1.0	1.5	1.9
Percentage points change due to						
Population growth	1.3	1.5	1.5	1.4	1.5	1.5
Labour force participation	0.9	0.5	–0.3	–0.5	0.0	0.4

Source: Labour Force Survey.

The participation rate is one of the most important indicators relating to the labour force. It represents the proportion of the population aged 15 and over who are in the labour force. Analysis of participation rates, particularly in terms of age, sex and marital status, provides the basis for monitoring changes in the size and composition of labour supply. The annual average participation rate for males has generally been declining for some time, and in 1999–2000 it was 72.6%. In contrast, the female participation rate increased to 53.9% in 1996–97. It stood at 54.5% in 1999–2000 (graph 6.4).

Table 6.5 shows changes in labour force status between 1994–95 and 1999–2000. Notable features include a steady increase in employment for both males and females. Over this period, the male unemployment rate decreased from 9.1% in 1994–95 to 7.0% in 1999–2000. The female unemployment rate decreased from 8.7% in 1994–95 to 6.8% in 1999–2000.

6.4 PARTICIPATION RATES, Annual Average

Source: Labour Force, Australia (6203.0).

In 1999–2000 the labour force participation rate for persons born overseas was 58.1%, compared with a participation rate of 67.0% for persons born in Australia. The participation rate for persons born overseas in other than main English-speaking countries was 54.0%. Of all overseas-born persons, those born in Oceania (which includes New Zealand) and Northern America had higher participation rates than persons born in Australia (table 6.6).

6.5 CIVILIAN POPULATION AGED 15 AND OVER, Labour Force Status, Annual Average

	Unit	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
				MALES			
Employed	'000	4 628.8	4 718.3	4 757.0	4 818.9	4 914.2	5 023.3
Unemployed							
Looking for full-time work	'000	414.4	400.0	400.9	386.0	357.5	312.5
Looking for part-time work	'000	51.1	53.4	58.5	59.4	58.6	62.9
Total unemployed	*'000*	*465.5*	*453.4*	*459.4*	*445.5*	*416.1*	*375.4*
Labour force	'000	5 094.3	5 171.7	5 216.4	5 264.3	5 330.3	5 398.6
Not in the labour force	'000	1 810.2	1 833.2	1 892.0	1 949.9	1 993.4	2 042.5
Civilian population	'000	6 904.6	7 004.9	7 108.4	7 214.3	7 323.7	7 441.1
Unemployment rate	%	9.1	8.8	8.8	8.5	7.8	7.0
Participation rate	%	73.8	73.8	73.4	73.0	72.8	72.6
				FEMALES			
Employed	'000	3 463.8	3 582.9	3 623.7	3 677.5	3 766.5	3 893.3
Unemployed							
Looking for full-time work	'000	224.7	210.7	223.8	215.2	194.9	179.0
Looking for part-time work	'000	103.5	100.3	109.3	103.6	107.3	107.0
Total unemployed	*'000*	*328.2*	*310.9*	*333.0*	*318.8*	*302.1*	*286.0*
Labour force	'000	3 791.9	3 893.9	3 956.7	3 996.3	4 068.7	4 179.3
Not in the labour force	'000	3 335.1	3 343.8	3 390.3	3 454.2	3 486.6	3 486.5
Civilian population	'000	7 127.1	7 237.7	7 347.0	7 450.5	7 555.3	7 665.8
Unemployment rate	%	8.7	8.0	8.4	8.0	7.4	6.8
Participation rate	%	53.2	53.8	53.9	53.6	53.9	54.5
				PERSONS			
Employed	'000	8 092.6	8 301.2	8 380.6	8 496.4	8 680.8	8 916.6
Unemployed							
Looking for full-time work	'000	639.1	610.7	624.7	601.2	552.4	491.5
Looking for part-time work	'000	154.6	153.6	167.7	163.0	165.9	169.8
Total unemployed	*'000*	*793.7*	*764.3*	*792.4*	*764.2*	*718.2*	*661.4*
Labour force	'000	8 886.3	9 065.5	9 173.1	9 260.6	9 399.0	9 577.9
Not in the labour force	'000	5 145.4	5 177.1	5 282.3	5 404.2	5 480.0	5 529.0
Civilian population	'000	14 031.6	14 242.6	14 455.3	14 664.8	14 879.0	15 106.9
Unemployment rate	%	8.9	8.4	8.6	8.3	7.6	6.9
Participation rate	%	63.3	63.7	63.5	63.1	63.2	63.4

Source: Labour Force Survey.

Table 6.7 provides an overview of labour force status of persons at June 2000, according to the family relationship within households. Notable features include: for couple families with dependants present, 84.6% of husbands were employed full-time, compared with 26.1% of wives (with a further 35.1% of wives employed part-time). For lone parents with dependants, 52.7% of male lone parents were employed full-time compared with 23.1% of female lone parents. The unemployment rate for lone parents was higher than for husbands or wives.

6.6 CIVILIAN LABOUR FORCE, By Birthplace, Annual Average—1999–2000

	Employed		Unemployed				
	Full-time workers	Total	Looking for full-time work	Total	Total labour force	Unemployment rate	Participation rate(a)
	'000	'000	'000	'000	'000	%	%
Born in Australia	4 900.3	6 720.0	357.6	487.5	7 207.4	6.8	67.0
Born outside Australia							
Main English-speaking countries	733.6	948.2	45.9	59.1	1 007.3	5.9	64.6
Other countries	952.5	1 248.4	88.0	114.8	1 363.1	8.4	54.0
Oceania	223.4	283.2	17.9	23.0	306.2	7.5	74.0
Europe and the former USSR	856.6	1 121.2	57.9	72.8	1 194.0	6.1	53.3
The Middle East and North Africa	68.5	90.2	10.5	13.2	103.4	12.8	49.8
South-East Asia	204.4	263.5	23.4	30.1	293.5	10.2	61.2
North-East Asia	105.1	142.8	6.4	9.6	152.4	6.3	54.8
Northern America	38.4	49.4	2.2	3.0	52.4	5.8	72.7
Other	189.7	246.3	15.6	22.1	268.5	8.2	68.3
Total born outside Australia	*1 686.1*	*2 196.6*	*133.9*	*173.9*	*2 370.5*	*7.3*	*58.1*
Total	**6 586.4**	**8 916.6**	**491.5**	**661.4**	**9 577.9**	**6.9**	**64.6**

(a) Participation rate calculated using population estimates which exclude those in institutions.

Source: Labour Force Survey.

6.7 LABOUR FORCE STATUS, Relationship in Household(a)—June 2000

	Employed		Unemployed						
	Full-time	Total	Looking for full-time work	Total	Labour force	Not in labour force	Civilian population aged 15 and over	Unemployment rate	Participation rate
	'000	'000	'000	'000	'000	'000	'000	%	%
MALES									
Family member	3 570.5	4 093.0	201.8	249.9	4 342.9	1 485.4	5 828.3	5.8	74.5
Husband									
With dependants	1 743.6	1 844.1	73.7	78.8	1 922.9	138.8	2 061.7	4.1	93.3
Without dependants	1 159.4	1 302.8	38.0	45.4	1 348.2	903.5	2 251.8	3.4	59.9
Total husband	2 903.0	3 146.9	111.7	124.2	3 271.1	1 042.3	4 313.5	3.8	75.8
Lone parent									
With dependants	39.8	48.4	4.3	5.8	54.2	21.2	75.5	10.7	71.8
Without dependants	25.8	27.7	1.3	1.6	29.2	21.8	51.1	5.4	57.3
Total lone parent	65.6	76.1	5.6	7.4	83.4	43.1	126.6	8.8	65.9
Dependent student(b)	5.3	168.0	7.5	36.7	204.7	251.4	456.1	17.9	44.9
Non-dependent child(c)	525.3	616.8	69.1	72.9	689.8	92.0	781.7	10.6	88.2
Other family person	71.2	85.1	7.9	8.8	93.9	56.6	150.4	9.4	62.4
Non-family member	709.5	806.1	72.5	77.4	883.5	372.7	1 256.2	8.8	70.3
Lone person	380.1	428.7	42.1	43.6	472.3	292.7	764.9	9.2	61.7
Not living alone	329.4	377.4	30.4	33.9	411.3	80.0	491.3	8.2	83.7
Total	4 433.3	5 084.5	293.2	348.3	5 432.8	2 061.0	7 493.8	6.4	72.5
FEMALES									
Family member	1 702.7	3 245.9	110.2	205.7	3 451.5	2 500.5	5 952.1	6.0	58.0
Wife									
With dependants	520.1	1 217.9	30.4	65.0	1 282.9	707.5	1 990.4	5.1	64.5
Without dependants	702.8	1 086.7	23.7	33.5	1 120.2	1 096.9	2 217.2	3.0	50.5
Total wife	1 222.9	2 304.6	54.1	98.6	2 403.1	1 804.4	4 207.6	4.1	57.1
Lone parent									
With dependants	109.2	232.1	20.9	35.1	267.2	205.3	472.5	13.1	56.5
Without dependants	36.0	53.6	5.5	5.9	59.5	104.6	164.1	9.9	36.3
Total lone parent	145.2	285.7	26.4	41.0	326.7	309.9	636.6	12.5	51.3
Dependent student(b)	2.7	220.7	3.3	33.9	254.6	225.1	479.7	13.3	53.1
Non-dependent child(c)	286.4	365.0	23.1	27.0	392.0	53.9	445.9	6.9	87.9
Other family person	45.5	69.9	3.3	5.3	75.2	107.2	182.3	7.0	41.2
Non-family member	427.3	577.3	33.7	41.6	618.9	653.7	1 272.6	6.7	48.6
Lone person	226.4	303.9	17.6	21.6	325.5	581.8	907.3	6.6	35.9
Not living alone	200.9	273.3	16.1	20.0	293.4	71.9	365.3	6.8	80.3
Total	2 222.3	3 971.4	152.5	260.3	4 231.7	3 482.0	7 713.7	6.2	54.9
PERSONS									
Family member	5 273.2	7 338.8	312.0	455.6	7 794.4	3 985.9	11 780.3	5.8	66.2
Husband or wife									
With dependants	2 263.7	3 062.0	104.1	143.8	3 205.8	846.2	4 052.0	4.5	79.1
Without dependants	1 862.2	2 389.5	61.7	78.9	2 468.5	2 000.5	4 469.0	3.2	55.2
Total husband or wife	4 125.9	5 451.5	165.8	222.7	5 674.3	2 846.7	8 521.0	3.9	66.6
Lone parent									
With dependants	149.0	280.5	25.2	40.9	321.4	226.7	548.0	12.7	58.6
Without dependants	61.8	81.3	6.8	7.5	88.8	126.4	215.2	8.4	41.3
Total lone parent	210.8	361.8	32.0	48.3	410.2	353.0	763.2	11.8	53.7
Dependent student(b)	8.0	388.7	10.8	70.6	459.3	476.5	935.8	15.4	49.1
Non-dependent child(c)	811.7	981.8	92.2	99.9	1 081.7	145.9	1 227.6	9.2	88.1
Other family person	116.6	155.0	11.2	14.0	169.0	163.8	332.8	8.3	50.8
Non-family member	1 136.8	1 383.4	106.3	119.1	1 502.5	1 026.4	2 528.8	7.9	59.4
Lone person	606.6	732.6	59.8	65.2	797.8	874.5	1 672.2	8.2	47.7
Not living alone	530.2	650.8	46.5	53.9	704.7	151.9	856.6	7.6	82.3
Total	6 655.6	9 055.9	445.7	608.6	9 664.5	5 543.0	15 207.5	6.3	63.6

(a) Civilians who were residents of households where family status was determined. (b) Excludes persons aged 20–24 attending school. Also excludes sons or daughters aged 15–24 who are classified as husbands, wives or lone parents. (c) Aged 15 and over.

Source: Labour Force, Australia (6203.0).

Persons employed

People are considered to be employed if they were in paid work for one hour or more in the reference period. Those people who have a job or a business, but were absent from work in the reference week, are also considered to be employed. This section contains information about people who are employed, including their status in employment and whether they worked full-time or part-time. The section also includes information about people who are underemployed, that is, people who work part-time but would like to work more hours.

Relating employment levels to population levels enables the evaluation of the strength of job growth as compared to population growth. The measure relating these two levels is the employment/population ratio. Its usefulness lies in the fact that, while movements in the employment level reflect net changes in the levels of persons holding jobs, movements in the ratio reflect net changes in the number of persons employed relative to changes in the size of the population. The overall employment/population ratio rose from 57.7% in 1994–95 to 59.0% in 1999–2000 (table 6.8).

The age groups showing the most notable increases over recent years have been 15–19 year olds (to 48.8% in 1999–2000), 20–24 year olds (to 74.2%) and 55–59 year olds (to 56.5%). For males, the highest ratio in 1999–2000 was for those aged 35–44 (86.8%), while for females, those aged 20–24 showed the highest proportion employed (70.6%).

6.8 EMPLOYED PERSONS, Employment/Population Ratios(a)

	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
Age group (years)	%	%	%	%	%	%
			MALES			
15–19	45.8	46.1	46.3	45.3	46.1	47.8
20–24	76.1	76.1	75.3	74.8	76.4	77.6
25–34	84.8	86.0	85.5	85.6	85.6	86.0
35–44	86.3	87.0	86.4	86.8	86.9	86.8
45–54	83.6	83.5	82.8	82.0	82.8	83.2
55–59	66.1	66.0	66.5	66.5	67.6	68.0
60–64	43.1	42.7	42.2	42.8	43.1	43.9
Over 64	9.5	9.4	9.5	10.1	9.4	9.6
Total	*67.0*	*67.4*	*66.9*	*66.8*	*67.1*	*67.5*
			FEMALES			
15–19	47.2	47.7	47.1	46.7	48.3	49.8
20–24	68.8	69.8	68.5	68.2	69.3	70.6
25–34	62.3	62.9	62.8	64.2	64.0	64.7
35–44	66.4	67.6	67.1	65.7	66.1	66.9
45–54	62.7	64.0	64.3	64.9	66.2	67.2
55–59	36.7	39.0	40.1	40.0	41.6	44.5
60–64	15.7	17.1	18.0	18.4	18.0	19.8
Over 64	2.4	2.7	2.8	2.9	3.0	3.2
Total	*48.6*	*49.5*	*49.3*	*49.4*	*49.9*	*50.8*
			PERSONS			
15–19	46.5	46.9	46.7	46.0	47.2	48.8
20–24	72.5	73.0	71.9	71.5	72.9	74.2
25–34	73.5	74.4	74.1	74.8	74.7	75.3
35–44	76.3	77.2	76.7	76.2	76.4	76.8
45–54	73.4	73.9	73.7	73.5	74.6	75.2
55–59	51.6	52.7	53.5	53.5	54.8	56.5
60–64	29.4	29.9	30.0	30.6	30.5	31.9
Over 64	5.5	5.6	5.7	6.1	5.8	6.0
Total	**57.7**	**58.3**	**58.0**	**57.9**	**58.3**	**59.0**

(a) The employment/population ratio for any group is the number of employed persons expressed as a percentage of the civilian population aged 15 and over in the same group.

Source: Labour Force Survey.

Information for employed persons is shown according to their status in employment (i.e. employers, own-account workers, employees and contributing family workers, as in diagram 6.1). Following falls in 1998–99, the number of own-account workers rose in 1999–2000 to 856,400, while the number of employers continued to fall, to 339,200 in 1999–2000. The number of employees has increased since 1994–95 to 7,620,300 in 1999–2000 (table 6.9).

Full-time workers are those who worked 35 hours or more during the reference week of the Labour Force Survey, or who usually work 35 hours or more each week. Part-time workers are those who usually work less than 35 hours a week and who did so during the reference week. In 1999–2000 there were 4,393,600 males employed full-time (87.5% of male employment). The number of females employed full-time was 2,192,800 (56.3% of female employment). For males, part-time work is most prevalent among the younger (aged 15–24) and older (aged 55 and over) age groups, while for females, the incidence of part-time work is more evenly spread across age groups (table 6.10).

6.9 EMPLOYED PERSONS, Status in Employment, Annual Average(a)

	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
	'000	'000	'000	'000	'000	'000
Employers	355.6	363.9	338.9	357.3	349.8	339.2
Own-account workers	822.9	849.1	819.5	855.7	822.5	856.4
Employees	6 801.7	7 001.1	7 121.1	7 183.1	7 399.7	7 620.3
Contributing family workers	77.2	75.0	75.2	65.4	66.3	70.6
Total	**8 057.4**	**8 289.2**	**8 354.7**	**8 461.4**	**8 638.4**	**8 886.5**

(a) Annual averages based on quarterly data.

Source: Labour Force Survey.

6.10 EMPLOYED PERSONS, Full-time and Part-time Workers by Age, Annual Average(a)—1999–2000

	Age group (years)								
	15–19	20–24	25–34	35–44	45–54	55–59	60–64	Over 64	**Total**
	'000	'000	'000	'000	'000	'000	'000	'000	**'000**
MALES									
Full-time workers	152.5	426.3	290.2	136.0	1 146.1	1 188.7	995.1	58.7	**4 393.6**
Part-time workers	175.4	106.4	34.9	33.4	86.8	75.0	77.4	40.3	**629.7**
Total	327.9	532.8	325.2	169.4	1 232.9	1 263.7	1 072.5	98.9	**5 023.3**
FEMALES									
Full-time workers	87.6	314.6	104.6	33.0	620.3	523.6	496.9	12.3	**2 192.8**
Part-time workers	238.4	155.6	101.2	43.1	314.4	460.6	358.1	29.2	**1 700.5**
Total	326.0	470.2	205.7	76.1	934.7	984.2	855.0	41.5	**3 893.3**
PERSONS									
Full-time workers	240.1	740.9	394.8	169.0	1 766.4	1 712.3	1 492.0	71.0	**6 586.4**
Part-time workers	413.8	262.0	136.1	76.5	401.2	535.6	435.5	69.4	**2 330.2**
Total	653.9	1 002.9	530.9	245.5	2 167.6	2 247.9	1 927.5	140.4	**8 916.6**

(a) Annual averages based on monthly data.

Source: Unpublished data, Labour Force Survey.

Underemployed workers

Underemployment exists when people who are working part-time have a preference to work more hours. The number of underemployed workers is an important indicator of labour market performance. It highlights the unsatisfied aspirations of many workers for adequate work and greater earnings.

In September 1998 there were 8,677,200 employed persons aged 15 and over. Of these, 502,800 (6%) usually worked part-time and wanted to work more hours, and less than 1% usually worked full-time but worked part-time in the survey reference week for economic reasons (table 6.11).

Of all part-time workers who wanted more hours, 60% were female. Some 63% of part-time workers who wanted more hours reported that they would like to work full-time hours.

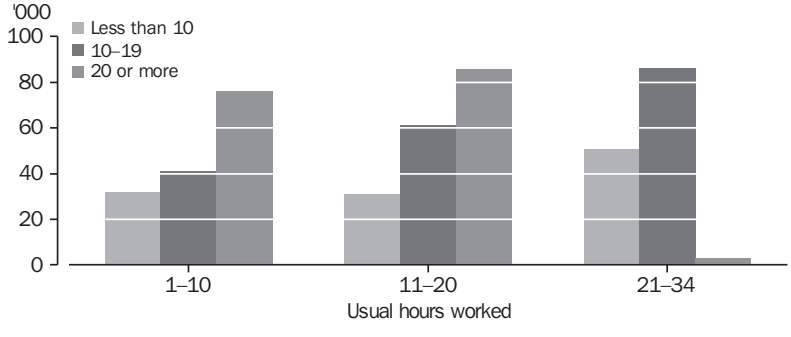
The median duration of the current period of insufficient work for persons working part-time and wanting to work more hours was 25 weeks for males and 26 weeks for females. Duration generally increased with age for both males and females. For females, the median duration ranged from 20 weeks for those aged 15–19 years, to 104 weeks for those aged 55–59 years. For males, the median duration ranged from 12 weeks for those aged 20–24 years, to 80 weeks for those aged 45–54 years.

6.11 UNDEREMPLOYMENT STATUS OF EMPLOYED PERSONS—September 1998

	Males	Females	Persons
	'000	'000	'000
Fully employed workers	4 660.3	3 471.3	8 131.6
Full-time workers	4 284.2	2 195.0	6 479.2
Part-time workers	376.1	1 276.3	1 652.4
Usually work full-time but worked part-time for economic reasons	32.9	10.0	42.8
Usually work part-time and want more hours	202.3	300.5	502.8
Usually work part-time and want more part-time hours	48.0	135.9	183.9
Usually work part-time and want full-time hours	154.2	164.7	318.9
Employed persons	**4 895.5**	**3 781.8**	**8 677.2**

Source: Underemployed Workers, Australia (6265.0).

6.12 USUALLY WORK PART-TIME: USUAL HOURS WORKED AND PREFERRED NUMBER OF EXTRA HOURS—September 1998



Source: Underemployed Workers, September 1998 (6265.0).

Persons unemployed

In the Labour Force Survey, people are considered to be unemployed if they satisfy three criteria: they are not employed, they are available for work, and they are taking active steps to find work.

Two important measures of unemployment are the number of persons unemployed and the unemployment rate. The unemployment rate is defined as the number of unemployed persons expressed as a percentage of the labour force.

The number of unemployed persons in annual average terms peaked at 940,500 in 1992–93 before falling to 764,300 in 1995–96. After a rise in 1996–97, the number of unemployed persons fell to 661,400 in 1999–2000 (table 6.13).

The number of persons unemployed for 52 weeks or more (the 'long-term unemployed') fell from 336,300 in 1992–93 to 225,600 in 1995–96. In 1997–98 the number of long-term unemployed rose to 241,700, but fell again to 189,600 in 1999–2000. Of all unemployed persons in 1999–2000, 28.7% had been unemployed for 52 weeks or more, compared with 34.4% in 1994–95.

The annual average unemployment rate for all persons peaked at 11.0% in 1992–93. The rate has generally been falling since then, to 6.9% in 1999–2000. For males the rate fell to 7.0% in 1999–2000 from a peak of 11.7% in 1992–93. The female rate fell from 10.0% in 1993–94 to 8.0% in 1995–96. Following a rise to 8.4% in 1996–97, the rate fell to 6.8% in 1999–2000 (graph 6.14).

In 1999–2000 the unemployment rates for 15–19 year olds (21.9%) and 20–24 year olds (10.5%) looking for full-time work were higher than the average for all age groups (6.9%). These rates were also higher than for those in the same age groups seeking part-time work (15.2% and 7.7%, respectively) (table 6.15). In these age groups, many people are still completing their education. There are more 15–19 year olds studying full-time and looking for part-time work (67,700) than not studying full-time and looking for full-time work (57,100).

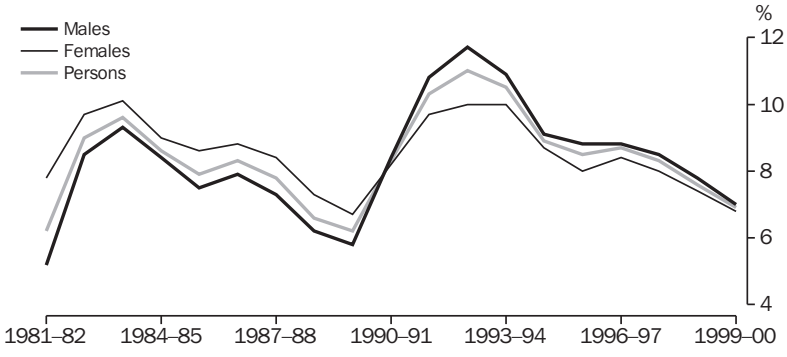
6.13 UNEMPLOYED PERSONS, Duration of Unemployment, Annual Average

Duration of unemployment (weeks)	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
NUMBER UNEMPLOYED ('000)						
Under 4	123.1	129.0	135.2	126.4	129.4	137.3
4 and under 13	159.2	167.4	177.9	161.1	154.5	156.1
13 and under 26	110.5	116.3	115.5	108.1	97.8	87.2
26 and under 52	127.6	126.1	132.5	126.9	107.3	91.2
52 and over	273.3	225.6	231.4	241.7	229.2	189.6
Total	793.7	764.3	792.4	764.2	718.2	661.4
% OF TOTAL UNEMPLOYMENT						
Under 4	15.5	16.9	17.1	16.5	18.0	20.7
4 and under 13	20.1	21.9	22.4	21.1	21.5	23.5
13 and under 26	13.9	15.2	14.6	14.1	13.6	13.2
26 and under 52	16.1	16.5	16.7	16.6	14.9	13.9
52 and over	34.4	29.5	29.2	31.6	31.9	28.7
Total	100.0	100.0	100.0	100.0	100.0	100.0

(a) Estimates from January 1995 to January 1999 have been revised to reflect revisions in the civilian population arising from the 1996 Census

Source: Labour Force Survey.

6.14 UNEMPLOYMENT RATE, Annual Average



Source: Labour Force, Australia (6203.0).

6.15 UNEMPLOYED PERSONS, Age and Whether Looking for Full-time or Part-time Work, Annual Average—1999–2000

	No. unemployed			Unemployment rate		
	Males	Females	Persons	Males	Females	Persons
	'000	'000	'000	%	%	%
LOOKING FOR FULL-TIME WORK						
Aged 15–19	38.4	29.4	67.8	20.0	25.1	21.9
Attending school/tertiary educational institution full-time	6.6	4.2	10.7	47.3	42.7	45.4
Not attending school/tertiary educational institution full-time	31.8	25.3	57.1	18.0	23.6	20.1
Aged 20–24	54.8	32.1	86.9	11.4	9.3	10.5
Attending a tertiary educational institution full-time	3.0	2.1	5.1	24.5	20.0	22.4
Not attending a tertiary educational institution full-time	51.8	30.0	81.8	11.0	8.9	10.2
Aged 25–34	81.1	42.8	123.9	6.6	6.4	6.6
Aged 35–44	64.0	41.0	105.0	5.1	7.3	5.8
Aged 45–54	46.9	26.5	73.5	4.5	5.1	4.7
Aged 55 and over	27.3	7.2	34.6	5.3	4.6	5.2
Total	**312.5**	**179.0**	**491.5**	**6.6**	**7.5**	**6.9**
LOOKING FOR PART-TIME WORK						
Aged 15–19	36.0	38.4	74.4	17.0	13.9	15.2
Attending school/tertiary educational institution full-time	32.9	34.8	67.7	19.4	15.7	17.3
Not attending school/tertiary educational institution full-time	3.0	3.6	6.6	7.3	6.6	6.9
Aged 20–24	9.6	12.5	22.0	8.2	7.4	7.7
Attending a tertiary educational institution full-time	7.0	6.2	13.2	11.1	8.6	9.8
Not attending a tertiary educational institution full-time	2.6	6.2	8.8	4.8	6.5	5.9
Aged 25–34	5.7	19.6	25.4	6.2	5.9	5.9
Aged 35–44	3.7	21.5	25.2	4.7	4.4	4.5
Aged 45–54	3.4	10.4	13.8	4.2	2.8	3.1
Aged 55 and over	4.5	4.6	9.1	4.0	2.5	3.1
Total	**62.9**	**107.0**	**169.8**	**9.1**	**5.9**	**6.8**

Source: Labour Force Survey.

Job search experience

Two key aspects of a person's search for work are the steps taken to find work, and barriers they encounter in obtaining work. Characteristics such as age, sex and education can often influence the person's job search experience and outcomes.

Table 6.16 shows that, in July 1999, almost two-thirds (63%) of unemployed persons were registered with Centrelink and also contacted prospective employers. A further 32% of unemployed persons contacted prospective employers, but were not registered with Centrelink.

As table 6.17 shows, in July 1999 the most commonly reported main difficulties in finding work were 'considered too young or too old by employers' (15% of unemployed persons) and 'too many applicants for available jobs' (12%). Another common difficulty was 'lacked necessary skills or education' (11%).

The main difficulties in finding work most commonly reported by the long-term unemployed were 'considered too young or too old by employers' (26%) and 'lacked necessary skills or education' (13%).

6.16 UNEMPLOYED PERSONS(a), Active Steps Taken to Find Full-time or Part-time Work—July 1999

	Looking for full-time work			Looking for part-time work			Total		
	Males	Females	Persons	Males	Females	Persons	Males	Females	Persons
Active steps taken to find work	'000	'000	'000	'000	'000	'000	'000	'000	'000
Registered with Centrelink and									
Contacted prospective employers	241.1	105.0	346.2	8.2	16.7	24.9	249.3	121.7	371.1
Took other active steps	*4.2	*3.0	7.2	*1.4	*0.2	*1.6	*5.5	*3.2	8.7
Took no other active steps	*0.1	*0.7	*0.8	*0.0	*1.3	*1.3	*0.1	*2.0	*2.1
Total	*245.4*	*108.8*	*354.1*	*9.6*	*18.2*	*27.8*	*255.0*	*126.9*	*381.9*
Not registered with Centrelink and									
Contacted prospective employers	47.2	44.8	92.0	36.4	61.9	98.4	83.6	106.7	190.3
Took other active steps	5.7	*1.0	6.7	*3.2	8.8	12.0	8.9	9.8	18.7
Total	*52.9*	*45.8*	*98.7*	*39.6*	*70.8*	*110.4*	*92.5*	*116.5*	*209.1*
Total	**298.3**	**154.5**	**452.8**	**49.2**	**88.9**	**138.2**	**347.5**	**243.5**	**591.0**

(a) Excludes persons who have been stood down.

Source: Job Search Experience of Unemployed Persons, Australia (6222.0).

6.17 UNEMPLOYED PERSONS(a), Main Difficulty in Finding Work—July 1999

	Duration of current period of unemployment (weeks)						
Main difficulty in finding work	1 and under 8 '000	8 and under 26 '000	26 and under 52 '000	1 and under 2 years '000	2 years and over '000	Total '000	Average duration weeks
Considered too young or too old by employers	14.3	16.0	12.3	17.0	31.4	91.0	91
No vacancies at all	15.2	16.1	9.6	7.1	11.2	59.1	56
No vacancies in line of work	17.6	8.5	9.2	*5.1	6.0	46.5	41
Insufficient work experience	14.7	11.4	14.9	8.4	10.1	59.5	57
Too many applicants for available jobs	18.4	21.0	16.9	7.4	7.8	71.5	42
Lacked necessary skills or education	15.1	13.3	13.0	9.1	15.7	66.3	63
Too far to travel, transport problems	8.3	7.0	7.3	*3.5	8.0	34.1	56
Own ill health or disability	6.3	8.2	5.8	7.4	12.8	40.5	84
Language difficulties	*4.3	*1.6	*2.0	*2.2	*3.9	14.0	68
Unsuitable hours	9.9	5.9	*3.5	*1.6	*1.2	22.1	22
Difficulties with childcare, other family responsibilities	*3.7	*5.3	*3.7	*1.2	*1.0	14.9	43
Other difficulties(b)	6.3	6.7	*3.3	*2.4	*3.4	22.1	41
No difficulties reported	39.9	*4.6	*2.6	*1.6	*0.7	49.4	9
Total	**174.0**	**125.6**	**104.3**	**74.0**	**113.1**	**591.0**	**56**

(a) Excludes persons who have been stood down. (b) Includes persons who reported difficulties because of ethnic background.

Source: Job Search Experience of Unemployed Persons, Australia (6222.0).

Job vacancies

Job vacancies statistics, taken together with employment statistics, help in assessing the demand for labour. A job vacancy is a job available for immediate filling on the survey reference day and for which recruitment action has been taken by the employer.

After peaking at 88,800 in May 1989, the estimated number of job vacancies in Australia fell rapidly to a low of 29,000 in May 1992. Vacancies subsequently rose to a new peak of 112,700 in February 2000.

From May 1999 to May 2000 there was an increase of 17,900 job vacancies in Australia, including increases of 8,800 in Victoria and 4,800 in Queensland. Only Western Australia (down 400), Tasmania (down 700) and the Northern Territory (down 100) recorded decreases (table 6.18).

Table 6.19 shows that of the 17,900 increase in job vacancies in Australia, the largest increases occurred in Property and business services (up 7,600) and Personal and other services (up 5,000), with small movements in other industries.

6.18 JOB VACANCIES, By State/Territory

State/Territory	May 1995 '000	May 1996 '000	May 1997 '000	May 1998 '000	May 1999 '000	May 2000 '000
New South Wales	30.2	30.8	24.6	25.6	37.5	41.8
Victoria	12.7	14.3	14.3	25.9	22.1	30.9
Queensland	7.5	9.1	15.2	19.6	10.9	*15.7
South Australia	4.1	3.0	3.8	3.3	4.4	5.0
Western Australia	7.9	6.7	10.8	13.9	8.3	7.9
Tasmania	2.0	0.9	1.7	0.7	*2.0	1.3
Northern Territory	1.2	1.0	1.1	1.9	*1.3	1.2
Australian Capital Territory	1.4	0.9	1.2	1.5	2.4	3.0
Australia	**66.9**	**66.7**	**72.7**	**92.5**	**88.9**	**106.8**

Source: Job Vacancies Survey, Australia (6354.0).

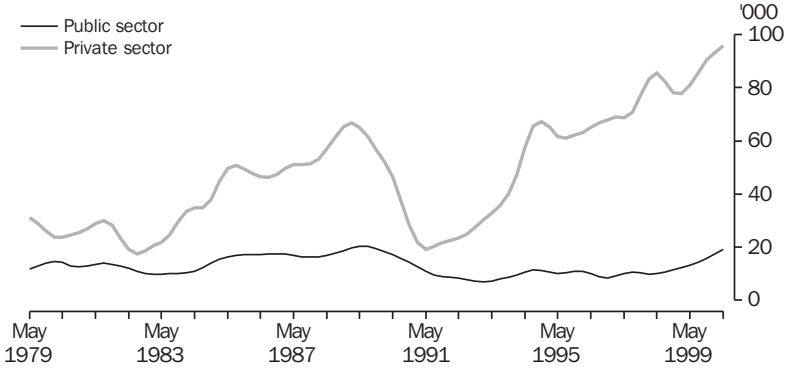
6.19 JOB VACANCIES, By Industry

Industry	May 1995 '000	May 1996 '000	May 1997 '000	May 1998 '000	May 1999 '000	May 2000 '000
Mining	1.6	3.7	1.5	1.1	1.1	0.8
Manufacturing	7.7	10.7	7.5	8.3	12.2	*12.2
Electricity, gas and water supply	0.2	0.2	0.3	0.2	0.3	0.4
Construction	4.5	1.5	5.9	7.8	*4.6	*4.4
Wholesale trade	5.7	2.9	6.4	7.6	*6.6	5.2
Retail trade	9.2	13.2	9.0	15.5	9.0	8.3
Accommodation, cafes and restaurants	4.6	3.7	6.0	4.5	8.9	*8.5
Transport and storage	1.1	2.4	0.7	1.7	*2.7	2.9
Communication services	0.3	0.3	0.3	0.3	1.2	1.5
Finance and insurance	5.7	3.6	5.0	3.1	3.1	5.2
Property and business services	7.3	9.4	13.1	22.5	*17.2	*24.8
Government administration and defence	3.4	2.5	3.3	3.8	4.7	4.9
Education	3.1	2.8	2.8	3.7	3.1	6.7
Health and community services	7.1	5.9	7.9	7.7	7.7	9.7
Cultural and recreational services	1.4	1.3	1.9	1.2	*3.1	2.9
Personal and other services	4.0	2.6	1.2	3.5	*3.4	*8.4
All industries	**66.9**	**66.7**	**72.7**	**92.5**	**88.9**	**106.8**

Source: Job Vacancies Survey, Australia (6354.0).

Graph 6.20 provides trend estimates of job vacancies for both the private sector and public sector, for the period May 1979 to May 2000. It shows that, after declining to below 10,000 through much of the 1990s, job vacancies in the public sector have increased recently and stood at 19,200 in May 2000. In contrast, the number of job vacancies in the private sector has been far more volatile. After reaching a low of 19,100 in May 1991, private sector job vacancies climbed to 95,800 in May 2000, the highest level recorded to that point.

6.20 JOB VACANCIES, By Sector, Trend Estimates



Source: Job Vacancies, Australia (6354.0).

Persons not in the labour force

Persons not in the labour force represent that group of the population who, during the reference week of a Labour Force Survey, are neither employed nor unemployed (see diagram 6.2). Interest in this group centres primarily on their potential to participate in the labour force.

Of the 3,712,400 persons aged 15–69 years not in the labour force at September 1999, the majority (66%) were female.

Some 24% of persons not in the labour force were marginally attached to the labour force (table 6.21). These people wanted to work and were either looking for work or available to start work, but did not satisfy all the criteria for being classified as unemployed. An estimated 70% of these potential labour force participants were female.

In September 1999 there were 105,800 discouraged job seekers. The majority (65%) of discouraged job seekers were female. Discouraged job seekers are a part of the marginally attached to the labour force. They are persons who want to work and are available to start work, but are not actively looking for work as they believe they will not find a job.

An estimated 60% of male discouraged job seekers and 57% of female discouraged job seekers reported that they intended to enter, or might enter, the labour force in the next 12 months.

6.21 CIVILIAN POPULATION AGED 15–69, Labour Force Status

	September 1993	September 1994	September 1995	September 1996	September 1997	September 1998	September 1999
	'000	'000	'000	'000	'000	'000	'000
Persons in the labour force	8 744.6	8 875.5	9 057.0	9 183.1	9 225.4	9 442.9	9 568.3
Persons not in the labour force							
With marginal attachment to the labour force							
Wanted to work and were actively looking for work							
Were available to start work within four weeks	34.8	38.4	32.8	34.7	35.7	33.2	45.5
Were not available to start work within four weeks	23.5	22.9	31.0	23.3	17.6	25.5	19.7
Total	*58.3*	*61.4*	*63.8*	*58.0*	*53.3*	*58.7*	*65.2*
Wanted to work and were available to start work within 4 weeks, but not actively looking for work.							
Discouraged jobseekers	147.4	106.5	111.9	118.9	118.4	110.9	105.8
Other	702.0	605.5	687.1	702.6	718.7	753.0	712.2
Total	*849.5*	*712.0*	*799.0*	*821.5*	*837.2*	*863.9*	*818.0*
Total with marginal attachment to the labour force	907.8	773.3	862.8	879.6	890.5	922.6	883.2
Without marginal attachment to the labour force(a)	2 769.8	2 789.7	2 703.5	2 735.8	2 803.7	2 716.1	2 829.2
Total persons not in the labour force	*3 677.5*	*3 563.0*	*3 566.3*	*3 615.4*	*3 694.2*	*3 638.8*	*3 712.4*
Civilian population aged 15–69	**12 422.1**	**12 438.5**	**12 623.3**	**12 798.5**	**12 919.6**	**13 081.6**	**13 280.7**

(a) Includes persons who were permanently unable to work.

Source: Persons Not in the Labour Force, Australia (6220.0).

Characteristics of employment

Tables 6.22 to 6.24 and graph 6.25 provide information on the number of employed persons and the proportion employed, by occupation, industry and sector. The occupation groups containing the largest number of employed persons were Professionals with 17.9% of persons, 16.1% of males and 20.3% of females; Intermediate clerical, sales and service workers with 17.2% of persons, 8.7% of males and 28.2% of females; and Tradespersons and related workers with 13.5% of persons, 21.5% of males and 3.0% of females.

In 1999–2000, the Retail trade and Manufacturing industries were the two largest employing industries, followed by Property and business services, and Health and community services. Manufacturing was the largest employer of males, with 16.2% of all male workers in that industry. The greatest number of female workers (17.6%) were in Retail trade, followed closely by Health and community services (16.8%).

6.22 EMPLOYED PERSONS BY OCCUPATION(a), Annual Average(b)—1999–2000

	Males		Females		Persons	
	No.	Proportion employed	No.	Proportion employed	No.	Proportion employed
Occupation	'000	%	'000	%	'000	%
Managers and administrators	489.1	9.8	146.4	3.8	635.5	7.2
Professionals	805.1	16.1	786.1	20.3	1 591.2	17.9
Associate professionals	633.1	12.6	374.7	9.7	1 007.7	11.3
Tradespersons and related workers	1 077.3	21.5	118.2	3.0	1 195.4	13.5
Advanced clerical and service workers	41.3	0.8	346.7	8.9	387.9	4.4
Intermediate clerical, sales and service workers	433.6	8.7	1 093.1	28.2	1 526.6	17.2
Intermediate production and transport workers	682.5	13.6	105.7	2.7	788.2	8.9
Elementary clerical, sales and service workers	296.0	5.9	580.4	15.0	876.3	9.9
Labourers and related workers	551.0	11.0	326.5	8.4	877.5	9.9
All occupations	**5 008.8**	**100.0**	**3 877.7**	**100.0**	**8 886.5**	**100.0**

(a) Classified according to the Australian Standard Classification of Occupations (ASCO), Second Edition. (b) Annual average of quarterly data.

Source: Labour Force Survey.

6.23 EMPLOYED PERSONS BY INDUSTRY(a), Annual Average(b)—1999–2000

	Males		Females		Persons	
	No.	Proportion employed	No.	Proportion employed	No.	Proportion employed
Industry	'000	%	'000	%	'000	%
Agriculture, forestry and fishing	302.7	6.0	134.9	3.5	437.5	4.9
Mining	69.0	1.4	9.2	0.2	78.2	0.9
Manufacturing	812.2	16.2	300.9	7.8	1 113.1	12.5
Electricity, gas and water supply	52.9	1.1	11.6	0.3	64.5	0.7
Construction	609.6	12.2	85.8	2.2	695.4	7.8
Wholesale trade	341.7	6.8	153.3	4.0	494.9	5.6
Retail trade	643.4	12.8	681.2	17.6	1 324.6	14.9
Accommodation, cafes and restaurants	192.5	3.8	240.3	6.2	432.8	4.9
Transport and storage	308.7	6.2	98.6	2.5	407.3	4.6
Communication services	114.3	2.3	55.0	1.4	169.3	1.9
Finance and insurance	145.9	2.9	181.6	4.7	327.5	3.7
Property and business services	552.3	11.0	436.4	11.3	988.7	11.1
Government administration and defence	190.0	3.8	155.8	4.0	345.8	3.9
Education	197.4	3.9	411.9	10.6	609.3	6.9
Health and community services	175.6	3.5	652.5	16.8	828.1	9.3
Cultural and recreational services	116.7	2.3	100.4	2.6	217.1	2.4
Personal and other services	184.0	3.7	168.3	4.3	352.3	4.0
All industries	**5 008.8**	**100.0**	**3 877.7**	**100.0**	**8 886.5**	**100.0**

(a) Classified according to the Australian and New Zealand Standard Industrial Classification (ANZSIC). (b) Annual average of quarterly data.

Source: Labour Force Survey.

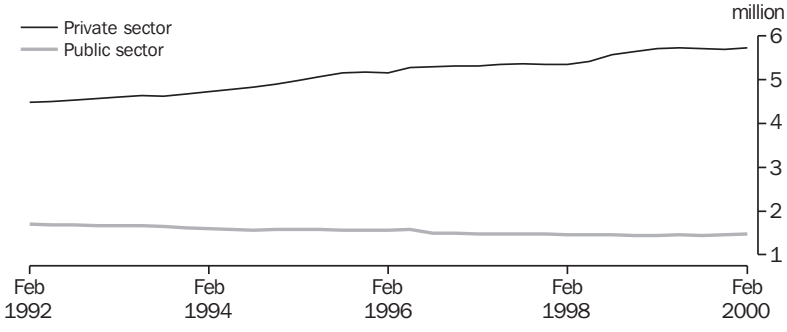
Table 6.24 and graph 6.25 provide a view of the distribution of employee jobs between the private and public sectors, and across the States and Territories. These statistics are obtained from the quarterly Survey of Employment and Earnings, a survey of employing businesses. They are complementary to, but not compatible with, estimates of employed persons from the household-based Labour Force Survey. While the latter provides a better indicator of overall employment movements at the Australian and State/Territory levels, the former provides dissections by sector.

6.24 EMPLOYEE JOBS, Private/Public Sector—February 2000

	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Aust.
Sector	'000	'000	'000	'000	'000	'000	'000	'000	'000
Private	1 905.3	1 545.0	1 016.3	420.3	575.3	118.8	52.8	83.0	5 716.9
Public									
Commonwealth	69.5	55.3	31.7	16.2	16.9	5.7	3.2	50.6	249.2
State	340.0	216.5	226.3	87.1	116.5	29.6	16.1	17.1	1 049.2
Local	44.6	32.1	34.7	7.9	13.6	3.8	2.7	. .	139.4
Total	*454.1*	*303.8*	*292.7*	*111.2*	*147.1*	*39.1*	*22.0*	*67.7*	*1 437.8*
Total	**2 359.4**	**1 848.9**	**1 309.1**	**531.5**	**722.4**	**157.9**	**74.8**	**150.7**	**7 154.7**

Source: Wage and Salary Earners, Australia (6248.0).

6.25 EMPLOYEE JOBS, By Sector, Trend Estimates



Source: Wage and Salary Earners, Australia (6248.0).

Forms of employment

There is a diverse range of employment arrangements in the Australian labour market. The Forms of Employment Survey, first conducted in August 1998, examined some of the key factors relating to employment arrangements.

The employment types classification used in the Forms of Employment Survey differs from the status in employment classification used in the Labour Force Survey, in that the employment types classification uses more detailed information to classify employment arrangements.

In August 1998, some 59% of employed persons were employees with leave entitlements, 18% identified themselves as being casually employed, and 20% worked in their own business. Table 6.26 shows the number of people in each employment type. Males formed the majority in each employment type, with the exception of self-identified casuals (61% of this group were females).

In August 1998 there were 268,300 persons working on fixed-term contracts, and a further 610,900 persons who worked in their own business and undertook contract work. The majority of people working in their own business were independent of their client (85%).

In August 1998, 21% of employed persons had worked for their employer/business for less than one year and a further 21% had worked for their current employer/business for one to two years. A further 38% had worked for their current employer/business for six years or more.

An estimated 84,300 persons reported that they were paid by an employment agency. Some 65% of these persons were self-identified casuals, 53% were females and 38% were aged 25–34 years.

6.26 EMPLOYED PERSONS—August 1998

	Males	Females	Persons
Employment type	'000	'000	'000
Employees with leave entitlements	2 835.7	2 104.0	4 939.7
Self-identified casuals	580.4	906.5	1 486.9
Other employed persons	182.8	116.7	299.5
Owner managers of incorporated enterprises	409.8	181.1	590.9
Owner managers of unincorporated enterprises	735.5	343.3	1 078.8
Total(a)	**4 744.2**	**3 651.6**	**8 395.8**

(a) Excludes contributing family workers and persons who worked only for payment in kind.

Source: Forms of Employment, August 1998 (6359.0).

6.27 MULTIPLE JOBHOLDERS, Selected Characteristics—July 1999

Characteristics	Males '000	Females '000	Persons '000	Proportion of employed persons %
Marital status				
Married	131.0	140.3	271.3	5.0
Not married	68.6	107.5	176.1	5.3
Birthplace and period of arrival				
Born in Australia	162.1	195.2	357.3	5.4
Born outside Australia				
Born in main English speaking countries	21.3	26.9	48.2	5.1
Born in other countries	16.2	25.8	41.9	3.4
Total born outside Australia	*37.5*	*52.7*	*90.2*	*4.2*
Age (years)				
15–19	10.8	21.1	31.9	5.1
20–24	22.1	35.4	57.5	5.8
25–34	45.2	56.0	101.2	4.7
35–44	53.1	65.3	118.4	5.3
45–54	49.7	56.8	106.5	5.6
55 and over	18.7	13.3	32.0	3.7
Total	**199.6**	**247.8**	**447.4**	**5.1**

Source: Multiple Jobholding, July 1997 (6216.0).

Multiple jobholding

Multiple jobholding is a relatively small yet significant feature of the Australian labour market. Measuring the size and composition of this group is important as it impacts on many workplace and labour market issues. These include underemployment, job casualisation, labour costs, workplace health and safety, transport and labour mobility.

To be classified as a multiple jobholder a person has to have a second job and be an employee in at least one of their jobs. In July 1999, there were 447,400 multiple jobholders, representing 5.1% of all employed persons.

A greater number and proportion of employed females (247,800, or 6.5%) than males (199,600, or 4.0%) held multiple jobs. The only age group in which males outnumbered females was '55 and over'. A high proportion of 20 to 24 year old females (7.6%) held multiple jobs. Persons born in Australia (5.4%) and persons born outside Australia in main-English speaking countries (5.1%) were more likely to hold multiple jobs than those born in other countries (3.4%).

Hours, earnings and benefits

Hours of work and work patterns

Statistics on hours and patterns of work are essential for the study of economic activity, productivity, working conditions, living standards and the quality of life of working people. This section examines some aspects of work patterns and hours of work.

The average weekly hours worked in 1999–2000 by various categories of employed persons, and in different industries, are shown in tables 6.28 and 6.29. In 1999–2000 men worked on average 39.5 hours per week, while women worked 28.4 hours per week, with married women working slightly fewer hours. The difference between males and females is less marked when full-time and part-time work are looked at separately. Male full-time workers worked an average of 43.0 hours per week while women who were employed full-time averaged 38.3 hours per week. For part-time workers, the difference between men and women is minimal, with men working on average 15.6 hours and women working 15.8 hours. Although part-time work is increasing, the hours worked in part-time employment account for only 11.8% of all hours worked. For women, part-time work accounts for 24.2% of aggregate hours worked, but for men it accounts for just 5.0%.

In 1999–2000 the highest average weekly hours worked were recorded in the Mining industry (44.8 hours). For females the average weekly hours worked ranged from 21.4 in the Construction industry to 37.6 in Mining. The average weekly hours worked for males ranged from 35.7 in the Cultural and recreational services industry to 48.3 in Agriculture, forestry and fishing (table 6.29).

6.28 EMPLOYED PERSONS, Aggregate and Average Weekly Hours Worked(a), Annual Average(b)—1999–2000

	Unit	Males	Females			Persons
			Married	Not married	Total	
Aggregate weekly hours worked by						
All workers	mill. hours	198.6	65.7	45.0	110.7	**309.3**
Full-time workers	mill. hours	188.7	48.0	35.9	83.9	**272.7**
Part-time workers	mill. hours	9.9	17.8	9.0	26.8	**36.6**
Average weekly hours worked by						
All workers	hours	39.5	28.2	28.8	28.4	**34.7**
Full-time workers	hours	43.0	38.3	38.2	38.3	**41.4**
Part-time workers	hours	15.6	16.4	14.6	15.8	**15.7**
Employees	hours	38.6	28.2	28.9	28.5	**34.1**
Other than employees	hours	44.2	27.7	28.3	27.8	**38.6**
All workers who worked one hour or more in the reference week	hours	42.1	30.6	30.7	30.6	**37.1**
Full-time workers who worked one hour or more in the reference week	hours	45.7	41.4	40.6	41.1	**44.2**
Part-time workers who worked one hour or more in the reference week	hours	16.7	17.9	15.6	17.1	**17.0**

(a) The estimates refer to actual hours worked, not hours paid for. (b) Averages calculated on monthly estimates.

Source: Labour Force Survey.

6.29 EMPLOYED PERSONS, Average Weekly Hours Worked(a) by Industry(b), Annual Average(c)—1999–2000

	Males	Females		Persons
		Married	Total	
Industry	hours	hours	hours	hours
Agriculture, forestry and fishing	48.3	29.3	29.8	42.6
Mining	45.8	35.0	37.6	44.8
Manufacturing	40.8	32.5	33.1	38.7
Electricity, gas and water supply	39.0	30.4	33.5	38.0
Construction	41.9	19.5	21.4	39.3
Wholesale trade	42.4	30.9	32.2	39.2
Retail trade	37.2	29.0	25.2	31.0
Accommodation, cafes and restaurants	38.8	31.2	28.1	32.8
Transport and storage	42.4	29.8	32.1	39.9
Communication services	39.8	31.7	32.7	37.5
Finance and insurance	41.8	30.5	32.5	36.6
Property and business services	41.4	28.7	31.1	36.9
Government administration and defence	37.2	30.4	31.6	34.7
Education	38.4	30.5	31.4	33.7
Health and community services	38.1	27.5	28.4	30.5
Cultural and recreational services	35.7	26.7	27.1	31.7
Personal and other services	37.6	27.8	28.9	33.4
All industries	**40.6**	**29.2**	**29.4**	**35.7**

(a) The estimates refer to actual hours worked, not hours paid for. (b) Classified according to the Australian and New Zealand Standard Industrial Classification (ANZSIC). (c) Averages calculated on quarterly estimates.

Source: Labour Force Survey.

Level of earnings

The level of earnings is an important measure of the adequacy of employment available. This is usually measured through estimates of average weekly earnings. These can be compared between various demographic groups, occupations or industries.

Movements in the level of earnings have been used as a key economic indicator in the past. However, the ABS has introduced the Wage Cost Index as a more accurate measure of movements in wage and salary rates. This is explained in more detail in the section *Changes in the price of labour*.

The quarterly Survey of Average Weekly Earnings measures earnings for time worked and payments for leave taken during a one week reference period in the middle month of a quarter. Irregular earnings not related to the reference period are excluded.

Weekly total earnings include ordinary time and overtime pay. Weekly ordinary time earnings relate only to that part of total earnings attributable to award, standard or agreed hours of work.

Table 6.30 shows average weekly earnings for male and female employees over the five years from May 1995 to May 2000. While average weekly earnings for female employees increased by more than those for male employees in the past year (4.5% compared to 3.4%), the level of earnings for females is still much lower than earnings for males, with average weekly earnings at $504.80 for females compared to $757.70 for males.

Average weekly earnings data are also available from the biennial Employee Earnings and Hours (EEH) survey. This survey produces complementary information, by providing statistics on the composition of average weekly earnings which enable comparison of earnings for various categories of employees, by occupation groups and industries.

Table 6.31 shows average weekly total earnings for different occupation groups and categories of employees in May 1998. Average weekly total earnings vary considerably across occupations, with persons in lower skilled jobs tending to receive lower wages. In May 1998, full-time Managers and administrators received estimated average weekly total earnings of $1,236.00. In contrast, Elementary clerical, sales and service workers earned on average $552.20.

Men tend to get paid more than women within the same occupation group. Average weekly total earnings for full-time employees are closest for Professionals (women's average earnings are 85.2% of men's) and furthest apart for Tradespersons and related workers (women's earnings 69.7% of men's).

Table 6.32 presents average weekly earnings with ordinary and overtime earnings separated. The largest amounts of overtime earnings were recorded for full-time adult employees in Mining ($129.30), Transport and storage ($89.50), Communication services ($80.20) and Construction ($79.80).

6.30 AVERAGE WEEKLY EARNINGS

	May 1995	May 1996	May 1997	May 1998	May 1999	May 2000
	$	$	$	$	$	$
MALES						
Full-time adult employees						
Average weekly ordinary time earnings	687.80	715.80	740.70	773.20	798.40	832.80
Average weekly total earnings	743.00	774.20	795.80	829.90	853.40	884.90
All male employees						
Average weekly total earnings	652.70	671.50	687.10	714.50	733.00	757.70
FEMALES						
Full-time adult employees						
Average weekly ordinary time earnings	575.50	594.10	620.30	646.90	669.60	697.90
Average weekly total earnings	589.80	607.90	634.80	660.60	683.50	714.50
All female employees						
Average weekly total earnings	429.90	441.10	457.40	468.30	483.00	504.80
PERSONS						
Full-time adult employees						
Average weekly ordinary time earnings	647.30	672.60	696.60	726.90	750.80	782.60
Average weekly total earnings	687.80	715.20	736.80	767.80	790.60	821.50
All employees						
Average weekly total earnings	548.10	564.40	577.80	596.20	611.10	634.70

Source: Average Weekly Earnings, States and Australia (6302.0).

6.31 AVERAGE WEEKLY TOTAL EARNINGS, Occupation(a) by Category of Employee—May 1998

	Full-time employees							
	Managerial	Non-managerial			Total			
Occupation	Adult $	Adult $	Junior $	Total $	Adult $	Total $	Part-time employees $	All employees $
MALES								
Managers and administrators	1 283.60	1 113.30	. .	1 113.30	1 276.80	1 276.80	409.60	1 260.60
Professionals	1 086.20	994.10	404.40	992.30	1 010.00	1 008.50	437.80	928.40
Associate professionals	816.10	919.70	337.70	913.70	876.60	873.10	328.50	833.20
Tradespersons and related workers	546.30	773.30	340.30	723.80	756.70	712.20	293.90	688.00
Advanced clerical and service workers	882.00	744.80	361.90	743.10	769.50	768.00	248.10	715.10
Intermediate clerical, sales and service workers	766.60	694.20	302.40	684.30	698.20	688.70	262.00	599.90
Intermediate production and transport workers	550.70	771.20	364.40	761.10	764.30	754.70	255.80	675.30
Elementary clerical, sales and service workers	530.30	625.30	336.10	607.60	623.30	606.10	199.60	395.30
Labourers and related workers	621.90	630.40	313.60	618.40	630.40	618.40	204.50	480.90
All occupations	*1 034.80*	*792.20*	*337.40*	*771.80*	*843.30*	*825.20*	*262.00*	*729.80*
FEMALES								
Managers and administrators	1 079.50	1 148.90	. .	1 148.90	1 082.40	1 082.40	453.00	1 015.70
Professionals	967.10	850.70	514.20	850.40	859.00	858.80	425.80	680.60
Associate professionals	653.40	700.70	390.90	699.30	683.10	681.90	350.50	587.70
Tradespersons and related workers	530.60	547.90	282.90	494.50	547.00	496.10	265.90	395.20
Advanced clerical and service workers	480.40	641.50	340.70	630.70	627.70	618.30	289.90	510.80
Intermediate clerical, sales and service workers	623.20	581.10	336.30	568.10	582.10	569.40	280.50	429.30
Intermediate production and transport workers	* 366.70	573.50	341.00	566.50	573.20	566.20	227.90	409.20
Elementary clerical, sales and service workers	330.80	526.50	333.40	504.00	522.80	501.20	207.70	289.90
Labourers and related workers	378.50	526.90	367.20	521.80	526.00	520.90	213.90	319.90
All occupations	*820.50*	*659.00*	*332.20*	*645.50*	*679.40*	*666.80*	*285.60*	*484.00*
PERSONS								
Managers and administrators	1 240.80	1 121.10	. .	1 121.10	1 236.00	1 236.00	436.60	1 205.30
Professionals	1 054.50	923.10	423.90	922.10	939.60	938.80	428.40	789.60
Associate professionals	762.80	838.90	348.50	834.90	808.40	805.90	344.60	731.90
Tradespersons and related workers	545.60	760.20	334.10	709.10	744.80	698.70	281.10	658.60
Advanced clerical and service workers	602.90	657.70	341.10	648.00	652.20	643.50	288.00	537.70
Intermediate clerical, sales and service workers	705.40	621.90	329.20	609.30	624.90	612.60	278.00	475.20
Intermediate production and transport workers	549.50	748.00	361.10	738.20	742.50	733.00	245.40	630.30
Elementary clerical, sales and service workers	436.00	576.00	334.30	554.30	573.20	552.20	205.40	327.30
Labourers and related workers	555.80	603.60	325.90	593.50	603.30	593.30	209.80	416.20
All occupations	**978.50**	**739.40**	**335.50**	**721.80**	**782.20**	**766.20**	**279.20**	**610.20**

(a) Occupation classified according to the Australian Standard Classification of Occupations (Second Edition).

Source: Employee Earnings and Hours, Australia (6306.0).

6.32 AVERAGE WEEKLY EARNINGS(a), Composition—May 1998

Industry	Ordinary earnings $	Overtime earnings $	**Total earnings $**
Mining	1 182.30	129.30	**1 311.70**
Manufacturing	680.90	72.80	**753.80**
Electricity, gas and water supply	854.70	64.90	**919.70**
Construction	744.10	79.80	**823.80**
Wholesale trade	719.10	23.10	**742.20**
Retail trade	572.70	14.90	**587.60**
Accommodation, cafes and restaurants	563.60	* 11.90	**575.50**
Transport and storage	734.30	89.50	**823.80**
Communication services	846.10	80.20	**926.30**
Finance and insurance	899.40	11.30	**910.70**
Property and business services	803.60	20.70	**824.30**
Government administration and defence	766.90	23.20	**790.00**
Education	831.40	3.20	**834.60**
Health and community services	731.10	19.70	**750.90**
Cultural and recreational services	769.40	15.00	**784.40**
Personal and other services	698.70	56.30	**755.00**
All industries	742.60	39.60	**782.20**

(a) For full-time adult employees.

Source: Employee Earnings and Hours, Australia (6306.0).

Changes in the price of labour

Currently the ABS compiles and publishes a quarterly index, the Wage Cost Index (WCI), which measures changes in the price of the wage and salary component of labour services. Development is continuing towards a Labour Price Index, which will include, in addition to wages and salaries, changes in the price of 'non-wage' components (e.g. superannuation and workers compensation) which contribute to the cost to employers of employing labour. It is expected that the Labour Price Index will be published from 2003.

The WCI is a 'pure' price index which measures changes over time in wage and salary rates of pay for employee jobs, unaffected by changes in the quality and quantity of work performed. Index numbers in the WCI are compiled from hourly prices, i.e. quality adjusted hourly wage and salary rates of pay, for a representative sample of employee jobs within a sample of employing organisations. To enable the WCI to measure changes in price over time, data are collected for a sample of individual jobs common between consecutive quarters. Only those jobs that have a price derived in both the current and previous quarters (i.e. matched jobs) contribute to index calculations. Thus, unlike other ABS earnings measures such as the quarterly Average Weekly Earnings series, the WCI does not measure changes in average (per employee) wage payments.

As shown in table 6.33, the indexes of increases in the total hourly rates of pay excluding bonuses varied across sectors and across States and Territories. At the all sectors level, the annual percentage increase from March quarter 1999 to March quarter 2000 for Australia was 2.8%. The increase for the public sector at 2.5% was lower than for the private sector at 2.9%.

At the all sectors level, the annual percentage increases from March quarter 1999 to March quarter 2000 ranged from 2.4% for the Northern Territory and the Australian Capital Territory to 3.0% for Victoria. The increases for the private sector ranged from 2.2% for the Northern Territory to 3.4% for the Australian Capital Territory, and for the public sector ranged from 1.6% for New South Wales to 3.7% for Queensland.

As illustrated in table 6.34, the indexes also varied across industries. At the all sectors level, the annual percentage increases from March quarter 1999 to March quarter 2000 ranged from 2.0% for Health and community services, and Cultural and recreational services, to 4.0% for Electricity, gas and water supply.

Table 6.35 shows the indexes for occupations. At the all sectors level, the annual percentage increases from March quarter 1999 to March quarter 2000 ranged from 2.4% for Advanced clerical and service workers, Intermediate production and transport workers, and Labourers and related workers, to 3.1% for Managers and administrators.

More detailed information on the WCI is available in *Wage Cost Index, Australia* (6345.0) and *Information Paper: Wage Cost Index, Australia, 2000* (6346.0).

6.33 TOTAL HOURLY RATES OF PAY EXCLUDING BONUSES, State by Sector

State/Territory	Index numbers(a)					Percentage change from corresponding quarter of previous year
	March quarter 1999	June quarter 1999	September quarter 1999	December quarter 1999	March quarter 2000	March quarter 2000
			PRIVATE			
New South Wales	104.5	105.1	106.5	106.9	107.7	3.1
Victoria	104.4	105.1	106.1	106.8	107.6	3.1
Queensland	104.4	105.0	106.0	106.6	107.1	2.6
South Australia	104.6	104.7	105.8	106.5	107.3	2.6
Western Australia	104.9	105.6	106.3	106.7	107.5	2.5
Tasmania	104.0	104.7	105.5	106.0	106.5	2.4
Northern Territory	103.9	104.3	105.3	105.7	106.2	2.2
Australian Capital Territory	103.7	104.3	105.9	106.2	107.2	3.4
Australia	*104.5*	*105.1*	*106.2*	*106.7*	*107.5*	*2.9*
			PUBLIC			
New South Wales	108.2	108.5	109.0	109.3	109.9	1.6
Victoria	104.9	105.1	106.0	106.9	107.6	2.6
Queensland	105.0	105.3	107.4	108.4	108.9	3.7
South Australia	104.5	104.8	106.3	107.4	107.8	3.2
Western Australia	104.0	105.0	105.6	106.5	107.6	3.5
Tasmania	103.8	104.3	105.7	106.1	106.5	2.6
Northern Territory	106.1	106.1	106.5	108.5	108.7	2.5
Australian Capital Territory	104.4	104.5	105.4	105.8	106.3	1.8
Australia	*105.9*	*106.2*	*107.2*	*107.9*	*108.5*	*2.5*
			PRIVATE AND PUBLIC			
New South Wales	105.3	105.9	107.0	107.5	108.2	2.8
Victoria	104.5	105.1	106.1	106.8	107.6	3.0
Queensland	104.6	105.1	106.3	107.1	107.6	2.9
South Australia	104.6	104.7	105.9	106.8	107.4	2.7
Western Australia	104.7	105.4	106.1	106.7	107.5	2.7
Tasmania	103.9	104.6	105.5	106.0	106.5	2.5
Northern Territory	104.7	105.0	105.8	106.7	107.2	2.4
Australian Capital Territory	104.1	104.4	105.6	106.0	106.6	2.4
Australia	**104.8**	**105.4**	**106.4**	**107.0**	**107.7**	**2.8**

(a) Base of each index: September Quarter 1997 = 100.0.

Source: Wage Cost Index, Australia (6345.0).

6.34 TOTAL HOURLY RATES OF PAY EXCLUDING BONUSES, By Industry(a)

	Index numbers(b)					Percentage change from corresponding quarter of previous year
Industry	March quarter 1999	June quarter 1999	September quarter 1999	December quarter 1999	March quarter 2000	March quarter 2000
Mining	104.0	105.0	105.7	106.1	106.7	2.6
Manufacturing	105.1	105.8	106.9	107.4	108.1	2.9
Electricity, gas and water supply	105.2	106.1	107.2	108.1	109.4	4.0
Construction	105.3	106.0	106.8	107.5	108.8	3.3
Wholesale trade	103.7	104.2	105.3	105.9	106.6	2.8
Retail trade	103.7	104.0	104.8	105.4	106.1	2.3
Accommodation, cafes and restaurants	103.7	103.9	105.0	105.6	106.0	2.2
Transport and storage	104.1	104.6	105.6	106.1	106.6	2.4
Communication services	104.2	104.2	105.4	106.2	107.9	3.6
Finance and insurance	105.3	106.2	107.4	107.9	108.9	3.4
Property and business services	104.9	105.5	107.6	108.2	108.7	3.6
Government administration and defence	105.5	105.7	106.8	107.7	108.0	2.4
Education	105.5	106.0	106.9	107.3	107.9	2.3
Health and community services	105.9	106.2	107.2	107.7	108.0	2.0
Cultural and recreational services	104.2	104.5	105.2	105.4	106.3	2.0
Personal and other services	104.5	105.2	106.3	106.9	107.7	3.1
All industries	**104.8**	**105.4**	**106.4**	**107.0**	**107.7**	**2.8**

(a) Industry classified according to the Australian and New Zealand Standard Industrial Classification (ANZSIC) (1993). (b) Base of each index: September Quarter 1997 = 100.0.

Source: Wage Cost Index, Australia (6345.0).

6.35 TOTAL HOURLY RATES OF PAY EXCLUDING BONUSES, By Occupation(a)

	Index numbers(b)					Percentage change from corresponding quarter of previous year
Occupation	March quarter 1999	June quarter 1999	September quarter 1999	December quarter 1999	March quarter 2000	March quarter 2000
Managers and administrators	105.2	105.9	107.1	107.7	108.5	3.1
Professionals	105.5	106.2	107.2	107.7	108.2	2.6
Associate professionals	104.9	105.3	106.3	106.9	107.9	2.9
Tradespersons and related workers	104.8	105.2	106.4	106.9	107.7	2.8
Advanced clerical and service workers	104.8	105.3	106.6	107.1	107.3	2.4
Intermediate clerical, sales and service workers	104.2	104.7	105.8	106.6	107.2	2.9
Intermediate production and transport workers	104.5	105.0	105.7	106.3	107.0	2.4
Elementary clerical, sales and service workers	103.9	104.3	105.5	106.0	106.7	2.7
Labourers and related workers	104.7	105.1	106.1	106.7	107.2	2.4
All occupations	**104.8**	**105.4**	**106.4**	**107.0**	**107.7**	**2.8**

(a) Occupation classified according to the Australian Standard Classification of Occupations (ASCO) (second edition). (b) Base of each index: September Quarter 1997 = 100.0.

Source: Wage Cost Index, Australia (6345.0).

6.36 EMPLOYEES IN MAIN JOB(a), By Type of Benefit Received

	Working full-time		Working part-time		Total employees	
	August 1994	August 1999	August 1994	August 1999	August 1994	August 1999
	TYPE OF BENEFIT (%)					
Superannuation	93.1	95.1	67.4	72.6	87.1	88.7
Holiday leave	89.6	87.5	34.0	33.3	76.6	71.9
Sick leave	89.4	87.4	34.4	33.7	76.6	72.0
Long service leave	77.3	74.4	28.1	27.9	65.8	61.1
Goods or services	16.5	17.3	18.8	17.8	17.1	17.5
Transport	17.7	19.3	4.8	3.8	14.7	14.8
Telephone	9.3	12.4	3.2	3.0	7.9	9.7
Holiday expenses	4.0	4.3	0.8	0.9	3.2	3.3
Medical	3.8	3.1	1.2	0.8	3.2	2.5
Housing	3.5	3.5	1.2	0.7	2.9	2.7
Low-interest finance	3.1	2.3	0.9	0.9	2.6	1.9
Study leave	3.4	3.5	2.7	3.6	3.2	3.5
Shares	4.5	6.9	1.8	2.2	3.9	5.5
Union dues/professional association	3.2	3.3	0.7	0.6	2.6	2.5
Electricity	2.2	2.5	1.1	0.9	2.0	2.0
Entertainment allowance	1.9	2.2	*0.3	0.1	1.5	1.6
Club fees	2.1	2.1	0.4	0.4	1.7	1.6
Child care/education expenses	0.5	0.4	*0.2	0.1	0.4	0.3
No benefits	2.2	1.2	21.7	18.1	6.8	6.0
	NUMBER OF EMPLOYEES ('000)					
Total	4 872.4	5 208.1	1 476.1	2 096.1	6 348.5	7 304.2

(a) Excludes persons attending school.

Source: Employee Earnings, Benefits and Trade Union Membership, August 1999, Australia (6310.0).

Non-wage benefits

In addition to wages and salaries, the majority of employees also receive paid leave (sick, holiday and long-service) and superannuation benefits.

In August 1999, 97% of the 5,208,100 full-time employees received one or more of the standard employment benefits of superannuation, sick leave, holiday leave or long-service leave in their main job. In comparison, 75% of the 2,096,100 part-time employees received one or more standard employment benefits.

Table 6.36 shows the proportion of employees receiving each type of employment benefit. For full-time and part-time employees, the proportion receiving holiday and sick leave fell between 1994 and 1999.

Information on other non-wage benefits was collected in August 1999. The least reported benefits were entertainment allowance (2%), club fees (2%) and child care/education expenses (0.3%). The more commonly received additional non-wage and non-leave benefits were goods and services (18%), transport (15%) and telephone (10%).

Superannuation

In August 1999, 89% of employees received superannuation as an employment benefit in their main job (table 6.37). The proportion of males who received superannuation increased from 87% in August 1993 to 90% in August 1999. In comparison, the proportion of females receiving superannuation as an employment benefit increased from 82% in August 1993 to 87% in August 1999 (table 6.37).

6.37 EMPLOYEES WHO RECEIVED SUPERANNUATION BENEFITS, At August(a)

	Males	Females	Persons
	%	%	%
1993	87.4	81.8	84.9
1994	89.4	84.6	87.3
1995	89.2	84.4	87.0
1996	88.0	84.3	86.4
1997	89.3	86.8	88.2
1998	89.7	87.6	88.7
1999	89.8	87.3	88.7

(a) Based on a supplement to the monthly Labour Force Survey in August of each year.

Source: Employee Earnings, Benefits and Trade Union Membership (6310.0).

The majority (92%) of employees aged 20 years and over received superannuation as an employment benefit in August 1999. In contrast, just over half (53%) of employees aged 15–19 years were covered by superannuation.

In August 1999, 96% of employees in the public sector received superannuation benefits (97% of males and 96% of females) compared with 87% of private sector employees (88% of males and 85% of females).

Industrial relations

Industrial disputes

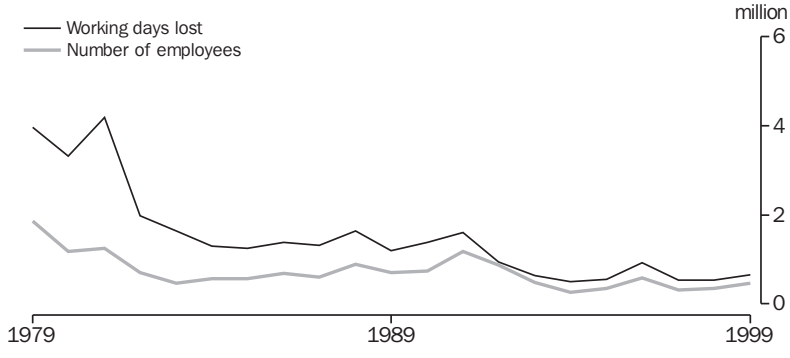
This section presents statistics on industrial disputes involving the loss of ten working days or more at the establishments where stoppages occurred. Working days lost refers to working days lost by workers directly or indirectly involved in disputes at those establishments.

The number of working days lost per year, and the number of employees involved, have fluctuated from year to year, but have demonstrated a significant downward trend over the last two decades (graph 6.38). However, the number of working days lost in 1999 was 650,500, an increase of almost 24% on the 1998 figure. Over the same period the number of employees involved in industrial disputes (either directly or indirectly) increased by 32% (table 6.39).

The overall increase of 124,200 in working days lost between 1998 and 1999 was primarily due to increased disputation in Education; Health and community services industries (up 148,300), and Metal products; Machinery and equipment manufacturing industries (up 76,700).

This was partly offset by falls in Construction (down 45,800), Coal mining (down 34,400), and Transport and storage; Communication services (down 32,500).

6.38 INDUSTRIAL DISPUTES



Source: Industrial Disputes, Australia (6322.0).

6.39 Number of Disputes and Employees Involved

	Disputes		Employees involved		
	Commenced in year	Total	Newly involved(a)	Total	Working days lost
Year	no.	no.	'000	'000	'000
1994	556	560	263.4	265.1	501.6
1995	635	643	335.4	344.3	547.6
1996	539	543	575.9	577.7	928.5
1997	444	447	315.0	315.4	534.2
1998	516	519	347.8	348.4	526.3
1999	727	731	460.7	461.1	650.5

(a) Comprises workers involved in disputes which commenced during the year and additional workers involved in disputes which continued from the previous year.

Source: Industrial Disputes, Australia (6321.0).

6.40 WORKING DAYS LOST, By Industry(a)

Industry	1994 '000	1995 '000	1996 '000	1997 '000	1998 '000	1999 '000
Mining						
Coal	151.0	111.1	160.8	95.7	60.4	26.0
Other	18.3	78.0	4.4	1.1	1.4	2.0
Manufacturing						
Metal products; Machinery and equipment	45.4	54.8	58.6	76.9	27.5	104.2
Other	78.3	105.1	44.8	68.7	67.7	80.3
Construction	20.2	42.7	334.8	107.8	210.9	165.1
Transport and storage; Communication services	59.4	38.6	20.4	47.7	52.8	20.3
Education; Health and community services	73.8	70.9	239.8	94.0	75.8	224.1
Other industries(b)	55.2	46.3	64.9	42.1	29.8	28.4
All industries	**501.6**	**547.6**	**928.5**	**534.2**	**526.3**	**650.4**

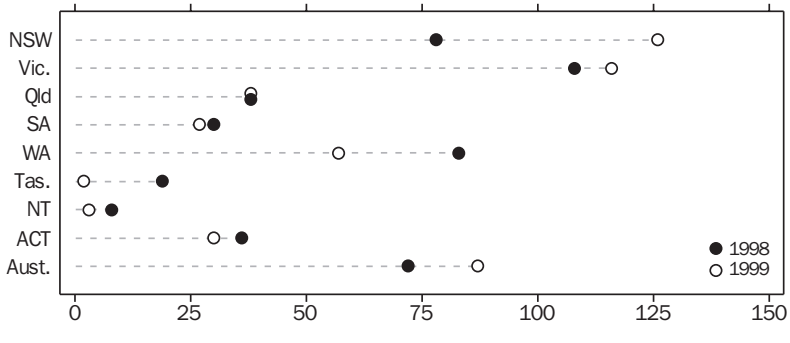
(a) Prior to January 1994, industry information was classified according to Australian Standard Industrial Classification (ASIC). From that time, industry data have been classified according to the Australian and New Zealand Standard Industrial Classification (ANZSIC). (b) Includes: Agriculture, forestry and fishing; Electricity, gas and water supply; Wholesale trade; Retail trade; Accommodation, cafes and restaurants; Finance and insurance; Property and business services; Government administration and defence; Cultural and recreational services; Personal and other services.

Source: Industrial Disputes, Australia (6322.0).

There were 87 working days lost per thousand employees in 1999, compared to 72 working days lost per thousand employees in 1998 (graph 6.41). Among the States and Territories, New South Wales recorded the highest number of working days lost per thousand employees in 1999 (126), followed by Victoria (116) and Western Australia (57). Tasmania recorded the lowest number of working days lost per thousand employees (2), with the Northern Territory also recording a very low number of working days lost per thousand employees (3).

Western Australia recorded the largest drop in the number of working days lost per thousand employees, from 83 in 1998 to 57 in 1999. Tasmania also recorded a large decrease of 17 working days lost per thousand employees over this period. New South Wales recorded the largest increase, from 78 in 1998 to 126 in 1999, with Victoria the only other State to record an increase, up 8 to 116 working days lost per thousand employees.

6.41 NUMBER OF WORKING DAYS LOST PER THOUSAND EMPLOYEES, By State/Territory



Source: Industrial Disputes, Australia (6322.0).

Trade union membership

In August 1999, of 7,304,200 employees aged 15 and over, 26% were trade union members in connection with their main job (table 6.42).

Of permanent employees, 31% were trade union members. In comparison, 11% of casual employees were trade union members.

Electricity, gas and water supply, and Communication services were the most unionised industries, with 50% and 48% of employees respectively being trade union members. Agriculture, forestry and fishing was the least unionised (5% of employees).

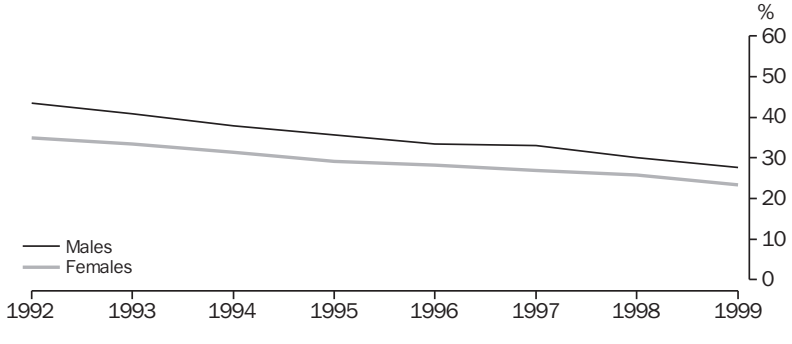
As shown in graph 6.43, the proportion of employees who were trade union members in connection with their main job has been steadily declining. Between August 1992 and August 1999, the level of trade union membership reported by employees declined by around 25% (14 percentage points).

6.42 PROPORTION OF EMPLOYEES WHO WERE TRADE UNION MEMBERS—August 1998

Industry	Males %	Females %	Persons %
Agriculture, forestry and fishing	*3.5	*7.4	4.6
Mining	38.8	*0.0	35.3
Manufacturing	36.4	22.2	32.8
Electricity, gas and water supply	55.1	*25.9	50.1
Construction	28.5	*3.0	25.7
Wholesale trade	11.7	5.0	9.6
Retail trade	14.7	19.8	17.4
Accommodation, cafes and restaurants	8.3	11.6	10.1
Transport and storage	45.0	20.6	38.7
Communication services	55.8	33.3	48.3
Finance and insurance	24.0	30.0	27.5
Property and business services	10.5	8.8	9.7
Government administration and defence	45.8	35.6	41.2
Education	49.9	43.9	45.8
Health and community services	30.7	30.7	30.7
Cultural and recreational services	17.6	13.6	15.7
Personal and other services	40.4	18.8	30.5
All industries	**27.7**	**23.4**	**25.7**

Source: Employee Earnings, Benefits and Trade Union Membership (6310.0).

6.43 PROPORTION OF ALL EMPLOYEES WHO WERE TRADE UNION MEMBERS IN MAIN JOB



Source: Employee Earnings, Benefits and Trade Union Membership, Australia (6310.0).

A century of change in the Australian labour market

Introduction

This article examines unemployment, employment by industry, and trade union membership, and describes some of the major changes in these aspects of the labour force over the twentieth century. There are also data on the use of child labour in factories in Australia earlier in the century, and its decline later in the century.

Unemployment rate

Unemployment is an important economic and social indicator that has been measured and recorded in Australia throughout the twentieth century. The way in which unemployment is now measured by the Labour Force Survey (LFS) dates back to 1960. Prior to this, a measure of unemployment was available from the reporting by trade unions of the number of unemployed members on an annual basis from 1906 to 1954, with less frequent data from 1891. These unemployment statistics are not directly comparable over time, but some broad time series comparisons are possible. The unemployment rates presented are calendar year averages.

The unemployment rate has fluctuated throughout the century, with peaks and troughs closely reflecting movements in the economic cycle (graph 6.44). In 1906, unemployment stood at 6.7%, and fluctuated at around this rate (though it rose briefly to a little over 9% in 1915, and just over 11% in 1921) until 1929 when unemployment stood at 11.1%. The unemployment rate then increased rapidly to 19.3% in 1930, before reaching a peak of 29.0% in 1932, in response to the economic conditions of the Great Depression. This unprecedented high rate of unemployment persisted for two years, before the unemployment rate fell rapidly to below 10% by 1937. During World War II, unemployment in Australia reached a new low of 1.1%. This marked the beginning of a sustained period of low unemployment, with the unemployment rate generally remaining below 3% until the early 1970s.

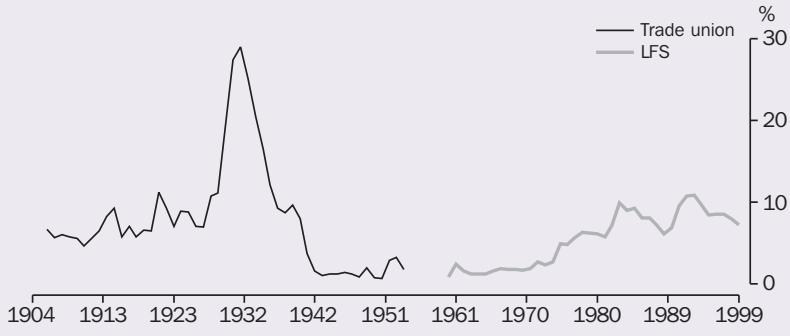
From the early 1970s until the early 1990s, rises in the unemployment rate reflected the business cycle, as well as industry and organisation restructuring. A further notable characteristic of the unemployment rate during this period was the persistence of relatively high rates of unemployment following economic downturns. In 1975 the unemployment rate stood at 4.9%, reaching 6.3% in 1978 and 1979. This higher rate of unemployment was not reversed in the early 1980s. By 1983 the Australian economy had experienced another economic recession and the effects were manifested in a substantial increase in the unemployment rate to 10.0%. The unemployment rate recovered to 6.2% in 1989. It then increased again, reaching a peak of 10.9% in 1993 following the severe economic downturn of 1990–91. The unemployment rate has been generally falling since then. By 1999 it had fallen to 7.2%, slightly higher than it was near the beginning of the century.

Employment by industry

The composition of Australian industry has changed dramatically over the last century. Australia has evolved from an economy heavily reliant on primary industries and the production of goods, to one in which industries providing services have assumed increasing importance. This article draws on Keating (1973),[1] time series from 1910–11 to 1960–61, and industry data from August 1966 from the Labour Force Survey, to provide a broad account of the changes in employment by industry.

In terms of the proportion of all employed persons, the particular importance of the primary and manufacturing industries over the first half of the century is apparent. Employment in the primary industries (predominantly mining and agriculture) together with employment in the manufacturing industry accounted for just over half (52%) of total employment in 1910–11, but was in slow decline or static through most of the next three decades. War-related activity was accompanied by a return to 1910–11 proportions (52%) in the early 1940s. The pattern of sustained slow decline in the relative importance of primary and manufacturing industries resumed after the war, continuing to the present day. By 1999, employment in these industries was reduced to 19% of all employed persons. Service industries such as wholesale and retail trade, finance, education, health and personal services have grown to take over as the major industries of employment.

6.44 UNEMPLOYMENT RATE



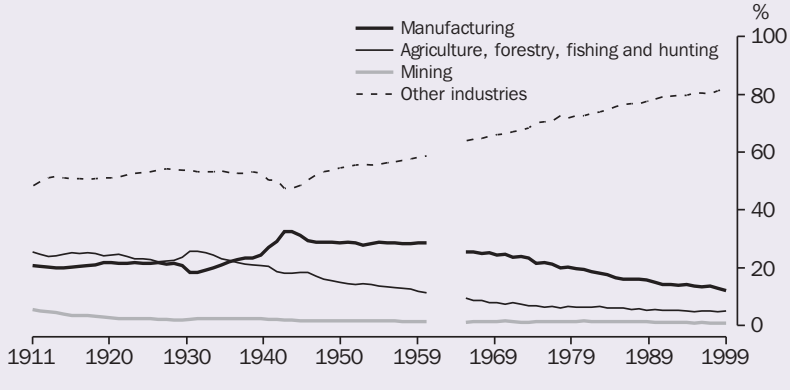
Source: Trade union unemployment data; ABS Labour Report, 1906–1954; Labour Force Survey, State Capitals, 1960–1964; Labour Force Survey, 1966–1999.

In 1910–11, 98,000 or approximately 6% of all employed persons worked in the mining industry. A substantial decline in employment in mining occurred in the early part of the century, falling to 2% of total employment by 1927–28. In 1999 mining employed 76,000 persons, less than 1% of all employed persons.

Agriculture and related industries (forestry, fishing and hunting) employed 422,000 persons, or 26% of total employment, in 1910–11. Apart from a brief resurgence at the time of the Depression, the relative importance of employment in these primary industries has been in steady decline for many decades, although the rate of decline has slowed in recent years. Notably, the number of persons employed in agriculture and related industries in 1999 was similar to that early in the century, but the proportion of total employment had declined significantly to around 5% (graph 6.45).

Manufacturing was one of the most important industries throughout much of the twentieth century. In 1910–11 it employed 361,000 persons, accounting for 21% of total employment. Employment in manufacturing grew rapidly after the Depression, reaching 33% of all employed persons by the mid-1940s. From the mid-1960s, when employment in manufacturing stood at 25%, the proportion fell

6.45 EMPLOYMENT BY INDUSTRY



Source: Keating (1973) 1910–1961; Labour Force Survey 1966–1999.

steadily, and by 1999 manufacturing accounted for only 12% of total employment or 1,068,000 persons. Although the number of persons employed in manufacturing had increased almost three-fold over the century, the proportion of total employment was almost halved.

The composition of the manufacturing industry itself also changed. Early in the century, textiles and clothing manufacturing was the most significant manufacturing activity in employment terms, accounting for 34% of employment in manufacturing in 1910–11. This declined to 26% by 1920–21, to 15% by 1960–61, and to 7% by 1999.

The other major manufacturing activity at the beginning of the century was metals, engineering and vehicles, with 22% of all manufacturing employment in 1910–11. This grew substantially to 44% of all employment in manufacturing by 1943–44, and remained the most significant manufacturing area with 37% of all manufacturing employment in 1999.

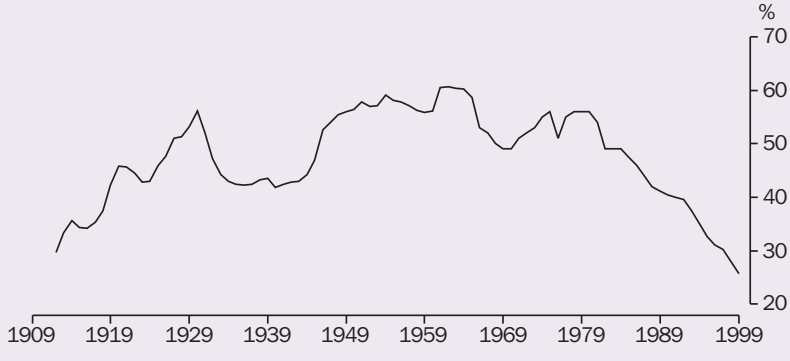
Some industries remained quite static over the course of the century in terms of their employment share. These included the transport and communication industry and the building and construction industry, each accounting for between 7% and 8% of total employment throughout the century.

Service industries gradually grew in terms of employment, to become the major employers at the end of the century. In 1910–11 commerce employed 13% of all employed persons, increasing to 17% of total employment in 1960–61. Community and business services accounted for 5% of total employment in 1910–11, increasing to 9% of total employment in 1960–61. By 1999, persons employed in wholesale and retail trade accounted for 21% of total employment, property and business services for 11%, health and community services for 9%, and cultural, recreation, personal and other services for 6% of total employment. Other service industries such as finance and insurance, and accommodation, cafes and restaurants, employed smaller but still substantial numbers of people in 1999.

Trade union membership

Trade union membership in Australia experienced growth throughout much of the twentieth century, followed by a decline in membership over the latter part of the century. Information on the number of trade union members was first collected in 1912, when there were 433,000 members, representing around 30% of all employees (graph 6.46). A relatively rapid increase in trade union membership over the following years resulted in the number of trade union members more than doubling to 912,000 persons by 1927, or half of all employees. Growth in the number of trade union members continued, despite fluctuating membership during the war years, to reach a peak of over 2.1 million persons, or approximately 60% of all employees, in 1961. Trade union membership then began to decline to just over half of all employees by the early 1970s.

6.46 TRADE UNION MEMBERSHIP



Source: Labour Report 1912–1968; Employee Earnings, Benefits and Trade Union Membership (6310.0) 1969–1999.

Although the numbers of trade union members had increased to 2.7 million by 1990, the proportion of all employees who were trade union members had continued to decline to 41%. By the close of the century, there were 1.9 million union members, or 26% of all employees. Factors contributing to the decline of trade union membership are likely to be changing work place relations, increase in part time and casual employment which historically has been less unionised, and changing industry composition.

Child labour in factories

For the greater part of the twentieth century, it was not uncommon for children to be employed in factories. In this context the term 'child' was taken to mean persons under the age of sixteen, except in New South Wales, where it meant any persons under fifteen. Children were generally not allowed to work in factories in Australia until they reached the age of thirteen. Certain conditions prevailed for the use of child labour in factories. The *Official Year Book of the Commonwealth of Australia, 1901–1907*[2] quotes legislation stating: "On the whole the conditions of labour are satisfactory, and opportunity is assured that a proper period shall be devoted to elementary education, and that the early years of toil shall not exhaust the worker before the attainment of full growth".

In 1906 there were approximately 10,000 children employed in factories in Australia, rising to 20,000 or more in the 1920s. The factory employment of children peaked in 1940 when there were approximately 34,000 children working in factories in Australia, accounting for around 6% of all persons employed in factories. This peak was followed by a large decline in child labour in factories, to 14,000 by 1948 (less than 2% of factory employment). Possible reasons for this decline were given as: raising of the leaving age for schooling in some States; fewer children being available for employment due to a decline in the birth rate; the post war social and economic conditions; and the higher level of employment, which enabled parents to keep their children at school beyond the statutory leaving age.

By the time of the final collection/publication of these statistics in 1968, there were 9,000 children employed in factories (less than 1% of factory employment). Child labour tended to be concentrated in specific industries; those having the greatest concentration of child employees were metals and machinery for males, and clothing and textiles for females.

Endnotes

1 Keating. M. 1973, *The Australian Workforce 1910–11 to 1960–61*, The Australian National University, Canberra.

2 Commonwealth Bureau of Census and Statistics (CBCS) 1908, *Official Year Book of the Commonwealth of Australia, 1901–1907*, Government Printer, Melbourne.

Bibliography

ABS publications and standard data services

Average Weekly Earnings, States and Australia (6302.0).

Employee Earnings and Hours, Australia (6306.0).

Employee Earnings, Benefits and Trade Union Membership, Australia (6310.0).

Forms of Employment, Australia (6359.0).

Industrial Disputes, Australia (6321.0).

Information Paper: Wage Cost Index, Australia (6346.0).

Job Search Experience of Unemployed Persons, Australia (6222.0).

Job Vacancies, Australia (6354.0).

Labour Force, Australia (6203.0).

Labour Force Status and Other Characteristics of Families, Australia (6224.0).

Persons Not in the Labour Force, Australia (6220.0).

Underemployed Workers, Australia (6265.0).

Wage and Salary Earners, Australia (6248.0).

Wage Cost Index, Australia (6345.0).

Internet sites

Centrelink, *http://www.centrelink.gov.au*

Commonwealth Department of Employment, Workplace Relations and Small Business (DEWRSB), *http://www.dewrsb.gov.au*

—Job Network, *http://jobnetwork.dewrsb.gov.au*

International Labour Organisation (ILO), *http://www.ilo.org*

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Introduction

The economic wellbeing or standard of living of individuals and families is largely dependent on the economic and social resources available to provide for the consumption of goods and services and for participation in society. Such resources may be in the form of cash income received from wages and salaries or investments, or as income support from government. Other factors can also contribute to economic resources, including personal resources such as savings, services such as aged care, respite care and child care from government and welfare organisations, and assistance from family and friends.

Government programs aim to help the economically disadvantaged to achieve social and economic outcomes and to participate in society. Such programs include those of the Department of Family and Community Services (FaCS), which provides income security for the retired, people with disabilities, carers, unemployed people and families with children. Other departments provide income support for other special groups, such as war veterans, war widows and their families, and students. In addition to cash income, government programs also help those with low incomes to meet payments for housing through rent assistance, and for a range of goods and services through pensioner concession and health cards, and other services aimed at helping people in personal and social hardship. Other types of programs aim to provide assistance with employment and advocacy to people with disabilities.

This chapter provides information on the levels and sources of income of Australia's population and on the levels and patterns of expenditure on consumer goods and services. Further information is provided on the main income support programs of the Commonwealth Government, describing the eligibility requirements, numbers of beneficiaries and government expenditure on these programs. It covers these in four sections: *Income support programs of the Department of Family and Community Services; Community support programs of the Department of Family and Community Services; Aged care programs of the Department of Health and Aged Care*; and *Services provided by the Department of Veterans' Affairs*.

Household income and expenditure

Household income

Regular income is the means by which most individuals and families finance current consumption and make provision for the future through saving and investment. The level of cash income can be used as an indicator of the standard of living for most of the population. Information about the levels and sources of income is used to monitor shares of income going to labour, capital and transfers. From a social welfare perspective, analyses of cash income distribution indicate which groups in the population are most disadvantaged, and provide information on the number and characteristics of those needing access to government services.

While income is usually received by individuals, analyses of the distribution of income are traditionally based on incomes of families or groups of individuals, which reflects the sharing of income that takes place within families. The following analysis is based on the income of a restricted family grouping called an 'income unit', which assumes that income is shared between partners in couple families and between parents and dependent children. Other family members such as non-dependent children are treated as separate income units. Analyses of income distribution using different units, such as families and households, provide different results.

The ABS conducted six income distribution surveys between 1968 and 1990. In July 1994, the ABS started collecting income data on a continuous basis in the Survey of Income and Housing Costs. These surveys have provided information on the current and annual income of individuals and family units as well as on their characteristics such as age, education, labour force participation, source of income, and the size and composition of family units.

While the five yearly Household Expenditure Survey also collects income data in order to explain variations in expenditure levels and to identify groups of special interest (e.g. government income support recipients and low income households), the data are not available on an income unit basis.

The most recent information on current income distribution on an income unit basis is available from the 1997–98 Survey of Income and Housing Costs. Income refers to gross receipts of recurring and usually regular cash flows at the time of interview. It comprises cash receipts from wages and salaries, profit or loss from own business, property income in the form of interest, rent and dividends, private transfers such as superannuation and child support, and cash transfers from government in the form of benefits and allowances.

Income distribution

As table 7.1 shows, in 1997–98 the average gross weekly income for all income units was $658. The median gross weekly income (i.e. the midpoint when all units are ranked in order of income) was considerably lower at $499. This difference reflects the typically asymmetric distribution of income where a large number of units have nil or very low incomes and a smaller number have very high incomes.

Income units cover a wide variety of individuals and family types, and include varying numbers of people. These range from young single people just out of school, to couples with dependent children, through to elderly retired couples or single people, i.e. units at various stages of the life cycle and working career. It is therefore not surprising that income is distributed unevenly across all income units. This was the case in 1997–98 when income units in the lowest quintile (i.e. the lowest 20% of units when ranked according to income) received an average gross weekly income of $124, compared to $1,590 received by those in the highest quintile (i.e. the highest 20% of units when ranked according to income).

Income units in the lowest quintile were mainly single people. One-third of these were living with parents or with relatives. Few people were employed and most relied on government pensions and allowances as their principal source of income.

In comparison, income units in the highest quintile were usually couples with or without dependent children, and most had two earners. Their principal source of income was mainly wages and salaries, with very few relying on government pensions and allowances.

See also the Centenary Article *Household income and its distribution* following this chapter, which explores the measurement issues in detail and over longer time frames.

Changes in income, 1994–95 to 1997–98

From 1994–95 to 1997–98, the mean (average) gross weekly income for all income units in private dwellings increased by 10% from $596 to $658 (table 7.2). The mean weekly income of the largest group of income units, those who were mainly dependent on wage and salary income, increased by 11% from $801 to $888. The mean income of those relying on government cash benefits also increased by 11% over this period. Movements in income from other sources over the period were more volatile. Mean incomes for units dependent on their own businesses were particularly volatile. From 1994–95 to 1997–98, their income increased by 12%. Mean income of those dependent on other income increased by 30% between 1994–95 and 1997–98.

The degree of inequality in the income distribution of all income units remained almost unchanged between 1994–95 and 1997–98 (table 7.3). Income inequality can be measured by comparing the share of total income received by each quintile group. While the shares of total income received by the income quintile groups changed slightly over the three years, the changes are not statistically significant.

7.1 ALL INCOME UNITS, Selected Characteristics by Gross Weekly Income Quintile Groups—1997–98

	Unit	Lowest 20%	Second quintile	Third quintile	Fourth quintile	Highest 20%	**All income units**
Upper boundary of quintile group	$	204	387	613	995	. .	**—**
Mean income	$	124	295	498	784	1 590	**658**
Median income	$	166	296	499	774	1 367	**499**
Principal source of income (% of income units)							
Weekly employee income	%	8.7	25.2	68.5	84.4	88.1	**54.9**
Weekly own business income	%	2.7	4.5	5.6	8.3	8.0	**5.8**
Weekly government pensions and allowances	%	67.4	62.3	16.7	1.4	**0.0	**29.6**
Weekly income from other sources	%	9.8	7.9	9.1	5.8	3.9	**7.3**
Total(a)	%	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	***100.0***
Income unit type (% of income units)							
Couple with dependent children	%	2.9	7.2	18.1	33.5	51.6	**22.6**
Couple without dependent children	%	6.9	32.8	21.6	23.5	36.5	**24.3**
One parent	%	2.3	12.9	6.6	5.0	1.4	**5.7**
Lone person	%	87.8	47.1	53.8	38.0	10.5	**47.4**
Total	%	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	***100.0***
Earners							
None	%	83.1	64.2	20.1	5.5	2.3	**35.1**
One	%	14.7	33.0	72.1	66.6	26.4	**42.5**
Two	%	2.2	2.8	7.8	27.9	71.3	**22.4**
Total earners	%	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	***100.0***
Dwelling tenure type (% of income units)							
Owners without a mortgage	%	31.3	41.5	26.2	25.8	27.9	**30.6**
Owners with a mortgage	%	5.7	8.0	17.3	35.8	51.5	**23.6**
Renters							
State housing authority	%	9.4	7.2	3.5	1.4	*0.6	**4.5**
Private landlord	%	16.3	21.2	25.3	21.7	14.4	**19.8**
Other	%	15.0	11.5	15.7	8.1	2.7	**10.6**
Total renters	%	*40.8*	*39.9*	*44.5*	*31.1*	*17.8*	***34.8***
Other	%	22.3	10.6	12.0	7.2	2.9	**11.0**
Total	%	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	***100.0***
Estimated number of income units							
Capital city	'000	1 092	1 062	1 163	1 248	1 334	**5 899**
Rest of State	'000	733	775	652	580	491	**3 231**
Total	*'000*	*1 825*	*1 837*	*1 815*	*1 828*	*1 824*	***9 129***

(a) Includes income units with nil or negative income.

Source: Unpublished data, 1997–98 Survey of Income and Housing Costs.

7.2 ALL INCOME UNITS, Mean Gross Weekly Income by Principal Source of Income

	Mean weekly income			
	1994–95	1995–96	1996–97	1997–98
	$	$	$	$
Principal source of income				
Weekly employee income	801	816	844	888
Weekly own business income	850	916	908	956
Weekly government pensions and allowances	231	238	254	256
Weekly income from other sources	420	432	507	546
All income units(a)	596	609	625	658

(a) Includes income units with nil or negative income from all sources.

Source: Income Distribution, Australia (6523.0).

7.3 ALL INCOME UNITS, Percentage Share of Gross Weekly Income by Quintile

Percentage share

	1994–95	1995–96	1996–97	1997–98
	%	%	%	%
Gross weekly income quintile				
Lowest	3.6	3.8	3.8	3.8
Second	9.3	9.1	9.4	9.0
Third	15.2	15.0	15.2	15.0
Fourth	24.0	23.7	24.0	23.9
Highest	47.9	48.3	47.5	48.3
All income units	100.0	100.0	100.0	100.0

Source: Income Distribution, Australia (6523.0).

Household expenditure

Information about income provides one indicator of standard of living. However, it does not always accurately indicate command over goods and services, particularly when income is variable or expenditure financed through running down assets or acquiring debts. In these cases, the levels and patterns of household expenditure can provide an alternative indicator of living standards.

The latest household expenditure information is available from the 1998–99 Household Expenditure Survey. This was the sixth major survey of its kind undertaken by the ABS. It collected detailed information on the expenditure, income and characteristics of households in Australia.

The household is the usual unit of analysis for expenditure because it is assumed that sharing of the use of goods and services occurs at this level. If smaller units are adopted, for example person or income unit, then it is difficult to attribute the use of shared items such as food, accommodation and household goods.

Levels of expenditure

In 1998–99, Australian households spent an average of $699 per week (table 7.4) on goods and services. The level and pattern of expenditure differs between households, reflecting characteristics such as income, household composition, household size and location.

For example, the level of household expenditure differs between households with different main sources of income. In 1998–99, households relying mainly on employee income had the highest average weekly expenditure at $866, followed by those relying on own business income ($745). Households whose primary source of income was government pensions and allowances had the lowest average weekly expenditure at $365. Average weekly income in Australian households followed a similar pattern, with households relying mainly on employee income having an average weekly income of $1,216, compared with $980 for those relying mainly on own business income and $308 for those whose main source of income was government pensions and allowances.

The pattern of household expenditure also varies between these groups. For example, households whose principal source of income was government pensions and allowances spent proportionately more than the other groups on essentials such as current housing costs (16% of household expenditure, compared with 14% for households relying mainly on employee income) and food and non-alcoholic beverages (22%, compared with 18% for households relying mainly on employee income). They spent proportionately less on some of the more discretionary items, for example recreation (11%, compared with 13% for households relying mainly on employee income).

Income support programs of the Department of Family and Community Services (FaCS)

On 1 July 1947, with the passage of the *Social Services Consolidation Act 1947*, all Acts providing social service benefits were amalgamated into the *Social Security Act 1947*. This Act was repealed and in July 1991 was replaced with the *Social Security Act 1991*.

The main income support payments provided by the Commonwealth under the 1991 Act for the financial years 1996–97 to 1999–2000 are listed in table 7.5.

7.4 HOUSEHOLD EXPENDITURE AND CHARACTERISTICS, By Principal Source of Household Income—1998–99

	Unit	Employee income	Own business	Government pensions and allowances	Other(a)	All households(b)
Mean gross weekly income	$	1 216	980	308	545	879
Mean age of reference person	years	41	46	58	63	48
Household composition (% of households)						
Couple, one family						
Couple only	%	20.3	25.0	27.2	44.9	24.6
Couple with dependent children only	%	32.6	39.2	8.8	3.6	23.8
Other couple, one family households	%	16.0	11.0	5.3	5.5	11.8
One parent, one family with dependent children	%	3.8	2.1	13.9	4.2	6.4
Other family households	%	6.8	2.9	4.1	1.5	5.4
Lone	%	15.5	17.7	38.7	37.2	24.2
Group	%	5.0	2.2	2.0	3.1	3.8
Total	%	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*
Expenditure (as % of total expenditure)						
Current housing costs (selected dwelling)	%	14.0	12.1	16.2	10.5	13.9
Domestic fuel and power	%	2.3	2.8	3.8	2.7	2.6
Food and non-alcoholic beverages	%	17.6	18.8	21.7	16.7	18.2
Alcoholic beverages	%	3.1	3.2	2.0	2.5	2.9
Tobacco	%	1.4	1.5	2.4	0.9	1.5
Clothing and footwear	%	4.8	4.8	3.9	4.0	4.6
Household furnishings and equipment	%	6.0	5.7	5.6	7.3	6.0
Household services and operation	%	5.5	6.1	7.7	6.0	5.9
Medical care and health expenses	%	4.4	5.4	4.5	6.8	4.6
Transport	%	17.6	15.8	13.5	16.6	16.9
Recreation	%	12.7	13.1	11.2	15.3	12.7
Personal care	%	2.0	1.8	2.1	2.0	2.0
Miscellaneous goods and services	%	8.7	9.0	5.3	8.7	8.2
Total	%	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*
Average weekly expenditure on all goods and services	$	866	745	365	638	699
Estimated number of households	'000	4 083	422	1 938	581	7 123

(a) Comprises households where the principal source of income was in the form of superannuation or annuity; interest on financial institution accounts, investments or property rent; scholarships; workers' compensation; accident compensation; maintenance or alimony; or regular income not elsewhere classified. (b) Includes households whose principal source of income was undefined because total income was zero or negative.

Source: Unpublished data, 1998–99 Household Expenditure Survey.

An outline, together with associated statistics, of the main social security payments in effect throughout the 1999–2000 financial year is given below.

Payments for the retired

The Age Pension is payable to men who are aged 65 years or over and women who are 61 years and 6 months or over, and is subject to Australian residency qualifications. The minimum Age Pension age for women was raised to 61 years and 6 months on 1 July 1999. The minimum Age Pension age for women will continue to increase by six months at two year intervals until 1 July 2013, when it will be 65 years. The number of age pensioners at June for the years 1996 to 1999 is shown in table 7.6.

The Age Pension is means-tested based on pensioners' income and assets.

The Wife Pension (age) is gradually being phased out. New grants of Wife Pension ceased after 30 June 1995. However, women receiving Wife Pension (or who had lodged claims and were entitled to the pension) at that date continue to receive this payment.

New applicants can apply for another type of payment such as Parenting Allowance, Partner Allowance, Carer Pension, Disability Support Pension, Newstart Allowance or Sickness Allowance.

7.5 INCOME SUPPORT PAYMENTS(a)

Type of payment	1996–97 $'000	1997–98 $'000	1998–99 $'000	1999–00 $'000
Payments made under Social Security Act 1991				
The retired				
Age Pension	13 204 658	13 141 895	13 569 056	14 037 940
Wife Pension (Aged)	. .	254 752	243 433	240 751
People with disabilities or the sick				
Carer Payment	. .	258 474	307 506	369 723
Child Disability Allowance(b)	233 106	248 429	244 896	. .
Carer Allowance(b)	. .	. .	. .	412 334
Disability Support Pension	5 299 148	4 599 452	4 920 223	5 253 241
Wife Pension (DSP)	. .	599 136	534 069	479 205
Disability Wage Supplement(c)	2 193	2 034	. .	. .
Mobility Allowance	38 118	41 863	46 137	52 096
Rehabilitation Allowance	–36	–219	. .	. .
Sickness Allowance	144 280	92 684	93 043	83 881
The unemployed				
Austudy Payment(d)	. .	. .	287 173	253 870
Fares Allowance(d)	. .	. .	675	569
Job Search Allowance	. .	–47 105	. .	. .
Newstart Allowance	6 047 829	5 804 836	5 370 669	4 954 450
Mature Age Allowance	472 469	443 380	401 698	367 250
Partner Allowance	497 841	532 278	590 185	646 460
Pensioner Education Supplement(d)	. .	. .	44 601	49 571
Student Financial Supplement(e)	. .	. .	259 745	290 681
Youth Allowance(f)	. .	. .	1 843 498	2 002 830
Families with children				
Additional Family Payment	–2 927	. .	. .	. .
Basic Family Payment	–2 803	. .	. .	. .
Double Orphan Pension	1 681	1 778	1 725	1 779
Family Allowance	6 284 731	6 363 712	6 391 490	6 573 857
Family Tax Payment	288 564	558 735	546 217	531 927
Home Child Care Allowance	–1 049	. .	. .	. .
Maternity Allowance	196 716	183 607	167 085	195 809
Parenting Allowance(g)	2 216 628	1 570 502	–17 192	. .
Parenting Payment(g)	. .	1 455 563	5 402 944	5 494 230
Sole Parent Pension(h)	2 992 322	2 206 233	–18 274	. .
Provision for special circumstances				
Bereavement Allowance	1 178	997	734	782
Disaster Relief Payment	–12	28	165	. .
Special Benefit	132 289	95 867	99 585	98 704
Widow Class 'B' Pension	296 905	147 187	105 694	89 849
Widow Allowance	117 273	180 112	227 289	270 825
Total	38 550 242	38 894 385	41 667 765	42 752 614
Payments made under other Acts				
Childcare cash rebate(i)	. .	123 050	117 000	164 447
Child Support Trust Account(j)	. .	31 638	34 778	4 158
States Grants Housing Act 1971(k)	. .	5 500	5 498	5 500
Youth Training Allowance(f)(l)	159 138	158 177	3 699	. .
Unexplained remittances	. .	266	330	42
Total Special Appropriations(m)	**38 550 242**	**39 054 839**	**41 825 371**	**42 926 761**

(a) Expenditure for 1998–99 onwards is reported on an accrual basis and is not directly comparable to expenditure in previous years. (b) Carer Allowance replaces Child Disability Allowance, and Domiciliary Nursing Carer Benefit has been added (transferred from Department of Health and Aged Care on 1 July 1999). (c) Disability Wage Supplement was abolished on 1 January 1998. All recipients were transferred to Disability Support Pension. (d) Replaces, in part, the former AUSTUDY (Department of Employment, Education, Training and Youth Affairs). (e) Previously administered by the (then) Department of Employment, Education, Training and Youth Affairs. (f) From 1 July, 1998, Youth Allowance replaced payments made to certain recipients of the following: Newstart Allowance; Youth Training Allowance; Sickness Allowance and AUSTUDY. (g) Parenting Allowance and Sole Parent Pension replaced by Parenting Payment on 20 March 1998. (h) Comprising Parenting Payment (Partnered) and Parenting Payment (Sole Parent). (i) Payments made under the Childcare Rebate Act 1993 (transferred from the Department of Health and Family Services in October 1998). (j) Payments made under the Child Support (Registration and Collection) Act 1988 (transferred from the Department of the Treasury in October 1998). These payments are to cover shortfalls in the Child Support Trust Account. (k) Payments made under the States Grants Housing Act 1971. (l) Payments made under the Student and Youth Assistance Act 1973. (m) Components do not add to total as Youth Training Allowance is also included under Newstart Allowance in this table.

Source: Department of Family and Community Services.

7.6 AGE PENSIONERS(a)

	Unit	June 1997	June 1998	June 1999	June 2000
Age group (years)					
60–64	no.	208 309	187 256	189 410	169 240
65–69	no.	481 624	479 884	478 856	477 118
70–74	no.	364 766	388 474	414 302	436 900
75 and over	no.	625 515	627 003	633 224	646 602
Males	no.	597 859	613 587	634 112	654 557
Females	no.	1 082 355	1 069 030	1 081 680	1 075 303
Persons	*no.*	*1 680 214*	*1 682 617*	*1 715 792*	*1 729 860*
Wife pensioners (age)	no.	36 577	36 233	32 196	31 406
Total payments in financial year ending 30 June(b)	$'000	13 204 658	13 396 647	13 812 488	14 394 469

(a) Expenditure for 1998–99 onwards is reported on an accrual basis and is not directly comparable to expenditure in previous years. (b) Includes allowances, Rent Assistance, and Wife Pension (age), and Age Pensioners paid by the Department of Veterans' Affairs where applicable.

Source: Department of Family and Community Services.

Payments for people with a disability and the sick

Disability Support Pension (DSP)

The DSP is the main form of income support available to people with disabilities. It is paid to a person aged 16 years or over who has a physical, intellectual or psychiatric impairment and who is assessed as being unable to do any work for at least 30 hours a week at full award wages, or to be retrained for any work, for at least two years. Table 7.7 shows the number of recipients of DSP at June for the years 1997 to 2000.

The DSP for people aged 21 years and over is paid at the same rate as the Age Pension and is subject to the same income and assets tests, except for permanently blind recipients, who are not subject to either the income or assets test. Youth rates apply to those aged under 21 years. These are largely tied to Youth Allowance rates, but include a supplement of $79.50 per fortnight. Youth rates are not subject to parental income or assets tests. A Pharmaceutical Allowance of $5.60 per fortnight (single or couple combined) is also paid to people receiving DSP.

Disability Support pensioners and other people with disabilities can gain access to rehabilitation, training, labour market programs or labour force re-entry assistance. Job seekers are assessed by Centrelink to determine if they are eligible for Commonwealth employment assistance from either a disability employment service or Commonwealth Rehabilitation Service (CRS) Australia or through the Job Network. The streaming tool used by Centrelink is the Work Ability Tables (WATs). Since May 1998, eligible job seekers with a WATs score of less than 50 are referred to Job Network members funded by Department of Employment Workplace Relations and Small Business (DEWRSB). Job seekers with a WATs score of 50 or more are referred to specialist disability employment services funded by FaCS.

7.7 DISABILITY SUPPORT PENSIONERS(a)

	Unit	June 1997	June 1998	June 1999	June 2000
Age group (years)					
16–19	no.	12 313	13 178	14 126	15 025
20–39	no.	119 990	124 712	129 600	133 509
40–59	no.	298 530	311 398	326 987	339 283
60 and over	no.	96 681	104 048	106 969	114 576
Males	no.	352 607	361 539	373 340	382 412
Females	no.	174 907	191 797	204 342	219 981
Persons	*no.*	*527 514*	*553 336*	*577 682*	*602 393*
Wife pensioners (DSP)	no.	91 307	79 892	68 523	59 935
Total payments for financial year ending 30 June(b)	$'000	5 299 148	5 198 588	5 454 292	5 732 446

(a) Expenditure for 1998–99 onwards is reported on an accrual basis and is not directly comparable to expenditure in previous years. (b) Includes Disability Support Pension and Wife Pension (DSP) where applicable.

Source: Department of Family and Community Services.

A job seeker does not have to be receiving Disability Support Pension to be eligible to receive assistance from a disability employment service or CRS Australia. Eligibility is not based on the actual receipt of Centrelink payments, but on a person's barriers to employment resulting from a disability (measured by the WATs tool).

Mobility Allowance

Mobility Allowance is a payment for people with a disability aged 16 or more who cannot use public transport without substantial assistance and who are undertaking one or more of the following activities for at least 8 hours per week:

- work, vocational training or a combination of both;
- voluntary work for a community, charitable or welfare organisation;
- receiving Newstart Allowance, Youth Allowance or Austudy payments.

From 1 July 2000, the rate of Mobility Allowance is $60 per fortnight. The payment is indexed annually in line with Consumer Price Index movements. A lump sum advance equivalent to six months allowance may be paid once a year.

Payment of Mobility Allowance is not subject to an income or assets test, but cannot be paid to a person who has received a sales tax exemption on a motor vehicle within the previous two years.

Mobility Allowance customers who do not receive any other income support from FaCS qualify for a Health Care Card. The card is not income or asset tested.

Carer Payment

The Carer Payment is an income support payment available to people who are providing constant care or supervision to a person aged 16 years or over with a physical, intellectual or psychiatric disability or who is frail aged.

The carer must personally provide this level of care or supervision in the private home of the care recipient, but is not required to live in or adjacent to the care recipient's home. The carer must also meet certain Australian residency requirements, with income and assets below the levels where qualification ceases. The rate of Carer Payment is the same as for other pensions.

From 1 July 1998, eligibility for the Carer Payment was extended to carers of children under 16 years of age with profound disabilities. The eligibility criteria for this payment focus on the high level of care provided by parents and other carers to maintain comfort, sustain life, or attend to a bodily function that the child with a profound disability cannot manage alone. Table 7.8 shows the number of Carer Payment recipients at June for the years 1997 to 2000.

Sickness Allowance

The Sickness Allowance is paid to people aged at least 21 years (students in receipt of Austudy must be aged at least 25 years), but below Age Pension age, who are temporarily unable to work or continue with their full-time studies due to illness or injury. To be eligible, the person must have a job or study to which they can return. Unemployed people who become temporarily incapacitated may receive Newstart Allowance (NSA). People in receipt of full-pay sick leave do not qualify.

From 20 September 2000, the basic single rate of Sickness Allowance is $350.80 per fortnight, and the basic partnered rate is $316.40 per fortnight (each). The rate is indexed twice a year in line with Consumer Price Index movements. Pharmaceutical Allowance of $5.60 per fortnight (single or couple combined) is payable to Sickness Allowance recipients.

Payment of Sickness Allowance is subject to income and assets tests and recipients qualify for a Health Care Card.

7.8 CARER PAYMENT, By Number of Recipients

	Unit	June 1997	June 1998	June 1999	June 2000
Type					
Carer Payment (Age)	no.	10 954	11 740	13 407	15 346
Carer Payment (DSP)	no.	15 735	18 556	21 392	24 500
Carer Payment (Other)	no.	2 869	3 683	5 271	7 704
Total	no.	**29 558**	**33 979**	**40 070**	**47 550**

Source: Department of Family and Community Services.

Carer Allowance

Carer Allowance (CA) is a supplementary payment made in recognition of a person's disability and the impact it has on his or her family and other carers. It was introduced on 1 July 1999, combining Child Disability Allowance (CDA) with Domiciliary Nursing Care Benefit (DNCB). DNCB was previously the responsibility of the Health and Aged Care portfolio. The rate of CA at 1 July 2000 was $79.50 per fortnight. CA is not means tested and is not taxable.

To qualify for CA a claimant must be providing daily care and attention to a person with a serious disability or medical condition. The disability or medical condition must be permanent or likely to continue for an extended period. The care must ordinarily be provided in a private home that is the residence of both the claimant and the person(s) cared for. Both the carer and the person(s) cared for must be Australian residents. Qualification may be maintained during periods of hospitalisation, during respite or where the carer and the care receiver are travelling overseas together.

Persons who receive Carer Allowance in respect of a disabled child are also entitled to a Health Care Card for that child. The carer of a child with a level of disability that does not qualify them for the full allowance may receive a Health Care Card for that child if the child requires 'substantially more care and attention' compared to a child of the same age without a disability.

Payments for the unemployed

Newstart Allowance (NSA)

NSA is paid to people aged 21 years or over and under the Age Pension age who are unemployed and actively searching for work. To qualify for NSA a person must be a permanent resident of Australia and be residing in Australia. Table 7.9 provides details of NSA recipients.

From 1 July 1998, NSA for 16 to 20 year olds (and certain 15 year olds) was replaced by Youth Allowance (YA). Only those people on NSA or Sickness Allowance who were also aged 18 to 20 years at 17 June 1997 (the date of YA announcement), and when YA commenced on 1 July 1998, were able to remain on NSA.

There are a small number of 18 to 20 year old unemployed customers receiving NSA in 2000 who continued to receive their existing payment following the introduction of YA in July 1998.

Recipients of NSA are required to satisfy an activity test (exemptions apply in certain cases, such as when a person is temporarily incapacitated). A person satisfies the activity test if they are actively seeking, and willing to undertake, suitable paid work, including casual and part-time work. The activity test can also be satisfied in other ways including, for example, undertaking a course of vocational training, participating in a labour market program, or entering and complying with the terms of an activity agreement requiring the person to engage in specified activities.

From 1 July 1998, Mutual Obligation (MO) requirements were placed on young people (18 to 24 years) unemployed for at least six months. These people are required to participate in an activity in addition to their job search. From 1 July 1999, MO requirements were extended to 25 to 34 year olds who have been receiving unemployment benefits for 12 months or more.

Mutual Obligation requires people to look for work more actively and to take part in activities to improve their skills and work habits. It aims to enhance unemployed people's job prospects and competitiveness in the labour market and to promote their involvement with the community that supports them, and facilitates movement from welfare to work.

The NSA is also subject to Allowance Income and Assets Test. NSA recipients are required to complete a fortnightly statement (in some circumstances this period may be extended) to advise of changes in circumstances that may affect entitlement to NSA or the rate payable, and in most cases to provide details of their job search efforts.

NSA recipients may also receive Rent Assistance, Remote Area Allowance and Pharmaceutical Allowance.

7.9 RECIPIENTS OF NEWSTART ALLOWANCE(a)

	Unit	June 1995	June 1996	June 1997	June 1998	May 1999	June 2000
SHORT-TERM CUSTOMERS (12 MONTHS OR LESS)							
Age group (years)							
Less than 21	no.	86 261	78 535	62 975	62 134	39	28
21–34	no.	180 135	216 818	181 147	166 023	136 232	106 866
35–54	no.	102 076	132 935	118 903	103 087	93 187	80 829
55–59	no.	14 574	18 507	17 185	13 743	12 834	12 118
60 and over	no.	10 785	10 231	7 551	6 790	6 941	6 713
Males	no.	268 257	310 366	262 583	234 551	171 764	143 659
Females	no.	125 574	146 660	125 178	117 226	77 469	62 895
Persons	*no.*	*393 831*	*457 026*	*387 761*	*351 777*	*249 233*	*206 554*
LONG-TERM CUSTOMERS (OVER 12 MONTHS)							
Age group (years)							
Less than 21	no.	42 545	37 153	40 985	41 082	13 197	2 300
21–34	no.	164 836	140 955	163 140	172 208	171 196	155 126
35–54	no.	139 316	125 022	146 861	162 673	163 224	156 842
55–59	no.	29 194	27 025	29 451	29 880	28 986	28 205
60 and over	no.	3 937	3 361	1 661	2 192	3 053	3 852
Males	no.	279 936	240 907	272 592	289 458	273 366	247 366
Females	no.	99 892	92 609	109 506	118 577	106 290	98 959
Persons	*no.*	*379 828*	*333 516*	*382 098*	*408 035*	*379 656*	*346 325*
SHORT- AND LONG-TERM CUSTOMERS							
Age group (years)							
Less than 21	no.	128 826	115 688	103 960	103 216	13 236	2 328
21–34	no.	344 971	357 773	344 287	338 231	307 428	261 992
35–54	no.	241 392	257 957	265 764	265 760	256 411	237 671
55–59	no.	43 768	45 532	46 636	43 623	41 820	40 323
60 and over	no.	14 722	13 592	9 212	8 982	9 994	10 565
Males	no.	548 193	551 273	535 175	524 009	445 130	391 025
Females	no.	225 466	239 269	234 684	235 803	183 759	161 854
Persons	*no.*	*773 659*	*790 542*	*769 859*	*759 812*	*628 889*	*552 879*
Total payments for financial year ending 30 June(b)	$'000	7 061 006	5 765 174	6 047 829	5 757 731	5 370 669	4 954 450

(a) Expenditure for 1998–99 onwards is reported on an accrual basis and is not directly comparable to expenditure in previous years. (b) Total payments for the year ending 30 June 1995 include payments to partners of married allowees. From 1 July 1995 they are required to claim payment in their own right, and most expenditure is incurred under Partner Allowance (PA) and Parenting Allowance.

Source: Department of Family and Community Services.

Youth Allowance (YA)

On 1 July 1998 the Government introduced YA for young people. It replaced numerous former schemes for young people, namely: Youth Training Allowance; AUSTUDY for students aged 16–24 years; Newstart Allowance for the unemployed aged 16–20 years; and Sickness Allowance for 16–20 year olds and those secondary students aged 16 and 17 years attracting more than the minimum rate Family Allowance.

YA is now the main income support payment available to young unemployed people aged 16 to 20, and to students aged from 16 to 24. There are some circumstances where it can be paid to young people under 16 years. It can also be paid to young people over 25 where they were enrolled in a course and receiving YA immediately prior to turning 25 and are still continuing in the same course.

YA is based on a flexible, streamlined policy which ensures that young people receive the same payment whether they are studying, training, looking for work, are sick, or a combination of these. It recognises that young people can follow several pathways, i.e. from school to further education, training or employment.

YA is usually subject to a personal and parental means test. To qualify for YA, young people must undertake approved activities, which may include full-time study or a combination of activities such

as job search, Work for the Dole, literacy and numeracy courses, part-time education, part-time work or voluntary work. The purpose of the requirement that young people undertake approved activities in order to receive YA is to help improve a young person's prospects of obtaining employment.

Young people under 18 who have not completed Year 12 or equivalent are encouraged to be in full-time education or training. Exemptions are made for those who are unable to obtain an appropriate training place, have carer responsibilities, are sick, or are in other special circumstances.

Austudy

From 1 July 1998, the Austudy payment replaced the AUSTUDY living allowance. It is paid to students over 25 years of age whose financial circumstances are such that without financial help, full time study would not be possible. The Austudy payment retains most of the features of the old AUSTUDY.

To be eligible for Austudy a person must be doing an approved full time course at an approved institution. People who are 25 or over are considered independent, and are not subject to a parental means test. The activity test requirements for Austudy are the same that applied under the old AUSTUDY. A person is considered to meet the activity test under Austudy if they are engaged in approved full-time study and are undertaking a full-time or concessional study load.

Mature Age Allowance (MAA)

The MAA is a non-activity tested income support payment. This payment recognises the labour market difficulties faced by some older unemployed people who are close to retirement age.

To qualify for MAA from 1 July 1996, a person must have turned 60 years of age and be less than Age Pension age; have no recent work force experience (defined as at least 20 hours a week for a total of 13 weeks or more in the previous 12 months); and be an Australian resident and currently residing in Australia. An eligible person must also satisfy one of the following:

- be receiving Newstart Allowance and have been on an income support payment for a continuous period of at least nine months immediately before claiming MAA;
- have received at least one payment of a Social Security pension, Widow Allowance, Partner Allowance, Sickness Allowance, Department of Veterans' Affairs (DVA) service pension, Austudy payment or Parenting Payment (other than non-benefit Parenting Payment (partnered)) at any time within the 13 weeks immediately before claiming; or
- have previously received MAA.

Until 1 July 1995, Mature Age Partner Allowance was paid to partners of MAA recipients. This payment is gradually being phased out, with no new grants since that date.

Since 1 July 1996, MAA has been paid under allowance income and assets test conditions rather than under pension income and assets tests.

MAA recipients are eligible to receive a Pensioner Concession Card.

Partner Allowance (PA)

Since 1 July 1995 the payment has only been granted to persons born on or before 1 July 1955, who have no dependent children and no recent workforce experience. It is payable to people with partners in receipt of Newstart Allowance, Special Benefit, Age Pension, Disability Support Pension, Disability Wage Supplement, Mature Age Allowance or a Department of Veterans' Affairs service pension. Partners who do not qualify for PA may qualify for another income support payment in their own right, such as Parenting Payment or Newstart Allowance.

PA is a non-activity tested payment subject to allowance income and assets tests.

Widow Allowance (WA)

WA is a non-activity tested income support payment. It recognises the labour market difficulties faced by single older women who may have previously depended on the support of their partner.

WA is available to women over 50 years of age who were widowed, divorced or separated (including separated de facto) after the age of 40. To qualify for WA, an older woman must have no recent workforce experience (defined as at least 20 hours a week for a total of 13 weeks or more in the previous 12 months); currently be in Australia; and not be subject to an assurance of support.

She must also satisfy one of the following residence criteria:

- have been an Australian resident for a continuous period of at least 26 weeks immediately before claiming; or
- have at any time been an Australian resident for a continuous period of at least 10 years; or
- have a qualifying residence exemption; or
- both she and her former partner were Australian residents at the time she became widowed, divorced or separated.

WA is paid at allowance rates and under allowance income and assets tests. Recipients of WA may also be eligible for Rent Assistance, Remote Area Allowance and Pharmaceutical Allowance.

WA will be phased out from 1 July 2005, with new grants only to be made to women born on or before 1 July 1955.

Table 7.10 shows the number of recipients of and expenditure on MAA, PA and WA.

Payments for families with children

Family Allowance

Family Allowance is paid for dependent children aged under 21 (or up to age 24 if in full-time study); it cannot be paid in respect of a dependant who receives Youth Allowance. Changes to eligibility criteria during 1999–2000 resulted in a shift of beneficiaries from Youth Allowance to Family Allowance.

Family Allowance has become part of the new Family Tax Benefit introduced in July 2000.

The rate of Family Allowance depends on the family's income and assets, the number and ages of children in the family, whether the family is renting privately and whether the parent is single. Family Allowance is reduced by 50 cents for each dollar of income over the income free threshold (in 2000 this amount was $23,800 for a one child family) until the minimum Family Allowance rate ($24.00) is reached. No Family Allowance is payable if family income is more than $67,134 (plus $3,359 for each child after the first). Multiple Birth Allowance is payable with Family Allowance in respect of multiple (three or more) births until the children reach six years of age.

Payments are made to the primary carer of the children. Family Allowance can also be paid to approved charitable, religious or government institutions for children in their care.

Table 7.11 shows the number of customers receiving Family Allowance and the number of children for whom payment is made.

Parenting Payment

The Parenting Payment was introduced in March 1998, incorporating the previous Sole Parent Pension and Parenting Allowance. It provides income support to persons who have care of a dependent child. The payment has two streams:

- Parenting Payment (single) which is payable to lone parents; and
- Parenting Payment (partnered) which is payable to one of the parents in a couple.

7.10 OTHER LABOUR MARKET RELATED PAYMENTS(a)

	Unit	June 1995	June 1996	June 1997	June 1998	May 1999	June 2000
Mature Age Allowance(b)	no.	54 118	57 886	60 737	55 132	47 360	42 106
Mature Age Allowance(c)	$'000	358 489	443 778	472 469	443 380	401 698	367 250
Partner Allowance(d)	no.	216 739	69 840	72 117	77 746	81 804	89 580
Partner Allowance	$'000	. .	462 547	497 841	532 278	590 185	646 460
Widow Allowance	no.	8 818	11 748	17 468	24 656	27 822	32 982
Widow Allowance	$'000	3 104	88 233	117 273	180 112	227 289	270 825

(a) Expenditure for 1998–99 onwards is reported on an accrual basis and is not directly comparable to expenditure in previous years. (b) Mature Age Allowance includes Mature Age Partner Allowance customers. (c) Annual expenditure excludes Rent Assistance but includes Running Costs. (d) Partner Allowance expenditure for 1994–95 was included with the Newstart Allowance appropriation.

Source: Department of Family and Community Services, Annual Report 2000.

7.11 FAMILY ALLOWANCE(a)

	Unit	June 1997	June 1998	June 1999	June 2000
Family Allowance at the minimum rate					
Customers	no.	893 207	866 440	839 580	911 283
Children	no.	1 669 930	1 619 438	1 566 845	1 573 122
Family Allowance above the minimum rate					
Customers	no.	918 538	909 223	896 192	832 284
Children	no.	1 821 230	1 799 427	1 770 622	1 791 337
Total on Family Allowance					
Customers	no.	1 811 745	1 775 663	1 735 762	1 743 567
Children	no.	3 491 160	3 418 865	3 337 467	3 364 459
Total payments for financial year ending 30 June	$'000	6 279 001	6 363 712	6 391 490	6 564 761

(a) Expenditure for 1998–99 onwards is reported on an accrual basis and is not directly comparable to expenditure in previous years.

Source: Department of Family and Community Services.

Prior to 1 July 2000, a third form of Parenting Payment, known as Basic Parenting Payment, was available to partnered parents. It was income tested only on the income of the recipient, and was not asset tested. From 1 July 2000 this form of the payment was subsumed by Family Tax Benefit Part B.

To qualify for the Parenting Payment, a person must:

- care for a dependent child or children aged under 16 years;
- have income and assets under certain amounts; and
- have been an Australian resident for at least two years, or be a refugee, or have become a lone parent while an Australian resident.

Table 7.12 shows the number of customers receiving Parenting Payment (single) at end June for the years 1997 to 2000, and total payments for those financial years. Table 7.13 shows the corresponding information for Parenting Payment (partnered).

7.12 PARENTING PAYMENT (SINGLE)(a)

	Unit	June 1997	June 1998	June 1999	June 2000
Age group (years)					
Under 20	no.	10 477	10 478	10 676	10 943
20–29	no.	112 797	114 570	116 760	118 655
30–39	no.	150 652	155 740	159 497	163 634
40–49	no.	75 114	80 626	86 298	91 142
50–59	no.	9 531	10 435	11 258	12 383
60 and over	no.	322	437	453	557
Males	no.	23 920	25 546	27 128	28 463
Females	no.	334 973	346 740	357 814	368 851
Persons	*no.*	*358 893*	*372 286*	*384 942*	*387 314*
Total payments for financial year ending 30 June	$'000	2 992 322	3 079 547	3 266 957	3 407 804

(a) Expenditure for 1998–99 onwards is reported on an accrual basis and is not directly comparable to expenditure in previous years.

Source: Department of Family and Community Services.

7.13 PARENTING PAYMENT (PARTNERED)(a)

	Unit	June 1997	June 1998	June 1999	June 2000
Non-benefit Parenting Allowance	no.	425 378	407 345	394 966	377 648
Benefit Parenting Allowance	no.	239 488	238 386	227 988	218 189
Total	*no.*	*664 866*	*645 731*	*622 321*	*595 837*
Total payments for financial year ending 30 June	$'000	2 216 628	2 152 752	2 135 987	2 086 426

(a) Expenditure for 1998–99 onwards is reported on an accrual basis and is not directly comparable to expenditure in previous years.

Source: Department of Family and Community Services.

Jobs, Education and Training (JET) Program

The JET program is a joint program of the Department of Family and Community Services (FaCS); the Department of Employment, Workplace Relations and Small Business (DEWRSB) and the Department of Education, Training and Youth Affairs (DETYA). FaCS has primary responsibility for overall program management and Centrelink has responsibility for delivery of the program.

JET is a voluntary program which aims to improve the financial circumstances of eligible customers by assisting with skill development and aiding their entry or re-entry into the paid workforce.

JET officers assist eligible customers overcome barriers to workforce participation. The types of assistance provided include: development of a plan to achieve labour market readiness; access to education, training and employment assistance; referrals to government and community services; and child care assistance.

The number of customers in the JET program at June 1999 was 135,160, some 26% fewer than the previous year.

Pensioner Education Supplement (PES)

The PES aims to assist pensioners with the costs associated with study, and is available to both full-time students and those approved to undertake at least 25% of a full-time study load. PES is a non-taxable, non-income and assets-tested payment of $62.40 or $31.20 per fortnight (see next paragraph), available to certain FaCS and Department of Veterans' Affairs (DVA) pensioners who undertake study. In the 1999 calendar year there were approximately 55,300 PES customers.

From March 2000, the rate of PES for students with a study load of less than 50% was $31.20 per fortnight.

Disability support pensioners and recipients of an invalidity service pension or war widowers receiving an invalidity income support supplement from DVA will continue to receive the full rate of invalidity income support supplement as well as PES.

Child Support Scheme

The Child Support Scheme is a joint FaCS and Attorney-General's Department scheme, administered by Child Support Agency (CSA).

The CSA can collect child support payments from liable parents. However, where possible, parents are encouraged to make their own private arrangements. In order to receive more than the base rate of Family Tax Benefit, parents must receive at least the amount of child support payable under court order or as determined by CSA.

At March 2000, around 54% of all Parenting Payment (single) customers were receiving child support, compared with 26% of the same client group at the beginning of the Scheme in 1989. In 1999–2000, the total amount of Child Support transferred between parents was $1,384m, which benefited almost one million children.

Family Tax Payment

The Family Tax Payment was introduced on 1 January 1997 and is part of the Government's Family Tax Initiative to provide additional assistance to families with children. The majority of eligible families (those with a taxable income of less than $70,000 and one child, and a further $3,000 for each additional child), receive assistance through the taxation system. However, low income families receive an equivalent level of assistance in the form of a fortnightly cash payment—the Family Tax Payment, through FaCS. There were 866,901 Family Tax Payment customers at June 2000.

Family Allowance has become part of the new Family Tax Benefit introduced in July 2000.

Maternity Allowance and Maternity Immunisation Allowance

Maternity Allowance assists families with the costs associated with the birth of a child. Maternity Allowance is a non-taxable, lump sum payment of $750. It is paid for each new child to families who meet the Family Allowance residence, income and assets tests within 13 weeks of the child's birth.

Maternity Immunisation Allowance of $200 is paid after a child reaches 18 months, and upon proof of age-specific immunisation. Families are not disadvantaged in cases where children are not immunised for medical reasons or where parents conscientiously object to immunisation

Other payments

Special Benefit

Special Benefit may be granted to people not qualified for any other income support payment, but who are unable to earn a sufficient livelihood for themselves and their dependants and are in

financial hardship. To qualify, a person must be in Australia and an Australian resident, or have a qualifying residence exemption, or hold a specified visa sub-class. The rate at which Special Benefit is payable is discretionary, but cannot exceed the applicable Newstart or Youth Allowance, Family Allowance or Austudy rate.

Payment of Special Benefit is subject to an income test, an assets test and an available funds test. The assets test is the same as that applying to Newstart Allowance customers, but both the income test and the available funds test are specific to Special Benefit.

Ancillary payments

Ancillary payments provide targeted financial assistance to income support recipients to help them meet expenses associated with a range of specific circumstances. These circumstances include residence in remote areas, having a telephone connected, purchase of pharmaceutical prescriptions, and financial adjustment following the death of a partner, child or care recipient.

Each of the ancillary payments has a different set of qualifications attached. A person's eligibility for any of the ancillary payments depends upon their prior eligibility for income support. Eligibility for these payments is assessed as part of claiming income support.

Concessions

Centrelink issues concession cards on behalf of FaCS to people who receive a means tested income support payment or who qualify for an income tested card. These cards are the Pensioner Concession Card, the Health Care Card and the Commonwealth Seniors Health Card.

The Commonwealth's primary purpose in issuing a concession card is to assist the cardholder and the cardholder's family with the cost of prescription medicines. State and local governments may provide cardholders with a reduction in household rates, energy bills, public transport fares, motor vehicle registration and a range of other health, educational and recreational concessions. Some private organisations also provide concessions on various goods and services to holders of Commonwealth concession cards.

International agreements and payment of pensions abroad

Under Australia's social security law, pensions for old age, severe disability and widowhood pensions payable to widowed persons can usually be permanently paid abroad. Pensions for some other contingencies can be paid outside Australia for periods of up to 6 months (the period was changed from 12 months to 6 months on 20 September 2000), except in New Zealand where the recipient will normally have to apply to the New Zealand Government for a payment. At July 2000, Australia was paying more than 55,000 pensions to residents and former residents who were absent from Australia for more than 12 months. At August 1999, other countries' social security systems were making over 300,000 similar payments to Australian pensioners.

Australia has social security agreements with Austria, Canada, Cyprus, Denmark, Ireland, Italy, Malta, New Zealand, Portugal, Spain, the Netherlands, and the United Kingdom. Australia has given the United Kingdom notice that it will be terminating the agreement on 28 February 2001.

A social security agreement with Germany is expected to be signed in mid-September 2000, to come into force in July 2002.

Negotiations to extend Australia's social security agreement network are also under way with Chile, Croatia, Norway, Finland, Slovenia, Switzerland and the USA. Australia has also had preliminary discussions with Greece and Turkey.

The agreements that have been made form part of Australia's social security law. They enhance people's access to social security benefits from partners to the agreements and guarantee the payment of those benefits when people move between countries.

Apart from New Zealand and the United Kingdom with which Australia has older style host country agreements, Australia negotiates social security agreements based on a principle of shared responsibility, so that countries in which individuals may have lived and worked, contribute towards social security payments for those individuals.

Some agreements will eventually also contain provisions to avoid double coverage. For example, non-resident employees and their employers can be exempted from the requirement to make superannuation guarantee contributions in Australia in return for similar exemptions in the other country.

Centrelink

The agency came into existence on 1 July 1997. Centrelink was set up to provide assistance to a range of customers in one place. Centrelink's customers include the retired, families, the unemployed, the short-term incapacitated, people with a disability, carers, widows, primary producers, students and young people.

Centrelink delivers services for ten Government agencies. For FaCS, Centrelink provides social security payments to millions of Australians. For the DEWRSB, Centrelink is the gateway to the Job Network. For the Department of Education, Training and Youth Affairs, Centrelink administers, among other programs, ABSTUDY and Assistance for Isolated Children. On behalf of the Department of Health and Aged Care, Centrelink provides income assessment for residential aged care fees. On behalf of DVA, Centrelink provides services to this country's veterans. Centrelink administers the Tasmanian Freight Equalisation Scheme for the Department of Transport and Regional Services to support Tasmanian industry development. For the Department of Agriculture, Fisheries and Forestry–Australia, Centrelink supports rural industries by administering the Farm Help—Supporting Families through Change Initiative and Exceptional Circumstances Relief Payments. The Australian Passport Information Service Call Centre is operated by Centrelink Tasmania on behalf of the Department of Foreign Affairs and Trade.

Increasingly, Centrelink is working with other Government agencies to broaden the community's access to government services. Agencies such as the Child Support Agency are provided with access to facilities and support to enable them to strengthen their regional activities. In partnership with Service Tasmania Centrelink is working to increase awareness of Commonwealth and State government activities.

On 3 July 2000 the Commonwealth Government launched the Family Assistance Office, a one-stop shop providing integrated assistance for Australian families. The Family Assistance Office offers families more choice by enabling them to deal with just one agency and one set of rules in over 560 locations around Australia. A Family Assistance Office has been set up in all Centrelink, Medicare and ATO access and enquiry sites to deliver the Government's new payments for families.

Centrelink has 6.1 million customers, including 700,000 people with disabilities and their carers; 500,000 youth and students; 1.1 million job seekers; 2 million retirees; 200,000 rural and housing service recipients; and 1.8 million families and children.

Centrelink has 1,000 points of delivery staffed by 22,000 employees. Centrelink expects to have received 22 million phone calls in the year 2000 in 24 Call Centres around the nation, and 105 million visits to Centrelink Customer Service Centres.

Community support programs of the Department of Family and Community Services

Family and children's services programs

Commonwealth Child Care Program

The objective of the Commonwealth Child Care Program is to assist families with dependent children to participate in the workforce and in the general community by supporting the provision of child care. Assistance is available under the Program to improve the choice, affordability, supply and quality of child care.

Child care services funded under the Program include centre-based long day care, family day care, outside school hours care, vacation care, multifunctional centres (providing a mix of service types) and occasional care. There are also mobile and other innovative services for rural and remote areas. Commonwealth funded child care places increased from 124,000 in December 1990 to 339,400 in June 1998.

To help families with the cost of child care, Commonwealth financial subsidies currently include:

- Childcare Assistance to low and middle income families currently paid directly to services on behalf of eligible families. Services then reduce the fees that these families have to pay; and
- the Childcare Rebate, which assists families with their work-related child care expenses by providing a rebate of 30% of the family's out-of-pocket child care expenses. Families with income over the Family Tax Initiative cutoffs ($70,000 for one child and $3,000 for each additional child) receive a rebate of 20% of the family's out-of-pocket expenses.

As part of the Tax Reform package, from 1 July 2000 the two existing forms of assistance (Childcare Assistance and the Childcare Rebate) were combined into one Childcare Benefit (CCB).

Quality assurance for child care services

The Quality Improvement and Accreditation System (QIAS) was established to ensure good quality care for all children in long day care centres. The National Childcare Accreditation Council is funded by the Government to administer the system. Funding for training and support is also provided to assist centres to participate in the system.

Family Services Sub-Program

The objective of the Family Services Sub-Program is to support families and people in crisis, with a particular focus on assisting disadvantaged families, children at risk and homeless people.

Supported Accommodation Assistance Program (SAAP)

SAAP is a joint Commonwealth and State/Territory program providing services to people who are homeless or at risk of being homeless.

SAAP is administered on a day to day basis by State and Territory Governments which have service agreements with community organisations and local governments for services such as refuges, shelters and halfway houses, and also for referral, counselling and advocacy services. About 1,200 service outlets are funded under SAAP.

The Commonwealth has allocated over $800m over the next five years to 2004–05 for the continuation of the SAAP program. The Commonwealth's contribution to SAAP over the next five years includes over $115m for new or expanded services and program improvements. This is the first increase in SAAP funding in real terms in over six years.

For further information on crisis accommodation see the section *Crisis accommodation* in *Chapter 8, Housing.*

Partnerships Against Domestic Violence

Partnerships Against Domestic Violence is a new Commonwealth government strategy to combat domestic violence. Through the Commonwealth Government's new national strategy, funding has been made available to SAAP over the three years to June 2001.

Early intervention projects are being established to test service responses to families experiencing domestic violence (funding of $1.5m) and for adolescent boys who have experienced or witnessed domestic violence and are at risk of becoming offenders ($0.5m). In addition, $3.2m has been dedicated to continue and expand the domestic violence services in isolated and rural communities.

Reconnect Program

The Reconnect Program is a new youth homelessness early intervention program based on the recommendations of the Youth Homelessness Taskforce. Reconnect aims to improve the level of engagement in family, work, education and the community of young people who are homeless, or those at risk of being homeless, and their families. The first 29 services under this program began operating in communities nationwide from December 1999. In July 2000 another 36 services began operation.

Emergency Relief Program

The Emergency Relief Program provides grants to a range of religious, community, and charitable organisations. The purpose of this funding is to enable the funded organisation to provide emergency financial assistance to individuals and families in financial crisis. Approximately 900 agencies, operating almost 1,200 outlets, are currently funded through the Emergency Relief Program. Funding for 2000–01 is over $26m.

Youth Activity Services (YAS)

The YAS Program aims to keep young people engaged with their community. Under the program, over $3.8m a year is distributed to about 93 sponsors throughout Australia to provide a range of innovative activities, generally after school hours, for young people aged 11 to 16 in disadvantaged areas. An additional $2m a year is distributed to 83 of these sponsors for the employment of part-time family support workers (Family Liaison Workers), to support families with adolescent children.

Stronger Families and Communities Strategy

The Stronger Families and Communities Strategy aims to strengthen communities through investing in the community's capacity to solve problems and grasp opportunities to strengthen families through investing in prevention and early intervention.

Commencing in 2000–01 the strategy provides $240m over four years, for nine specific initiatives

which are designed and driven by communities themselves in partnership with government:

- Stronger Families Fund ($40m over 4 years);
- early intervention, parenting and family relationship support ($47.3m over 4 years);
- greater flexibility and choice in child care ($65.4m over 4 years);
- longitudinal study of Australian children ($6.1m over 4 years);
- potential leaders in local communities ($371m over 4 years);
- skills development program for volunteers and International Year of the Volunteer (IYV) ($15.8m over 4 years);
- local solutions to local problems ($15.4m over 4 years);
- Can-Do communities ($5.2m over 4 years); and
- communication strategy ($8m over 4 years).

Family and Community Networks Initiative (FCNI)

FCNI is a four year pilot program running to June 2002. The principal aims of the initiative are to improve access to information and services relevant to families and community organisations; and to enhance the capacity of communities and services to work together more effectively to address the needs of families and communities.

The budget for the FCNI is $8.6m over four years. There are three key components: funding of community networking projects; funding of one-off projects; and development of a national Internet site offering links to a comprehensive range of information relevant to family and community groups.

These networking projects encourage local groups and networks to work together in developing collaborative proposals, in particular project ideas that identify linkages and partnerships with other community or government agencies or the business sector.

Community Business Partnership

The Community Business Partnership has been established to develop and promote a culture of community/business collaboration in Australia. The initiative aims to encourage business and communities to develop strategic partnerships and to channel corporate generosity into the creation of stronger, more vibrant and self-reliant communities.

Located in Sydney, the Partnership Secretariat provides management, communications policy development and research, community and business liaison and organisation of the Prime Minister's Awards for Excellence in Community Business Partnerships.

Strengthening and supporting families coping with illicit drugs

In the 1999–2000 Budget the Commonwealth Government announced a measure to assist communities and community groups to provide support to families affected by illicit drug use.

Funding of $11m over four years has been provided to FaCS to fund and administer a range of early intervention and outreach strategies for families dealing with drug problems. Funding for the first year (1999–2000) is $2m, with about $3m for each of the three successive years.

Disability programs

People with disabilities

The *Disability Services Act 1986* was introduced to expand opportunities for the participation of people with disabilities in the Australian community. Under the Act, the Commonwealth Government provides grants for the provision of services to support people with disabilities, particularly in the labour market. Disability Programs promote participation and choice in work and community life by maximising delivery of services and targeting income support to assist people with disabilities in their pursuit of increased social and economic participation.

Under the Commonwealth/State Disability Agreement, the Commonwealth has responsibility for the provision of employment services for people with disabilities. Disability employment services assist people with disabilities in job search and job placement, and provide individualised on-the-job training and support. The Commonwealth also provides funds to assist the States and Territories in the planning, policy setting and management of accommodation and other related services for people with disabilities. Areas such as advocacy and research and development continue to be a responsibility of both levels of government.

In 1994 the Commonwealth Disability Strategy was adopted as a ten-year policy and planning framework for Commonwealth government departments and authorities, to improve access to their programs, services and facilities for people with disabilities.

The Strategy was adopted in response to the *Commonwealth Disability Discrimination Act 1992*, which makes discrimination on the grounds of disability unlawful.

Aged care programs of the Department of Health and Aged Care

National Strategy for an Ageing Australia

The Commonwealth Government is developing a National Strategy for an Ageing Australia. The four major themes of the National Strategy are: Healthy Ageing; World Class Care; Attitude, Lifestyle and Community Support; and Independence and Self Provision. Following a consultation process, the National Strategy was expected to be released in late 2000.

Residential Aged Care Program

The aim of the Residential Aged Care Program is to provide residential care services for frail people, 70 years and older.

Recurrent funding is available for each person in a residential care facility, for example, a nursing home. The funding depends on the care needs of the resident. Each facility which provides care is required to meet specific care standards and, from 1 January 2001, will need to be accredited by the Aged Care Standards and Accreditation Agency (ACSAA) in order to continue to receive Commonwealth government funding. Commonwealth government expenditure on residential aged care in 1999–2000 is shown in Table 7.14.

Community care programs

Home and Community Care (HACC) Program

The aim of HACC is to provide basic maintenance and support services to enable frail older people, and younger people with disabilities, to remain living in the community and to prevent premature admission to residential care. HACC funded services also assist the carers of these groups. The types of HACC funded services available include home maintenance and modification, as well as home help, food services, personal care, community nursing, transport and respite care.

The HACC Program is a joint Commonwealth/State cost-shared program which provided $865m nationally for the 1999–2000 financial year to service provider organisations. Of the total, the Commonwealth contributed $526m or 60%, the States and Territories the remaining 40%.

While the Commonwealth provides funding for HACC, the day-to-day administration, priority setting and approval of project allocations is the responsibility of the State and Territory Governments.

Community Care Packages Program

Community Care Packages are funded by the Commonwealth to provide personal care services for people in the community with complex needs who may otherwise require entry to long-term residential care.

Service providers use a case management approach to develop and monitor care delivery to the older person. One of the benefits of the Community Care Packages Program is its flexibility in service delivery to meet individual needs. This flexibility sees people given assistance with eating meals, using the telephone, personal and domestic care, and transport.

7.14 COMMONWEALTH EXPENDITURE ON RESIDENTIAL AGED CARE—1999–2000

	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	**Aust.**
	$m	$m	$m	$m	$m	$m	$m	$m	**$m**
Expenditure 1999–2000(a)									
Residential care (recurrent)	1 318.5	861.0	594.7	333.9	284.4	102.2	10.6	34.3	**3 539.6**
Residential care (capital)(b)	7.2	5.3	4.1	3.7	1.0	1.0	2.1	0.0	**25.7**

(a) Includes expenditure by Department of Health and Aged Care, and Department of Veterans' Affairs on a cash basis. (b) Total amount for Australia includes $1.4m of National expenditure which has not been included under individual States and Territories.

Source: Department of Health and Aged Care.

At June 2000 there were some 18,000 packages approved under the program. Total cash expenditure for 1999–2000 was approximately $150m. Some 6,500 additional places have been offered for 2000–01.

In April 1998, the Commonwealth provided $95.5m over the next four years to increase the number of community care package places available across Australia. The number of care packages available will have more than doubled from July 1998 to July 2001.

Aged Care Assessment Program (ACAP)

ACAP is a joint Commonwealth/State program introduced in 1986. The aim of ACAP is to ensure that frail aged people have access to available residential care and community care services appropriate to their needs, through the operation of multidisciplinary Aged Care Assessment Teams (ACATs).

A network of 123 ACATs operates throughout Australia. In addition, each State has an evaluation unit which monitors and evaluates the performance of the program in that State. The Commonwealth funds State health authorities which manage the program on a day-to-day basis. The State health authorities also contribute additional resources to the operation of ACATs and evaluation units. The Commonwealth Government has contributed $36m to this program in 1999–2000.

ACATs operate on a regional basis, and their structure is influenced by the requirements of the community in which they function. The Teams' responsibilities include holistic assessment of clients, approval of clients to receive residential aged care or Community Care Packages, appropriate referral to other community services, and further assistance for older people through advice about aged care services in general. ACATs are also well positioned to act as an interface between aged care services and the health care system.

Assistance with Care and Housing for the Aged (ACHA) Program

The ACHA Program assists frail, low-income older people who are renting, are in insecure/inappropriate housing or are homeless, to remain in the community by accessing suitable housing linked to community care.

The Commonwealth contributes recurrent funds to organisations that provide support through paid workers and/or volunteers, assisting clients to access and be maintained in secure and affordable housing. The primary role of program workers is to link clients to appropriate mainstream housing and/or care services.

In 1999–2000 the program funded 46 projects nationally from an allocation of $2.5m. The funding for each project varies according to identified community need, the number of staff employed by individual services and the tenure of employment (i.e. full-time or part-time). Most projects are located in inner city areas where there is a concentration of frail elderly people living in insecure accommodation.

National Continence Management Strategy

In 1998, the Commonwealth provided $15m over four years to address the needs for improved continence management for older Australians through the National Continence Management Strategy.

Under this Strategy, a number of national research and service development initiatives are being trialed to complement existing continence care.

The Commonwealth Government also funds the Continence Aids Assistance Scheme (CAAS) which was established to assist people with a permanent disability-related incontinence condition when they are seeking or maintaining employment. CAAS currently provides $450 subsidy per year to assist eligible individuals. CAAS funding for 2000–01 is $8.43m.

Commonwealth Hearing Services Program

The role of the Commonwealth Hearing Services Program is to purchase services for eligible people with a hearing impairment. The administration of the Commonwealth Hearing Services Program is the responsibility of the Office of Hearing Services (OHS), a branch within the Department of Health and Aged Care, Aged and Community Care Division.

Eligible adults include holders of Pensioner Concession Cards, holders of Repatriation Health Cards issued for conditions that include hearing loss to Veterans, Sickness Allowees, dependants of the above categories, Commonwealth Rehabilitation Service (CRS) Australian clients undergoing a vocational rehabilitation program and referred by their case manager, and serving Defence personnel. OHS purchases hearing services from accredited public and private sector providers.

Access to hearing services for eligible adults is provided through the Hearing Services Voucher System. Voucher System expenditure in 1999–2000 was $112.1m.

More than 130 accredited hearing services providers are contracted by the OHS to provide services under the Hearing Services Voucher System. Services are provided at more than 300 permanent and about 1,000 visiting sites throughout Australia by qualified hearing services practitioners (audiologists and audiometrists). OHS also has supply contracts with 17 hearing devices suppliers for the supply of quality hearing devices into the Program.

In addition, the Government funds Australian Hearing Services to provide specialised hearing services for children and young adults under the age of 21 years, and to ensure access to appropriate hearing services for eligible adults with special needs. These clients include those who live in remote locations, who are Aboriginal or Torres Strait Islander people, or who have complex hearing needs. Funding is also provided to Australian Hearing Services to undertake research, through the National Acoustic Laboratories, to increase understanding of issues related to hearing loss, hearing rehabilitation and the harmful effects of noise.

Services provided by the Department of Veterans' Affairs

Services provided to veterans are determined by the Repatriation Commission. The Department of Veterans' Affairs provides the administrative machinery through which the Commission operates. The Commission, comprising three full-time members, has the following functions:

- granting pensions, allowances and other benefits in accordance with the provisions of Repatriation legislation;
- arranging the provision of treatment and other services for eligible persons;
- advising the Minister, and providing the Minister with information on matters relating to Repatriation legislation;
- performing other functions conferred on the Commission by the Act or other Acts; and
- administering the Acts subject to the control of the Minister.

Repatriation benefits are provided under the *Veterans' Entitlements Act 1986* for service with the Australian Defence Forces in World War I, World War II, the Korean and Malayan operations, the Australian contingent of the British Commonwealth Far East Strategic reserve, in Viet Nam and South East Asia, and for service in the Regular Defence Forces on or after 7 December 1972. However, since 6 April 1994, peacetime service is covered through the Military Compensation Scheme under the *Safety Rehabilitation and Compensation Act 1988*.

Certain civilians, Australian mariners of World War II (since July 1994) and Australian members of certain designated peacekeeping, observing and monitoring forces who had peacekeeping service overseas may also be eligible for benefits. Under the *Papua New Guinea (Members of the Forces Benefits) Act 1957*, indigenous inhabitants of Papua New Guinea who served in the Australian forces in World War II, and members of the Royal Papuan Constabulary and New Guinea Police Force who served in that conflict, are eligible for compensation-type benefits. Members of other Commonwealth countries' forces and other allied veterans are not eligible for compensation-type benefits in respect of their service, unless they were domiciled in Australia immediately before their enlistment. However, they may qualify for income support payments such as the service pension.

Qualification for receiving subsidised housing loans, granted under the Defence Service Homes Act, generally depends on service with the Australian Defence Forces in World War I, World War II, or specified service in Korea, Malaya, South East Asia, Namibia, or the Middle East for the Kuwaiti crisis, and for service in the Regular Defence forces on or after 7 December 1972, provided the person's first service in the Forces was before 15 May 1985. Certain civilians may also be eligible.

More detailed information on repatriation allowances, benefits and services is available from the Department.

Compensation Program

The principal objective of the Compensation Program is to ensure that eligible veterans, their war widows and widowers, and their dependants have access to appropriate compensation and income support in recognition of the effects of war or defence service. Compensation is administered under four sub-programs—the Compensation Sub-Program, the Income Support Sub-Program, the Housing Sub-Program and the Veterans' Review Board.

Compensation Sub-Program

The main benefits provided under this sub-program are the Disability Pension and the War/Defence Widow's/Widower's Pension and ancillary benefits. Table 7.15 shows the number of pensions at 30 June 2000.

The Disability Pension is to compensate persons for incapacity resulting from eligible war, defence or peacekeeping service. Table 7.16 shows the number of disability pensioners at 30 June 2000. General rate disability pensions range from 10% up to and including 100%, depending on the degree of war-caused or defence-caused incapacity. Higher rates of pension (intermediate rate and special rate) are payable if:

- there is at least 70% incapacity due to war, defence-caused injury or disease; and
- the veteran is totally and permanently incapacitated from accepted disabilities alone; and
- the disabilities render him/her incapable of undertaking remunerative work for periods aggregating to more than 20 hours per week for the intermediate rate, or eight hours for the special rate.

An Extreme Disablement Adjustment, equal to 150% of the general rate, is payable to severely disabled veterans who are 65 years of age or over.

The War/Defence Widow's/Widower's Pension is payable to the widow or widower of a veteran:

- whose death has been accepted as war-caused or defence-caused;
- who at the time of his or her death was receiving or entitled to receive a special rate Disability Pension or the Extreme Disablement Adjustment; or
- who had been a prisoner of war; or
- who at the time of his/her death was receiving a pension which had been increased due to certain amputations and blindness.

From 1 January 1993, the War Widow's/Widower's Pension also became available to the widows/widowers of former prisoners of war.

Orphan's Pension is payable to the children of these veterans.

Table 7.17 shows the number of disability pensions at 30 June 2000 and for the eight preceding years.

7.15 DISABILITY AND WAR WIDOWS' PENSIONS—30 June

	1996	1997	1998	1999	2000
Recipient	no.	no.	no.	no.	no.
Incapacitated veterans	159 178	160 145	161 829	162 810	162 730
Wives and widows(a)	74 725	69 858	65 442	60 864	(b)56 300
Children	5 176	4 247	3 752	3 337	(b)3 000
War widows and widowers(c)	93 456	97 522	100 746	104 553	107 953
Orphans	470	459	420	414	410
Other dependants	850	812	771	735	(b)700
Total	**333 855**	**333 043**	**332 960**	**332 713**	**331 093**

(a) Wives of still living veterans and widows of deceased veterans who have not died from an accepted war caused condition.
(b) Estimates. (c) Widows and widowers of deceased veterans who have died from an accepted war caused condition.

Source: Department of Veterans' Affairs.

7.16 DISABILITY PENSIONERS—30 June 2000

	World War I	World War II(a)	Korea/ Malaya	FESR(b)	Viet Nam	Peacetime forces	Miscell-aneous(c)	**Total**
	no.	no.	no.	no.	no.	no.	no.	**no.**
General rate—from 10% to 100%	12	86 736	3 744	879	10 991	25 851	422	**128 635**
Intermediate rate	0	484	30	4	243	221	5	**987**
Special rate (TPI or equivalent)	0	8 966	855	258	9 084	4 080	35	**23 278**
Extreme Disablement Adjustment	1	9 232	382	32	64	119	0	**9 830**
Total	**13**	**105 418**	**5 011**	**1 173**	**20 382**	**30 271**	**462**	**162 730**

(a) Includes interim forces. (b) Far East Strategic Reserve. (c) Includes service in the Gulf War.

Source: Department of Veterans' Affairs.

7.17 DISABILITY AND WAR WIDOWS' PENSIONS

	Number of disability pensions in force, 30 June				
Year	Incapacitated veterans no.	Dependants of incapacitated veterans no.	Dependants of deceased veterans no.	Total no.	Annual expenditure(a) to 30 June $'000
1992	157 790	102 953	81 125	341 868	1 396 192
1993	156 923	96 948	83 642	337 513	1 445 308
1994	156 565	91 722	86 224	334 511	1 508 446
1995	157 298	85 837	90 039	333 174	1 570 136
1996	159 178	80 204	94 473	333 855	1 720 239
1997	160 145	74 405	98 493	333 043	1 819 338
1998	161 829	69 484	101 647	332 960	1 888 416
1999	162 810	64 486	105 417	332 713	2 067 783
2000	162 730	(b)59 580	108 783	331 093	2 099 205

(a) Includes associated allowances. (b) Estimate.

Source: Department of Veterans' Affairs.

7.18 VETERANS' CHILDREN EDUCATION SCHEME, Cost of Education Beneficiaries

Year	NSW(a) $'000	Vic. $'000	Qld $'000	SA(b) $'000	WA $'000	Tas. $'000	**Aust.** **$'000**
1991–92	1 475.8	1 068.2	1 201.6	542.5	289.6	358.8	**4 936.5**
1992–93	1 612.4	1 092.7	1 198.1	310.1	644.8	413.6	**5 271.7**
1993–94	1 749.3	1 170.2	1 303.8	348.5	771.6	463.5	**5 806.9**
1994–95	1 905.7	1 163.9	1 601.4	371.7	791.8	491.8	**6 326.3**
1995–96	2 401.2	1 399.4	1 877.8	432.8	925.4	553.1	**7 589.7**
1996–97	2 913.7	1 694.8	2 430.4	522.3	1 135.8	620.7	**9 317.7**
1997–98	3 535.7	2 071.9	3 024.4	685.2	1 442.3	718.8	**11 478.3**
1998–99	3 969.5	2 420.7	3 609.0	812.4	1 713.6	789.3	**13 314.5**
1999–00	3 858.3	2 584.8	3 904.2	975.6	1 919.0	788.9	**14 030.8**

(a) Includes the Australian Capital Territory. (b) Includes the Northern Territory.

Source: Department of Veterans' Affairs.

The Veteran's Children Education scheme (see tables 7.18 and 7.19) provides financial help, guidance and counselling to certain students up to 25 years of age. To be eligible a student must be the child of a veteran, an Australian mariner, or a member of the Forces, who is (or has been) in receipt of a Special Rate Disability Pension. Children of former prisoners of war, of veterans, or of Australian mariners whose death has been accepted as war-caused, are also eligible.

Income Support Sub-Program

The main form of income support paid under this sub-program is the Service Pension. This is an income and assets tested pension similar to the Age Pension and Disability Support Pension paid by Centrelink. The pension is payable at age 60 to veterans with qualifying service. Prior to 1 July 1995, the pension was payable at age 55 to female veterans with qualifying service. From 1995 to 2013 the minimum age will be lifted from 55 to 60 years in six-monthly increments every two years; for example the qualifying age for Service Pension (Age) at 1 July 1999 was 56 years, but by 1 July 2013 the qualifying age will be the same as for male veterans, i.e. 60 years. Veterans with qualifying service may be paid the pension at any age if they are permanently incapacitated for work. Qualifying service generally means service in an area and at a time when there was danger from hostile enemy forces.

Veterans of other Commonwealth and allied countries may also qualify for the Service Pension for service in wars or war-like conflicts in which Australia has engaged. Veterans of Commonwealth forces must have served outside the country of enlistment or be entitled to the award of a campaign medal for service within that country. Allied veterans must have service in formally raised forces. The veteran must be an Australian resident with at least ten years residency. A Service Pension is also available to Australian, other Commonwealth and allied mariners of World War II.

7.19 VETERANS' CHILDREN EDUCATION SCHEME, Number Receiving Benefits—At 30 June 2000

Type of training	NSW(a) no.	Vic. no.	Qld no.	SA(b) no.	WA no.	Tas. no.	**Aust. no.**
At school							
Primary(c)	300	167	428	105	178	70	**1 248**
Secondary	677	402	642	160	279	129	**2 289**
Total	*977*	*569*	*1 070*	*265*	*457*	*199*	***3 537***
Tertiary professional	252	186	251	69	128	49	**935**
Technical	50	75	93	29	80	11	**338**
Total	1 279	830	1 414	363	665	259	**4 810**

(a) Includes the Australian Capital Territory. (b) Includes the Northern Territory. (c) Not in receipt of an education allowance.

Source: Department of Veterans' Affairs.

From 1 April 1993, all service pensioners became eligible for 'fringe benefits', provided by the Commonwealth Government, which include medical and hospital treatment, pharmaceutical benefits and the payment of a telephone allowance.

A number of supplementary benefits are also available under the sub-program. These include:

- rent assistance;
- additional pension in respect of dependent children;
- remote area allowance;
- guardian allowance;
- bereavement payment; and
- pharmaceutical allowance.

Table 7.20 shows the total number of pensions as at 30 June 2000, and Table 7.21 shows the number of pensions and annual expenditure for the years 1992–2000.

7.20 SERVICE PENSIONS, Number by Category—At 30 June 2000

	World War I no.	World War II(a) no.	Korea, Malaya & FESR(b) no.	Viet Nam no.	Other no.	**Total no.**
Veterans						
Old age/permanently incapacitated	15	135 344	10 313	16 786	3 334	**165 792**
Tuberculosis(c)	0	144	4	0	0	**148**
Total	15	135 488	10 317	16 786	3 334	**165 940**
Wives and widows	87	108 393	7 753	12 238	2 665	**131 136**
Total	102	243 881	18 070	29 024	5 999	**297 076**

(a) Includes British Commonwealth and Allied Forces. (b) Far East Strategic Reserve. (c) Eligibility on these grounds ceased on 2 November 1978.

Source: Department of Veterans' Affairs.

7.21 SERVICE PENSIONS, Number and Expenditure

	Pensions in force, 30 June			
Year	Veterans no.	Wives and widows no.	Total no.	Annual expenditure(a) $'000
1992	215 010	156 603	371 613	2 377 619
1993	210 406	152 742	363 148	2 389 886
1994	204 793	148 184	352 977	2 382 307
1995	198 793	148 974	347 713	2 426 579
1996	192 342	145 481	337 823	2 609 460
1997	186 228	142 520	328 748	2 644 118
1998	179 673	138 906	318 579	2 602 122
1999	172 654	135 904	308 558	2 680 409
2000	165 940	131 136	297 076	2 587 972

(a) Includes associated allowances.

Source: Department of Veterans' Affairs.

Housing Sub-Program (Defence Service Homes Scheme)

The Defence Service Homes (DSH) Scheme provides financial benefits to recognise the contribution of certain men and women who have served Australia in either peacetime or wartime. The benefits include housing loan interest subsidies, comprehensive home owners' insurance cover at competitive rates, and home contents insurance (see table 7.22).

The Scheme was established in 1918 as the War Service Homes Scheme. In 1972 its name was changed to the Defence Service Homes Scheme to recognise the extension of eligibility to those with qualifying peacetime service.

The Commonwealth Government sold the DSH mortgage portfolio to Westpac Banking Corporation, which became the Scheme's lender on 19 December 1988. Under the Agreement between the Commonwealth and Westpac, the Commonwealth subsidises Westpac for the low-interest loans provided. The subsidy is paid directly to Westpac and represents the difference between the concessional interest rate paid by the borrower and the agreed benchmark interest rate.

Since 1918, the Defence Service Homes Act has made provision for DSH insurance. Building insurance is available to all persons eligible under the Defence Service Homes Act or the Veterans' Entitlements Act. This benefit is also available to those who obtain assistance under the Australian Defence Force Home Loans Assistance Scheme. DSH contents insurance, a comprehensive insurance package underwritten by QBE Mercantile Mutual Insurance (Australia) Ltd, is available to veterans and the service community.

The maximum loan available under the DSH Scheme is $25,000 repayable over 25 years. The interest rate on new loans is capped at 6.85% for the term of the loan. Loans can be used to buy a home or strata unit, build or extend a home, buy a right of residence in a retirement village, refinance an existing mortgage, repair or modify an existing home, or obtain granny flat accommodation on another person's property.

The Military Compensation and Rehabilitation Service

The objective of the Military Compensation and Rehabilition Service (MCRS) is to ensure that current and former members of the Australian Defence Force (ADF), who suffer an injury or disease which is causally related to employment in the ADF, are provided with compensation and rehabilitation benefits and services. The MCRS is responsible for providing benefits through the *Safety, Rehabilitation & Compensation Act 1988* (SRCA). Table 7.23 summarises activities under the MCRS for 1999–2000.

The SRCA provides compensation cover for injury or disease sustained during peacetime service since 4 January 1949 and operational service since 7 April 1994. Once liability has been accepted for an injury a range of benefits may or may not apply to an individual case. In broad terms:

- weekly incapacity payments are made on the basis of ongoing evidence of loss of ability to earn at a rate of 100% of pre-injury earning capacity for 45 aggregated weeks less the current ability to earn. After 45 weeks the rate falls to 75% of pre-injury earning capacity if the client cannot work at all, gradually rising back up to 100% if some work is possible. Government funded superannuation entitlements are then deducted. Different entitlement regimes apply under transitional provisions for certain employees and periods prior to 1 December 1988;
- permanent impairment payments are assessed in accordance with the approved guide. The minimum threshold is 10% whole of person impairment with 100% attracting the maximum current rate of $160,169. Other rates and criteria apply for impairments arising under the currency of predecessor legislation prior to 1 December 1988;

7.22 DEFENCE SERVICE HOMES SCHEME

	Unit	1992–93	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
Subsidised loans									
Loans granted	no.	9 158	7 639	7 171	6 861	6 518	6 380	5 477	4 850
Interest subsidy	$m	54.3	37.5	45.1	53.0	29.2	12.2	17.2	15.4
Loan accounts at 30 June	no.	113 741	107 124	101 887	96 518	91 029	80 802	73 530	69 677
Building insurance									
Homes insured at 30 June	no.	157 510	147 853	140 508	137 012	133 711	126 799	123 068	118 430

Source: Department of Veterans' Affairs.

- death benefits are payable to defined dependants of ex- or current members who die because of injuries arising from ADF employment. One payment up to a maximum current lump sum rate of $174,730 is payable in respect of all eligible dependants. A funeral benefit of $4,033 is also payable. A weekly amount of $58.23 is payable to dependent children of the deceased;
- additional Defence Act payments are available (with effect from 7 April 1994) to 'top up' payments for death of the deceased and permanent impairment payments to those with 'severe injuries'. The severe injury adjustment and additional death benefit increases the lump sum amount payable to $209,960, with an additional $50,490 for each dependent child;
- medical benefits are payable in respect of the cost of medical treatment 'reasonably obtained' in relation to the accepted injury. There is broad definition of medical treatment;
- Rehabilitation Services are provided where applicable in the form of programs designed to return injured employees as close as possible to pre injury employment, mobility and lifestyle capacity. Programs include return to work retraining, aids, appliances and alterations;
- Household Service and Attendant Care benefits are available at a statutory rate payable to ensure that eligible injured members are able to maintain their household and/or remain in their home; and
- Appeal and Review mechanisms are available for clients who do not agree with a decision made by MCRS. Rights include access to an internal review followed by application to the Administrative Appeals Tribunal, with a mandatory conciliation step.

Health Program

Health care treatment is provided to people whose disabilities have been accepted by DVA as service-related, and for pulmonary tuberculosis, post traumatic stress disorder and malignant neoplasia whether they are service-related or not. In addition, and subject to certain conditions, health care treatment in Australia is provided to certain veterans of Australia's Defence Forces for all conditions. Eligible veterans include ex-prisoners of war; veterans and mariners of World War II aged 70 years or over who have qualifying service from that conflict; those receiving a disability pension at or above the maximum (100%) general rate; World War II veterans and mariners receiving both Service Pension at any rate and Disability Pension at 50% rate or higher; veterans, mariners or nurses who served in World War I; certain service pensioners; and returned ex-servicewomen of World War II. War widow/ers and certain other dependants of deceased veterans are also entitled to treatment for all conditions.

Younger veterans from post-World War II conflicts have needs additional to those of their older counterparts. These needs are addressed by a range of services which include integrated out-patient, in-patient and support services for the treatment and rehabilitation of veterans with war-related mental health conditions. Intensive in-patient treatment programs are available in each State. Community-based psychological services are provided by the Vietnam Veterans Counselling Service and individual providers.

Assistance is available for the Vietnam veterans community through a series of recent initiatives to support veterans and their families in response to the validated findings of the Vietnam Veterans Health Study. These include mental health support for veterans, their partners and children, assistance with treatment costs for Vietnam veterans' children with spina bifida or cleft lip/palate, and preventive health programs for veterans. The role of the National Centre for War-Related Post-traumatic Stress Disorder is being expanded to address mental health problems affecting the wider veteran community, and funding is being increased for research into veterans' health issues that may be the result of operational service.

7.23 MILITARY COMPENSATION & REHABILITATION SERVICE, Activities—1999–2000

Activity	no.
New primary injury claims received	5 844
No. of incapacity payees at 30 June 2000 (incl. dependent children)	2 079
New permanent impairment claims received	3 946
New rehabilitation referrals received	1 039
Total accounts paid (incl. medical, household services and attendant care)	56 339
New reconsideration requests received	984
New applications made to the AAT	162

Source: Department of Veterans' Affairs.

Vocational rehabilitation services are available to support those who are leaving the Australian Defence Force, those at risk of losing employment, and those who wish to return to the workplace. Rehabilitation Allowance may be available to people whose pension entitlement is affected—the intention is that no financial loss should occur for individuals taking up paid employment. Safety net arrangements enable a return to former pension status in the event that employment cannot be sustained (this applies to pensioners receiving above general rate levels of Disability Pension or Service Pension through invalidity).

With the transfer of the Rehabilitation General Hospitals to the States, or their sale to the private sector, all acute hospital care is now provided through the Repatriation Private Patient Scheme. This means that entitled beneficiaries can obtain treatment at a public hospital as a Repatriation private patient, in shared accommodation with a doctor of their choice. According to medical need, if treatment cannot be provided within a reasonable time, the Department may approve admission to a private hospital. The former Repatriation hospitals will remain available for treatment if beneficiaries choose to go there.

Following research showing the importance of community care services for veterans and war widow/ers, the Veterans' Home Care program was announced in the May 2000 Budget. From January 2001, this new initiative will extend the range of services provided to the veteran community to include a wide range of home care services. Veterans' Home Care services will be available to Australian veterans and war widow/ers who are assessed as needing care to remain in their homes. It is estimated that Veterans' Home Care will provide services to 50,000 veterans and war widow/ers at a cost of $147m in a full year.

Veterans' Home Care completes the range of health and community care services available to the veteran community. Net savings are expected from the Veterans' Home Care initiative due to better health outcomes for veterans, reducing avoidable illness, injury and associated health costs. Better health will mean that veterans spend less time in hospital and need fewer medications and other high cost services. More importantly, they will be able to lead fuller, more active lives.

Under arrangements with State Governments, entitled persons requiring custodial psychiatric care for a service-related disability are treated at departmental expense in State psychiatric hospitals.

Entitled persons may also be provided with dental treatment through the Local Dental Officer (LDO) Scheme, which comprised 6,825 LDOs at 1 June 1999. Optometrical services, including the provision of spectacles, the services of allied health professionals, as well as a comprehensive range of aids, appliances and dressings, may be provided to entitled persons.

In addition, entitled persons may be provided with pharmaceuticals through the Repatriation Pharmaceutical Benefits Scheme.

Through the Repatriation Transport Scheme entitled persons are eligible to receive transport assistance when travelling to receive approved medical treatment.

Vietnam Veterans' Counselling Service (VVCS)

The VVCS provides counselling to veterans of all conflicts and their families, as well as working with the ex-service community to promote understanding and acceptance of veterans' problems.

The VVCS is staffed by psychologists and social workers who have specialised knowledge about military service, particularly in Viet Nam, and its impact on veterans and their families, especially the impact of post-traumatic stress.

Access to counselling services for rural veterans and their families was greatly improved with the establishment of the Country Outreach Program in 1988, followed soon after by a toll-free 1800 telephone link to all VVCS centres. Recent service enhancement initiatives include the creation of group programs aimed at promoting better health for veterans. Table 7.24 shows use of the VVCS.

7.24 VIETNAM VETERANS' COUNSELLING SERVICE

Type of counselling	1994–95	1995–96	1996–97	1997–98(a)	1998–99	1999–00
	no.	no.	no.	no.	no.	no.
Face-to-face consultation	33 996	33 411	(a)30 000	30 000	(a)27 000	27 509
Group session consultation	356	724	784	500	485	903
Country outreach consultation	20 398	20 723	21 523	27 000	(a)26 000	26 874

(a) Estimates.

Source: Department of Veterans' Affairs.

The Office of Australian War Graves (OAWG)

OAWG manages the War Graves Program and maintains some 24,000 graves and memorials of Commonwealth war dead in 75 war cemeteries, plots and civil cemeteries in Australia, Papua New Guinea, Guadalcanal (Solomon Islands) and Norfolk Island. OAWG also makes an annual contribution to the Commonwealth War Graves Commission to assist with the maintenance of war cemeteries elsewhere in the world. OAWG represents the Australian Government's interest in the maintenance of graves of Australian service personnel and war memorials that commemorate those Australians who died in other conflicts, in overseas countries. These include the United Nations Memorial Cemetery, Pusan, Korea, and the British Commonwealth Forces Cemetery, Yokohama, Japan, and in Malaysia.

Another OAWG's major tasks is the official commemoration within Australia of those Australian men and women whose deaths in post-war years is accepted as due to their war service. In recent years OAWG has processed some 7,000 commemorations annually and it is anticipated this trend will continue during 2000–01. The Office has some 245,000 memorials under perpetual maintenance.

OAWG constructs major memorials at significant locations where Australians have suffered and died. In recent years memorials have been dedicated at Hellfire Pass, Thailand; Le Hamel and Fromelles in France; and at Sandakan, North Borneo, Malaysia. The Anzac Commemorative Site was constructed at North Beach, Gallipoli, and dedicated on Anzac Day 2000.

The Office also cares for war graves and cemeteries in Australia which contain the graves of foreign service personnel and civilian internees who died during the two World Wars. It also maintains the graves of, and memorials to, former Prime Ministers of Australia and Governors-General, on behalf of the Department of the Environment and Heritage.

Bibliography

ABS publications

Household Expenditure Survey, Australia: Detailed Expenditure Items, 1998–99 (6535.0).

Household Expenditure Survey: The Effects of Government Benefits and Taxes on Household Income, 1993–94 (6537.0).

Income Distribution, Australia (6523.0).

Other publications

Department of Family and Community Services:

—*Annual Report*.

—*FaCS Customers: A statistical overview*.

Department of Health and Aged Care, *Annual Report*.

Department of Veterans' Affairs, *Annual Report*.

Internet sites

Centrelink, *http://www.centrelink.gov.au*

Commonwealth Department of Education, Training and Youth Affairs, *http://www.detya.gov.au*

Commonwealth Department of Employment, Workplace Relations and Small Business, *http://www.dewrsb.gov.au*

Commonwealth Department of Family and Community Services, *http://www.facs.gov.au*

Commonwealth Department of Health and Aged Care, *http://www.health.gov.au*

Commonwealth Department of Veterans' Affairs, *http://www.dva.gov.au*

Household income and its distribution

Professor Peter Saunders

Professor Peter Saunders is the Director of the Social Policy Research Centre at the University of New South Wales. He has undertaken a series of research studies on income distribution and living standards and is one of Australia's leading experts in these fields. His research on poverty and income distribution has been widely cited overseas and was given special reference when he was elected a Fellow of the Academy of the Social Sciences in 1995.

Introduction

Over the course of the twentieth century, the Australian economy grew at an unprecedented level, resulting in rising material prosperity and increasing standards of living. Although the fruits of growth have not been distributed evenly—over time, across regions or between sub-groups of the population—the overall effect has been to raise the average level of economic wellbeing far above what it was when the century began. Although many groups have prospered over the last one hundred years, there are others whose relative economic circumstances have deteriorated. The material conditions of indigenous Australians still lag far behind, pockets of entrenched poverty exist alongside increased affluence, and where one lives can still exert an important influence on one's economic prospects. Overall, however, Australia is a country with a high standard of living and a life style that others view with envy. Migrants from around the world still flock to its shores, keen to participate in (and contribute to) the economy and the vibrant and diverse, multicultural society in which it is embedded.

This article explores the nature of the increase in living standards as measured by changes in the level of household income and its distribution. In undertaking such an exercise, it is important to emphasise some of the limitations of income as an indicator of economic wellbeing or standard of living. There is more to life than money, just as there is more to one's standard of living than income. But in a market economy like Australia, income reflects the ownership and use of human, financial and physical capital and provides access to the goods and services that support the standard of living. People's status in society—both as workers who contribute to economic output and as consumers who benefit from it—also reflects their income and the level of consumption that it can sustain.

The distribution of income can be presented in a variety of different ways, each focusing on a different aspect of income variation. A range of measures is also available for summarising how much inequality exists at any point in time. Most of these measures indicate how far the observed distribution deviates from a situation of total equality, where all incomes are equal. They reflect *relative* income differences. Supplementary statistics are needed to provide more insight into the nature of inequality and to identify its causes, but how the inequality statistics are presented can be important. Measures that relate income differentials to differences in location, ethnicity, age, gender, educational qualifications, or employment participation each reveal part of what is a complex multi-dimensional reality. It is not possible to do justice to all of these aspects in the limited space available. Emphasis has been given to describing the Australian income distribution, exploring how it has changed and how it compares internationally. Such an account, while primarily descriptive, provides the basis for further study of the causes and consequences of inequality.

Conceptual issues

In order to generate income, other things generally have to be sacrificed, at the level of both the individual and society. Individuals must forego leisure in order to work and earn an income, and there may be social costs associated with rising market incomes, including increased pollution, congestion and a decline in the value attributed to civic duties and other forms of work that are unpaid and often unrecognised. For these reasons, it cannot be assumed that an increase in income necessarily implies a higher standard of living. However, these considerations are likely to be more significant at an aggregate level than at the household level, and to exert a more significant influence in the longer run. For households, in the short to medium term, it can be assumed that, since income is the result of participation in activities that are generally freely entered into, an increase in income translates directly into an increased standard of living.

Even accepting this proposition, there are still a number of more specific questions surrounding the definition of income and its use as an indicator of the standard of living of households. Before discussing these, a few comments on the definition of the household itself are in order. Almost everyone lives in a household of some form and the vast majority live with their family, generally as a member of a 'nuclear family' consisting of adults (single or married) and (if there are any) their children. Although older children living with their parents may be largely independent of them, where children are younger and financially dependent on their parent(s) the nuclear family can be viewed as a single economic unit. In these circumstances, it is normally assumed (although the empirical basis for doing so is rather limited) that income is shared and used to benefit all family members equally. On this assumption, it is possible to use total family income as an indicator of the standard of living of all family members. It is, however, necessary to make an adjustment for the size of the family, because a given level of income will support a lower standard of living the more people there are reliant upon it.

Although most households consist of nuclear families only, there are many households that reflect other living arrangements. An increasing proportion of the population live by themselves, while others live with people they are not related to, or in multi-generational family households. Within these households, particularly those consisting of unrelated adults living together, the assumption that income is totalled up and used to the equal benefit of all household members becomes problematic. It may be true, but it may not, and the *degree* of income sharing is likely to vary from household to household (as it may within nuclear family units). No single income sharing assumption will be generally applicable, so that the use of household income to reflect the living standard of household members may not be justified. The standard approach for dealing with this issue is to treat all people as belonging to an income unit that consist of either one or two adults, with or without any dependent children, and to assume that income is only shared *within income units*. This approach has been used to derive the income distribution estimates presented and discussed in the section *Distribution of income in Australia* (where the method used to adjust income for differences in income unit size is also explained).

Thus far, the discussion has proceeded as if the definition of income is a straightforward matter. It is not. First, there is the question of defining cash or monetary income—a matter whose complexity is illustrated by the length of the income tax legislation. Of particular relevance in the current context is the question of deciding what should be included in income so that it better reflects the standard of living. Cash income is generally a good measure of the standard of living because it indicates the extent to which people are able to satisfy their consumption needs through market transactions, but it omits many non-cash and in-kind elements that contribute directly and indirectly to living standards.

One example of indirect in-kind income is the imputed rental income of home-owners. This is a form of interest income on the investment in the dwelling, even though it does not appear in conventional income measures. Employer superannuation contributions (along with other employer-provided fringe benefits) are another form of in-kind income. In this case, even though the superannuation benefits earned from the contributions have a cash value, they are income that is deferred until retirement. An example of non-cash income is the benefits that households receive in the

form of free or subsidised education and health services. These are generally referred to as part of the 'social wage', although they are more accurately described as 'social income' because many of the benefits accrue to groups in the population (pensioners and children, for example) who are not earning a wage. In the case of social income, households are given access to consumption of the services by government rather than being required to pay for them in the market (although many social income components can also be purchased in the market). Payment for social income services occurs collectively, through the tax system (supplemented by user charges) and the amounts involved affect cash income indirectly, as a larger than otherwise tax bill.

The significance of all three forms of in-kind or non-cash income—imputed rent, employer contributions and the social wage—reflect broader social trends, including patterns of home ownership, how the retirement income system is organised and what goods are provided collectively by government. They each contribute to the standard of living of households but are not reflected in the conventional statistics on household income, in part because of the inherent difficulty in identifying the benefits and estimating their value. If income is defined narrowly to include just cash income, the contribution of these other factors will be missed, leading to a distorted image of how living standards vary, over time and between groups at a point in time.

In relation to living standards, the form in which income is received—as cash, non-cash or in-kind benefits—matters less than its total value. To omit some items because of the difficulty of estimating their value runs the risk of producing a measure of income that has only marginal relevance to actual living standards. Ideally, the income concept should be both defensible in its measurement and practical in its application. The ABS has recently proposed such a broad income measure, which it defines in the following terms:

> "[I]ncome consists of receipts, as money or in-kind, that are received or accrued regularly and are of a recurring nature. Income may accrue from a wide range of sources both from outside and within the household itself …Cash income may be generated through involvement in economic production, either within the market economy or outside it… Non-cash income similarly covers income in-kind from [these] sources. It includes non-cash benefits received by employers and by owners of small business [and] non-cash government benefits directed to pensioners and beneficiaries and directed to the broader population groups in the form of government expenditure on services such as health, housing, welfare etc. In addition, non-cash income…includes the value of the production of goods and services provided by the household to itself [through] services such as child care and cooking as part of their unpaid household work." (ABS 1995, pp. 4–5)

It is clear from this definition that income is far broader in scope than what appears in the pay packet each fortnight, or even what is reported to the tax authorities each year. In order to be able to estimate the standard of living, it is necessary to impute a value for each of the different components of income, or at least to recognise the limitations of not doing so.

In recognition of this, there have been numerous attempts to estimate the value of various types of in-kind and non-cash income and to explore their impact on living standards and income distribution (ABS 1996; Yates 1991). These studies have made an important contribution to the measurement of living standards and how they compare between different groups in Australia. They are not considered further here, although their significance should be kept in mind when reviewing the estimates that follow.

Aggregate trends in household consumption and income

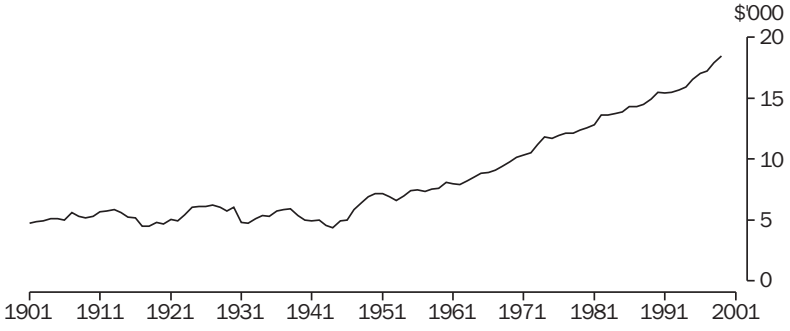
Writing about fifteen years ago, Maddock and McLean (1988) concluded that, however they are measured, Australian living standards improved substantially between the turn of the century and 1980. Drawing on a detailed review of the available evidence, the authors argued that Australians were better off in terms of income and consumption, and that income was more equally distributed, with the rich losing ground relative to others and the poor making up ground against the middle classes (Maddock and McLean 1988,

p. 351). How far these trends have continued into the last quarter of the twentieth century is addressed in this and the following section.

Although it is only a partial measure of living standards, private consumption by households is a significant indicator of how well household are able to meet their material needs by purchasing goods and services in the market. It is also an aspect of wellbeing for which reliable estimates are available over a long time period. Graph C5.1 plots movements in private consumption per head of population since 1900–01 after adjusting for movements in consumer prices (as measured by the price deflator for private household consumption expenditure). After rising modestly until around 1913, consumption per head varied considerably for much of the next three decades but displayed no overall trend. Since the mid-1940s, however, there has been a steadily rising trend, with price-adjusted consumption per head increasing *on average* by about 2.5% each year—equivalent to a doubling of its value about every 28 years.

The adjustment of total consumption for changes in population size accounts for the impact on consumption of the fact that there is an increasing number of people whose needs have to be supported by consumption spending. However, as noted earlier, the appropriate unit for living standards purposes is the household or family, within which the fruits of consumption spending are shared. This latter (resource-sharing) effect would only be captured accurately by expressing total consumption in per capita terms if the number of persons per household has remained approximately constant. It has not. As table C5.2 shows, there has been a steady decline in average household size throughout the twentieth century, particularly over the last thirty years. This period has seen the percentage of single-person households almost double, from 11.8% of all households in 1966 to 22.8% in 1996. The extent of this change can be gauged by observing that, had there been no change in average household size since 1966, the 1996 population could have been housed in 4.827 million dwellings—1.454 million (or 23.2%) fewer dwellings than actually existed in 1996.

C5.1 HOUSEHOLD FINAL CONSUMPTION EXPENDITURE PER CAPITA, in 1997–98 Prices—1900–01 to 1998–99



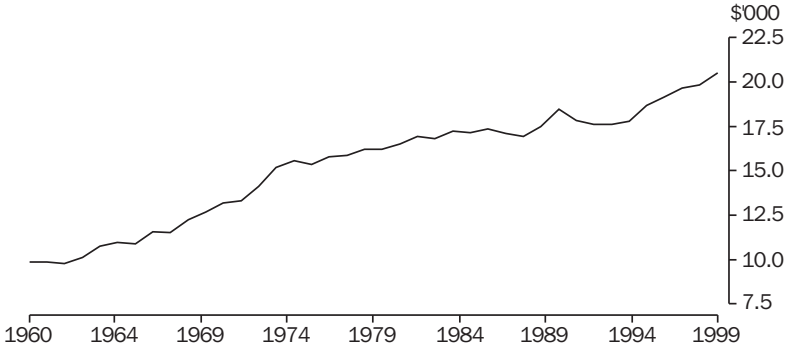
Source: Data for 1900 to 1980 are from Appendix Tables 1 and 4 of Maddock and McLean (1998), supplemented by ABS population and national accounts data from 1981.

C5.2 TRENDS IN HOUSEHOLD SIZE—1911 to 1996

	Occupants per dwelling					
	1	2–4	5 and over	Total dwellings	Total population in private dwellings	Average household size
Census year	no.	no.	no.	no.	no.	persons
1911	n.a.	n.a.	n.a.	894 389	4 055 926	4.53
1921	97 620	529 744	479 646	1 107 010	4 875 428	4.40
1933	128 785	824 886	556 000	1 509 671	6 629 839	4.39
1947	152 029	1 168 781	552 813	1 873 623	7 026 760	3.75
1954	213 088	1 523 238	607 095	2 343 421	8 314 362	3.55
1961	285 360	1 743 173	753 412	2 781 945	9 870 494	3.55
1966	371 861	1 958 351	821 714	3 151 926	10 930 500	3.47
1971	497 816	2 319 179	853 559	3 670 554	10 955 250	2.98
1981	839 302	3 041 213	788 396	4 668 911	13 918 445	2.98
1991	1 130 749	3 759 850	751 797	5 642 396	15 717 020	2.78
1996	1 432 820	4 122 479	726 518	6 281 817	16 751 439	2.67

Source: Census of Population and Housing, various years.

C5.3 HOUSEHOLD DISPOSABLE INCOME PER CAPITA, in 1997–98 Prices—1959–60 to 1998–99



Source: ABS population and national accounts data.

Factors influencing the decline in average household size include the ageing of the population, the decline in fertility, the increased incidence of divorce and the declining number of multi-generation households. Increased affluence has also played a role, in conjunction with changes in housing affordability, the trend towards urbanisation and preferred living arrangements. These factors also reflect broader changes in Australian society and community attitudes and values. Of particular significance in the current context is the fact that the number of households has grown faster than the population. This implies that consumption per household has grown more slowly than consumption per capita. As a consequence, the trend shown in graph C5.1 may overstate the increase in the benefits from private consumption that have accrued to household members (although adjusting for this effect would not remove the upward trend shown in the graph).

Changes in total consumption reflect changes in the total income that households have to spend. Accurate data on household income are only available for the more recent period, when the Australian National Accounts began to collect statistics on key economic aggregates. The national accounts data indicate that household disposable income has increased since 1959–60, after adjusting for population growth and increases in consumer prices (graph C5.3). Real household disposable income per capita more than doubled over the period, increasing on average by 1.9% a year—equivalent to a doubling in its value about every 37 years.

Although this trend signifies a considerable improvement in average living standards, of greater relevance in a distributional context is not the overall level of household income, but the relative size of its different components. Not all types of income are distributed in the same way among the population, and some income sources (such as social security benefits and income taxes) reflect explicit distributional goals, whereas others (such as interest income and dividends) are primarily market-determined and thus reflect the existing distribution of economic resources.

Table C5.4 indicates that there have been significant changes in the composition of household income since 1959–60. Although caution must be applied when considering the impact of the business cycle on short-term movements in income shares, over the longer term, compensation of employees (primarily wages and salaries) accounts for between 55% and 60% of household income. This percentage declined throughout the 1980s, but has been moving upwards again in the 1990s. Property income (interest, dividends, rental income, etc.) shows considerable short-run variation, reflecting movements in interest rates, property prices and the performance of the share market, but has fallen markedly in relative terms since 1990. Both social assistance benefits and income tax have more than doubled as a proportion of household income since 1960. The impact of recession on the relative importance of social assistance income is apparent in the rises experienced in the early part of the last three decades, when the economy was in recession. Income tax reveals a more consistently upward trend (and a larger absolute increase than social assistance benefits) and rose sharply after 1995, although it will have declined with the introduction of the GST in July 2000.

Table C5.4 summarises the overall (cash) income framework operating in Australia, delineating the respective roles and significance of labour and capital income, and of income that is generated through the market and redistributed by government tax and transfer policies. The broad features of this framework help to shape how income is distributed to households, according to their involvement in market activity (through employment and/or investment of assets), their receipt of social transfers and payment of taxes to government. How these different activities combine to determine the overall income distribution is now considered.

C5.4 CHANGING COMPOSITION OF HOUSEHOLD INCOME, Percentages of Gross Income—1959–60 to 1998–99

	1959–60	1964–65	1969–70	1974–75	1979–80	1984–85	1989–90	1994–95	1998–99
Income source	%	%	%	%	%	%	%	%	%
Compensation of employees	57.2	57.7	59.8	61.9	56.1	54.6	52.0	54.0	55.6
Property income	7.4	7.9	8.7	9.4	9.5	12.0	15.2	10.6	8.8
Primary income	93.0	92.4	92.5	90.1	88.0	85.9	88.2	84.6	84.9
Social assistance benefits	4.9	5.0	4.7	5.8	7.4	8.2	7.0	9.6	9.2
Total gross income	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Income tax payable	6.9	8.6	10.1	12.5	12.9	14.2	14.1	13.0	14.7
Disposable income	88.3	86.0	84.0	79.9	78.3	76.0	73.4	77.3	75.7

Source: Australian National Accounts, Household Income Account, various years.

The distribution of income in Australia

The national accounts provide an authoritative source of statistics on trends in the major income aggregates over the latter half of the century and a framework that has been used to derive estimates that cover earlier years. Unfortunately, the same cannot be said of the reliability—or even the existence—of data on the distribution of income. In part, this reflects the inherent difficulty of obtaining reliable information on income at the individual household level because of its sensitivity. Cost is also a factor. Deriving and administering a questionnaire capable of providing comprehensive and accurate income information is, as implied by the above discussion, a complex and expensive exercise. Even so, the absence of distributional data is somewhat surprising given the importance attached to equality and to the reduction of the extremes of both wealth and poverty as policy goals. It seems difficult to reconcile Australia's traditional reputation as an egalitarian nation with the lack of attention given to the collection of data on how income is distributed.

Reporting in 1975, the Taxation Review Committee made reference to the absence of reliable data on the distributions of income before and after tax (Taxation Review Committee 1975, para. 4.32). In fact, the first nation wide study of income distribution had been conducted in 1969, although results were not released until 1973 (Commonwealth Bureau of Census and Statistics, CBCS, 1973). A special income survey was also conducted in August 1973 to assist the Poverty Commission to estimate the extent of poverty (Commission of Inquiry into Poverty 1975). These initial surveys have been followed by a series of income distribution surveys conducted at regular intervals over the last three decades.

In the absence of survey data covering the first two-thirds of the century, a number of academic studies have attempted to estimate the income distribution in those years and how it changed (Jones 1975; McLean and Richardson 1986; Saunders 1993). Although beset by numerous definitional and data comparability obstacles, these studies allow a broad picture to be built up of how income distribution changed over that period. The broad consensus reached by this research is that income inequality declined between 1915 (when the first national data were available) and 1969, with much of the decline taking place after the height of the Depression in 1933. There was a further modest decline between 1969 and 1981, by which time inequality of both earnings and total income had began to increase.

The analysis reported below describes changes in income distribution over the three decades since the first comprehensive survey was undertaken in 1969. Table C5.5 compares the overall income inequality profile among families in 1968–69 and 1997–98. The estimates exclude 'non-family individuals' who were analysed separately in the earlier survey—an omission that is of significance given the increased incidence of single person households shown in table C5.2. The distribution of income among families became more unequal between 1968–69 and 1997–98, as measured by the two summary measures of inequality, the Gini coefficient and the 'Robin Hood Index'. The Gini coefficient varies between zero (complete equality) and one (extreme inequality), with a higher value indicative of more inequality. The Robin Hood Index indicates the percentage of total income that would need to be distributed away from those with above-average incomes and towards those with below-average incomes in order to equalise all incomes. The extent of the rise in the two summary measures (18.2% in each case—the fact that the figure is the same is a coincidence) is substantial, both historically, and internationally (tables C5.7 and C5.9).

According to the income distribution statistics in table C5.5, the relative income position of families at the bottom of the income distribution declined over the period, while the relative incomes of those at the top increased. These trends are contrary to those identified by Maddock and McLean (1988) as having occurred in the period up to 1980. In terms of how incomes changed relative to prices, the income cut-off that identifies families in the top 20% of the distribution (P80) increased by 50% more than the increase in consumer prices between 1968–89 and 1997–98. In contrast, the income cut-off that identifies families in the bottom 20% of the distribution (P20) declined relative to the increase in prices over the same period. The implication is that the incomes of some low-income families declined over the period, not only relative to the incomes of other families, but also relative to consumer prices

C5.5 CHANGES IN INCOME DISTRIBUTION AMONG FAMILIES—1968–69 to 1997–98

	1968–69		1997–98		Change, 1968–69 to 1997–98	
Income deciles	Income Share %	Upper Bound(a) $('97–98)	Income Share %	Upper Bound(a) $('97–98)	Income Share percentage points	Upper Bound(a) $('97–98)
First	2.2	13 040	1.8	15 030	–1.8	+1 990
Second	4.6	20 000	3.3	19 100	–1.3	–900
Third	6.2	24 200	4.4	26 220	–1.8	+2 020
Fourth	6.9	28 260	6.0	34 180	–0.9	+5 920
Fifth	8.5	32 460	7.6	43 020	–0.9	+10 560
Sixth	9.3	36 820	9.3	51 790	0.0	+14 970
Seventh	10.6	42 030	11.2	62 200	+0.6	+20 170
Eighth	12.2	49 130	13.3	74 000	+1.1	+24 870
Ninth	15.0	62 030	15.3	94 200	+0.3	+32 170
Tenth	24.7	. .	26.8	. .	+2.1	. .
P10/P50(b)	. .	0.402	. .	0.349	–0.053	. .
P90/P50(b)	. .	1.911	. .	2.19	+0.279	. .
P90/P10(b)	. .	4.756	. .	6.266	+1.510	. .
Gini coefficient	0.33		0.39		18.2%	
Robin Hood index	22.5		26.6		18.2%	

(a) In 1997–98 dollars. Incomes have been deflated using the private final consumption expenditure deflator.
(b) The percentile ratios (P10/P50, etc.) show the ratio of the upper bound income of the first decile (P10) to the fifth decile, or median (P50), and so on.

Source: CBCS 1973; ABS 1999.

Table C5.6 compares how individuals have fared since 1968–89 by investigating changes in the distributions of total incomes (from all sources) of full-time male and female workers. (It should be noted that the figures for 1968–69 refer to full-time, full-year workers, while those for 1997–98 refer to workers who were working full-time at the time of the survey.) Income inequality increased among both male and female full-time workers, with the relative position of lower-income workers declining and that of high-income workers improving. The extent of these changes for males and females was very similar. By 1997–98, low-income female full-time workers were equally well off (relative to the female median) than were low-income males (relative to the male median). In contrast, the position of higher-income male workers relative to the male median was above that of higher-income female workers, and throughout the period there was greater inequality in the male distribution than in the female distribution. At the same time, there has been a narrowing of male-female income differentials at all points in the two distributions since the late 1960s. Whereas in 1968–69 the median income of full-time male workers was 67% above that of the corresponding median female income, by 1997–98 that differential had fallen to 20%.

A more detailed exploration of changes in income distribution is restricted to the period since 1981–82, when the ABS income surveys were regularised and data stored electronically. There have, however, also been some changes to the survey methodology since then, most notably when the change to a continuous survey was introduced in 1995. This change has affected the comparability of some of the data from the more recent (post-1995) surveys with those collected in earlier years. The following analysis minimises the impact of these changes in survey methodology and represents the best estimates that can be produced from the currently available data.

C5.6 CHANGES IN TOTAL INCOME(a), People Working Full-Time, Quintile Upper Bounds(b)—1968–69 to 1997–98

	1968–69		1997–98		Change, 1968–69 to 1997–98	
	Males	Females	Males	Females	Males	Females
Income quintiles	$('97–98)	$('97–98)	$('97–98)	$('97–98)	%	%
First	17 540	10 510	19 840	16 490	13.1	56.9
Second	22 250	13 330	29 000	24 020	30.3	80.2
Third	27 170	15 870	37 630	30 140	38.5	89.9
Fourth	35 220	19 780	50 020	39 500	42.0	99.7
Fifth	. .	. .	. .	. .	. .	. .
Median	24 420	14 640	33 000	27 500	35.1	87.8
Quintile boundary ratios						
Q1/Median	0.718	0.718	0.601	0.600	–0.117	–0.118
Q4/Median	1.442	1.351	1.516	1.436	+0.074	+0.085
Q4/Q1	2.008	1.882	2.521	2.395	+0.513	+0.513
Male/female ratios						
Q1	1.669		1.203		–0.466	
Q4	1.781		1.266		–0.515	
Median	1.668		1.200		–0.468	

(a) Incomes have been deflated using the private final consumption expenditure deflator. (b) In 1997–98 dollars.

Source: CBCS 1973; ABS 1999.

Table C5.7 summarises changes in the income distribution for selected years between 1986 (the first year for which consistent data on disposable income are available) and 1997–98. The distributional profile has been summarised with the use of the inequality measures used previously, and several different distributions are shown for each year. The first distribution refers to the distribution of wage and salary income among full-time individual workers. This has significance because, as table C5.4 shows, wage income is the most important source of income—in aggregate and for most households with an employed member. It also allows the degree of inequality that exists among the 'core' labour force to be assessed, and provides a link with the longer-term distributional trend shown in table C5.6. The next three distributions—of market income, gross income and disposable income—correspond broadly to the national accounts concepts of primary, gross and disposable household income shown in table C5.4. There are some differences in the coverage and accuracy of some income components, particularly those such as imputed rental income and employer superannuation contributions, where it is difficult to collect reliable information in a household survey.

Despite these, it is worthwhile to explore several different income measures because this allows the factors contributing to income inequality to be identified and their impact assessed. The unit of analysis used to derive the estimates shown in table C5.7 is the income unit discussed earlier, on the grounds that the assumption of income pooling is most applicable at this level.

The framework underlying table C5.7 allows the degree of income inequality generated in the market to be differentiated from the impact of government transfer and tax programs that influence the distribution of post-transfer, post-tax (disposable) income. Thus, it is possible to assess the distributional impact of social security (and other regular) transfers by comparing the distributions of market and gross income. Similarly, the impact of (personal) income taxes can be assessed by the difference in the distributions of gross and disposable income. The overall impact of the tax-transfer system is reflected in the difference between the distributions of market and disposable incomes.

C5.7 CHANGES IN DISTRIBUTION OF WEEKLY INCOME—1986 to 1998

Year	Wage and salary income(a)	Market income(b)	Gross income(b)	Disposable income(b)	Equivalent disposable income(b)
1986					
Gini coefficient	0.238	0.532	0.417	0.364	0.352
Robin Hood index	16.6	38.4	30.1	26.2	25.5
P10/P50	0.603	0.000	0.318	0.373	0.453
P90/P50	1.711	2.632	2.517	2.289	2.193
P90/P10	2.838	. .	7.915	6.137	4.841
1990					
Gini coefficient	0.224	0.543	0.427	0.375	0.330
Robin Hood index	17.0	39.4	30.9	26.8	23.8
P10/P50	0.607	0.000	0.337	0.386	1.494
P90/P50	1.721	2.806	2.677	2.315	2.081
P90/P10	2.833	. .	7.937	6.000	4.215
1994–95					
Gini coefficient	0.271	0.570	0.436	0.385	0.338
Robin Hood index	18.9	41.7	31.5	27.6	24.4
P10/P50	0.645	0.000	0.344	0.392	0.501
P90/P50	1.775	3.087	2.721	2.415	2.129
P90/P10	2.913	. .	7.916	6.157	4.251
1997–98					
Gini coefficient	0.272	0.582	0.443	0.390	0.343
Robin Hood index	19.0	42.8	32.1	28.0	24.9
P10/P50	0.600	0.000	0.377	0.377	0.502
P90/P50	1.833	3.163	2.408	2.408	2.172
P90/P10	3.056	. .	6.377	6.377	4.326

(a) Covers full-time workers only. Includes wage and salary income from first and second jobs. (b) Covers all income units. (c) Income tax for 1986 was imputed from annual income and converted to a weekly figure.

Source: ABS unit record file data for each income survey.

The final distribution shown in table C5.7 adjusts disposable income by an equivalence scale that measures the relative needs of income units of differing size and composition. This adjustment attempts to place all income units on a common metric because it is based on a measure of (disposable) income adjusted for the needs that have to be met from that income of those who receive it. The equivalence adjustment involves estimating the number of 'equivalent adults' in each family, where children count as less than adults because their needs are lower, and where the needs of a second adult are less than those of the first adult because some costs such as housing and transport can be shared. Family income is divided by the number of equivalent adults in the family to produce equivalent (or need-adjusted) income and the distribution of this measure is then summarised. There is no single equivalence scale that allows this adjustment to be made perfectly. In deriving the estimates in table C5.7, the 'OECD equivalence scale' has been used in which the first adult in each income unit is assigned an equivalence value of 1.0, the second adult a value of 0.7, and each child a value of 0.5 (OECD 1982).

The anatomy of inequality, as indicated by how inequality changes as the income concept moves from full-time wage and salary income to market income, gross income, disposable income and equivalent disposable income, displays a consistent pattern in each year. The distribution of wage and salary income among full-time workers is quite equally distributed—far more so than total market income, as can be seen by comparing the estimates in the first two columns of table C5.7. Market forces may generate inequality, but not so much among the full-time workforce (at least up until 1997–98)—a reflection of the impact of centralised wage determination and the emphasis given in the past to achieving 'comparative wage justice' in Australia. Both social security transfers and income tax exert a considerable redistributive impact, with the former effect being largest. In 1997–98, for example, social transfers reduced income inequality (as measured by the Gini coefficient) by 23.9%, while income taxes reduced it by an additional 12%. In that year, the two main distributive instruments of the

welfare state combined to reduce income inequality generated in the market sector by around one-third. Another way of looking at these effects is to compare the amount of income that a hypothetical Robin Hood would have to redistribute in order to remove all inequality. In 1997–98, Robin Hood would have had to redistribute 42.8% of market income to achieve this goal, but only 28.0% of disposable income. Thus, his task was reduced by about one-third by the impact of the social security and tax systems.

The effect of adjusting for differences in need by using the OECD equivalence scale further reduces the extent of inequality by a considerable margin—approximately equal in magnitude in most years to that produced by the personal income tax system (i.e. by around one-eighth, or 12%). This effect reflects the positive association that exists between income unit size and the level of total income received by the unit. It follows from this association that when the equivalence scale adjustment is made, the incomes of those with low and high incomes both move closer to the middle of the distribution, causing the degree of inequality to decline.

Trends over time in inequality within each of the income measures shown in table C5.7 show that there has been instability in the distributions of the different income measures over the period, although most show an increase in inequality. In most cases, the increase in inequality was greatest between 1986 and 1994–95, since when it has moderated (although, with the exception of gross income, it is still increasing). One exception to the general pattern occurs in the case of equivalent disposable income, where inequality fell between 1986 and 1994–95 (particularly between 1986 and 1990) and rose slightly thereafter. Another is full-time wage and salary income, where inequality fell up until 1990, then rose sharply up to 1994–95, before stabilising.

Over the period as a whole, the increase in inequality for each of the different income measures in table C5.7 was: full-time wage and salary income, 14.3%; market income, 9.4%; gross income, 6.2%; disposable income, 7.1%; and equivalent disposable income, 9.7%. This pattern is consistent with the view that deregulation of the economy and the increasing role of market forces over the last two decades has produced an increase in income inequality that has been moderated, but not eliminated, by the social security and income tax systems. However, a more thorough examination would be required to establish the proximate causes of the increase in income inequality and the relative importance of the different contributing factors.

International comparisons

Australia is not unique in having experienced an increase in income inequality over the last three decades. Other countries have faced the same pressures (particularly the increased role of market forces in a deregulatory policy environment) and many (though not all) have seen a widening of their income distributions as a consequence. This recent trend to increasing inequality has been described as "one of the most important issues facing our societies and the world as a whole'' (Atkinson 1999, p. 1).

How does the increase in (Gini) inequality in Australia compare with that of other countries, and is Australia's reputation as an egalitarian nation warranted? In order to answer these questions, it is necessary to compare income distributions across countries and to rank them in terms of the degree of inequality in each. Such an exercise provides the basis for thinking more systematically about how the causes of income inequality relate internationally to differences in institutional structures and policies.

A series of international studies of income distribution in the 1970s suggested that Australia was a country characterised by relative equality in its income distribution. The most famous of these studies, undertaken by the OECD secretariat, used published data on income distribution to compare inequality in ten OECD countries, including Australia (Sawyer 1976). Using a range of different income measures (before-tax and after-tax; original and per capita household income), the study concluded that Australia, along with Japan and Sweden, had the lowest degree of inequality in its post-tax distribution. At the other extreme were France and the United States, both of which consistently showed up as having most inequality. The study was, however, severely limited by the available data, which restricted the scope for any adjustments that could improve cross-country comparability.

Responding to these criticisms requires having access to micro data at the household level that can be manipulated in order to derive a more consistent set of definitions and operating assumptions. Only then is it possible to determine whether the observed differences in the distributions reflect different statistical concepts and definitions rather than real differences in the underlying inequality profile of each country. As more and more countries have released income distribution data in unit record format, the possibility of imposing a common definitional framework became a practical reality with the establishment in 1983 of the Luxembourg Income Study (LIS). The aim of the LIS project is to gather, in one central location, sophisticated microdata sets containing comprehensive measures of income and economic wellbeing for a group of modern industrialised countries, in order to allow researchers to measure inequality and test ideas about its sources and causes.

The LIS project began with seven countries, to which Australia had been added (along with the Netherlands and Switzerland) by 1989. Australia's annual membership fee (which funds the LIS staff and support facilities required to modify and document the data provided, and monitor its access and use) has been provided by the ABS (two-thirds) and the Social Policy Research Centre at the University of New South Wales (one-third). Once Australia had joined the project, access to the LIS data and its full documentation became free to all Australian users. (Readers who are unaware of this possibility and wish to find out more are invited to contact the author for further details.) Since its establishment, membership of LIS has expanded and the project now covers twenty-one countries with three waves of data, covering the mid-1980s (Wave I), around 1990 (Wave II) and the mid-1990s (Wave III).

Although the development and accessibility of the LIS database has been an important vehicle for documenting, comparing and analysing income distribution in different countries, it is limited by the original data on which it is based. Sometimes, it is simply not possible to derive fully comparable data for different countries (or for different time periods in the same country) because of the way the data were originally collected. The scope and definition of income varies across time and space, as does the definition of families or households—in the treatment of dependent children and multi-generation households, for example. Different countries also adopt different methods for protecting confidentiality by suppressing data on very low and/or very high incomes and this can influence measured inequality. Finally, there are the problems alluded to earlier that make comparisons of income distribution over time within countries difficult, such as differences in social income, imputed rent or in-kind subsidies that are linked to the consumption of specific items (e.g. housing subsidies). For these reasons, in terms of comparability the LIS data are not ideal, but they are without doubt the best that can be generated given existing data limitations and constraints.

The LIS data have been used in a series of comparative studies of income distribution and how it has changed in recent years. It also forms the basis of the most comprehensive comparative study of income distribution yet undertaken, commissioned and published by the OECD (Atkinson, Rainwater and Smeeding 1995). The framework developed in that study has been applied to the latest wave of LIS data by LIS Research Director Professor Timothy Smeeding, whose results are now summarised (Smeeding 2000). The extent of inequality in the income distribution of the countries currently included in the LIS database is summarised in table C5.8. (The estimates for Japan in the table were generated within that country to conform to the LIS framework, because Japan is not yet a member of LIS.) The measure used is disposable (after-tax) income at the household level, adjusted for need using an equivalence scale equal to the square root of household size. (This equivalence scale implies that economies of scale within the household unit are considerably larger than is implied by the OECD scale used in table C5.7). The distributions themselves refer to individuals, where each individual is assigned the equivalent income of the household in which they are living. (Further details of these technical issues can be found in the studies cited above.)

C5.8 INCOME DISTRIBUTION, Selected Countries—around 1995

Country/year	Gini coefficient	P10/P50	P90/P50	P90/P10
Sweden (1995)	0.222	0.603	1.562	2.589
Finland (1995)	0.226	0.594	1.591	2.677
Belgium (1992)	0.230	0.588	1.625	2.764
Luxembourg (1994)	0.235	0.591	1.726	2.919
Denmark (1992)	0.240	0.545	1.546	2.840
Norway (1995)	0.242	0.556	1.570	2.825
Austria (1987)	n.a.	0.562	1.623	2.888
Taiwan (1995)	0.277	0.560	1.880	3.357
Netherlands (1994)	0.282	0.555	1.712	3.085
Canada (1994)	0.286	0.473	1.844	3.898
France (1994)	0.290	0.539	1.790	3.321
Germany (1994)(a)	0.300	0.545	1.735	3.185
Israel (1992)	0.305	0.497	2.049	4.121
Spain (1990)	0.306	0.499	1.974	3.958
Japan (1992)	0.315	0.460	1.920	4.174
Australia (1994)	0.317	0.455	1.919	4.222
Switzerland (1982)	0.323	0.545	1.847	3.390
Ireland (1987)	0.330	0.498	2.091	4.196
Italy (1995)	0.346	0.430	2.013	4.685
United Kingdom (1995)	0.346	0.463	2.089	4.515
United States (1997)	0.375	0.380	2.142	5.637
Average	**0.290**	**0.521**	**1.821**	**3.495**

(a) Refers to West Germany only.

Source: Smeeding, 2000; data provided by the author.

The countries have been ranked in table C5.8 by the value of their Gini coefficient. Also shown are the percentile ratios that allow inequality at the lower and upper ends of the distribution to be distinguished and compared. The variation in inequality is quite remarkable. The Gini coefficient in the lowest ranking country (the United States) is 69% higher than that in Sweden, which has the most equal distribution. Australia ranks sixteenth out of the twenty-one countries included—hardly justifying its claim to egalitarianism, at least in terms of its income distribution. In terms of its Gini coefficient, inequality in Australia is about 43% greater than in Sweden and 15% less than in the United States. It lies about mid-way between Canada and the United Kingdom, with around 10% more inequality than Canada, but 10% less than the UK. The Australian income distribution is very similar to that of Japan, another country whose inequality is considerably higher than had been suggested in Sawyer's original study using published statistics. The percentile ratios shed further light on why the Australian distribution ranks so low in terms of equality. It is inequality at the bottom of the distribution rather than at the top that is mainly responsible. This suggests that social security benefits (which are the main source of income for those around the tenth percentile) are relatively low in Australia compared with most of the other countries in table C5.8.

Table C5.9 shows changes in income inequality between the mid-1980s and the mid-1990s for the eleven countries that are included in Waves I-III of the LIS data. Australia again falls towards the bottom of the inequality ranking and is one of seven countries where inequality increased by more than 5% over the period (although at a declining rate after 1990). Interestingly, the general pattern in table C5.9 (with some exceptions, notably Finland and Germany, both of which faced particularly difficult economic problems) is for the increase in inequality between 1985 and 1995 to be greater in countries where inequality was originally highest. Although inequality has increased since 1985 in the majority of countries, it is significant that the increase has not been universal, nor has its magnitude been similar in different countries.

Increasing inequality has thus not been inevitable over this period of increased deregulation and globalisation of financial, capital and product markets. Some countries have managed to resist the increase in inequality by the operation of their tax and

transfer policies, though nowhere has inequality declined to any noticeable degree. The important point to emphasise is the value of comparisons like those shown in tables C5.8 and C5.9, not only in describing how income distribution varies in different countries, but also in raising important questions about why the differences arise and what can be done about them. The LIS project has contributed to the analysis of income distribution by providing a sound statistical basis for making cross-country comparisons and raising awareness that the income distributions of different countries *are* different.

C5.9 CHANGES IN INCOME DISTRIBUTION (GINI COEFFICIENTS)—1985 to 1995

	Year	Gini	Year	Gini	Year	Gini	Overall Change
Country(a)							%
Finland	1987	0.207	1991	0.223	1995	0.226	+9.2
Sweden	1987	0.220	1992	0.229	1995	0.222	+0.9
Norway	1986	0.234	1991	0.234	1995	0.242	+3.4
Luxembourg	1985	0.238	1991	0.239	1994	0.235	–1.3
Germany(b)	1984	0.265	1989	0.281	1994	0.300	+13.2
Netherlands	1987	0.268	1991	0.272	1994	0.282	+5.2
Canada	1987	0.289	1991	0.286	1994	0.286	–1.0
Australia	1985	0.295	1989	0.310	1994	0.317	+7.5
United Kingdom	1986	0.304	1991	0.340	1995	0.346	+13.8
Italy	1986	0.310	1991	0.290	1995	0.346	+11.6
United States	1986	0.341	1991	0.342	1997	0.375	+10.0

(a) Countries are ranked by their Gini coefficient in the initial year. (b) Refers to West Germany.

Source: Smeeding, 2000, Table 1.

Current issues

Australia has made enormous progress in many areas of economic activity during the course of the twentieth century. That progress has resulted in a substantial increase in economic prosperity in which all groups have shared, though to varying degrees. At the same time, there have been major changes in the institutional framework and social conditions that both shape and reflect economic progress. An assessment of the overall impact on living standards requires account to be taken not only of the increase in material prosperity, but also of changes in the social, environmental and cultural context within which the fruits of economic progress are produced, distributed and consumed. An important element of this is how economic product is distributed among members of society, and income distribution is one aspect of this. The distribution of income provides important information about how economic resources are distributed in society, particularly if income is defined in a broad way.

As the foregoing analysis has shown, however, significant progress over the century in our ability to measure the income distribution, identify its causes and monitor distributional change has evolved only recently. Although there has been a long-standing and intense interest in the topic, appropriate statistics and analytical tools have only emerged over the last three decades. Despite the considerable progress that has been made in this period, there are still many areas where current understanding of the causes and nature of income distribution is in its infancy. Yet the broad picture of rising inequality that has emerged from the statistics and research already conducted has entered the national psyche, with references to a "growing divide" and "poverty in the midst of affluence" a regular feature of media accounts of contemporary Australian society. Unfortunately, these accounts do not always capture the subtleties of the data and the complexities of income distribution measurement and analysis. This situation reinforces the need for more studies of income distribution and for greater effort at disseminating the findings *and* highlighting their limitations.

While great progress has been made in collecting income distribution statistics in Australia, the debate over living standards calls for more sophisticated measures of

income and economic resources. While the rationale for these is undisputed, there are many conceptual and practical problems associated with extending the income measure to include in-kind and non-cash social income. There are already many very valuable Australian studies that explore the distributional impact of these factors, although most of them employ methods that are, at best, rudimentary. More work is needed to assess the sensitivity of findings to alternative assumptions, and to bring the diverse range of estimates that currently exist together into an integrated framework that allows the overall picture to be assessed.

There are also a number of areas of data collection and analysis where there is scope for further improvement. The collection of longitudinal data on income dynamics that follows the income fortunes of the same individuals through time is only just beginning. The significance attached to a particular degree of inequality in the income distribution at a point in time (as measured here) may be less if it is known that there is a considerable degree of mobility in people's incomes and distributional positions over time. Research conducted using income simulations shows that the distribution of lifetime income differs substantially from that of annual income and that the tax and transfer systems are also less redistributive when assessed on a lifetime basis (Harding 1993).

In addition to putting more effort into measuring inequality, there is need for further study of why inequality matters, focusing on the economic and social consequences of inequality. Almost nothing is known about community attitudes to inequality, including what forms of inequality concern people most and what they think should be done about them.

The available statistics on the conventional measures of household income reveal that, while income distribution narrowed in Australia for much of the first three-quarters of the century, incomes have become less equally distributed since then. This has been primarily due to a growing disparity in market incomes, including wage and salary income and income derived from the ownership of property. In Australia, government action in the form of social security and progressive income taxation has moderated the trend to inequality, but not reversed it. Some see the rise in inequality in countries like Australia as a consequence of globalisation and technology whereby the demand for (and hence the incomes of) the most highly-qualified workers has increased, while increasingly intense international competition has put downward pressures on the incomes of those with fewest skills. Others have suggested that social conventions have changed in ways that have made growing income disparities more acceptable by reducing the implicit social penalties for breaking traditional norms of pay and income (Atkinson 1999). The former arguments appeal to those who emphasise the role of market forces, while the latter arguments see an important role for social convention, customs and values in the process of income determination.

These debates over the factors contributing to the rise in inequality in income distribution have been greatly facilitated by the increased availability of data that allows income distribution in different countries to be compared. The advent of the Luxembourg Income Study—itself made possible by the collection and release of unit record data by national statistical agencies around the industrialised world—has allowed researchers to explore whether income distribution differs in different countries and, if so, why. The research conducted to date on the LIS database has rejected earlier findings suggesting that the Australian income distribution is among the most equally distributed. That claim has now been shown to apply to the countries of Scandinavia and Northern Europe, with Australian ranking rather low in terms of overall equality—though still well above the position of the other English-speaking countries like the United Kingdom and the United States. One of the most important findings of the research conducted on the LIS data is that the degree of income inequality reflects the role and impact of the tax and transfer systems of government.

It follows from this that how much inequality a society is prepared to accept is something over which it has a choice. This does not mean that Australia should necessarily select a more equal distribution. The choices made on such matters reflect factors other than moral views about justice and inequality, including incentive structures and how these affect entrepreneurship, competitiveness and productivity and ultimately, economic growth. Income mobility and the dynamics of

income over time are also important because they reflect the ability of people to improve their distributional position, and thus influence the acceptability of a given degree of static inequality. If the question of income distribution is put in these terms, the choices become more complex and difficult. This does not mean that income distribution should be abandoned as a policy goal. Instead, it suggests a need for more discussion of what kind of distributional outcome best suits the goals of society as a whole, and about the choices and sacrifices that will have to be made in order to achieve it.

References

Atkinson A. B. 1999, "Is Rising Inequality Inevitable? A Critique of the Transatlantic Consensus", *WIDER Annual Lectures*, No. 3, World Institute for Development Economics Research, Helsinki.

Atkinson A. B., Rainwater L. and Smeeding T. M. 1995, *Income Distribution in OECD Countries. Evidence from the Luxembourg Income Study (LIS)*, OECD Social Policy Studies No. 18, OECD, Paris.

Australian Bureau of Statistics (ABS) 1995, *A Provisional Framework for Household Income, Consumption, Saving and Wealth* (6549.0), ABS, Canberra.

—1996, *Household Expenditure Survey: The Effects of Government Benefits and Taxes on Household Income, 1993–94* (6537.0), ABS, Canberra.

Commission of Inquiry into Poverty 1975, *First Main Report. Poverty in Australia*, AGPS, Canberra.

Commonwealth Bureau of Census and Statistics (CBCS), *1973 Income Distribution, 1968–69. Part 1*, Reference No. 17.6, CBCS, Canberra.

Harding A. 1993, "Lifetime vs Annual Tax-Transfer Incidence: How Much Less Progressive?", *Economic Record*, Vol. 69, pp. 179–92.

Jones F. L. 1975, "The Changing Shape of the Australian Income Distribution, 1914–15 to 1968–69", *Australian Economic History Review*, Vol. 15, pp. 21–34.

Maddock R. and McLean I. W. (eds.) 1988, *The Australian Economy in the Long Run*, Cambridge University Press, Cambridge.

McLean I. W. and Richardson S. 1986, "More or Less Equal? Australian Income Distribution in 1933 and 1981", *Economic Record*, Vol. 62, pp. 67–81.

OECD 1982, *The OECD List of Social Indicators*, OECD, Paris.

Saunders P. 1993, "Longer Run Changes in the Distribution of Income in Australia", *Economic Record*, Vol. 69, pp. 353–66.

Sawyer M. 1976, *Income Distribution in OECD Countries*, OECD, Paris.

Smeeding T. M. 2000, "Changing Income Inequality in OECD Countries: Updated Results from the Luxembourg Income Study (LIS)", in R. Hauser and I. Becker (eds), *The Personal Distribution of Income in an International Perspective*, Springer-Verlag, Berlin.

Taxation Review Committee 1975, *Full Report*, AGPS, Canberra.

Yates J. 1991, *Australia's Owner-Occupied Housing Wealth and Its Impact on Income Distribution*, Reports and Proceedings No. 92, Social Policy Research Centre, University of New South Wales.

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Introduction

Housing satisfies the essential needs of people for shelter, security and privacy. Shelter is recognised throughout the world as a basic human right. The adequacy or otherwise of housing is an important component of individual wellbeing. Housing also has great significance in the national economy, with its influence on investment levels, interest rates, building activity and employment.

The ways in which Australian families and individuals are housed reflect social, political and economic factors over the last century. For example, public health concerns towards the end of the nineteenth century resulted in legislation in the States which gave local government the authority to make building regulations and inspect dwellings, a responsibility they have to this day. Also at that time, demand for housing exceeded supply, rents were high, and overcrowding and slum conditions continued to be a problem into the twentieth century. This led to States introducing further legislation for the provision of public rental housing for low income earners. In the 1920s, the Commonwealth moved to provide financial assistance for access to home ownership to moderate and low income groups, and a number of policy initiatives over recent decades have focused on this goal. Governments have continued to actively promote home ownership as part of an overall policy directed at achieving people's self-reliance in housing, and a quality of housing adequate for their needs.

The predominance of separate, free standing houses situated on 'quarter acre blocks' within the mainland capital city areas is a feature of Australian urban development. More recently, governments have moved to promote higher housing densities, to provide greater choice of housing types and to make better use of existing infrastructure. This has resulted in changes to urban planning and building regulation. There have been some changes in the nature of housing, and efficiencies in the use of land and infrastructure. However, even within this new framework, green field developments and free standing houses still predominate. Households in such developments are still largely reliant on the family car to access many neighbourhood facilities and services.

This chapter provides information on the types of dwellings Australians live in and their tenure arrangements, the affordability of housing, and the government assistance provided through housing and income support programs. It is based largely on information from the 1997–98 Survey of Income and Housing Costs, but also draws on house price index data, on data about finance commitments for owner occupation and on administrative data relating to public housing and rent assistance. Care should be taken when comparing statistics from different sources because of differences in the timing, conceptual bases and scope of individual statistical sources.

Types of dwellings

Table 8.1 shows the number of dwellings of different types in each State and Territory in 1997–98. The table shows that the separate house is the most popular type of dwelling in Australia, making up 79% of all dwellings. Tasmania has the highest proportion of separate houses (84%) and New South Wales the lowest (74%).

Flats, units or apartments are the next most common type of dwelling in Australia, with 12% of all dwellings falling into this category. New South Wales (with 16%) has the highest proportion of flats, units or apartments, followed by the Northern Territory (with 12%). Western Australia and Tasmania have relatively low percentages of flats, units or apartments (with 5% and 6% respectively).

Semi-detached row or terrace houses and town houses comprise 9% of dwellings in Australia. South Australia, Western Australia, Tasmania and the Australian Capital Territory have more semi-detached housing than flats, units or apartments.

8.1 DWELLINGS, By Dwelling Structure and State/Territory—1997–98

State/Territory	Separate house %	Semi-detached/row or terrace house/townhouse %	Flat/unit/apartment %	Total(a) %	Total(a) '000
New South Wales	74.0	9.1	16.3	100.0	2 336.5
Victoria	81.2	7.2	11.2	100.0	1 724.7
Queensland	82.2	5.8	10.8	100.0	1 301.6
South Australia	78.5	13.2	7.5	100.0	603.1
Western Australia	81.9	12.9	5.0	100.0	689.3
Tasmania	84.4	9.1	5.8	100.0	185.8
Northern Territory(b)	74.6	11.8	11.6	100.0	52.4
Australian Capital Territory	79.3	12.4	8.0	100.0	118.9
Australia	**78.8**	**8.8**	**11.7**	**100.0**	**7 012.3**

(a) Includes other dwellings. (b) Excludes remote and sparsely settled areas.

Source: Unpublished data, Survey of Income and Housing Costs, 1997–98.

8.2 NUMBER OF DWELLINGS, By Dwelling Structure and Number of Bedrooms—1997–98

No. of bedrooms	Separate house '000	Semi-detached/row or terrace house/townhouse '000	Flat/unit/apartment '000	**Total(a) '000**
Bedsitter	n.p.	(b)7.9	(b)14.2	**24.3**
One bedroom	40.1	56.3	211.0	**321.2**
2 bedrooms	671.4	300.6	505.5	**1 491.6**
3 bedrooms	3 257.7	229.8	80.9	**3 581.7**
4 or more bedrooms	1 557.7	24.6	(b)9.3	**1 593.4**
All dwellings	5 529.0	619.3	821.0	**7 012.3**

(a) Includes other dwellings. (b) The estimate has a relative standard error of 25% to 50%.

Source: Unpublished data, Survey of Income and Housing Costs, 1997–98.

Number of bedrooms

One indicator of dwelling size is the number of bedrooms. In 1997–98, half of all dwellings in Australia had three bedrooms, 23% had four or more bedrooms and 21% had two bedrooms (table 8.2). Of separate houses, 59% had three bedrooms, while two bedroom dwellings were more common in semi-detached houses and in flats, units and apartments (49% and 62% respectively).

Over a third (35%) of three bedroom dwellings had only two persons living in them, a further 19% had three persons, and 18% had four persons (table 8.3). About 19% of three bedroom dwellings had only one person living in them. Of two bedroom dwellings, most had one or two persons living in them (42% and 43% respectively).

Information on the incidence of other types of rooms such as bathrooms, toilets, laundries and lounge/dining/family rooms is available from the 1994 Australian Housing Survey. These data were collected again in the 1999 Australian Housing Survey.

8.3 DWELLINGS, By Number of Persons and Number of Bedrooms—1997–98

No. of bedrooms	One person %	Two persons %	Three persons %	Four persons %	Five or more %	Total %	Total '000
Bedsitter	91.5	n.p.	—	—	—	100.0	24.3
One bedroom	79.5	17.9	(a)1.2	n.p.	n.p.	100.0	321.2
2 bedrooms	42.2	42.7	9.4	4.1	1.6	100.0	1 491.6
3 bedrooms	19.2	34.8	19.2	17.9	8.8	100.0	3 581.7
4 or more bedrooms	6.0	22.8	17.9	26.1	27.2	100.0	1 593.4
All dwellings	**24.1**	**32.9**	**15.9**	**16.0**	**11.1**	**100.0**	**7 012.3**

(a) The estimate has a relative standard error greater than 50%.

Source: Unpublished data, Survey of Income and Housing Costs, 1997–98.

Changing dwelling and household size

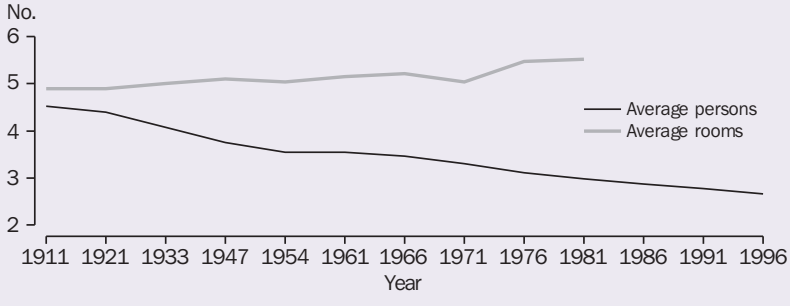
Since data were collected in the first Australian Census in 1911, there has been a slow but steady increase in the size of Australian dwellings, as demonstrated by the rise in the average number of rooms over the period to 1981. This increase occurred despite a steady decline in the average number of persons per dwelling (from 4.5 to 3.0 persons) over the same period (graph 8.4). These changes have meant that, between 1911 and 1981, the average number of persons per room declined from 0.9 to 0.5 persons. The average size of new homes has continued to increase over the last two decades. Between 1986 and 1999, the average size of new dwellings increased almost 30% (to 185.5 square metres).[1]

The trend toward smaller households can be attributed to factors such as changing patterns of household formation. For example, rising divorce and separation rates often lead to the formation of smaller households. Another example is the trend for couples first to delay starting a family, then to have fewer children.

Between 1921 and 1996 the proportion of two person households increased from 13.9% to 32.4%. There has also been a marked increase in the proportion of one person households, particularly over the latter half of the 20th century.

This can, in part, be attributed to the ageing of the Australian population. Older persons, left alone after the death of their partner, contribute significantly to the numbers of single person households. Between 1911 and 1961 the proportion of single person households fluctuated only slightly (between 8% and 11%). By 1996, a total of 1.4 million persons, nearly a quarter (23%) of all households, lived alone (graph 8.5). Some 38.5% of these households comprised persons aged 65 and over.

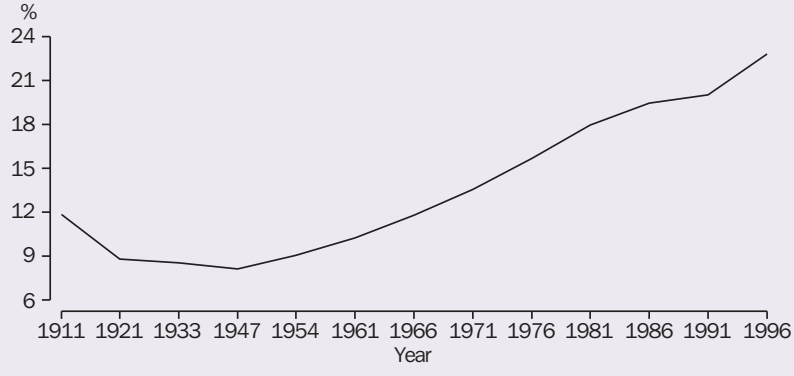
8.4 PERSONS AND ROOMS IN DWELLINGS—1911–1996



Note: In 1971, reported number of rooms possibly affected by layout of questions on census form. Number of rooms per dwelling not collected after 1981.

Source: Census of Population and Housing. For details see Endnote 2.

8.5 PERSONS LIVING ALONE—1911–1996



Source: Data sourced from Census of Population and Housing. For details see Endnote 2.

Endnotes

1 *Australian Social Trends 2000* (4102.0).

2 In addition to unpublished data from the Census of Population and Housing for 1971, 1976, 1981, 1986, 1991 and 1996, data for the graphs and text in this article were drawn from a range of publications relating to Censuses between 1911 and 1996.

Tenure

Home ownership and renting

Australia has a high rate of home ownership. Of the seven million households in Australia in 1997–98, 70% were living in their own home, and 26% were renting their dwelling from a State housing authority or private landlords (table 8.6).

In 1997–98, 39% of households owned their homes outright. This was a fall from the situation in 1995–96, when 42% of households owned their homes outright. In addition, 30% of households were paying off a mortgage or loan secured against their dwelling.

Of the two million households renting their dwellings, 73% were renting from private landlords, 20% were renting from State housing authorities and the remaining 8% from other landlords such as the owner/manager of a caravan park, an employer (including a government authority) or a community or church group.

Around 90% of owners lived in separate houses in 1997–98. Of renter households, 51% lived in separate houses and 29% lived in flats, units or apartments.

Almost one-third of households who owned their own home outright were couples with no children. One parent households accounted for 7% of outright owners, and lone person households made up 26% (based on table 8.7).

The majority (77%) of couple households with dependent children only were owners; just 21% of these households were renting. Of lone parent families, 52% were house owners, 16% were renting from a State housing authority and 28% were renting from private landlords.

8.6 NUMBER OF DWELLINGS, By Dwelling Structure and Tenure Type—1997–98

Tenure type	Separate house '000	Semi-detached/row or terrace house/townhouse '000	Flat/unit/apartment '000	**Total(a) '000**
Owner without a mortgage	2 473.3	152.1	118.5	**2 762.0**
Owner with a mortgage	1 925.7	92.3	105.4	**2 129.8**
Renter				
State housing authority	189.5	104.5	95.4	**389.4**
Private landlord	739.1	240.3	446.2	**1 437.7**
Total(b)	*1 015.0*	*365.1*	*582.1*	***1 977.5***
Rent-free	115.0	(c)9.8	(c)15.0	**143.0**
Total	5 529.0	619.3	821.0	**7 012.3**

(a) Includes other dwellings. (b) Includes a small number of other landlord types. (c) The estimate has a relative standard error greater than 50%.

Source: Unpublished data, Survey of Income and Housing Costs, 1997–98.

8.7 TENURE, By Type of Household—1997–98

Type of household	Owner without a mortgage '000	Owner with a mortgage '000	Renter: State housing authority '000	Renter: Private landlord '000	Renter: Total(a) '000	Rent-free '000	Total '000
Couple only	916.5	408.0	29.3	238.1	283.3	31.5	1 639.2
Couple with dependent children only	404.2	890.7	49.6	274.0	351.8	25.8	1 672.5
Couple—other	430.3	287.7	23.9	51.5	89.2	n.p.	810.6
Total couples	*1 751.0*	*1 586.4*	*102.9*	*563.5*	*724.3*	*60.7*	*4 122.4*
One parent—one family	194.2	142.1	102.0	181.2	302.5	(b)9.0	647.8
Lone person	704.5	276.3	165.5	423.0	638.7	64.6	1 684.1
Other	112.3	125.0	(b)19.0	270.0	312.1	(b)8.8	558.1
Total	**2 762.0**	**2 129.8**	**389.4**	**1 437.7**	**1 977.5**	**143.0**	**7 012.3**

(a) Includes a small number of other landlord types. (b) The estimate has a relative standard error of 25% to 50%.

Source: Unpublished data, Survey of Income and Housing Costs, 1997–98.

Tenure patterns vary across States and Territories. Victoria had the highest proportion of overall home ownership, with 75% of dwellings either being purchased or owned outright (table 8.8). The lowest proportion of overall home ownership (43%) was in the Northern Territory. The Australian Capital Territory, Victoria and Western Australia had the highest proportion of households still purchasing their home (34% in each).

In the Northern Territory more than half (53%) of all households rented their home. This was significantly higher than the national rate of 28%. The proportion of households renting from private landlords ranged from 16% in South Australia and Tasmania to 25% in Queensland.

The differences in tenure partly reflect differences in the age and life structures across States and Territories (see the section *Life cycle groups*).

8.8 TENURE, By State/Territory—1997–98

			Renter					
State/Territory	Owner without a mortgage %	Owner with a mortgage %	State housing authority %	Private landlord %	Total(a) %	Rent-free %	Total %	Total '000
New South Wales	41.1	26.7	5.8	21.7	29.9	2.2	100.0	2 336.5
Victoria	41.4	33.7	3.6	18.2	22.9	2.0	100.0	1 724.7
Queensland	36.9	30.3	3.9	24.5	31.1	1.7	100.0	1 301.6
South Australia	37.8	31.3	10.4	15.7	28.4	2.6	100.0	603.1
Western Australia	37.3	33.5	5.7	19.6	27.5	1.7	100.0	689.3
Tasmania	42.4	30.7	6.5	16.4	25.1	(b)1.8	100.0	185.8
Northern Territory(c)	15.0	27.7	20.4	22.7	53.0	(b)4.3	100.0	52.4
Australian Capital Territory	29.0	33.9	12.4	20.8	36.9	n.p.	100.0	118.9
Australia	**39.4**	**30.4**	**5.6**	**20.5**	**28.2**	**2.0**	**100.0**	**7 012.3**

(a) Includes a small number of other landlord types. (b) The estimate has a relative standard error of 25% to 50%. (c) Excludes remote and sparsely settled areas.

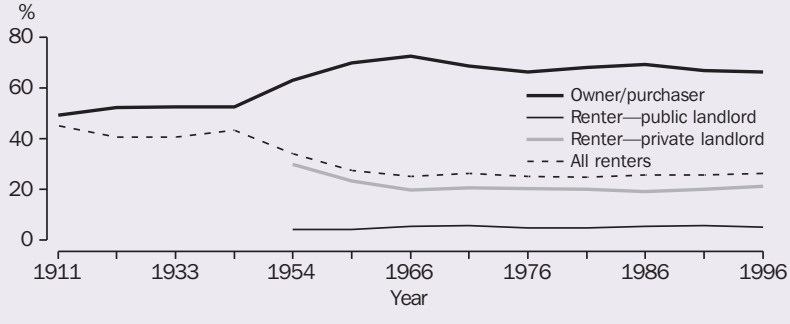
Source: Unpublished data, Survey of Income and Housing Costs, 1997–98.

Changing tenure status

Even as early as 1911, Australia had a reasonably high level of home ownership, about half (49%) of all households either owning or purchasing their own home. Since that time a broad mix of economic, social and political factors have influenced the housing tenure choices and options of Australian families.

In particular, accessibility to affordable and secure housing has long been recognised by successive Australian governments as being interlinked with strong economic growth and development. Subsequently, at both Commonwealth and State levels, governments have given high priority to housing policies and programs; through various incentive and assistance schemes, governments have had a considerable influence on the patterns of tenure depicted in graph 8.9.

8.9 TENURE STATUS—1911–1996



Note: Separate data for public and private renters not available prior to 1954.

Source: Data sourced from Census of Population and Housing. For details see Endnote 2.

Home ownership incentive schemes

Early Commonwealth government schemes, such as those developed in the 1920s to encourage home ownership, fell on hard times. This can be attributed to several factors such as constitutional difficulties and the economic effects of the Great Depression and World War II. As a result, home ownership levels increased only slightly over that period, reaching 53% by 1947.

Following the creation of the Commonwealth Housing Commission (CHC) in 1944 and the first of many Commonwealth State Housing Agreements (CSHAs) in 1945, policies encouraging home ownership have been given high priority. Home ownership has been promoted through the provision of grants or guaranteed loans to building societies and banks to finance construction of owner occupied homes and to provide increases in the amount of finance available for housing purposes. In addition, both Commonwealth and State Governments have, at various times, provided direct incentives and grants to home buyers. Examples of these include low interest loans, grants to first home buyers and low deposit 'start-up' schemes. All of this meant that, by the early 1970s, Australia had the second highest rate of home ownership in the developed world, coming second to only to Iceland.[1] When the Capital Gains Tax was introduced in the 1980s, exemptions were made for the profits made from the sale of the family home.

Since peak levels in the mid 1960s, there has been a slight decline in the proportion of households owning or purchasing their own home. There are a number of possible explanations. Social changes, such as people marrying later and delaying to have children, may cause subsequent delays in the timing of decisions to purchase a home. In addition, labour market reforms, which have resulted in a more mobile labour force and reduced certainty of employment, may have impacted on people's housing decisions. Also, the high interest rates of the 1980s made housing less affordable, while in the 1990s, rates of appreciation (price increase) of dwellings slowed in many areas and were even negative in some regions. As a result, it is possible that owner occupation was less likely to be viewed as the 'good investment' it once was, with some people opting to rent rather than buy a home and to seek alternative investments.

Public (rental) housing

The provision of low cost, subsidised public housing was recognised early as an essential complement to home ownership incentives and schemes.

After some earlier, tentative starts in Victoria and New South Wales, the large scale provision of public rental housing for both moderate and low income earners got underway after World War II. Since the mid 1940s, the Commonwealth Government has facilitated, through successive CSHAs, the growth (in numbers) of subsidised rental housing—usually through the provision of loans to participating States, with low interest rates and long repayment periods. Continuing into the mid 1990s, the emphasis has largely been on retaining public housing levels. For example, as stock was upgraded and sold off, earnings were usually pooled back into the purchase of replacement stock. Through measures such as these, the proportion of public housing stock has remained remarkably constant, at around 5%, since the mid 1960s. Indications are, however, that absolute numbers are now starting to decline. As with directions in other areas of public infrastructure, Commonwaelth and State Governments are moving to reduce their levels of investment in public housing.

Private rental assistance schemes

Since the late 1970s, the Commonwealth Government has broadened its involvement in private rental assistance programs, progressively widening the range of persons eligible for assistance through such schemes. It has also increased the amount of assistance available to individuals and families. (For more information on the private rental assistance scheme, see section *Housing assistance* in this chapter.)

Investment in the private rental market has also been encouraged, largely through the provision of tax breaks such as depreciation and negative gearing of rental properties.

Endnotes

1 *Housing Australia: A Statistical Overview, 1992* (1320.0).

2 In addition to unpublished data from the Census of Population and Housing for 1971, 1976, 1981, 1986, 1991 and 1996, data for the graph and text in this article were drawn from a range of publications relating to Censuses between 1911 and 1996.

Housing affordability

Housing costs

Housing costs cover different items for different types of tenure. For households renting their dwelling, housing costs comprise the regular rental amounts paid to landlords. For owners with a mortgage, housing costs comprise the value of the mortgage payments as well as property rates. For owners who have no mortgage, housing costs comprise only the rates paid.

In 1997–98, mean weekly housing costs for all owner and renter households were $110 (table 8.10). However, there was considerable variation in housing costs, with half of all households having payments of less than $71 per week.

Housing costs for owners with a mortgage, at an average of $205 per week, were higher than for other forms of tenure. Households renting from private landlords had mean weekly housing costs of $157, compared to $63 for tenants of State housing authorities.

8.10 HOUSING COSTS, By Tenure Type and Household Composition—1997–98

Tenure type	Couple only	Couple with dependent children only	Couple-other	Total couples	One parent-one family	Lone person	Other	**Total**
MEAN WEEKLY HOUSING COSTS ($)								
Owner without a mortgage	20	27	23	22	19	16	31	**21**
Owner with a mortgage	220	214	196	212	154	178	233	**205**
Renter—State housing authority	75	99	115	96	63	39	(a)85	**63**
Renter—private landlord	160	181	211	175	141	126	180	**157**
Total renters(b)	147	161	165	156	111	98	169	**132**
Total owner and renter households	93	157	100	120	93	76	155	**110**
MEAN WEEKLY INCOME ($)								
Owner without a mortgage	625	1 165	1 347	927	748	378	1 008	**778**
Owner with a mortgage	1 127	1 134	1 620	1 221	800	670	1 389	**1 131**
Renter—State housing authority	377	679	821	626	371	186	(a)605	**371**
Renter—private landlord	925	886	1 521	961	557	477	989	**773**
Total renters(b)	861	860	1 338	920	506	396	963	**694**
Total owner and renter households	794	1 083	1 443	1 040	645	435	1 069	**863**
MEAN HOUSING COSTS AS A PROPORTION OF INCOME (%)								
Owner without a mortgage	3	2	2	2	3	4	3	**3**
Owner with a mortgage	19	19	12	17	19	27	17	**18**
Renter—State housing authority	20	15	14	15	17	21	(a)14	**17**
Renter—private landlord	17	20	14	18	25	26	18	**20**
Total renters(b)	17	19	12	17	22	25	18	**19**
Total owner and renter households	12	14	7	12	14	17	15	**13**
HOUSEHOLDS ('000)								
Owner without a mortgage	916.5	404.2	430.3	1 751.0	194.2	704.5	112.3	**2 762.0**
Owner with a mortgage	408.0	890.7	287.7	1 586.4	142.1	276.3	125.0	**2 129.8**
Renter—State housing authority	29.3	49.6	23.9	102.9	102.0	165.5	(a)19.0	**389.4**
Renter—private landlord	238.1	274.0	51.5	563.5	181.2	423.0	270.0	**1 437.7**
Total renters(b)	283.3	351.8	89.2	724.3	302.5	638.7	312.1	**1 977.5**
Total owner and renter households	1 607.7	1 646.8	807.2	4 061.7	638.9	1 619.5	549.3	**6 869.3**
AVERAGE NUMBERS								
Average persons in household	2.0	4.1	3.9	3.2	2.7	1.0	3.0	**2.6**
Average bedrooms in dwelling	2.9	3.3	3.5	3.2	3.0	2.3	3.0	**3.0**

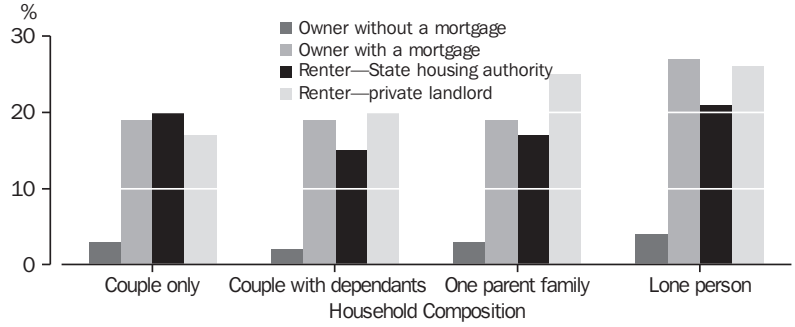
(a) The estimate has a relative standard error of 25% to 50%. (b) Includes other renters.

Source: Housing Occupancy and Costs, Australia (4130.0).

For many households, weekly housing costs are a significant proportion of their weekly income. In 1997–98, housing costs represented 18% of weekly income for owners with a mortgage, 17% of weekly income for tenants of State housing authorities and 20% of weekly income for tenants renting from private landlords. Housing costs as a proportion of income differed depending on tenure type and household composition (graph 8.11).

Furthermore, housing costs represented over 25% of weekly income for almost a third of households who were paying off a housing mortgage and for over 45% of households renting from a private landlord (table 8.12). This can have a major effect on funds left over for households to spend on other necessities such as food, clothing and transport. For low income households in particular, the level of housing costs may be a major factor in determining the economic wellbeing of the occupants.

8.11 MEAN HOUSING COSTS AS A PERCENTAGE OF INCOME, By Tenure Type and Household Composition—1997–98



Source: Housing Occupancy and Costs, Australia (4130.0).

8.12 HOUSING COSTS AS A PROPORTION OF INCOME, By Tenure Type—1997–98

Housing costs as a proportion of income	Owner without a mortgage	Owner with a mortgage	Renter			**Total**
			State housing authority	Private landlord	Total(a)	
	%	%	%	%	%	**%**
25% or less	97.2	67.5	87.3	53.9	62.9	**78.1**
26–30%	(b)0.2	10.2	7.9	9.9	9.1	**5.9**
31–50%	0.8	15.7	(b)4.5	23.9	18.6	**10.5**
More than 50%	0.9	5.5	n.p.	10.8	8.2	**4.4**
Total(c)	100.0	100.0	100.0	100.0	100.0	**100.0**
	'000	'000	'000	'000	'000	**'000**
Households	2 762.0	2 129.8	389.4	1 437.7	1 977.5	**6 869.3**

(a) Includes a small number of other landlord types. (b) The estimate has a relative standard error of 25% to 50%. (c) Includes households with nil or negative total income.

Source: Unpublished data, Survey of Income and Housing Costs, 1997–98.

Life cycle groups

Households can vary considerably in terms of their size and composition, as well as their housing tenure and the type of dwelling they occupy. All of these factors, along with location of the dwelling, influence their housing costs.

Households may be small, as with young single person households and those comprising young childless couples. They tend to grow in size as the couples get older and have children. Household size usually reaches its peak when parents and their dependent and adult children share the same dwelling. As children leave home, household size again declines.

The tenure of the dwelling tends to follow a similar progression to the life cycle of the occupants. This cycle follows a pattern of renting accommodation in early adulthood, moving to home purchase and mortgages while raising a family, and owning the accommodation outright without any mortgage in older age. Other factors that affect housing payments, such as income, are similarly related to life cycle stages. Housing payments and tenure are examined below, and illustrated in table 8.13, in terms of life cycle progression.

8.13 HOUSING COSTS, By Tenure Type and Selected Life Cycle Groups—1997–98

Selected life cycle groups	Owner without a mortgage	Owner with a mortgage	Renter: State housing authority	Renter: Private landlord	Renter: Total(a)	**Total**
MEAN WEEKLY HOUSING COSTS ($)						
Lone person only, under 35	(b)14	202	(b)45	124	113	**133**
Couple only, reference person under 35	(b)22	261	n.p.	173	171	**212**
Couple with dependent children only	27	214	99	181	161	**157**
One parent with dependent children	21	162	62	136	107	**107**
Couple with non-dependent children only	22	165	(b)109	(b)173	126	**71**
Couple only, reference person 55 to 64	21	156	(b)64	(b)123	102	**49**
Couple only, reference person 65 and over	18	68	57	125	94	**25**
Lone person only, 65 and over	15	(b)84	39	111	58	**26**
MEAN WEEKLY INCOME ($)						
Lone person only, under 35	(b)606	681	(b)193	477	454	**527**
Couple only, reference person under 35	(b)1 132	1 220	n.p.	1 023	1 017	**1 130**
Couple with dependent children only	1 165	1 134	679	886	860	**1 083**
One parent with dependent children	653	680	361	432	417	**515**
Couple with non-dependent children only	1 395	1 575	(b)901	(b)1 901	1 469	**1 452**
Couple only, reference person 55 to 64	703	850	(b)297	(b)553	557	**718**
Couple only, reference person 65 and over	464	610	279	420	359	**461**
Lone person only, 65 and over	271	(b)220	189	228	203	**254**
MEAN HOUSING COSTS AS A PROPORTION OF INCOME (%)						
Lone person only, under 35	(b)2	30	(b)23	26	25	**25**
Couple only, reference person under 35	(b)2	21	n.p.	17	17	**19**
Couple with dependent children only	2	19	15	20	19	**14**
One parent with dependent children	3	24	17	32	26	**21**
Couple with non-dependent children only	2	10	(b)12	(b)9	9	**5**
Couple only, reference person 55 to 64	3	18	(b)22	(b)22	18	**7**
Couple only, reference person 65 and over	4	11	21	30	26	**5**
Lone person only, 65 and over	6	(b)38	21	49	29	**10**
HOUSEHOLDS ('000)						
Lone person only, under 35	(b)18.7	94.1	(b)16.2	191.0	221.5	**334.3**
Couple only, reference person under 35	(b)15.8	189.0	n.p.	139.9	148.4	**353.1**
Couple with dependent children only	404.2	890.7	49.6	274.0	351.8	**1 646.8**
One parent with dependent children	60.3	96.1	89.0	148.7	248.8	**405.3**
Couple with non-dependent children only	269.3	122.3	(b)10.2	(b)13.9	29.1	**420.7**
Couple only, reference person 55 to 64	282.8	61.9	(b)4.6	(b)16.9	24.7	**369.4**
Couple only, reference person 65 and over	477.8	16.0	14.6	19.8	37.7	**531.4**
Lone person only, 65 and over	460.8	(b)14.4	86.0	35.1	139.3	**614.5**

(a) Includes other renters. (b) The estimate has a relative standard error of 25% to 50%.

Source: Housing Occupancy and Costs, Australia (4130.0).

Young single households

Young lone person households are relatively few in number. In 1997–98 these households numbered 334,300. The majority of young singles under the age of 35 are still living with their parent(s) and many others are sharing houses. It is estimated that in 1997–98 there were 258,600 households with related and unrelated young singles.

The high cost of living alone is probably one of the deciding factors in the choice of shared housing for the young. For young singles living alone in 1997–98, 57% were living in private rental accommodation, with average weekly housing costs of $124. This constituted an average of 26% of gross weekly income for these households. An additional 28% of these young single households had embarked on home purchase and were paying off a mortgage. Their average housing costs were higher at $202 per week or 30% of gross weekly income.

Couples only, under 35 years

Young couple households were more likely to have moved into home purchase than their single counterparts. Of the 353,100 young couple only households in 1997–98, about 189,000 or 54% were paying off a mortgage. Their average weekly housing costs were $261, 21% of gross weekly income. An additional 40% of young couple households were renting from private landlords and paying an average of $173 per week (17% of gross weekly income).

Couple households with dependent children only

The trend to home purchase increases as couples become parents and raise their children. In 1997–98, 54% of couples with dependent children only were paying off a mortgage and 25% were owners without a mortgage. Over one-fifth were still renting their accommodation, mainly from private landlords. Average weekly housing costs varied for different types of tenure. Of couple households with dependent children only, those with mortgages had average weekly housing costs of $214 or 19% of gross weekly income. Those without a mortgage had average weekly housing costs of $27. Households renting from private landlords were paying $181 per week or 20% of gross weekly income.

Lone parent households

In 1997–98, 15% of one-parent households owned their homes without a mortgage, 24% were still paying off a mortgage and 61% were renting their accommodation. Compared to most other households, a high proportion of one-parent households (22%) were renting from a State housing authority.

Housing costs for one-parent households ranged from an average of $21 per week for owners without a mortgage to a high of $162 for owners with a mortgage. For those households with a mortgage, housing costs constituted an average of 24% of gross weekly income. Of the lone parent households renting, those renting from private landlords paid an average of $136 or 32% of gross weekly income, while those renting from State housing authorities paid an average of $62 or 17% of gross weekly income.

Incomes also varied considerably across one-parent households, mainly reflecting their different attachments to the labour force. Owners paying off a mortgage tended to have higher average weekly incomes than those in other tenancy arrangements, $680 compared to $432 for those renting from a private landlord and $361 for those renting from a State housing authority.

Early retirement years—ages 55 to 64

The need to accommodate dependent children has ceased by the time many parents reach their mid-fifties. Some older couples (420,700 in 1997–98) have only non-dependent children present, and a smaller number of them (369,400 in 1997–98) were again living alone.

The wide disparity in income for couple only families in this age group is clear from the fact that, while the mean weekly household income was $718, around 50% of these households had an income of less than $524 (median income).

Almost 77% of couple only families, where the reference person was aged 55–64, were owners without a mortgage. Their housing payments were low at an average of $21 per week, 3% of total household income. About 17% of the households were owners with a mortgage, and both this group, and those who were renting, were paying substantially higher proportions of their income in housing payments, 18% in both cases.

Older households

By the traditional retirement age of 65 years, both incomes and housing payments have been greatly reduced. In 1997–98, 90% of older couple households were owners without a mortgage, with average weekly housing costs of $18 or 4%

of gross weekly income. For older couples who still had a mortgage, their repayments were lower than those of their younger counterparts, at an average of $68 per week or 11% of gross weekly income. This reflects in part the fact that these households may have purchased their first home some 10 to 20 years earlier when home prices and mortgages were considerably lower.

However, for the small proportion of older couples who were renting, housing payments consumed relatively large proportions of their incomes. In 1997–98, about 37,700 or 7% of couples with the reference person aged 65 and over, were renting, with average housing payments of $94 or 26% of their average weekly income. The 19,800 who were renting from private landlords were spending an average of 30% of their income on housing payments, and the 14,600 who were renting from State housing authorities were spending an average of 21%.

In 1997–98 there were about 614,500 lone person households with the occupant aged 65 years or over. Older people living alone were less likely to be owners without a mortgage than older couples, 75% and 90% respectively. A relatively high proportion of older people living alone were renting from State housing authorities, 14% in 1997–98. A further 6% were renting from private landlords. Generally, while the dollar value of their housing costs was lower than that of older couples with similar tenure, lone older people were paying slightly higher proportions of their incomes towards their housing.

8.14 HOUSING COSTS, By Tenure Type and Capital City—1997–98

Tenure type	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Canberra	All capital cities(a)
MEAN WEEKLY HOUSING COSTS ($)								
Owner without a mortgage	25	22	27	18	18	20	25	23
Owner with a mortgage	269	207	201	174	193	142	241	218
Renter—State housing authority	59	71	61	60	68	(b)54	80	64
Renter—private landlord	210	153	147	136	135	129	166	171
Total renters(c)	172	138	132	103	119	106	127	143
Total owner and renter households	138	117	122	98	106	83	136	122
MEAN WEEKLY INCOME ($)								
Owner without a mortgage	1 025	807	955	629	833	612	1 043	888
Owner with a mortgage	1 332	1 188	1 242	1 043	1 129	963	1 229	1 213
Renter—State housing authority	339	413	399	308	423	(b)244	462	372
Renter—private landlord	1 016	773	681	681	716	580	929	838
Total renters(c)	850	722	665	530	646	490	755	734
Total owner and renter households	1 053	924	959	747	889	695	1 000	949
MEAN HOUSING COSTS AS A PROPORTION OF INCOME (%)								
Owner without a mortgage	2	3	3	3	2	3	2	3
Owner with a mortgage	20	17	16	17	17	15	20	18
Renter—State housing authority	17	17	15	20	16	(b)22	17	17
Renter—private landlord	21	20	22	20	19	22	18	20
Total renters(c)	20	19	20	19	18	22	17	19
Total owner and renter households	13	13	13	13	12	12	14	13
HOUSEHOLDS ('000)								
Owner without a mortgage	573.6	483.1	180.7	149.7	191.1	31.5	34.5	1 652.1
Owner with a mortgage	385.6	440.9	195.0	148.0	174.4	25.2	40.3	1 423.9
Renter—State housing authority	87.7	47.5	33.4	44.5	26.8	(b)5.4	14.8	270.6
Renter—private landlord	332.8	234.3	145.2	66.8	97.1	13.2	24.7	926.1
Total renters(c)	454.9	295.9	185.4	121.5	127.8	20.3	43.9	1 277.3
Total owner and renter households	1 414.1	1 219.8	561.1	419.2	493.3	77.0	118.7	4 353.3

(a) Includes households in the Northern Territory, for which disaggregated data are not acceptable for most purposes. (b) The estimate has a relative standard error of 25% to 50%. (c) Includes other renters.

Source: Unpublished data, Survey of Income and Housing Costs, 1997–98.

Capital cities

In 1997–98, the mean weekly housing costs for households in all capital cities was $122 (table 8.14). However, there was considerable variation between capital cities. Hobart had the lowest mean housing costs at $83 per week. Sydney and Canberra had the highest mean housing costs at $138 and $136 per week respectively.

Housing costs for home owners without a mortgage were similar across all capital cities, ranging from an average of $18 a week in Perth and Adelaide to $27 per week in Brisbane.

For home owners with a mortgage, mean weekly housing costs were highest in Sydney and Canberra ($269 and $241 respectively), while they were lowest in Hobart ($142).

For households renting from private landlords, housing costs were significantly higher in Sydney, where private rents averaged $210 per week. The lowest rent was recorded in Hobart at an average of $129 per week.

Mean weekly housing costs for households renting from State or Territory housing authorities ranged from $54 in Hobart to $80 in Canberra.

House prices

House price indexes enable the comparison of price changes between cities, though not the price levels themselves.

From 1998–99 to 1999–2000, the price index of established houses increased in all capital cities (table 8.15).

For the third year in a row, Melbourne recorded the greatest rise in established house prices, increasing by 14.0% in 1999–2000. Other capital city price rises were in Sydney (11.0%), Adelaide (8.0%), Canberra (6.9%), Perth (5.9%), Hobart (4.7%), Darwin (2.9%) and Brisbane (0.9%). The weighted average of eight capitals index rose by 9.1%.

In 1999–2000, project home prices (cost of new dwellings excluding land) also rose in all cities (table 8.16). Adelaide (8.7%) recorded the largest increase, followed by Melbourne (8.4%), Perth (8.2%), Sydney (6.9%), Canberra (6.0%), Brisbane (4.2%), Darwin (3.0%) and Hobart (2.4%). The weighted average of eight capitals index rose by 6.7%.

The price index of materials used in house building is discussed in *Chapter 20, Construction*.

8.15 PRICE INDEX NUMBERS FOR ESTABLISHED HOUSES(a)

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra	Weighted average of eight capital cities
					INDEX NUMBER				
1997–98	128.5	114.3	138.9	112.1	113.3	125.4	198.9	126.2	122.8
1998–99	137.9	126.8	141.0	114.1	118.9	123.2	193.6	128.2	130.4
1999–00	153.1	144.6	142.2	123.2	125.9	129.0	199.2	137.0	142.3
					CHANGE FROM PREVIOUS YEAR (%)				
1997–98	8.1	12.7	1.2	3.6	3.8	–2.4	1.0	–0.2	6.7
1998–99	7.3	10.9	1.5	1.8	4.9	–1.8	–2.7	1.6	6.2
1999–00	11.0	14.0	0.9	8.0	5.9	4.7	2.9	6.9	9.1

(a) Reference base year 1989–90 = 100.0.

Source: House Price Indexes: Eight Capital Cities (6416.0).

8.16 PRICE INDEX NUMBERS FOR PROJECT HOMES(a)

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra	Weighted average of eight capital cities
					INDEX NUMBER				
1997–98	112.2	108.6	112.4	113.1	102.2	123.3	137.3	123.5	110.3
1998–99	115.2	112.5	113.4	117.0	106.1	123.3	139.0	124.4	113.1
1999–00	123.1	122.0	118.2	127.2	114.8	126.2	143.2	131.9	120.7
					CHANGE FROM PREVIOUS YEAR (%)				
1997–98	1.6	0.8	–0.3	4.4	0.9	0.0	1.0	–0.1	1.0
1998–99	2.7	3.6	0.9	3.4	3.8	0.0	1.2	0.7	2.5
1999–00	6.9	8.4	4.2	8.7	8.2	2.4	3.0	6.0	6.7

(a) Reference base year 1989–90 = 100.0.

Source: House Price Indexes: Eight Capital Cities (6416.0).

Value of dwellings

In the 1997–98 Survey of Income and Housing Costs, owners were asked to estimate the value of their dwelling. These estimates may differ from valuations made by accredited valuers or the actual sale price of the dwelling. The extent of the difference has not been measured. Therefore some care needs to be exercised in the use of these data.

The median owner-estimated value of dwellings for capital cities was $164,000, 13% higher than the national median ($145,200). The median value was highest in Sydney at $251,200 and lowest in Adelaide at $116,100 (table 8.17).

Housing finance for owner occupation

In 1999–2000 a total of $74,930m was committed by all lenders for the purchase of a total of 549,015 dwellings (table 8.18). The number of commitments in 1999–2000 increased 12.5% from the previous year, with the value of loans rising by 21.8% as a result of an 8.3% increase in the average borrowing size (to $136,500) over the period. In 1999–2000, 82.0% of the money was used to purchase or re-finance established dwellings, 14.2% to finance construction of new dwellings, and the remainder (3.8%) was used to purchase newly erected dwellings.

Commitments for the construction of dwellings rose by 3.0% in 1999–2000 to 75,684, while commitments for the purchase of newly erected dwellings fell by 8.0% to 18,533 for the same period. However, established dwelling commitments (including re-financing) increased by 15.3% to 454,798.

8.17 VALUE OF DWELLINGS(a), By Dwelling Structure and Capital City—1997–98

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Canberra	All capital cities(b)	All owner households
					MEDIAN VALUE OF DWELLINGS ($'000)				
Separate house	251.8	150.0	155.4	116.9	158.1	118.1	154.4	163.9	145.7
Semi-detached/row or terrace house/townhouse	253.4	165.4	(c)141.5	104.0	106.8	(c)106.5	(c)135.4	168.0	140.8
Flat/unit/apartment	236.9	112.1	(c)114.2	(c)100.3	(c)94.8	(c)84.7	n.p.	161.3	153.0
All dwellings(d)	**251.2**	**148.2**	**152.9**	**116.1**	**152.4**	**116.9**	**152.2**	**164.0**	**145.2**
					NUMBER ('000)				
Dwellings	959.2	924.0	375.7	297.7	365.5	56.7	74.8	3 076.0	4 891.8

(a) As reported by owners. (b) Includes households in the Northern Territory, for which disaggregated data are not acceptable for most purposes. (c) The estimate has a relative standard error of 25% to 50%. (d) Includes other dwellings.

Source: Unpublished data, Survey of Income and Housing Costs, 1997–98.

Banks continued to be the predominant lenders. Banks' market share was 82.3% of total commitments in 1999–2000, down slightly from 82.8% in the previous year. The number of commitments made by banks for housing finance totalled 451,800 during 1999–2000, a rise of 11.8% from the previous year.

Commitments made by lenders other than banks during the same period also rose, up 13,249 (15.8%) to 97,215.

In 1999–2000 the average borrowing from banks was $139,200 (up 9.2% from 1998–99), from permanent building societies $116,500 (down 1.0%), and $125,900 from other lenders (an increase of 5.4%).

8.18 SECURED HOUSING FINANCE COMMITMENTS(a), By Purpose and Type of Lender

		Type of lender			
	Unit	Banks	Permanent building societies	Other lenders(b)	**Total**
CONSTRUCTION OF DWELLINGS					
Dwelling units					
1997–98	no.	63 325	3 732	7 160	**74 217**
1998–99	no.	62 464	3 787	7 238	**73 489**
1999–00	no.	65 673	3 276	6 735	**75 684**
Value of commitments					
1997–98	$m	7 014	487	877	**8 380**
1998–99	$m	7 936	519	901	**9 356**
1999–00	$m	9 292	472	851	**10 618**
PURCHASE OF NEWLY ERECTED DWELLINGS					
Dwelling units					
1997–98	no.	18 889	227	4 154	**23 270**
1998–99	no.	17 903	282	1 963	**20 148**
1999–00	no.	17 313	300	920	**18 533**
Value of commitments					
1997–98	$m	2 402	30	476	**2 907**
1998–99	$m	2 483	37	283	**2 802**
1999–00	$m	2 666	49	125	**2 840**
PURCHASE OF ESTABLISHED DWELLINGS(c)					
Dwelling units					
1997–98	no.	309 033	15 770	59 883	**384 686**
1998–99	no.	323 840	14 917	55 779	**394 536**
1999–00	no.	368 814	16 562	69 422	**454 798**
Value of commitments					
1997–98	$m	34 883	1 617	6 874	**43 374**
1998–99	$m	41 089	1 678	6 576	**49 343**
1999–00	$m	50 919	1 825	8 729	**61 472**
TOTAL					
Dwelling units					
1997–98	no.	391 247	19 729	71 197	**482 173**
1998–99	no.	404 207	18 986	64 980	**488 173**
1999–00	no.	451 800	20 138	77 077	**549 015**
Value of commitments					
1997–98	$m	44 299	2 134	8 227	**54 661**
1998–99	$m	51 508	2 234	7 760	**61 501**
1999–00	$m	62 877	2 346	9 705	**74 930**

(a) Excludes alterations and additions. (b) Includes mortgage managers. (c) Includes refinancing.

Source: Unpublished data, Survey of Housing Finance for Owner Occupation.

Housing assistance

While most Australians are able to house themselves without government assistance, such assistance remains important for various population groups, especially low income earners and social security recipients. Housing assistance is provided by the Commonwealth Government and the State and Territory Governments through a range of housing and other programs. Assistance for people with low incomes is provided through public housing, home purchase assistance and rent assistance schemes (see the earlier article *Changing tenure status*). Assistance is also provided to community organisations and local governments for refuges and crisis accommodation.

The *Housing Assistance Act 1996* provides the legislative basis for the Commonwealth's provision of financial assistance to the States and Territories for housing and related purposes. The Act authorised the Commonwealth to form and enter into a Commonwealth State Housing Agreement (CSHA) with the States and Territories. The 1996 CSHA expired on 30 June 1999. A new CSHA was agreed and commenced on 1 July 1999. Unlike the 1996 CSHA, it provides for bilateral housing agreements between the Commonwealth and each State and Territory. The CSHA sets out the terms for the provision of housing assistance for rental housing, home purchase and other specific housing programs. Details of Commonwealth assistance provided under the CSHA for 1999–2000 are set out in table 8.19.

The 1999–2003 CSHA includes a subsidiary National Housing Data Agreement outlining a commitment to the development and provision of nationally consistent data. The National Housing Data Agreement was signed by Housing Chief Executive Officers in January 2000. The ABS and the Australian Institute of Health and Welfare (AIHW) are also signatories to the Agreement, with the AIHW providing secretariat support. The three schedules to the Agreement identify the major work areas comprising development of national minimum data sets, national performance indicators and national data definitions and standards.

In 1999–2000, towards implementation of the three schedules to the Agreement, the AIHW and the ABS worked with the Commonwealth and the States and Territories to:

- develop a national performance indicator framework for public and community housing and undertake data collection for 1999–2000;
- advance the development of national minimum data sets with the establishment of a national public rental housing data repository involving the construction of a national data set based on each jurisdiction's data; and
- develop national data definitions and standards through drafting of the first national housing assistance data dictionary to be published March 2001.

Public housing

Public housing comprises dwellings owned and managed by State and Territory housing authorities and which are made available at low cost to tenants. Rents are generally set at a maximum of 25% of income, thereby providing low cost housing to people on low incomes. The median weekly housing costs for those renting from a State housing authority in 1997–98 were $53, compared to $143 for those renting from a private landlord. Expenditure under the CSHA on public housing and related assistance was approximately $1.3b in 1999–2000.

Over recent decades, public housing has been increasingly targeted towards those most in need. In 1997–98, 394,507 households (6% of all households) were living in public housing; of these, about 78% were in the lowest 40% of the household income distribution. Government pensions and benefits were the main source of income for the majority of households in public housing.

8.19 COMMONWEALTH STATE HOUSING AGREEMENT, Payments to States—1999–2000

	NSW	Vic.	Qld	WA	SA	Tas.	ACT	NT	**Aust.**
	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	**$'000**
Base Funding	253 020	18 584	138 124	73 232	59 068	22 705	17 394	13 557	**762 964**
Community Housing Program	21 651	15 905	11 819	6 267	5 054	1 598	1 047	649	**63 990**
Aboriginal Rental Housing Program	17 777	3 638	25 227	15 862	8 342	696	—	19 458	**91 000**
Crisis Accommodation Program	13 417	9 856	7 325	3 884	3 132	990	649	402	**39 655**
Total	305 865	215 263	182 495	99 245	75 596	25 989	19 090	34 066	**957 609**

Source: Department of Family and Community Services.

Home purchase assistance

Under the CSHA, the State and Territory Governments provide home purchase assistance to low to moderate income earners, including loans, shared equity schemes, deposit assistance and mortgage relief.

Rent assistance

Under the Commonwealth Government Rent Assistance Program, rent assistance is paid to people who rent privately (including boarders and lodgers, residents in retirement villages, caravan parks, etc.) and pay rent above minimum threshold rental levels. It is a non-taxable supplement payable by the Departments of Family and Community Services, Veterans' Affairs, and Education, Training and Youth Affairs to people with low incomes who are eligible. As at July 2000 there were 941,278 income units in receipt of rent assistance, where an income unit is defined as a single person with or without dependants, or a couple with or without dependants. Total expenditure on rent assistance in 1999–2000 was $1,538m. The level of rent assistance payable varies with the amount of rent paid, marital status and number of children in the family. For example, in July 2000, for a couple with one or two children who paid over $275.99 a fortnight in rent, the maximum fortnightly rent assistance was $99.26. In July 2000 the maximum rate of rent assistance increased by 10% as part of the new tax system package.

As with public housing renters, a large proportion of rent assistance recipients are either lone persons or sole parents. In March 2000, 40% of those receiving rent assistance from the Department of Family and Community Services were single non-sharers, 22% were sole parents, 16% single sharers, 14% were couples with dependants, and 8% were couples with no dependants.

Under the CSHA, the State and Territory Governments also assist low income earners with the costs of rent, bonds and relocation in the private rental market. In 1997–98 almost $68m was provided through these arrangements.

Crisis accommodation

Governments provide assistance in meeting the short-term accommodation needs of homeless people who are identified as a priority target group under the CSHA. The Commonwealth Government provides capital funding of $40m per annum through the Crisis Accommodation Program under the CSHA. The Commonwealth Government and the State and Territory Governments also provide assistance to people who are homeless or at imminent risk of homelessness, through the Supported Accommodation Assistance Program (SAAP).

Within the context of the SAAP IV Bilateral Agreements (2000–05), national funding (Commonwealth and State/Territory contributions) will be over $1.4b (see also *Chapter 7, Income and welfare*). Funds are provided to community organisations and local governments for services such as refuges, shelters and halfway houses, and also for referral, counselling and advocacy services. About 1,200 service outlets are funded under SAAP.

The AIHW estimates that at least 90,700 persons were provided with support or supported accommodation through SAAP in 1998–99. These persons had a total of 163,200 support periods over that time. Clients between 15 and 19 years of age were the single largest age grouping, accounting for one-fifth of all clients. Those aged between 20 and 24 years constituted 16% of all clients, while 13% were aged 45 years and over. Indigenous Australians constituted 13% of SAAP clients and people from non-English speaking backgrounds constituted 11%.

In relation to the housing circumstances of clients prior to their use of services, the largest proportion of support periods (36%) was for clients who were living in the private rental market. A further 20% of support periods were for clients who had been staying at SAAP or Crisis Accommodation Program (CAP) funded accommodation. Some 14% of all support periods were for clients who had no shelter at all or had been living in a car, tent or squat prior to seeking assistance.

Housing assistance programs for Indigenous people

The Aboriginal and Torres Strait Islander Commission (ATSIC) administers a number of programs to improve the living environment of Aboriginal and Torres Strait Islander people, with the aims of providing culturally appropriate, safe and affordable housing and improving community and individual health and wellbeing.

Results of the 1996 Census suggest that Aboriginal and Torres Strait Islander people are disadvantaged in terms of housing need. It was estimated that there is a national shortfall of almost 39,000 bedrooms to adequately house Indigenous families. During 1999 the ABS

undertook for ATSIC a national survey of all Indigenous communities and housing organisations—the Community Housing and Infrastructure Needs Survey (CHINS). The results from the 1999 CHINS were released in April 2000. This survey collected similar information to that collected in 1992, but the scope was extended in 1999 to include urban community housing organisations. The data from the 1999 CHINS and the 1996 Census have provided a comprehensive picture of Indigenous housing across the country. The survey confirms the results of the 1996 Census analysis—that the circumstances of Indigenous Australians have improved slightly, but that there is still a long way to go. The article *Housing in remote Aboriginal and Torres Strait Islander communities* highlights some of the main findings from the 1999 CHINS.

ATSIC's Community Housing and Infrastructure Program (CHIP) provides funds for the construction, purchase, repairs and management of community housing as well as for the provision and maintenance of housing related infrastructure (essential services such as water, sewerage, electricity and community roads). ATSIC also provides grants to some State Governments to supplement their efforts in the provision of essential and municipal services to disadvantaged rural and remote communities. In 1999–2000 CHIP expenditure totalled $227m, of which around half went to the provision of housing. ATSIC's Community Housing and Infrastructure Program has a particular focus on environmental health infrastructure, and a specific element of the program is the National Aboriginal Health Strategy component. In 1999–2000, as part of the overall expenditure of $227m, an amount of $75m was spent on large-scale projects targeting priority housing and infrastructure including power, water and waste removal, mainly in rural and remote Indigenous communities.

During 1999–2000, ATSIC began a new pilot program of repairs and maintenance for housing and infrastructure, in recognition that increased funding for maintenance will contribute to greater sustainability of assets and longer term health benefits. This program is in addition to the funding provided through Regional Councils for repairs and maintenance. An amount of $30m has been earmarked for this pilot over four years and funds will be targeted at communities having priority needs.

The Aboriginal Rental Housing Program is a program specified under the CSHA and is administered by the Department of Family and Community Services (FaCS). Funding for the program for 1999–2000 was $91m.

ATSIC's Home Ownership scheme aims to reduce the disparity between the rate of home ownership in Indigenous communities and that in the wider Australian community. The rate of home ownership for Aboriginal family and lone-person households was estimated in the 1996 Census to be 31%. This compared with a national non-Indigenous figure of 71%.[1] The scheme provides home loans at concessional interest rates to Aboriginal and Torres Strait Islander families. It targets low-income families with the capacity to repay a long-term loan, but who have difficulty obtaining finance from traditional lending institutions. Around 450 loans were made in 1999–2000, with the total loan portfolio administered by ATSIC now at $280m.

The Commonwealth Government, through FaCS and ATSIC, has been negotiating bilateral housing agreements with State and Territory Governments to maximise program efficiency and effectiveness and to better coordinate the two Indigenous-specific housing programs, CHIP and the Aboriginal Rental Housing Program. At 30 June 2000, agreements had been signed with the Northern Territory, Western Australia, New South Wales and South Australia, while negotiations with other States are continuing.

A Commonwealth State Working Group on Indigenous Housing (CSWGIH), was set up by Commonwealth and State Housing Ministers in 1997 to develop practical strategies to address impediments to improved housing outcomes for Aboriginal and Torres Strait Islander people. The working group has provided a forum for greater cooperation and information sharing between State and Territory housing agencies, FaCS and ATSIC. Working parties were established with representation from across Commonwealth, State and Territory agencies, to specifically focus on the issues of performance indicators, data collections, asset management, training in housing organisation and sustainable healthy housing. A report on the work of this Group was due to be made to Housing Ministers late in 2000. The work carried out has covered a range of issues and during the year a number of initiatives were introduced. These included the signing of an Agreement on National Indigenous Housing Information to facilitate Indigenous housing data development and ensure consistency across data collection activities. This agreement was signed in December 1999 by the Chief Executive Officers of the Commonwealth and State and Territory agencies administering Indigenous housing

assistance, the ABS and the AIHW, while the AIHW provides secretariat support. Underpinning this agreement was the establishment of the National Indigenous Housing Information Implementation Committee, which is already actively coordinating developments such as:

- a formal structure for National Indigenous Housing Research; and
- a national framework for the design, building and management of Indigenous housing in rural and remote areas.

In 1999–2000, the AIHW and the ABS worked with agencies responsible for Indigenous housing assistance at Commonwealth and State/Territory levels to implement the agreement. It provides a framework to improve the measurement of outcomes for Indigenous housing with a focus on developing national data and sector development. Indigenous housing data development will continue through the development of a national minimum data set as part of the National Indigenous Housing Data Management Strategy.

Endnote

1 Census 1996, *Census of Population and Housing: Aboriginal and Torres Strait Islander People, Australia* (2034.0).

Other programs

The Commonwealth Government, through the Department of Health and Aged Care, finances and regulates residential care for frail older people. The residential care is usually provided by the non-government sector, including religious, charitable and private sector providers. A small number of residential services are operated by the State and local government sectors. Capital assistance for upgrading or construction of facilities is made available to those aged care services catering largely for residents with special needs or on low incomes, and those in rural and remote areas of Australia (see the section *Residential Aged Care Program* in *Chapter 7, Income and welfare*).

Under the Commonwealth/State Disability Agreement, the Commonwealth provides funds to assist the States and Territories in the planning, policy setting and management of accommodation and other related services for people with disabilities. The State and Territory Governments are responsible for administering these services (see the section *People with disabilities* in *Chapter 7, Income and welfare*). Areas such as advocacy and research and development continue to be a responsibility of both levels of government.

The Commonwealth also funds the AIHW. The role of the AIHW is to gather, analyse and disseminate national data on health and welfare services, including housing assistance, in order to support planning and policy making in government and community organisations. The Housing Assistance unit of AIHW is involved in describing the need for, provision and use of housing assistance in Australia. In November 1999, the Institute published *Australia's Welfare 1999: Services and Assistance* which contains chapters on housing assistance and services for homeless people. Included is information examining the need for assistance, government expenditure on services and assistance, the characteristics of recipients of assistance, and outcomes. As outlined above under *Housing assistance* and *Housing assistance programs for Indigenous people*, the AIHW is responsible for a number of programs including the implementation of the National Housing Data Agreement as well as the Agreement on National Indigenous Housing Information.

A housing authority also exists in each State and Territory, which is responsible for the provision of public rental housing and often other housing related services such as home loans. These authorities are:

- New South Wales—Department of Housing;
- Victoria—Department of Human Services (Office of Housing);
- Queensland—Department of Housing;
- South Australia—Department of Human Services (South Australian Housing Trust);
- Western Australia—Ministry of Housing (Homeswest);
- Tasmania—Department of Health and Human Services (Housing Tasmania);
- Northern Territory—Territory Housing; and
- Australian Capital Territory—ACT Housing.

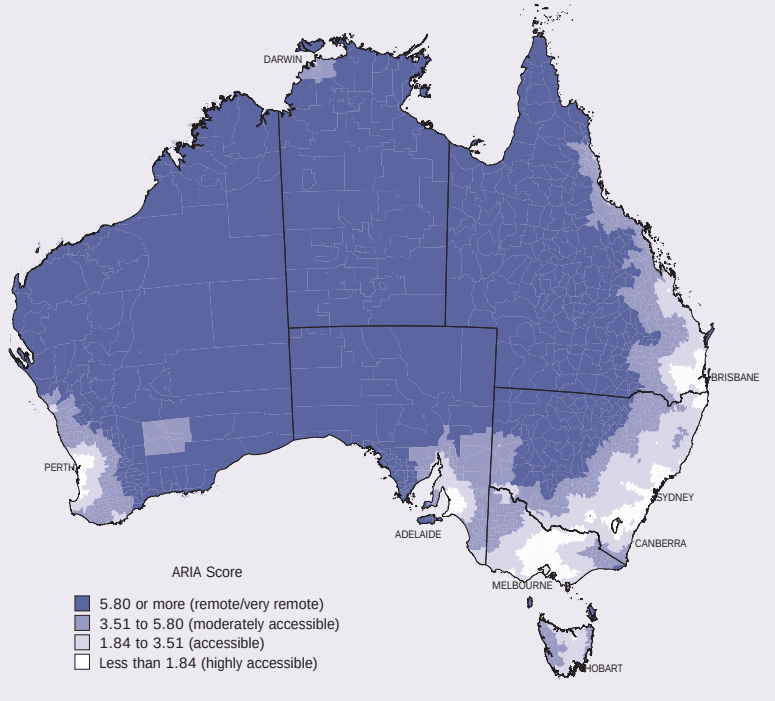
Housing in remote Aboriginal and Torres Strait Islander communities

This article uses information from the 1999 Community Housing and Infrastructure Needs Survey (CHINS), conducted by the ABS on behalf of the Aboriginal and Torres Strait Islander Commission (ATSIC).[1] It describes the housing circumstances of people living in discrete Indigenous communities located in remote parts of Australia.

A discrete Indigenous community is defined as a geographic location, bounded by physical boundaries, and inhabited or intended to be inhabited predominantly by Indigenous people.

The remoteness of a community was measured using the Accessibility/Remoteness Index of Australia (ARIA), and represents a generic measure of the relative degree of remoteness of all parts of non-metropolitan Australia.[2] This produces an index, based on road distance to service centres, which has been grouped into five categories, from *highly accessible* to *very remote*. In this article *'remote'* has been defined as a combination of the ARIA categories *remote* and *very remote*, and the five ARIA categories have been reduced to four (see map 8.20 and its key below).

8.20 ACCESSIBLE AND REMOTE AREAS OF AUSTRALIA



Source: Australian Social Trends, 2000 (4102.0).

Dwellings and their condition are categorised as follows:

- *Permanent dwellings* are buildings designed for people to live in, with fixed walls, a roof and doors.
- *Temporary dwellings* are caravans, tin sheds without internal dividing walls, humpies, dongas, or other makeshift shelters.
- *Housing conditions* refers to the condition of permanent dwellings owned or managed by an Indigenous housing organisation, as assessed and categorised by community housing officers, in terms of the costs of repairs needed:
  - Minor or no repairs: repairs of less than $20,000;
  - Major repairs: repairs of $20,000 to less than $60,000; and
  - Replacement: repairs of $60,000 or more.

These ranges were higher in high cost areas.

Discrete Indigenous communities

Having a home that provides adequate shelter and basic services is an expectation of most Australians. The lack of such housing, or difficulties with the supply of drinking water, electricity and sewerage systems, has a major impact on the quality of life of many Aboriginal and Torres Strait Islander communities.

In 1999, 81% of the Indigenous population living in discrete communities lived in remote area communities (table 8.21), over half of them (54%) in the Northern Territory. Together, the 88,700 people living in 1,187 discrete Indigenous communities located in remote areas represented close to 22% of all Indigenous people in Australia.[3] Many of the communities had small populations: of the communities involved, 914 (77%) had fewer than 50 people, while only 121 communities (10%), had 200 or more people.

Housing tenure

A large proportion (70%) of Australians either own or are purchasing their own home (see the earlier section *Home ownership and renting*). However, this pattern of tenure is not the norm in remote Indigenous communities. Most of the land is owned by the community as a whole, rather than by an individual. The 1999 Survey showed that 78% of all dwellings in these communities were owned or managed by community organisations, with only 1% of dwellings privately owned.

Housing conditions

Research has found that two of the major problems with living conditions of Indigenous people are with the inadequate supply of houses and with the poor quality of much of the housing that is available, both being regarded as unacceptable by general community standards.[4] It may be for these reasons that some Indigenous people share their dwellings with other people, increasing the level of crowding in their household. However, many also prefer to live, or at least sleep, near to their close kin.[4] As a result, dwellings occupied by Indigenous people tend to have more people than those of other Australians. In remote Indigenous communities, the average occupancy ratio was 5.8 people per dwelling, compared to a national average of about half that size (graph 8.4).

Not all residents of the communities surveyed lived in permanent dwellings. In 1999, 13% of all the dwellings in remote communities were temporary dwellings such as caravans, tin sheds or humpies, housing a population of over 7,000 people. Temporary dwellings were particularly prevalent in small communities: 27% of the population in remote small communities of fewer than 50 people occupied temporary dwellings.

The condition of permanent dwellings in terms of the extent of repairs required provides further insight into the quality of housing. One-third of all community owned or managed dwellings in these communities needed either major repairs or replacement (table 8.22). The need for this level of repair was more common in dwellings located in communities of 50 people or more.

The reliability of the infrastructure provided is also important. The provision and maintenance of basic essential services such as water, sewerage and power, are critical elements in the development of a healthy living environment.[5] While the large majority of people living in remote Indigenous communities have access to these services, many communities experienced problems in their operation.

8.21 DWELLINGS IN REMOTE INDIGENOUS COMMUNITIES —1999

	Number of people in community			
	Fewer than 50	50 to 199	200 or more	**Total**
	%	%	%	**%**
Permanent dwellings				
Community owned or managed	66.2	81.3	81.3	**78.1**
State owned and managed	..	3.2	8.7	**5.8**
Privately owned dwellings	0.1	1.4	1.9	**1.4**
All permanent dwellings(a)	66.3	86.2	94.3	**86.9**
Occupied temporary dwellings	33.7	13.8	5.7	**13.1**
Total dwellings	100.0	100.0	100.0	**100.0**
	'000	'000	'000	**'000**
Total dwellings	3.2	2.9	9.1	**15.2**
Total persons	13.9	14.8	60.0	**88.7**
	no.	no.	no.	**no.**
Occupancy ratio(b)	4.3	5.1	6.6	**5.8**

(a) Includes permanent dwellings owned and managed by other organisations. (b) Occupancy ratio equals the average number of persons per dwelling.

Source: Unpublished data, Community and Housing Infrastructure Needs Survey, 1999.

Availability of drinking water, electricity and sewerage systems

The supply of water to a community can determine the viability of that community. Without investments in constructing permanent storage and delivery systems, communities can have a precarious existence. In 1999, 16 communities did not have an organised water supply. These communities were very small, with few inhabitants.

The majority of communities (65%) reported that bore water was the most common form of organised drinking water in their community. This was true for communities of all sizes (table 8.23).

Although other fuels can be used for cooking and lighting, the supply of electricity is generally considered a basic amenity for a wide range of purposes. The supply of electricity to remote Indigenous communities was not as extensive as it was for water, with 11% of communities not having a supply of electricity. Virtually all of these communities had a population of fewer than 50 people (98%). Among all the remote communities, domestic generators (29%) and community generators (25%) were the main sources of electricity supply.

The proper disposal of sewage is an important environmental health issue. In 1999, some 69 communities (6% of all remote Indigenous communities), had no sewerage system. Once again, almost all of these communities (97%) had a population of fewer than 50 people.

The most common type of sewerage system was septic tanks with a leach drain, which were present in 46% of these communities. Pit toilets were also a common form of sewage disposal (25% overall), but they were less common in larger communities.

Problems experienced with infrastructure

Providing accommodation appropriate to the weather conditions and other aspects of the environment, and maintaining the existing facilities, is a difficulty in all remote communities.[6] It is important that the equipment and infrastructure be properly constructed, particularly for the circumstances in which such facilities are required. It has been suggested that taking into account the high cost of repairs in remote areas, much of the equipment is not sufficiently robust or durable.[4]

8.22 HOUSING CONDITION OF DWELLINGS OWNED BY COMMUNITY ORGANISATIONS—1999

	Number of people in community			
	Fewer than 50	50 to 199	200 or more	**Total**
	%	%	%	**%**
Permanent dwellings				
Minor or no repairs required	79.4	64.4	64.7	**67.3**
Major repairs required	14.9	26.5	23.6	**22.7**
Replacement required	3.9	9.1	11.6	**9.8**
Total dwellings(a)	100.0	100.0	100.0	**100.0**
	'000	'000	'000	**'000**
Total dwellings(a)	2.1	2.4	7.4	**11.9**

(a) Includes those for which the amount of repairs needed was not stated.

Source: Unpublished data, Community and Housing Infrastructure Needs Survey, 1999.

8.23 AVAILABILITY OF DRINKING WATER, ELECTRICITY AND SEWERAGE SYSTEMS—1999

	%
Main source of drinking water	
Bore water	64.9
Connected to town supply	10.4
Rain water tank	9.1
Other sources of drinking water	14.2
No organised supply	1.3
Main source of electricity supply	
Domestic generators	28.6
Community generators	24.9
Town supply or State grid	15.6
Other sources of electricity supply	19.7
No electricity supply	11.2
Main sewerage system	
Septic tanks with leach drain	45.7
Pit toilet	25.2
Septic tanks (common effluent disposal)	8.8
Other sewerage systems	14.5
No sewerage system	5.8
Total	100.0

Source: Unpublished data, Community and Housing Infrastructure Needs Survey, 1999.

This view is illustrated by the problems associated with water restrictions, power interruptions, and sewage overflows and leakages. Remote Indigenous communities of 50 or more people were surveyed for problems with the operation of these services.

In the 12 months prior to the survey, water restrictions were experienced in 36% of remote Indigenous communities of 50 people or more (table 8.24). The most common reason for having water restricted was the breakdown of equipment (reported by 19% of communities). These breakdowns happened more frequently in larger communities (22% of communities of 200 or more) than smaller communities (16% of communities of 50–199 people). Natural causes such as a normal dry season (9%), or drought (2%) were also reported as reasons for water restrictions.

Any interruption to the supply of electrical power will have an impact in many ways, particularly in the refrigeration of food, washing of clothes and contact with the outside world in the form of television. In 1999, power interruptions occurred in 85% of communities. Equipment breakdown was again a major problem, affecting 52% of remote Indigenous communities of 50 or more people. The only reported natural cause of power interruptions was storms, which occurred in 37% of these communities.

Any overflow or leakage of sewage can impact on the health of a community by providing conditions where disease spreads rapidly. In 1999, 59% of the communities examined reported that they had experienced sewage overflows or leakages. Nearly all the reported reasons for difficulties related to maintenance and support problems: blocked drains (34%), equipment failure (22%), insufficient capacity of the septic system (18%), and design or installation problems (2%).

Natural reasons played only a small part in causing sewage overflows or leakages. The main natural cause reported for overflows or leakages of sewage for remote Aboriginal and Torres Strait Islander communities was the annual wet season, which caused difficulties in 8% of these communities.

8.24 PROBLEMS WITH INFRASTRUCTURE —1999(a)

	%
Reasons for power interruptions	
Equipment breakdown	51.6
Storms	36.6
Planned outage for maintenance	28.6
No fuel	7.7
Vandalism	2.9
Other reasons for power interruptions	11.0
Total communities with interruptions(b)	85.0
Reasons for sewerage overflows or leakages	
Blocked drains	34.4
Equipment failure	22.3
Insufficient capacity of septic	17.6
Wet season	8.4
Population increases	7.3
Design or installation	2.2
Other reasons for sewerage problems	4.4
Total communities with overflows(b)	59.0

(a) In the 12 months prior to the Survey, in remote Indigenous communities with 50 or more people.
(b) Individual categories do not add to total because communities may report more than one specific problem.

Source: Unpublished data, Community and Housing Infrastructure Needs Survey, 1999.

Endnotes

1 For further information in relation to this collection, see *Housing and Infrastructure in Aboriginal and Torres Strait Islander Communities, Australia* (4710.0).

2 Commonwealth Department of Health and Aged Care 1999, *Accessibility/Remoteness Index of Australia (ARIA), Occasional papers series no. 6*, Commonwealth Department of Health and Aged Care, Canberra.

3 This was calculated by dividing the population of remote Indigenous communities by the projected total Indigenous population (Low series) for 1999. See *Experimental Projections of the Aboriginal and Torres Strait Islander Population* (3231.0).

4 Neutze M. 1998, *Housing and Infrastructure for Indigenous Australians, Urban Research Program working paper no. 65*, Research School of Social Sciences, Australian National University, Canberra.

5 Aboriginal and Torres Strait Islander Commission 1997, *Community Housing and Infrastructure Program Policy 1997–2000*, ATSIC, Canberra.

6 The National Housing Strategy 1991, *Aboriginal and Torres Strait Islander housing: Discussion package*, NHS, Canberra.

Bibliography

ABS publications

Australian Housing Survey: Housing Characteristics, Costs and Conditions (4182.0)—issues for 1994 and 1999.

Australian Social Trends (4102.0).

Census 1996, Census of Population and Housing: Aboriginal and Torres Strait Islander People, Australia (2034.0).

House Price Indexes: Eight Capital Cities (6416.0).

Household Investors in Rental Dwellings, Australia (8711.0).

Housing and Infrastructure in Aboriginal and Torres Strait Islander Communities, Australia (4710.0).

Housing Finance for Owner Occupation, Australia (5609.0).

Housing Occupancy and Costs, Australia (4130.0).

Income Distribution, Australia (6523.0).

Other publications

Australian Institute of Health and Welfare 1999, *Australia's Welfare 1999: Services and Assistance*, AIHW, Canberra.

Australian Institute of Health and Welfare 1999, *SAAP National Data Collection Annual Report 1998–99, Australia*, AIHW, Canberra.

Australian Institute of Health and Welfare 2000, *The Agreement on National Indigenous Housing Information*, AIHW, Canberra.

Australian Institute of Health and Welfare 2000, *The National Housing Data Agreement: a Subsidiary Agreement of the 1999–2003 Commonwealth–State Housing Agreement*, AIHW, Canberra.

Department of Family and Community Services, *Annual Report*, AGPS, Canberra.

The latest annual reports of the State and Territory Government housing authorities, and the latest annual report of the Department of Family and Community Service's *Housing Assistance Act 1996,* show further details of government activities in the field of housing.

Internet sites

Aboriginal and Torres Strait Islander Commission, *http://www.atsic.gov.au*

Australian Institute of Health and Welfare, *http://www.aihw.gov.au*

Commonwealth Department of Family and Community Services, *http://www.facs.gov.au*

Commonwealth Department of Health and Aged Care, *http://www.health.gov.au*

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Introduction

This chapter provides information on various aspects of the health of the Australian population and the activities of government and other bodies relating to health. The chapter uses data from the most up-to-date sources available, including data from the 1995 National Health Survey. Results for Indigenous people from the survey are provided in this chapter only for non-remote areas, because of concerns about the quality of the data for remote areas. The chapter also makes extensive use of the historical mortality data set compiled by the Australian Institute of Health and Welfare Mortality Monitoring System. These data were coded by the ABS from official death registrations. In addition, historical data from psychiatric institution registers published in previous editions of Year Book Australia have been included in the section on *Mental health*.

The Australian health care system comprises a diversity of arrangements for planning, funding and delivering health services which feature a mix of private and public sector involvement. At the national level, health services in Australia are administered by the Commonwealth Government, through two ministers appointed to the portfolio of Health and Aged Care.

The Minister for Health and Aged Care has overall responsibility for the whole portfolio and has specific responsibility for Medicare benefits, hospitals, private health insurance, medical workforce issues, public health, health research, Aboriginal and Torres Strait Islander health issues and the Health Insurance Commission. The Minister is assisted by a Parliamentary Secretary who has specific responsibility for the Therapeutic Goods Administration, the Australia New Zealand Food Authority, pharmaceutical benefits, Health Services Australia Limited, administrative aspects of the Pharmaceutical Benefits Scheme, and general support for Aboriginal health in Northern Australia.

The Minister for Aged Care is responsible for aged care services and Australian Hearing Services.

The Minister for Veterans' Affairs administers health services for ex-service personnel and their dependants.

The State and Territory Governments are heavily involved in the public provision of health services, including public and psychiatric hospitals, public health and mental health. Each has a minister who is responsible to the Government of the particular State or Territory for the administration of its health authorities. In some States/Territories, the responsibility for health services is shared by several authorities, while in others one authority is responsible for all these functions.

Local governments and non-government organisations (both non-profit and for profit) also provide health services. Most medical and dental care, and some other professional medical and allied health services such as physiotherapy, are provided by private, non-salaried practitioners.

Under the National Health Information Agreement, to which the Australian Bureau of Statistics, the Australian Institute of Health and Welfare, the Commonwealth Department of Health and Aged Care, and the various State and Territory health authorities are signatories, the National Health Information Development Plan sets out agreed national priorities for health information to be considered by the Australian Health Ministers' Advisory Council. This work is managed by the National Health Information Management Group.

As well, a National Public Health Partnership (NPHP) has been established, from 1996, between the Commonwealth Government and the State and Territory Governments in recognition of the need for a national approach to public health and health promotion to improve the health status of Australians, in particular the population groups most at risk.

Health status

The World Health Organization (WHO) defines health as "a state of complete physical, mental and social wellbeing, and not merely the absence of disease or infirmity". While the level of disease or infirmity can be assessed by mortality, disability and morbidity statistics, the presence of positive wellbeing is more difficult to measure. Multidimensional instruments which address physical, mental and social functioning continue to be developed and are increasingly being used to measure health and wellbeing in individuals and populations.

The following health status information includes morbidity and mortality data; disability-related topics are contained in *Chapter 7, Income and welfare*.

Health and wellbeing

The 1995 National Health Survey revealed that 83% of Australians aged 15 and over reported having good, very good or excellent health. This proportion varies from 93% of 15–19 year old females, to 54% of males aged 85 years or more. Because of this variation with age, all estimates in this section have been standardised by age and sex to remove the effects of different age structures in the populations being considered.

Although males had a similar rate of fair or poor health (17%, compared to 16% of females), there were some noticeable differences between the sexes within individual population groups (table 9.1). Of those not in the labour force, 31% of males reported fair or poor health, compared to 23% of females. However, a higher proportion of unemployed females (28%) reported fair or poor health than unemployed males (25%).

Among the overseas-born, 14% of females who had been in Australia for less than five years perceived their health to be fair or poor, while only 10% of males in this category reported fair or poor health. People who spoke English at home reported lower rates of fair or poor health than those who spoke a language other than English (16% compared to 23%).

There was a steady improvement in perceived health from people in households with the lowest income to those in households with the highest income. The socioeconomic status of the area in which people lived was also associated with self-reported health status. People living in the most disadvantaged areas of the nation were almost twice as likely to consider their health to be fair or poor as those living in the most advantaged areas.

9.1 INDICATORS OF SELF-ASSESSED HEALTH STATUS(a)—1995

Population characteristics	Males %	Females %	Persons %
Labour force status			
Employed	12.4	11.4	12.0
Unemployed (looking for work)	25.2	28.2	26.2
Not in labour force	31.1	22.7	25.4
Equivalent household income(b)			
Lowest income quintile	24.9	22.2	23.2
Second income quintile	23.2	20.3	21.6
Third income quintile	16.8	14.0	15.4
Fourth income quintile	13.9	11.2	12.6
Highest income quintile	8.9	9.9	9.3
Relative socioeconomic disadvantage of areas(c)			
Most disadvantaged areas quintile	21.2	20.3	20.7
Second quintile	20.3	17.4	18.8
Third quintile	17.0	17.5	17.3
Fourth quintile	16.7	13.7	15.1
Least disadvantaged areas quintile	11.7	11.7	11.7
Birthplace			
Born in Australia	16.6	15.7	16.1
Born overseas	17.8	17.8	17.8
Less than 5 years in Australia	10.3	14.0	12.4
5 years or more in Australia	18.2	18.1	18.1
Language spoken at home			
English	16.4	15.6	16.0
Language other than English	22.1	23.0	22.6
Self-assessed body weight			
Underweight	28.6	30.4	29.4
Acceptable weight	13.5	12.5	13.0
Overweight	21.7	20.1	20.8
All persons	16.9	16.3	16.6

(a) Indirectly standardised by age and sex. (b) Household income adjusted for the number of adults and children in the household, and the employment status of members of the household. Uses Henderson Equivalence scales. Includes respondents from households where all adults members stated their income. (c) The Socioeconomic Indexes for Areas describe the characteristics of the area in which a person lives, rather than the characteristics of the person.

Source: Unpublished data, 1995 National Health Survey.

Morbidity

The 1995 National Health Survey found that almost 75% of the Australian population of all ages experienced one or more long term conditions (i.e. conditions that have lasted, or are expected to last, six months or more). The most common long term conditions related to eyesight, particularly hypermetropia/far-sightedness and myopia/short-sightedness (table 9.2).

Females were more likely than males to experience long term conditions, partly due to their older age structure. The higher number of long term conditions reported by females may also reflect that women are more likely to consult health professionals, and hence have conditions diagnosed.

The proportion of the population with any long term conditions increased with age, from 31% of 0–4 year olds to over 99% of people aged 60 years and over (graph 9.3).

The prevalence of hypermetropia increased slowly with age to 10% of people aged 35–39, then increased strongly to over 50% of people aged 55–60 years. It remained at this level (approximately 50%) for people in their sixties until decreasing gradually to 40% of those aged 85–89 years.

The prevalence of deafness in the community also increased with age; of those aged 90 years and over, 54% reported deafness as a long term condition, indicating that as people age their hearing abilities deteriorate. Factors such as the natural ageing process, as well as environmental exposure to noise, could explain this pattern.

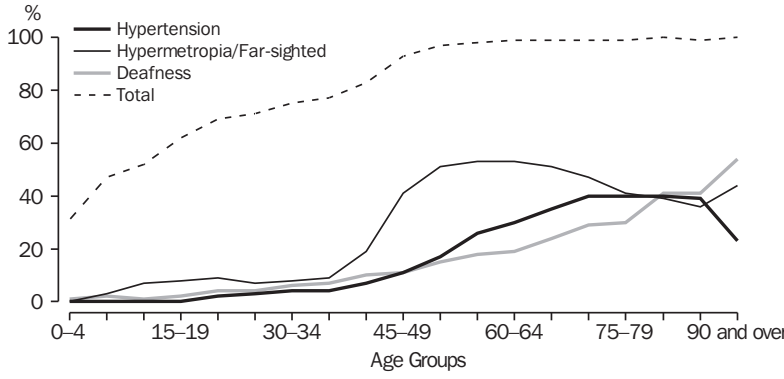
Age is also a major determining factor in the prevalence of hypertension. Less than 1% of the Australian population aged under 20 experienced hypertension, compared to over 39% of those aged 70 years and over.

9.2 TOP TEN LONG TERM CONDITIONS, By Sex—1995

	Males	Females	Total
Long term conditions	%	%	%
Hypermetropia/far-sighted	18.5	23	20.8
Myopia/short-sighted	17.8	22.8	20.3
Hayfever	12.9	14.5	13.7
Asthma	10.7	11.4	11.1
Hypertension	9.5	10.9	10.2
Sinusitis	8.0	11.9	10
Deafness (complete/partial)	12.1	6.9	9.5
Presbyopia	7.5	8.9	8.2
Osteoarthritis	4.6	8.2	6.4
Arthritis n.e.c.	5.2	6.4	5.8
Total	**72.7**	**76.4**	**74.5**

Source: 1995 National Health Survey.

9.3 PREVALENCE OF LONG TERM CONDITIONS—1995



Source: Unpublished data, 1995 National Health Survey.

Long-term mortality trends

This article discusses trends in causes of death[1] through the 20th century.

There were 127,202 deaths registered in 1998, a decrease of 1.7% on the corresponding figure for 1997. The 1998 total consisted of 67,073 male and 60,129 female deaths.

In 1998 deaths from cancer (27% of all deaths) and Ischaemic heart disease (22%) were the leading causes of death, followed by cerebrovascular disease (9%) (table 9.4). Chronic obstructive pulmonary disease and allied conditions (including asthma, emphysema and bronchitis) (5%) was the fourth leading cause of death, followed by accidents (4%).

9.4 LEADING CAUSES OF DEATH—1998

Causes of death	Males no.	Females no.	Persons no.	Proportion of total deaths %
All causes	**67 073**	**60 129**	**127 202**	**100.0**
Malignant neoplasms (cancer)	19 279	15 037	34 316	26.5
Malignant neoplasms of trachea, bronchus and lung	4 821	2 053	6 874	5.4
Ischaemic heart disease	15 024	12 801	27 825	21.9
Cerebrovascular disease (stroke)	4 812	7 170	11 982	9.4
Chronic obstructive pulmonary disease and allied conditions	3 628	2 486	6 114	4.8
Pneumonia and influenza	2 049	2 530	4 579	3.6
Accidents	3 168	1 652	4 820	3.8
Motor vehicle traffic accidents	1 224	507	1 731	1.4
Diseases of arteries, arterioles and capillaries	1 415	1 330	2 745	2.2
Diabetes mellitus	1 424	1 327	2 751	2.2
Suicide	2 150	533	2 683	2.1
Hereditary and degenerative diseases of the central nervous system	947	1 085	2 032	1.6
All other causes	12 866	14 245	27 111	21.3

Source: Causes of Death, Australia, 1998 (3303.0).

Causes of death from 1908 to 1998

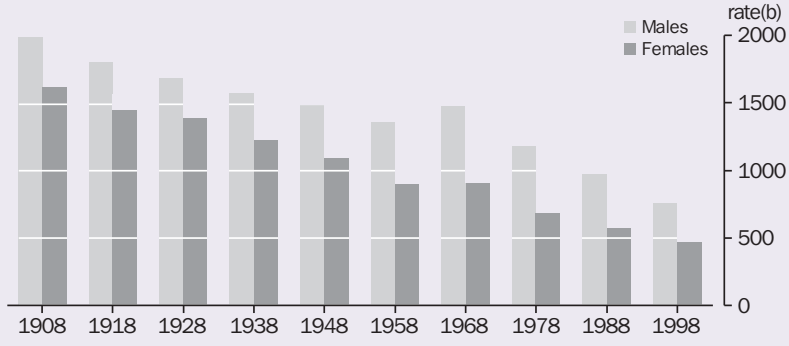
The overall death rate in Australia declined substantially throughout the 20th century. This period was characterised by a shift in disease patterns and the age at which people were dying. In the first half of the century, cause of death statistics were dominated by infectious diseases which tended to impact on the very young and the very old. This pattern changed during the second half of the century as degenerative diseases in the middle and older age groups replaced infectious diseases as the main causes of death (Omran 1971; Olshansky 1986).

During the period from 1908 to 1998 the standardised death rate for males declined from 1,982 to 760 deaths per 100,000 and for females from 1,618 to 460 (graph 9.5). The overall pattern of male and female deaths was similar during this period, although the ratio of male to female deaths converged marginally, from approximately 1.4 male deaths to every 1 female death in the 1900s to 1.1 male deaths to every 1 female death in the 1990s.

In the first half of the 20th century the greatest decline in death rates in Australia was in infants and in children aged less than five years (United Nations 1982). The death rate for boys aged 0–4 years declined from nearly 2,500 per 100,000 persons in 1908 to less than 600 in 1958, and subsequently to 137 deaths per 100,000 persons aged 0–4 years in 1998. The pattern for females was similar, with the death rate for girls aged 0–4 years declining from more than 2,000 to less than 470 per 100,000 in the first half of the century, to 111 per 100,000 in 1998. In 1908 children aged 0–4 years comprised 24.5% of all deaths, but by 1998 this percentage had declined to 1.3.

In the older age groups the greatest gains came in the second half of the 20th century. For example, during this period the death rate for males aged 65–69 years declined by more than 50%, and a similar pattern was evident for females (table 9.6). The shift in the age of death is highlighted by the fact that in 1908 approximately 30% of all deaths occurred in persons aged 65 years or more, but by 1998 this percentage had increased to nearly 78% of all deaths.

9.5 AGE-STANDARDISED(a) DEATH RATES, Males and Females—1908 to 1998



(a) Age-standardised to the 1991 Australian mid-year population. (b) Per 100,000 population.

Source: AIHW Mortality Monitoring System.

9.6 AGE-SPECIFIC DEATH RATES(a), By Selected Years and Age Groups—1908 to 1998

	Age groups (years)									
	0–4	5–9	15–19	25–29	35–39	45–49	55–59	65–69	75–79	85+
	MALES									
1908	2 498.5	208.2	305.5	425.5	641.6	1 199.8	1 939.9	4 660.4	12 269.9	31 248.0
1938	1 258.5	139.9	175.9	248.1	376.7	773.2	1 760.2	4 106.7	9 877.8	27 430.8
1958	587.7	57.3	131.5	155.1	229.3	599.9	1 623.6	4 061.9	9 303.9	24 783.2
1978	320.0	29.0	140.6	135.5	185.7	502.1	1 384.7	3 518.2	8 519.4	20 720.0
1998	137.4	15.0	75.0	134.6	152.5	248.6	684.6	1 997.4	5 363.0	16 722.8
	FEMALES									
1908	2 047.1	199.8	291.3	455.3	608.0	962.2	1 459.2	3 594.0	9 608.4	25 534.1
1938	967.5	111.2	129.1	242.6	343.6	587.0	1 159.6	2 861.9	7 978.9	24 966.7
1958	469.7	37.9	48.4	66.9	154.3	372.6	841.6	2 186.5	6 390.2	20 581.7
1978	246.4	22.5	50.4	46.8	104.9	287.4	690.8	1 674.6	4 800.0	16 411.6
1998	111.2	9.5	37.1	42.0	76.6	163.0	397.7	1 041.8	3 145.3	13 611.7

(a) Per 100,000 of the relevant age group.

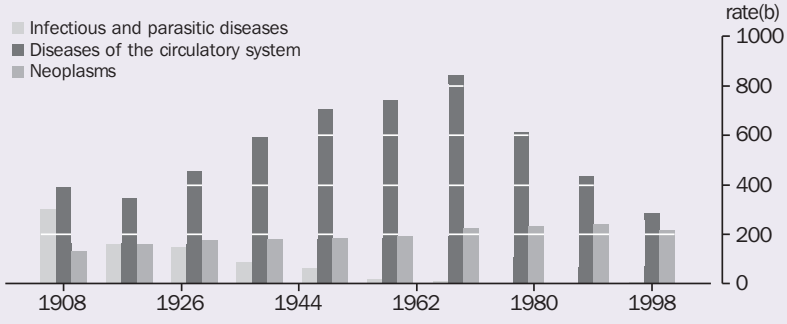
Source: AIHW Mortality Monitoring System.

The decline in infectious diseases, particularly in the younger age groups, was the driving force behind the decline in mortality in the first half of the 20th century. In 1908 infectious diseases comprised approximately 25% of all deaths for both males and females; the death rate for males from infectious diseases was 300 per 100,000 persons, and for females 233. In 1920 three of the leading causes of death for children under five years of age were infectious diseases: diarrhoea and enteritis; diptheria; and measles (United Nations 1982). By 1998 infectious diseases comprised approximately 1% of all deaths.

As in other developed countries, infectious diseases in Australia declined following World War I and degenerative diseases began to rise, in particular diseases of the circulatory system (Omran 1971). Graphs 9.7 and 9.8 show the emergence and dominance of diseases of the circulatory system for both males and females, although the impact was greater for males. The age-standardised death rate for diseases of the circulatory system peaked for males in the late 1960s at 843 per 100,000 persons, and for females in the early 1950s at 558 per 100,000 persons. Since the 1970s the death rate for diseases of the circulatory system declined rapidly, mainly due to changes in lifestyle and improvements in the management of the disease (AIHW 2000). By 1998 the death rate for this group of diseases had declined to 285 for males and 188 for females per 100,000 persons.

The age-standardised death rate for cancer among males increased from 132 per 100,000 persons in 1908 to 217 in 1998; for females it decreased marginally from 138 per 100,000 persons in 1908 to 131 in 1998. However, as a proportion of all deaths, cancer deaths increased significantly during the 20th century. In 1908 cancer accounted for 6% of all male deaths and 7% of female deaths. By 1998 this proportion of all deaths had increased to approximately 25% for both males and females. Paradoxically, a greater proportion of cancer deaths in a population often reflects the higher longevity of that population, because cancer is predominantly a disease of the elderly.

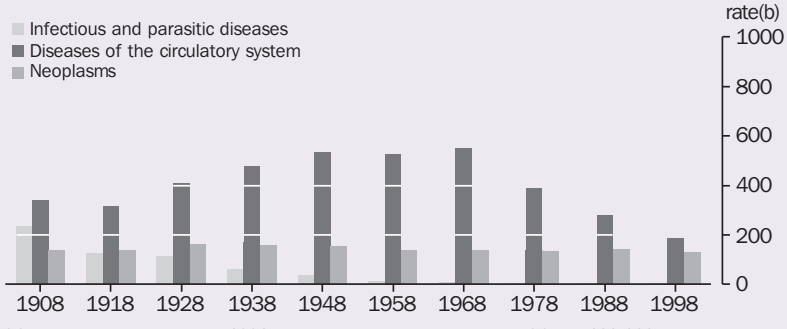
9.7 AGE-STANDARDISED DEATH RATES(a) FOR SELECTED DISEASES, Males—1908 to 1998



(a) Age-standardised to the 1991 Australian mid-year population. (b) Per 100,000 population.

Source: AIHW Mortality Monitoring System.

9.8 AGE-STANDARDISED DEATH RATES(a) FOR SELECTED DISEASES, Females—1908 to 1998



(a) Age-standardised to the 1991 Australian mid-year population. (b) Per 100,000 population.

Source: AIHW Mortality Monitoring System.

Endnote

1 In 1997 the ABS introduced an automated system for coding causes of death. As the system was developed in the United States, it uses the US interpretation of the *International Classification of Diseases Version 9 (ICD-9)* coding rules for identifying the underlying cause of death. That interpretation, in some instances such as pneumonia, differs significantly from the interpretation of the rules previously used in Australia.

References

Australian Institute of Health and Welfare 2000, *Australia's Health 2000: the seventh biennial health report of the Australian Institute of Health and Welfare*, AIHW, Canberra.

Olshansky, S.J. and Ault, A.B. 1986, "The fourth stage of the epidemiologic transition: the age of delayed degenerative diseases", *The Milbank Quarterly*, Vol. 64, No. 3, 1986.

Omran, A.R. 1971, "The epidemiologic transition, a theory of the epidemiology of population change", *The Milbank Quarterly*, Vol. 49, No. 4, 1971, Part 1.

United Nations 1982, *Country monograph series No.9, Population of Australia, volume 1*, Economic and Social Commission for Asia and the Pacific, Bangkok, Thailand.

National Health Priority Areas

The health of Australians is among the best in the world. Nationwide efforts, such as the recognition of national health priority areas, will help to ensure that this state continues.

The National Health Priority Areas (NHPA) initiative emphasises collaborative action between Commonwealth Government and the State and Territory Governments, the National Health and Medical Research Council (NHMRC), the Australian Institute of Health and Welfare (AIHW), non-government organisations, appropriate experts, clinicians and consumers.

The initiative recognises that specific strategies for reducing the burden of illness should be holistic, encompassing the continuum of care from prevention through treatment and management to rehabilitation, and should be underpinned by evidence based on appropriate research.

Priorities are established through national consultation taking into account:

- the importance of the disease to the community;
- the impact of the disease (including morbidity, mortality, potential years of life lost, costs to the individual and the community, and consequent inequities such as socioeconomic disadvantage);
- the achievability of improved outcomes; and
- the feasibility of measuring the impact of activities.

At present, six priority areas have been endorsed by Australian Health Ministers. These are: cardiovascular health, cancer control, injury prevention and control, mental health, diabetes mellitus, and asthma. A range of program initiatives has been established, aimed at improving health outcomes in these areas. A set of indicators has been developed, or is currently under development, to assist monitoring of the priority areas. The indicators have been designed to monitor the efficacy of program interventions.

In addition to the NHPA initiative, the National Public Health Partnership is developing national public health performance indicators designed to monitor health determinants as well as health status in populations.

Cardiovascular health

Cardiovascular disease includes all heart disease, cerebrovascular disease, and diseases of the arteries, arterioles and capillaries. Ischaemic heart disease and stroke were the leading causes of burden of disease in Australia in 1996; together these conditions account for nearly 18% of healthy life lost through premature death or disability (AIHW 2000). According to consecutive ABS health surveys, the prevalence of cardiovascular disease in the adult Australian population increased from 17% (2.2 million) in 1989–90 to 21% (2.8 million) in 1995 (table 9.9). Age-standardisation of the data indicated that over this period the ageing of the Australian population played only a small part in the increase in prevalence of cardiovascular disease.

9.9 PREVALENCE OF CARDIOVASCULAR CONDITIONS, Persons Aged 18 Years and Over

	1989–90		1995	
Type of condition	'000	%	'000	%
Hypertension	1 535.1	12.3	1 932.5	14.4
Heart disease	440.1	3.5	493.5	3.7
Atherosclerosis	45.7	0.4	25.5	0.2
Stroke (and other cerebrovascular disease)	89.6	0.7	115.7	0.9
Other diseases of the circulatory system	274.8	2.2	694.8	5.2
Ill-defined signs and symptoms of heart conditions	256.2	2.1	337.5	2.5
Total cardiovascular conditions(a)	**2 164.7**	**17.4**	**2 795.5**	**20.9**

(a) Each person may have reported more than one type of condition, and therefore components may not add to totals.

Source: National Health Survey: Cardiovascular and Related Conditions, Australia, 1995 (4372.0).

In 1998 cardiovascular disease was the leading cause of death in Australia, accounting for 40% of all deaths (50,797 deaths). Ischaemic heart disease accounted for 22% of all deaths, and cerebrovascular diseases a further 9%. Between 1997 and 1998, cardiovascular age-standardised death rates for males declined from 224 to 208 deaths per 100,000 persons, and female rates from 133 to 123 deaths per 100,000.

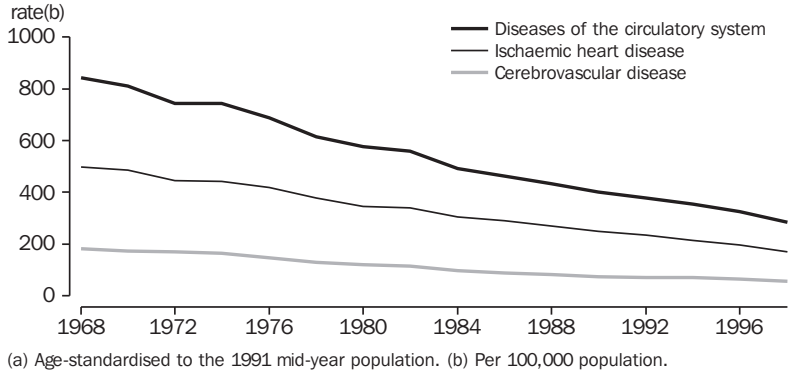
National statistics on deaths of Indigenous people are not available because of incomplete recording of Indigenous status in the death records of some States and Territories. However, in 1998 data on deaths were considered to be of acceptable quality from Queensland, Western Australia, South Australia and the Northern Territory. In 1998 the leading cause of death among the Indigenous populations in these four States and the Northern Territory was diseases of the circulatory system, which accounted for 27% of all Indigenous male deaths, and 33% of all Indigenous female deaths. The median age of Indigenous persons who died from circulatory diseases was 60 years, compared with 81 years for the total population (based on deaths from Queensland, Western Australia, South Australia and the Northern Territory).

Since the early 1970s there has been an overall decline of 66% in cardiovascular death rates, compared with 22% for non-cardiovascular diseases (AIHW 2000). Age-standardised male death rates for diseases of the circulatory system have declined from 843 per 100,000 persons in 1968 to 285 in 1998 (graph 9.10), while the rate for females declined from 548 to 188 (graph 9.11). Since 1987 the average annual rate of change has been 3.9% for males and 3.7% for females.

Age-standardised death rates for males from Ischaemic heart disease declined from 498 per 100,000 persons in 1968 to 171 in 1998. A similar trend was apparent for females; their rates declined from 250 to 93. The decline in Ischaemic heart disease over this period is mainly attributable to the reduction in the prevalence of smoking, better control of blood pressure, a general reduction of saturated fats in diets and improved management of the disease (AIHW 2000).

The age-standardised death rate from cerebrovascular disease for males declined from 183 per 100,000 persons in 1968 to 56 in 1998, and for females from 168 to 51. As with Ischaemic heart disease, the decline in rates of cerebrovascular disease has been attributed to changes in lifestyle and improvements in the management of the disease (AIHW 2000).

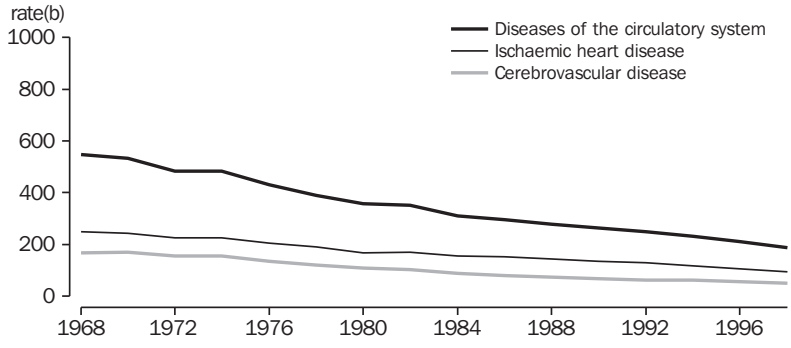
9.10 DISEASES OF THE CIRCULATORY SYSTEM(a), Males—1968 to 1998



(a) Age-standardised to the 1991 mid-year population. (b) Per 100,000 population.

Source: AIHW Mortality Monitoring System.

9.11 DISEASES OF THE CIRCULATORY SYSTEM(a), Females—1968 to 1998



(a) Age-standardised to the 1991 mid-year population. (b) Per 100,000 population.

Source: AIHW Mortality Monitoring System.

Cancer control

The concept of cancer control recognises that, while it may not be possible to eradicate cancer, its impact and burden on the community can be reduced. Eight cancers have been targeted in this priority area—lung cancer, melanoma, non-melanocytic skin cancer, colorectal cancer, non-Hodgkin's lymphoma, prostate cancer and cancer of the cervix and breast. In 1996 lung cancer accounted for 4% of years of healthy life lost through premature death or living with disability; similarly colorectal cancer (3%) and breast cancer (2%) were included in the 15 leading causes of burden of disease in Australia (AIHW 2000).

Incidence

In 1996, the National Cancer Statistics Clearing House, within the Australian Institute of Health and Welfare, reported that 77,666 new cases of cancer were diagnosed. Of these, 42,733 were males and 34,933 were females—an age-standardised cancer incidence rate of 489 for males and 338 for females per 100,000 persons. This equates to a lifetime risk of one in three males and one in four females who were directly affected by cancer (AIHW 1999). This statistic excludes approximately 270,000 annual diagnoses of non-melanocytic skin cancers, which are the most common form of cancer in Australia, but for which data are not collected routinely by cancer registries.

Survival from cancer depends on a number of factors, including whether the cancer is fast or slow growing, its metastatic characteristics, its stage of diagnosis, the availability of appropriate treatment and the general health of the person.

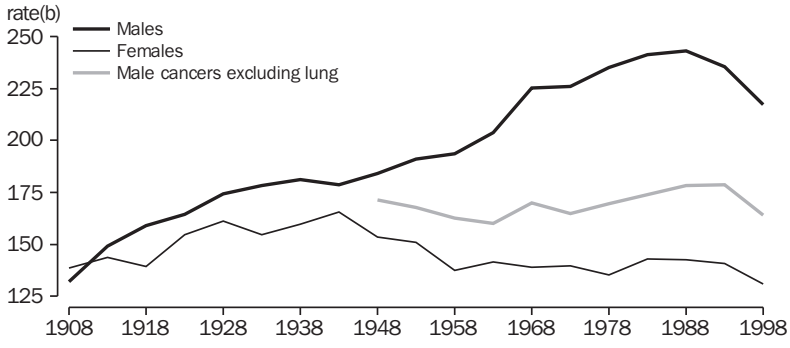
The South Australian and New South Wales cancer registries estimate that the 5-year relative survival ratio for all cancers is approximately 46% for males and 57% for females (AIHW 2000).

Mortality

In 1998, malignant cancers accounted for 34,560 deaths (27% of all deaths). There were 19,590 male deaths and 14,970 female deaths. The overall age-standardised death rate was 168 per 100,000 persons—217 for males and 131 females per 100,000 persons. Overall, cancer of the trachea, bronchus and lung was the leading cause of cancer deaths, accounting for nearly 20% of all deaths from cancer (6,874 deaths). Among males, the leading causes of cancer were cancer of the trachea, bronchus and lung (4,821 deaths) followed by prostate cancer (2,531 deaths) and colon cancer (1,733 deaths). Among females, leading causes were breast cancer (2,542 deaths) followed by cancer of the trachea, bronchus and lung (2,053 deaths) and colon cancer (1,661 deaths). As expected, age-specific death rates from cancer showed a marked increase with age and were greater for males than females in most age groups.

In 1908, the age-standardised cancer rate was similar for males and females (132 and 138 per 100,000 persons). The rates began to diverge significantly in the 1950s, and by 1988 the age-standardised male rate of cancer peaked at 243 compared with the female rate of 142 per 100,000 persons. The rise in male cancers during this period can largely be explained by the increase in cancers of the trachea, bronchus and lung (graph 9.12). Although cancer death rates for males have recently declined there is still a large disparity between the rates for males and females from this disease.

9.12 CANCER MORTALITY RATES(a), By Sex—1908 to 1998



(a) Age-standardised to the 1991 mid-year population. (b) Per 100,000 population.

Source: AIHW Mortality Monitoring System.

Cancer screening

Screening is currently believed to be the most effective method of reducing mortality from breast and cervical cancer. The National Program for the Early Detection of Breast Cancer was established in 1991; since 1994 it has been called Breast Screen Australia. The primary aim of the program is to reduce morbidity and mortality from breast and cervical cancer. Breast Screen Australia's main aim is to detect small cancers in the breast which are more easily treatable while in their early stages. The program recommends that women in the target age group (50–69 years) have a mammogram every two years. Women in the 40–49 years and 70–79 years age groups also have access to mammography, but are not actively recruited (AIHW 1998).

Although Pap smears have been available since the 1960s, the National Cervical Screening Program did not come into effect until 1991. The program seeks to detect the precursors to cancer or abnormalities of cells in the cervix which may lead to invasive cervical cancer. It is estimated that 90% of cervical cancers are potentially preventable (AIHW 1998).

Injuries and deaths due to external causes

Injuries are a significant source of preventable illness, disability and mortality in Australia, and place a heavy burden on health services.

Over the past decade, injuries, poisonings and violence (referred to as external causes) accounted for more than 7,000 deaths per year, including suicides. National hospital statistics for 1998–99 show external causes to be the second leading cause of hospital separations.

The draft National Injury Prevention Action Plan has nominated four priority areas not well covered by other agencies for action in the period 2000 to 2002. These include injury due to falls among persons aged 65 years and older; falls among children under 15 years of age; drowning and near drowning; and poisoning of infants and children less than 5 years of age. Summary data on these four types of injuries (table 9.13) show that, although the number of deaths from these injuries is relatively small, they account for a large number of hospital admissions (AIHW 2000).

In 1998, 6% of all deaths (7,946 deaths) were due to external causes (table 9.14). Leading external causes of death were suicide (34% of all external causes of death) followed by motor vehicle accidents (22%) and accidental falls (15%). Males accounted for 71% of all deaths due to external causes (male death rate of 61 per 100,000 compared with 22 for females). The male death rate from suicide was more than four times the female rate, and from motor vehicle accidents it was more than twice the female rate.

9.13 MORTALITY(a) AND HOSPITAL SEPARATIONS(b), Cases of Falls, Drowning and Poisoning—1997–98

	Falls at ages 65 years and over	Falls at ages 0–14 years	Drowning	Poisoning at ages 0–4 years
Mortality cases(a)(b)				
Males	397	2	215	2
Females	617	1	58	1
Persons	1 014	3	273	3
Hospital separations(c)(d)				
Males	12 557	15 189	467	1 974
Females	36 863	9 706	224	1 622
Persons	49 420	24 895	691	3 596

(a) Mortality is by year of registration. Episodes of hospital care are by year of separation from hospitals. (b) In calendar year 1998.
(c) A separation refers to an episode of care which can be a total hospital stay or a portion of a hospital stay.
(d) In 1997–98.

Source: AIHW National Injury Surveillance Unit.

9.14 EXTERNAL CAUSES OF DEATH—1998

Cause of death	no.	%	Crude death rate(a)
MALES			
Suicide	2 150	38.3	23.1
Motor vehicle accidents	1 224	21.8	13.4
Accidental falls	531	9.5	6.2
Homicide	203	3.6	2.2
Drowning and submersion	187	3.3	2.0
Poisoning by drugs/medications	430	7.7	4.7
Other	889	15.8	9.7
All external causes	*5 614*	*100.0*	*61.2*
FEMALES			
Suicide	533	22.9	5.6
Motor vehicle accidents	507	21.7	5.3
Accidental falls	651	27.9	4.4
Homicide	104	4.5	2.2
Drowning and submersion	58	2.5	0.6
Poisoning by drugs/medications	143	6.1	1.5
Other	336	14.4	3.2
All external causes	*2 332*	*100.0*	*21.6*
PERSONS			
Suicide	2 683	33.8	14.3
Motor vehicle accidents	1 731	21.8	9.3
Accidental falls	1 182	14.9	5.2
Homicide	307	3.9	1.6
Drowning and submersion	245	3.1	1.3
Poisoning by drugs/medications	573	7.2	3.1
Other	1 225	15.4	6.4
All external causes	**7 946**	**100.0**	**41.2**

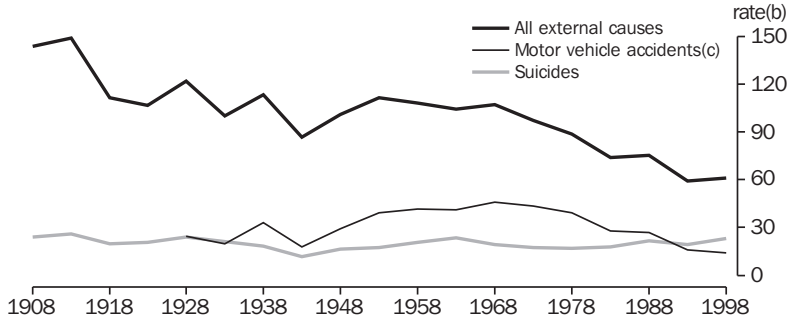
(a) Deaths per 100,000 population.

Source: Causes of Death, Australia, 1998 (3303.0).

The age-standardised death rates due to external causes for males and females declined substantially throughout the 20th century, although external causes as a proportion of all deaths were much the same in 1908 (7%) as in 1998 (6%). In 1908 the death rate due to external causes for males was 144 and for females a much lower rate of 53 per 100,000 persons; by 1998 the respective rates had declined to 61 and 22 (graphs 9.15 and 9.16). Motor vehicle accidents and suicides were major contributors to external causes of death for both males and females. The motor vehicle accident death rate for males and females peaked in the early 1970s, but has since declined rapidly, mainly due to the success of road safety initiatives such as seat belts.

For suicides, the age-standardised death rate for males and females was much the same in 1908 (24 for males and 5 for females per 100,000 persons) as in 1998 (23 for males and 6 for females per 100,000 persons). However, the overall rates mask major changes in specific age groups. In absolute terms the biggest increase in deaths from suicide during the 20th century was for males in the 15–24 years age group (from 6 per 100,000 persons in the early 1920s to 17 in the late 1990s). As a proportion of all deaths, suicides in this age group increased from 3% to 27% during this period.

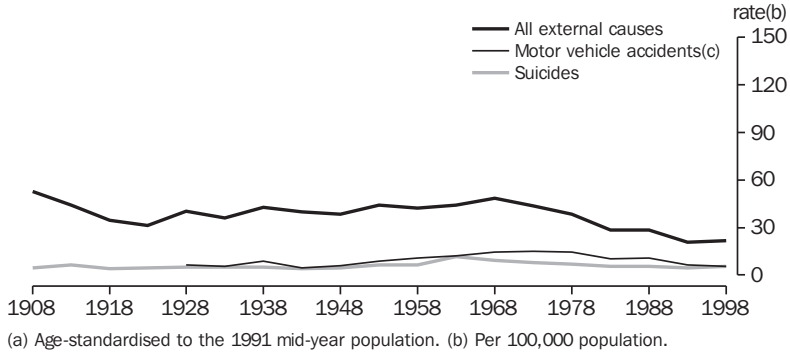
9.15 SELECTED EXTERNAL DEATH RATES(a), Males—1908 to 1998



(a) Age-standardised to the 1991 mid-year population. (b) Per 100,000 population.
(c) Data not available prior to 1928.

Source: AIHW Mortality Monitoring System.

9.16 SELECTED EXTERNAL DEATH RATES(a), Females—1908 to 1998



(a) Age-standardised to the 1991 mid-year population. (b) Per 100,000 population.
(c) Data not available prior to 1928.

Source: AIHW Mortality Monitoring System.

Diabetes mellitus

Diabetes mellitus is the seventh leading cause of death in Australia, and contributes to significant illness and disability. In 1996 diabetes mellitus was the seventh leading cause of burden of disease in Australia, and it is estimated that diabetes and its complications were responsible for more than 53,000 years of healthy life lost to disability (AIHW 2000). People with diabetes have reduced life expectancy and are more likely than people without diabetes to experience major health complications involving the eyes, kidneys, nerves and arteries (McCarthy et al. 1996). Population groups at particular risk of diabetes are older people, Indigenous people and some sections of the overseas-born population.

In the 1995 National Health Survey, 2.4% of Australians (430,700) reported that they had been diagnosed with diabetes mellitus at some time during their lives (table 9.17). In contrast, diabetes was reported by 7% of Indigenous adults aged 20–44 years, 24% of those aged 45–54 years and 17% of those 55 years and over. Indigenous people in non-remote areas were 7–8 times more likely to report diabetes than non-Indigenous people, in both the 25–44 and 45–54 year age groups, and were twice as likely in the age group 55 years and over.

There are several types of diabetes mellitus; the three most common types are Type 1 diabetes which is marked by a complete lack of insulin, Type 2 diabetes which is marked by reduced levels of insulin, or the inability of the body to use insulin properly, and Gestational diabetes which occurs during pregnancy in about 4–6% of females not previously diagnosed with diabetes (AIHW 2000).

In 1998, diabetes mellitus was the underlying cause of death in 2.2% of all deaths (2,751 deaths). Of these, 1,424 deaths were males and 1,327 females. The age-standardised diabetes death rate for persons was 13 per 100,000 persons (16 for males and 11 for females per 100,000 persons). Death rates from diabetes increased rapidly with age, rising from 54 per 100,000 for the 65–74 year age group to 251 deaths per 100,000 for 85 years and over.

The trend in diabetes death rates from 1908 to 1998 is unusual in that, for the first part of the 20th century, female age-standardised death rates were higher than for males. In 1908 the rate was 18 for females and 12 for males. The female diabetes death rate rose sharply during the 1930s and 1940s to a peak of 34 per 100,000 persons in 1943. Following this period there was a sharp decline in the female diabetes death rate, particularly for women in the older age groups and the child bearing age group 35–49 years. By the 1990s diabetes death rates for males were 16 and for females 11 per 100,000 persons (graph 9.18).

In 1999, the National Diabetes Register was established at the Australian Institute of Health and Welfare, as part of the National Diabetes Strategy. The register collects information about people who have been diagnosed with insulin-treated diabetes since January 1999. Major objectives of the register are to assist researchers in epidemiological studies of the causes, complications and prevention of diabetes (AIHW 2000).

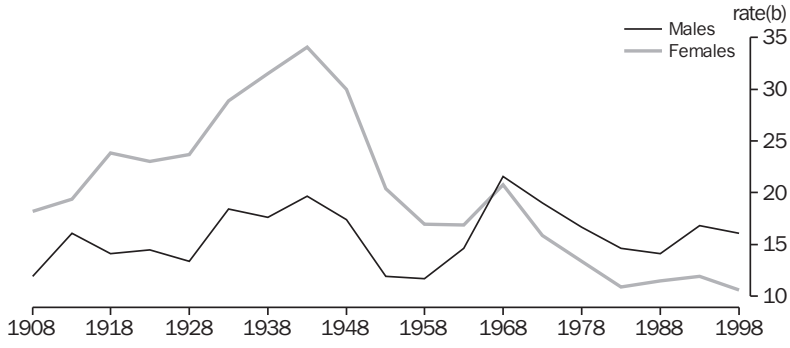
9.17 PEOPLE WITH DIABETES(a), By Type and Sex—1995

Type of diabetes	Males '000	Females '000	Persons '000	Persons %
Non-insulin dependent diabetes mellitus—Type 2	92.9	88.9	181.8	42.2
Insulin dependent diabetes mellitus—Type 1	43.7	35.8	79.5	18.5
Gestational diabetes mellitus	—	27.0	27.0	6.3
Diabetes type unknown	69.6	72.8	142.4	33.1
Total diabetes	**206.2**	**224.5**	**430.7**	**100.0**

(a) Based upon people who reported a diabetes diagnosis at any time during their lives.

Source: National Health Survey: Diabetes, Australia, 1995 (4371.0).

9.18 DIABETES DEATH RATES(a), By Sex—1908 to 1998



(a) Age-standardised to the 1991 mid-year population. (b) Per 100,000 population

Source: AIHW Mortality Monitoring System.

Mental health

Although approximately 80% of the population enjoy 'good' mental health free of mental disorders, it has been estimated that mental disorders caused 13% of the total disease burden in 1996, and were responsible for about 30% of the non-fatal burden (AIHW 1999). Care of people with mental illness has increasingly moved from long-term institutions to mental health services provided in the general health sector. Such mental health services include a range of community-based services across the health, housing and community service sectors designed to support individuals and their families.

Policy initiatives

The National Mental Health Strategy—a joint initiative by the Commonwealth Government and the State and Territory Governments—was adopted by all Health Ministers in 1992, and was implemented over the five years ending in June 1998. The Second National Mental Health Plan was endorsed in July 1998 as the framework of activity for a renewed National Mental Health Strategy. The Plan is to operate over a five-year period from 1998–99 to 2002–03.

Additionally, in March 2000, the Minister for Health and Aged Care announced the Depression Initiative to address problems associated with depression in the Australian Community. The three key aims under the Initiative will be to:

- foster greater awareness and community education so that understanding of the illness is increased and stigma and discrimination decreased;
- promote professional training and development so that the capacity to respond quickly and effectively is increased and more of those experiencing depression are able to get the assistance they need; and
- support research into prevention, treatment and management approaches to ensure that knowledge continues to develop and benefit those dealing with the illness.

Prevalence of mental disorders and self-harm

Having a mental disorder—particularly depression—is a major risk factor for self-harm. It is estimated that between 60% and 90% of young people who attempt suicide are considered to have depression (NHMRC 1997). The 1997 National Survey of Mental Health and Wellbeing of Adults covered major mental disorders, namely anxiety disorders, affective disorders and substance use disorders. Table 9.19 shows that young people aged between 18 and 24 years were the most likely to have one or more of the mental disorders covered in the survey, and those aged 65 years and over were the least likely. Anxiety disorders were the most common for the older age groups while substance use disorders were more frequent for younger people. Physical conditions such as heart problems, diabetes, asthma, bronchitis, cancer, etc. became more prevalent with age.

The survey also included a number of questions about suicide and suicidal thoughts over the last 12 months. Approximately 3% of adults (representing about 385,000 people) said that they had thoughts of suicide in the last 12 months. It is well documented that, while men

who die from suicide outnumber women, the reverse is true for suicide attempts. This may be reflected in the survey results showing that, of those who had thought of suicide in the last 12 months, 61% were women and 39% were men.

Those who had thought about suicide in the past 12 months were likely to have a mental or physical condition. Over 80% of people who had thought about suicide in the last 12 months had at least one major mental disorder. In particular, about half the people who had thought about suicide in the past year suffered from depression (as a mental disorder). However, only 10% of men and 16% of the women with a mental disorder had thought about suicide in the previous 12 months.

Trends in institutional care

There have been considerable changes in mental health treatment, particularly over the last 40 to 50 years. Improvements in the effectiveness of medication treatments since the 1950s have supported a movement away from the long-term institutionalisation of people with mental disorders to treatment through a range of community mental health services. This is illustrated in graph 9.20. Data from 1906 to 1971 should be interpreted with caution as definitions of psychiatric institutions differed between States and Territories.

In the past 10 years, mental health policy has been largely concerned with raising the community's awareness and understanding, and improving the human rights of those with mental disorders. More detailed information about changes in service mix, mental health expenditure and availability of psychiatric beds in the States and Territories over the last decade is provided in the National Mental Health Strategy's *National Mental Health Report 1997*.

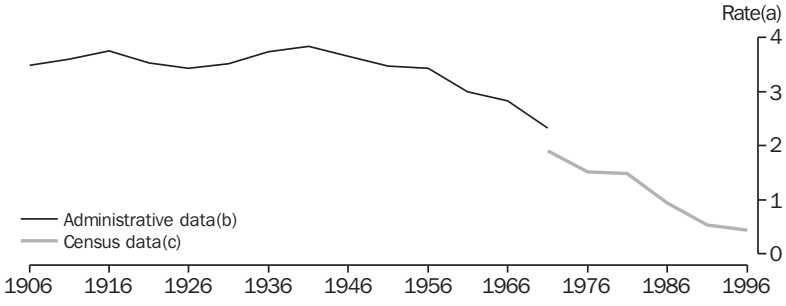
9.19 PREVALENCE OF DISORDERS OVER 12 MONTHS(a), Australian Adults(b) By Age and Whether Thought About Suicide in the Last Year(a)—1997

	Age groups (years)							
	18–24	25–34	35–44	45–54	55–64	65 & over	Total	Suicidal thoughts in last year
Disorders and conditions	%	%	%	%	%	%	%	%
Physical conditions	22.5	20.3	24.7	42.0	60.4	76.1	38.5	46.2
Mental Disorders								
Anxiety disorders	11.2	9.8	11.4	11.9	7.8	4.5	9.7	57.0
Affective disorders(c)	6.7	6.6	7.2	6.4	5.0	1.7	5.8	57.1
Substance use disorders(d)	17.5	12.3	8.5	5.3	3.2	1.1	8.2	29
Total mental disorders	*27.8*	*22.2*	*20.2*	*17.5*	*12.3*	*6.1*	*18.1*	*81.7*
No mental disorders or physical conditions	58.1	64	61.9	49.9	37.2	23.2	50.9	8.9
Total(e)	**100**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

(a) During the 12 months prior to interview. (b) Aged 18 years and over. (c) Affective disorders include mainly depressive conditions. (d) Includes harmful use and dependence on alcohol and other drugs. (e) A person may have more than one mental disorder with or without a physical condition. The components when added may therefore be larger than the total.

Source: 1997 National Survey of Mental Health and Wellbeing of Adults.

9.20 PATIENTS IN PSYCHIATRIC INSTITUTIONS AND HOSPITALS—1906 to 1996



(a) Crude rate per 1,000 population. (b) Counts of patients in Psychiatric Institutional Registers. (c) Counts of people resident in psychiatric institutions on Census night.

Source: Data for 1906 to 1971 from Psychiatric Institutional Registers in various editions of Year Book Australia; Population Census data for 1971 to 1976.

Asthma

Australia has one of the highest rates of asthma prevalence, morbidity and mortality in the world (AIHW 2000). The 1995 National Health Survey estimated that 11% of Australians (2.04 million people) had asthma, generally as a long-term condition. This represents an increase from the prevalence in 1989–90 National Health Survey, which estimated that 8.5% of Australians had the condition.

The management of asthma is an important public health issue because of the personal burden it places on its sufferers and the financial burden it places on the health system. In 1996, asthma was responsible for 2.6% of the total burden of disease in Australia (AIHW 1999). Asthma became the sixth National Health Priority area in 1999.

As illustrated in graph 9.21, asthma is particularly prevalent in children. The International Study of Asthma and Allergy in Childhood reported an estimated prevalence rate of approximately 25% in 6–7 year old Australian children and 29% in 13–14 year olds (ISAAC Steering Committee 1998). The 1995 National Health Survey found that the prevalence of asthma was most common in those aged less than 25 years, peaking in the 5–14 years age group (19%). People with asthma reported worse general health and wellbeing than people without asthma. Furthermore, asthma can cause significant disability. The 1998 Survey of Disability, Ageing and Carers estimated that over 171,000 people experienced disability associated with their asthma, resulting in restriction of daily living activities such as attendance at work or school.

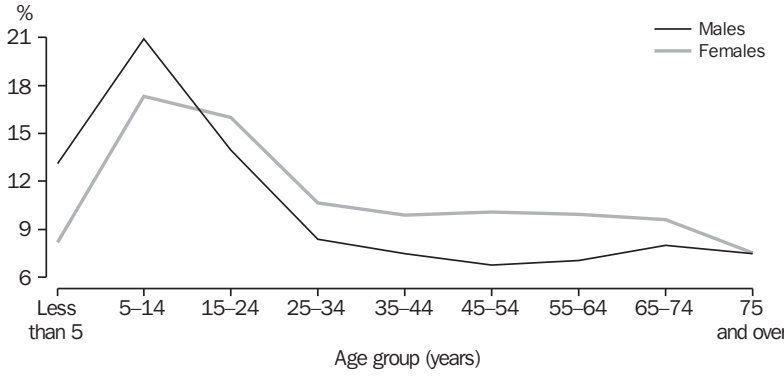
In the 1995 National Health Survey, around 90% of those with asthma reported taking a health-related action recently, in particular using medications (81%) and consulting a doctor (31%).

According to the Bettering the Evaluation and Care of Health (BEACH) survey, asthma is the sixth most frequently managed problem by general practitioners, accounting for 32 of every 1,000 encounters (AIHW General Practice Statistics and Classification Unit 1999). Asthma is also one of the top five reasons for doctors referring patients to hospital. During 1997–98 asthma was the principal diagnosis in 60,280 hospital separations (1.1% of all hospital separations), with an average stay of 3.5 days. There were 251,470 or 4.5% of hospital separations if both principal and additional diagnoses are included.

Mortality

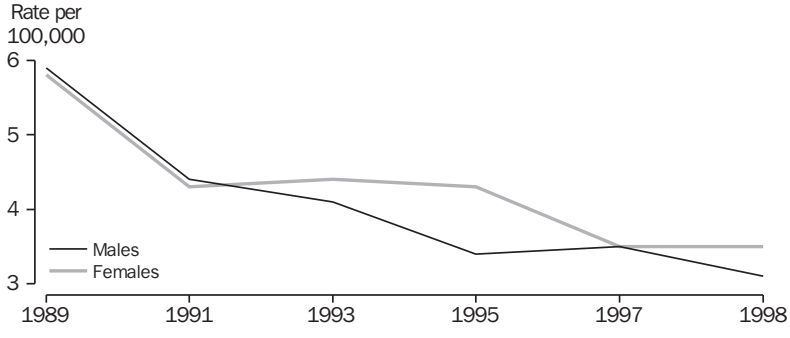
Asthma accounted for 0.5% of deaths in Australia in 1998, when 278 males and 407 females died from the disease. As graph 9.22 shows, between 1989 and 1998 the standardised death rates due to asthma declined for males (from 5.9 to 3.1 per 100,000) and females (from 5.8 to 3.5 per 100,000). In 1998 death rates were highest for those aged 65 years and over for both males and females.

9.21 PREVALENCE OF ASTHMA, By Age Group and Sex—1995



Source: 1995 National Health Survey.

9.22 STANDARDISED DEATH RATES(a) FROM ASTHMA, By Sex—1989 to 1998



(a) Standardised death rate per 100,000 of the mid-year 1991 population.

Source: Causes of Death, Australia, 1998 (3303.0).

Communicable diseases and children's immunisation

Communicable diseases

Communicable diseases (including infectious and parasitic diseases) are those diseases capable of being transmitted from one person to another, or from one species to another. In 1998 infectious diseases accounted for 1.1% of all deaths in Australia (1,355 deaths). Pneumonia and influenza accounted for a further 3.6% of deaths (4,579 deaths). Death rates increased with age and were greater for males than females aged 45 years and over.

Under the National Notifiable Diseases Surveillance System, State and Territory health authorities submit reports of communicable disease notifications for compilation by the Commonwealth Department of Health and Aged Care. The range of diseases required to be reported to State and Territory health authorities has varied over time, and case definitions of these diseases have varied from State to State. Since 1991 approximately 50 disease groups have been included, as recommended by the NHMRC.

9.23 NATIONAL NOTIFIABLE DISEASE SURVEILLANCE SYSTEM REPORTS(a)(b)

	Notifications			Rate per 100,000 population		
	1996	1997	1998	1996	1997	1998
Disease	no.	no.	no.			
Arbovirus Infection n.e.c.	52	18	81	0.3	0.1	0.4
Barmah Forest virus infection	837	704	558	4.6	3.8	3.0
Brucellosis	38	41	45	0.2	0.2	0.2
Campylobacteriosis	12 158	11 848	13 439	100.4	96.7	108.3
Chancroid	3	1	1	—	—	—
Chlamydial infection n.e.c.	8 420	9 126	11 405	69.6	74.5	87.7
Cholera	4	3	4	—	—	—
Dengue	43	210	557	0.2	1.1	3.0
Diphtheria	—	—	—	—	—	—
Donovanosis	50	45	31	0.5	0.4	0.3
Gonococcal infection	4 173	4 689	5 428	22.8	25.3	29.0
Haemophilus influenzae type b infection	51	53	35	0.3	0.3	0.2
Hepatitis A	2 150	3 076	2 503	11.7	16.6	13.4
Hepatitis B—incident	225	247	261	1.2	1.3	1.4
Hepatitis B—unspecified	n.a.	7 114	6 682	—	38.4	35.6
Hepatitis C—incident	72	81	343	0.8	0.5	2.2
Hepatitis C—unspecified(c)	9 489	19 689	19 261	89.3	106.3	102.7
Hepatitis n.e.c.	36	29	19	0.2	0.2	0.1
Hydatid infection	45	61	46	0.2	0.3	0.4
Legionnellosis	192	161	271	1.0	0.9	1.4
Leprosy	10	14	3	0.1	0.1	—
Leptospirosis	227	126	197	1.2	0.7	1.1
Listeriosis	70	71	58	0.4	0.4	0.3
Lymphogranuloma venereum	—	—	—	—	—	—
Malaria	849	746	705	4.6	4.0	3.8
Measles	498	852	306	2.7	4.6	1.6
Meningococcal infections	426	499	455	2.3	2.7	2.4
Mumps	128	191	183	0.9	1.0	1.0
Ornithosis	85	46	56	0.7	0.4	0.6
Pertussis	4 389	10 668	6 432	24.0	57.6	34.3
Q fever	555	593	571	3.0	3.2	3.0
Ross River virus infection	7 823	6 683	3 094	42.7	36.1	16.5
Rubella	2 845	1 446	772	15.5	7.8	4.1
Salmonellosis n.e.c.	5 819	7 004	7 700	31.8	37.8	41.1
Shigellosis	676	799	615	5.6	6.5	5.0
Syphilis	1 523	1 304	1 689	8.3	7.0	9.0
Tetanus	2	8	7	—	—	—
Tuberculosis	1 067	1 008	982	5.8	5.4	5.2
Typhoid(d)	84	77	69	0.5	0.4	0.4
Yersiniosis n.e.c.	268	245	207	2.2	2.0	1.7
Total	**65 382**	**89 576**	**85 096**	. .	. .	. .

(a) No notifications have been received during 1993–98 for the following: botulism (food borne), plague, rabies, yellow fever, or other viral haemorrhagic fevers. (b) Not all diseases were notifiable in every State and Territory every year. (c) Data from SA and NSW included for the first time in 1997. (d) Includes paratyphoid in NSW and Victoria, and from July 1996 in Queensland.

Source: Communicable Diseases Intelligence, Vol. 23, No. 1, January 1999; National Notifiable Disease Surveillance System Annual Report 1998, Vol. 23, No. 11, October 1999.

There was a slight decrease in the number of notifications to the National Notifiable Diseases Surveillance System from 1997 to 1998, with 85,096 notifications in 1998 (table 9.23). There was very little change in Hepatitis C (unspecified) notifications from 1997 to 1998 although it continued to account for the largest number of communicable disease notifications with 19,261 notifications in 1998. Sexually transmissible diseases, which accounted for 22% of all communicable disease notifications, also increased in 1998, with Chlamydial and Gonococcal infections continuing to rise. A slight rise in the number of food-borne disease notifications, such as for Campylobacteriosis and Salmonellosis, was detected in 1998. The rate of Dengue and Legionnellosis notifications rose substantially in 1998, while Ross River virus notifications fell. The increase in Dengue notifications was largely due to an outbreak in far

north Queensland. Rubella and measles notifications declined and measles rates remained lower than in the outbreak years of 1993 and 1994. Since surveillance began in 1991, a record low was attained for Haemophilus influenzae type b notifications in 1998. Pertussis notifications also declined in 1998 after an outbreak which peaked toward the end of 1997 (Thomson et al. 1999).

HIV and AIDS

In collaboration with the State and Territory health authorities and the Commonwealth Government, surveillance for human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS) is conducted by the National Centre in HIV Epidemiology and Clinical Research (NCHECR). This centre is part of the Faculty of Medicine, University of New South Wales and is funded primarily by the Commonwealth Department of Health and Aged Care through the Australian National Council on AIDS and Related Diseases (ANCARD).

By the end of 1999, it was estimated that 20,122 HIV cases, 8,362 AIDS diagnoses and 5,850 deaths following AIDS had occurred in Australia (table 9.24). Surveillance indicates that AIDS incidence peaked during 1994 and a steady decline was observed from 1994 to 1996. This decline can be attributed to the fall in HIV transmission in the mid 1980s and the introduction of more effective antiretroviral therapy for the treatment of HIV infection in the mid 1990s. By the end of 1999, approximately 12,000 people were estimated to be living with HIV infection in Australia.

HIV infection continues to overwhelmingly affect males (94%), and disease transmission continues to predominantly occur by sexual contact between men, accounting for about 78% of all HIV transmission in Australia (table 9.25 and graph 9.26). Between 1991 and 1999, both the total annual number of new cases of HIV and the annual number of male homosexually acquired cases declined. Although the proportion of new cases acquired through heterosexual contact has increased over this period, peaking in 1998, the number of these new cases has remained relatively stable at 140 to 190 per year.

9.24 NEWLY DIAGNOSED HIV CASES(a)(b), AIDS CASES AND DEATHS FOLLOWING DIAGNOSIS—to 1999

	Year of diagnosis										
	Prior to 1991	1991	1992	1993	1994	1995	1996	1997	1998	1999	**Total**
	no.	no.	no.	no.	no.	no.	no.	no.	no.	no.	**no.**
HIV cases(a)	11 247	1 418	1 238	1 092	1 029	941	925	794	722	699	**20 122**
AIDS cases(b)	2 623	804	788	844	955	805	657	375	315	196	**8 362**
AIDS deaths(b)	1 572	586	600	695	735	652	505	236	157	112	**5 850**

(a) Not adjusted for multiple reporting. Total includes 17 cases for which the date of HIV diagnosis was not reported. (b) AIDS cases and deaths following AIDS in 1996, 1997, 1998 and 1999 were adjusted for reporting delays; AIDS cases and deaths in previous years were assumed to be completely reported.

Source: HIV/AIDS and Related Diseases in Australia, Annual Surveillance Report 1999, National Centre in HIV Epidemiology and Clinical Research.

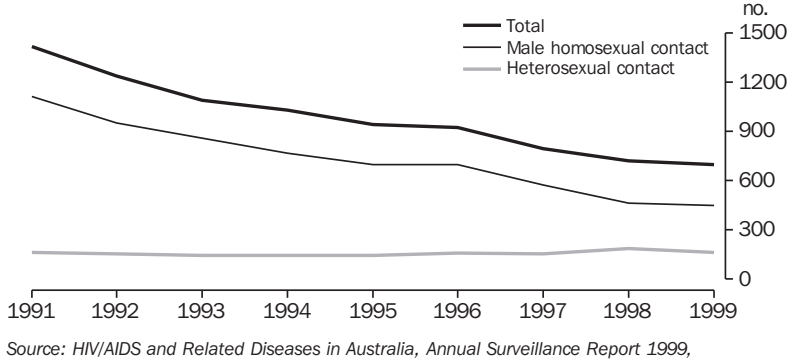
9.25 CHARACTERISTICS OF CASES OF NEWLY DIAGNOSED HIV INFECTION(a), Number of Cases and Percentage of Total Cases—to 1999

		Year of HIV diagnosis										
	Unit	Prior to 1991	1991	1992	1993	1994	1995	1996	1997	1998	1999	**Total(b)**
Total cases	no.	11 247	1 418	1 238	1 092	1 029	941	925	794	722	699	20 122
Males	%	95.6	94.0	92.9	93.1	91.4	92.2	92.1	91.0	87.4	88.7	**93.9**
State/Territory												
New South Wales	%	61.1	57.4	57.7	55.7	49.7	57.8	50.4	51.6	51.2	51.7	**58.0**
Victoria	%	20.5	21.6	20.4	20.3	21.1	17.7	20.2	22.7	19.4	19.7	**20.5**
Queensland	%	7.9	11.1	12.4	12.6	16.2	12.3	16.8	14.2	14.4	17.3	**10.5**
South Australia	%	3.5	3.2	2.7	5.0	3.6	3.3	5.0	4.4	4.7	3.2	**3.7**
Western Australia	%	4.8	5.2	4.2	4.7	7.2	6.2	5.9	4.7	6.8	5.6	**5.1**
Tasmania	%	0.4	0.4	0.8	0.2	0.2	0.6	0.3	0.0	0.4	0.4	**0.4**
Northern Territory	%	0.5	0.4	0.5	0.9	0.7	0.2	0.5	1.4	1.7	1.0	**0.6**
Australian Capital Territory	%	1.3	0.7	1.3	0.6	1.3	1.9	0.9	1.0	1.4	1.1	**1.2**
Exposure category(c)												
Male homosexual contact	%	82.2	78.4	77.0	78.6	74.6	74.0	75.5	72.4	64.4	64.0	**78.4**
Male homosexual contact and injecting drug use	%	3.4	3.2	3.7	3.7	5.9	5.0	3.6	4.2	4.9	5.9	**3.8**
Injecting drug use(d)	%	4.9	4.7	5.0	3.5	3.3	4.4	2.8	3.0	3.3	5.7	**4.5**
Heterosexual contact	%	4.0	11.6	12.4	13.4	14.2	15.2	17.0	19.3	26.1	23.4	**9.7**
Haemophilia/coagulation disorder	%	3.3	0.4	0.4	0.0	0.0	0.2	0.0	0.0	0.2	0.5	**1.8**
Receipt of blood/tissue	%	2.1	1.1	1.1	0.3	0.9	0.4	0.2	0.1	0.6	0.3	**1.4**
Mother with/at risk of HIV infection	%	0.1	0.5	0.4	0.5	1.0	0.8	0.9	1.0	0.5	0.2	**0.4**
Other/undetermined	%	24.7	18.0	12.0	10.4	6.4	8.9	11.0	12.1	12.7	16.9	**19.1**

(a) Not adjusted for multiple reporting. (b) Total includes 17 cases in males for which the date of HIV diagnosis was not reported. (c) The 'Other/undetermined' category was excluded from the calculation of the percentage of cases attributed to each HIV exposure category. (d) Excludes males who also reported a history of homosexual/bisexual contact.

Source: HIV/AIDS and Related Diseases in Australia, Annual Surveillance Report 1999, National Centre in HIV Epidemiology and Clinical Research.

9.26 NUMBER OF NEWLY DIAGNOSED CASES OF HIV INFECTION, By Exposure Category, Australia—1991 to 1999



Source: HIV/AIDS and Related Diseases in Australia, Annual Surveillance Report 1999, National Centre in HIV Epidemiology and Clinical Research.

Children's immunisation

Immunisation coverage goals for Australia for the year 2000, recommended by the National Health and Medical Research Council (NHMRC), call for 90% or more coverage of children at two years of age, and near universal coverage of children at school-entry age, against diphtheria, tetanus, pertussis (whooping cough), poliomyelitis, measles, mumps, rubella and hib (haemophilus influenza type b).

The Australian Childhood Immunisation Register (ACIR), which commenced operation on 1 January 1996, aims to provide accurate and comprehensive information about immunisation coverage for all children under the age of seven. The register is administered by the Health Insurance Commission (HIC) on behalf of the Commonwealth Department of Health and Aged Care, and is a key component of initiatives to improve the immunisation status of Australian children.

ACIR data indicated that, at June 2000, 88% of one year olds and 82% of two year olds were fully immunised according to the NHMRC Recommended Immunisation Schedule. State summaries by age group based on ACIR data are published quarterly in Communicable Diseases Intelligence (CDI) bulletin.

Chronic diseases and risk factors

The World Health Organization has endorsed a global strategy for the prevention and control of non-communicable diseases. Non-communicable diseases are to an extent preventable. Four of the most prominent non-communicable diseases—cardiovascular disease, diabetes, cancer, and chronic obstructive pulmonary disease—share common modifiable behavioural risk factors, namely tobacco use, unhealthy diet and physical inactivity.

These four diseases are among the leading causes of death, and among the leading causes of burden of disease. Cancer, diseases of the circulatory system and diseases of the respiratory system were the three leading classes of cause of death in Australia in 1998.

In Australia in 1996, the ten leading causes of burden of disease were Ischaemic heart disease, stroke, chronic obstructive pulmonary disease, depression, lung cancer, dementia, diabetes mellitus, colorectal cancer, asthma, and osteoarthritis (table 9.27). Burden of disease was measured using the disability-adjusted life year (DALY), which takes into account the impact of disability and other non-fatal health outcomes, as well as the impact of premature death. One DALY is equivalent to one lost year of 'healthy' life; and burden of disease is a measurement of the difference between current health status and the ideal of living into old age free of disease and disability.

Considerable proportions of the overall burden of disease in Australia in 1996 were attributable to a number of major risk factors (table 9.28). The leading risk factor, tobacco smoking, was responsible for 10% of the total burden of disease, followed by physical inactivity (7%), high blood pressure (5%) and obesity (4%). Insufficient intake of fruits and vegetables (fewer than five servings per day) caused an estimated 3% of the total burden of disease and 11% of the cancer burden.

The following analysis of the three risk factors: tobacco smoking, physical inactivity and insufficient intake of fruits and vegetables, is based on data from the 1995 National Nutrition Survey. It should be noted that estimates on smoking and exercise may differ slightly from estimates generated from the 1995 National Health Survey which have been published elsewhere.

Smoking

In 1995, 21% of Australians aged 18 years and over regularly smoked, i.e. smoked more than one cigarette per day. Smoking rates were higher for males than for females, although smoking rates for both sexes followed similar patterns, generally falling with age.

9.27 LEADING 10 CAUSES OF BURDEN OF DISEASE AND INJURY, Percentage of Total Disability-adjusted Life Years—1996

Leading causes of Burden	% of total
Males	
Ischaemic heart disease	13.6
Stroke	4.8
Lung cancer	4.5
COPD(a)	4.2
Suicide	3.3
Road traffic accidents	3.0
Diabetes mellitus(b)	3.0
Depression	2.7
Colorectal cancer	2.7
Dementia	2.5
Females	
Ischaemic heart disease	11.1
Stroke	6.1
Depression	4.8
Dementia	4.7
Breast cancer	4.6
COPD(a)	3.2
Asthma	3.1
Diabetes mellitus(b)	3.0
Osteoarthritis	2.9
Colorectal cancer	2.7
Persons	
Ischaemic heart disease	12.4
Stroke	5.4
COPD(a)	3.7
Depression	3.7
Lung cancer	3.6
Dementia	3.5
Diabetes mellitus(b)	3.0
Colorectal cancer	2.7
Asthma	2.6
Osteoarthritis	2.2

(a) Chronic obstructive pulmonary disease (chronic bronchitis and emphysema). (b) Includes type 1 and type 2 diabetes.

Source: Mathers C.D., Vos E.T., Stevenson C.E. & Begg S.J., "The Australian Burden of Disease Study: measuring the loss of health from diseases, injuries and risk factors", The Medical Journal of Australia, Vol. 172, 19 June 2000.

However, the proportion of the population who had ever smoked regularly was quite different for men and women. This is largely an outcome of historical differences in smoking prevalence between the sexes. Around half of 25–34 year old males and females had smoked regularly at some stage in their lives. This reflects that in recent years the gap between smoking rates for men and women has been relatively small. However, this gap has been much greater historically, and so 72% of 65–74 year old males had ever smoked (the highest proportion of any age group), compared to only 39% of 65–74 year old women (graph 9.29). In older age groups, the proportion of men and women who had ever smoked decreases. This is likely to be a reflection of greater survival into older age groups by those who had never smoked, rather than historical patterns of smoking prevalence.

Physical inactivity

In 1995, 30% of Australians aged 15 years and over did no exercise for sport, recreation or fitness in a designated two-week period. The proportion of people who did no exercise increased slightly with age, from 26% of 18–24 year olds to 34% by 65–74, and 44% of people aged 75 years or more (graph 9.30). There was very little difference between males and females.

The intensity of exercise decreased more sharply with age, and there was a greater sex difference, with males more likely to engage in vigorous exercise than females. The duration of exercise, however, had a different age pattern, with the most exercise being undertaken by people aged 15–24 and 65–74, outside the prime working ages. Men, on average, spent more time exercising than women did.

9.28 BURDEN OF DISEASE ATTRIBUTABLE TO 10 MAJOR RISK FACTORS—1996

	% of total disability-adjusted life years (DALYs)		
Risk Factor	Males	Females	Persons
Tobacco	12.1	6.8	9.7
Physical inactivity	6.0	7.5	6.7
High blood pressure	5.1	5.8	5.4
Alcohol harm	6.6	3.1	4.9
Alcohol benefit	–2.4	–3.2	–2.8
Obesity	4.3	4.3	4.3
Lack of fruit and vegetables	3.0	2.4	2.7
High blood cholesterol level	3.2	1.9	2.6
Illicit drugs	2.2	1.3	1.8
Occupation	2.4	1.0	1.7
Unsafe Sex	1.1	0.7	0.9

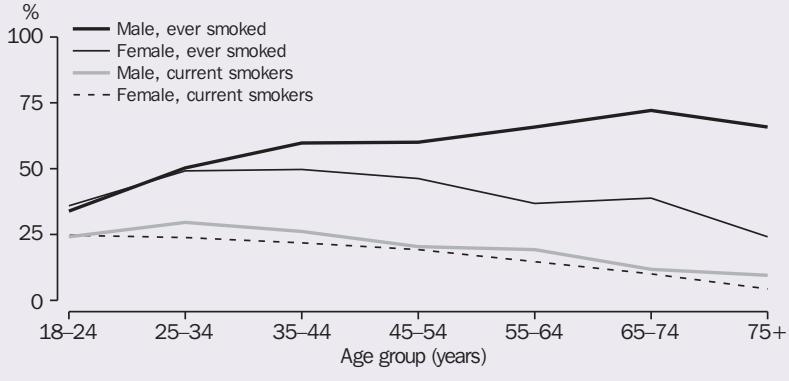
Source: Mathers C.D., Vos E.T., Stevenson C.E. & Begg S.J., "The Australian Burden of Disease Study: measuring the loss of health from diseases, injuries and risk factors", The Medical Journal of Australia, Vol. 172, 19 June 2000.

Fruit and vegetable consumption

In 1995, about a quarter (26%) of Australians aged 18 years and over reported that they usually ate one serve or less of vegetables per day, and 50% usually ate one serve or less of fruit per day. Approximately one-fifth (18%) of Australians aged 18 years and over fell into both categories, eating almost no fruit or vegetables.

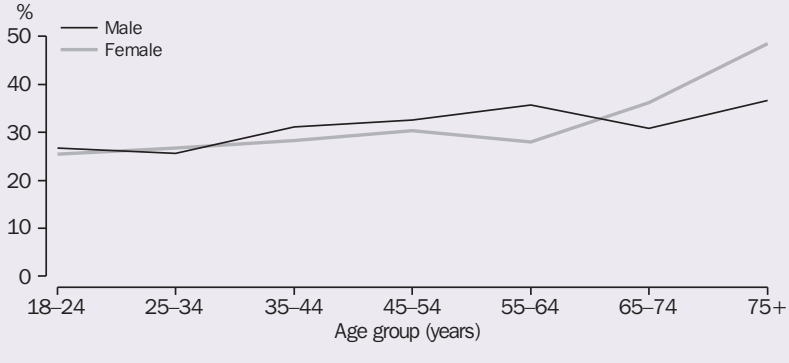
The proportion of the population with almost no fruit or vegetable intake generally decreased with age (graph 9.31). The highest rate was among 18–24 year olds, of whom 30% of males and 22% of females reported that they usually ate less than one serve each of fruit and vegetables per day.

9.29 AUSTRALIAN ADULTS, Proportion Who Had Ever or Currently Smoked—1995



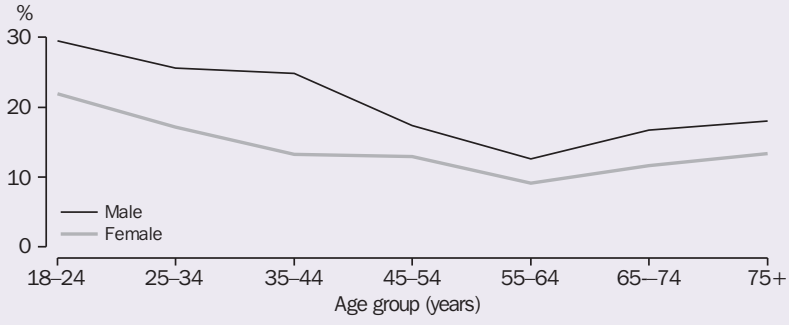
Source: Unpublished data, 1995 National Health and Nutrition Survey.

9.30 AUSTRALIAN ADULTS, Proportion Doing No Exercise in Previous Two Weeks—1995



Source: Unpublished data, 1995 National Health and Nutrition Survey.

9.31 AUSTRALIAN ADULTS, Proportion With Almost No(a) Intake of Fruit or Vegetables—1995



(a) People who usually eat one serve or less per day of both fruit and vegetables.

Source: Unpublished data, 1995 National Health and Nutrition Survey.

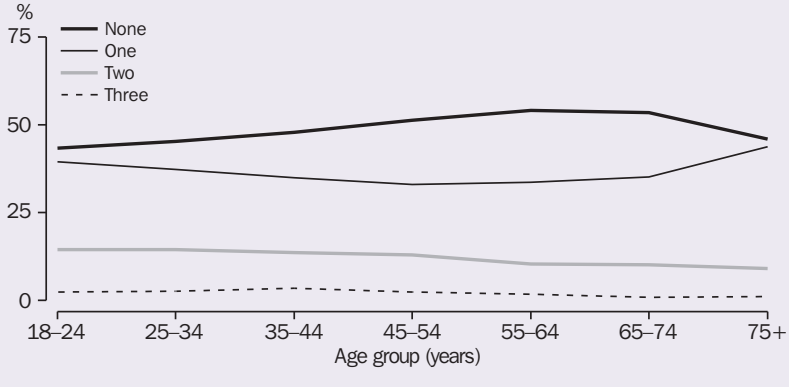
Number of risk factors

In 1995 nearly half of all Australian adults did not smoke, took some exercise, and usually had at least one serve of fruit and/or vegetables per day (graph 9.32). More than a third (36%) had one of the risk factors, 13% had two risk factors, and 2% of all adults aged 18 years and over smoked, took no exercise, and ate almost no fruit or vegetables. About half of the adult population had none of the three risk factors, including 46% of males and 51% of females.

The proportion of people with all three risk factors varied between 4.6% of 35–44 year old males and 0.5% of 55–64 year old females, while the proportion with none of these risk factors ranged from 40% of 18–24 year old males to 58% of 55–64 year old females.

In virtually all age groups, men are more likely than women to exhibit all three risk factors, although the relationship with age is similar for both males and females.

9.32 ADULT AUSTRALIANS, Proportion By Number of Risk Factors—1995



Source: Unpublished data, 1995 National Health and Nutrition Survey.

Combination of risk factors

About half the people who smoked also had other risk factors, with 12% of smokers, or 2% of the adult population, also having no physical exercise, and almost no fruit or vegetable intake (table 9.33).

About three-fifths (61%) of people who took no physical activity had neither of the other risk factors. This was true for 44% of people who ate almost no fruit or vegetables, and 47% of people who smoked.

While only 2% of the adult population had all three risk factors, this is more than twice the proportion that could be expected if there were no correlation between these risk factors (if there were no correlation between the three risk factors, then 1.1% of Australians (21% of 18% of 30%) would be in this group).

9.33 AUSTRALIAN ADULTS, Combination of Risk Factors—1995

	Smoker	Non smoker	**Total**
Combination of risk factors	%	%	**%**
Physically inactive			
Almost no fruit or vegetables	2.4	4.3	**6.7**
Some fruit or vegetables	5.1	18.4	**23.5**
Total	7.5	22.7	**30.2**
Physically active			
Almost no fruit or vegetables	3.5	8.0	**11.5**
Some fruit or vegetables	9.8	48.5	**58.3**
Total	13.3	56.5	**69.8**
Totals			
Almost no fruit or vegetables	5.9	12.3	**18.2**
Some fruit or vegetables	15.0	66.9	**81.8**
Total	20.8	79.2	**100.0**

Source: Unpublished data, 1995 National Health and Nutrition Survey.

Health care delivery and financing

Government role

The Commonwealth has a leadership role in policy formulation, particularly in areas such as public health, research and national information management. It funds most non-hospital medical services, pharmaceuticals and health research. With the States and Territories, it jointly funds public hospitals, and home and community care for aged and disabled persons. Residential facilities for aged persons are funded by a number of sources, including the Commonwealth. Public health insurance is provided through Medicare, which is discussed in more detail later in this chapter.

The States and Territories are primarily responsible for the delivery and management of public health services and the regulation of health care providers. They deliver public hospital services and a wide range of community and public health services. For example, some State and Territory government funded organisations provide school dental care and dental care for low income earners, with other dental care being delivered in the private sector without government funding. Local governments within States deliver most environmental health programs.

Public hospitals, which provide the majority of acute care beds, are funded by the Commonwealth Government and the State and Territory Governments, in addition to receiving revenue from services to private patients. Large urban public hospitals provide most of the more complex types of hospital care such as intensive care, major surgery, organ transplants and renal dialysis, as well as non-admitted patient care. Public hospitals have their own pharmacies which provide medicines to in-patients free of charge and do not attract direct Commonwealth subsidies under the Pharmaceutical Benefits Scheme. This is discussed in more detail later in this chapter.

A small number of doctors and paramedical professionals are salaried employees of the various tiers of government. Many salaried specialist doctors in public hospitals are able to treat some

private patients in hospital and usually contribute to the hospital a portion of the income earned from fees charged. Other doctors may contract with public hospitals to provide medical services.

Private sector role

The strong private sector, operating in the delivery of, and insurance for, health services, receives substantial direct and indirect government subsidies. Within this sector, organisations operating for profit and not for profit play a significant role in providing health services, public health and health insurance. For example, privately owned nursing homes provide the majority of long-term aged care beds.

In the past, private hospitals tended to provide less complex non-emergency care, such as simple elective surgery. However, they are increasingly providing complex, high technology services. Separate centres for non-admitted and day-only admitted patient surgical procedures are mostly located in the private sector. The private sector includes a large number of doctors and paramedical professionals who are self-employed, generally providing services such as general practice and specialist services, diagnostic imaging, pathology and physiotherapy.

Most prescribed pharmaceuticals dispensed by private sector pharmacies are directly subsidised by the Commonwealth through the Pharmaceutical Benefits Scheme.

An important component of the Australian health care system is private health insurance, which can cover part or all of the hospital charges to private patients directly, a portion of medical fees for services provided to private admitted patients in hospitals, paramedical services and some aids such as spectacles. The Commonwealth subsidises private health insurance premiums through the 30% rebate.

National health care system

Australia has a national system for the delivery of health care which generally covers all permanent residents of Australia. The system is financed largely by general taxes, a proportion of which is raised by an income related Medicare levy. This is discussed in more detail in the following section.

There are five major kinds of Commonwealth health funding mechanisms:

- Health Care Agreement Grants to State and Territory Governments for the operation of public hospitals and a range of other health services;
- medical benefits, providing patients with rebates on fees paid to privately practising doctors and optometrists;
- pharmaceutical benefits, via the Pharmaceutical Benefits Scheme, providing patients with access to a broad range of subsidised medicines;
- Health Program Grants to government and non-government service providers for a range of health services (for example, radiation oncology (capital component), pathology and primary medical services). Health Program Grants are used to achieve health policy objectives such as improving access for specific population groups, influencing the growth and distribution of selected and potentially high cost services, or providing an alternative to fee-for-service arrangements, such as the Medicare and Pharmaceutical Benefits Schemes; and
- the 30% private health insurance rebate.

In addition to the specific funding mechanisms mentioned above, health services receive part of the general purpose grants provided by the Commonwealth to State and Territory Governments.

Medicare levy

When Medicare began in 1984, the levy was introduced as a supplement to other taxation revenue, to enable the Government to meet the additional costs of the universal national health care system which were greater than the more restricted systems that preceded it.

The Medicare levy, which was increased from 1% to 1.25% of taxable income on 1 December 1986, increased to 1.4% on 1 July 1993 and to 1.5% on 1 July 1995.

For 1999–2000, the general Medicare levy rate was 1.5% of taxable income. No levy was payable by individuals with income less than $13,550 per year or by families with income less than $22,865, with a further $2,100 per year allowed for each child. Single people with incomes above $50,000 and families with incomes above $100,000, with a further $1,500 after the first child, who were not covered by private health insurance, paid a levy of 2.5% of taxable income, which includes a 1% Medicare Levy Surcharge.

In a Government decision of 24 May 2000, high income earners ($50,000 single, $100,000 families) who purchase a high front end deductible (FED) health insurance product are not exempt from the Medicare Levy Surcharge

from 1 July 2000. A high FED costs over $500 for single participants and over $1,000 for families.

In 1998–99, revenue raised from the Medicare levy was approximately 17% of total Commonwealth health expenditure and 8.2% of total national health expenditure. The Australian Taxation Office estimated revenue from the Medicare levy to be $4.1b in 1998–99.

The Commonwealth Government's funding of hospitals

In 1998–99, the Commonwealth contributed $5.6b to the States in public hospital funding under the Australian Health Care Agreements through Health Care Grants.

Of this amount, approximately $5.5b was paid to the States under the General and Adjustments components of Base Health Care Grants. The remainder of Base Health Care Grants consisted of funding for:

- mental health for the implementation of the Second National Mental Health Plan—$50m;
- quality improvement and enhancement to fund and reward quality improvement and enhancement practices in our hospitals—$75m; and
- palliative care, to implement the National Palliative Care Strategy—$28m.

The remainder of funding under the Agreements is available for national initiatives in the areas of mental health, palliative care and case mix development.

Total health expenditure

For 1998–99, the preliminary estimate of total expenditure on health services (including both public and private sectors) was just over $50.3b, compared with expenditure of just over $47b in 1997–98. This represented an average rate of health services expenditure in 1998–99 of $2,671 per person. In 1998–99, governments provided more than two-thirds (70%) of the funding for health expenditure, while the remaining 30% was provided by the private sector. Health expenditure in volume terms grew at an average annual rate of 4.1% between 1989–90 and 1998–99 (table 9.34). In 1998–99, health services expenditure as a proportion of Gross Domestic Product (GDP) was 8.5%. This represented an increase from 8.3% in 1996–97 and 1997–98 and 8.2% in each of the years 1991–92 to 1995–96.

Based on available data, it was estimated that about $853m was spent on health services provided to Indigenous people in 1995–96. This figure represented 2.2% of total health expenditure for that year, and included both government and private expenditure. In 1995–96 the estimated expenditure per person was $2,320 for Indigenous people, compared to $2,163 for non-Indigenous people (Deeble et al. 1998).

9.34 TOTAL HEALTH EXPENDITURE(a) AND RATE OF GROWTH

	Expenditure		Rate of growth	
	Current prices	Chain volume measures(a)	Current prices	Chain volume measures(a)
Year	$m	$m	%	%
1989–90	28 800	34 609	n.a.	n.a.
1990–91	31 270	35 313	8.6	2.0
1991–92	33 087	36 377	5.8	3.0
1992–93	34 993	38 304	5.8	5.3
1993–94	36 787	39 798	5.1	3.9
1994–95	38 967	41 324	5.9	3.8
1995–96	41 783	43 392	7.2	5.0
1996–97	44 482	45 330	6.5	4.5
1997–98	47 030	47 030	5.7	3.7
1998–99(b)	50 346	49 503	7.1	5.3
Average annual growth rate 1989–90 to 1992–93	. .	. .	6.7	3.4
Average annual growth rate 1992–93 to 1998–99	. .	. .	6.1	4.2
Average annual growth rate 1989–90 to 1998–99	. .	. .	6.4	4.1

(a) Reference year 1997–98. Chain volume measures are discussed in detail in the section Chain volume or 'real' GDP of Chapter 29, National accounts. (b) Based on preliminary AIHW and ABS estimates.

Source: Australian Institute of Health and Welfare, Health Expenditure Data Base.

Hospitals

Public hospitals

In 1998–99 there were 755 public hospitals nationally, including 29 psychiatric hospitals, compared to 745 in 1994–95. There were an average of 53,885 beds in public hospitals during 1998–99 (table 9.35), representing 68% of all beds in the hospital sector (public and private hospitals combined). Public hospital beds have declined from 3.3 beds per 1,000 population in 1994–95 to 2.9 beds in 1998–99.

The number of patient separations (discharges, deaths, and transfers) from public hospitals during 1998–99 was 3.9 million, compared with 3.4 million in 1994–95. Same-day separations accounted for 45% of total separations in 1998–99 compared to 38% in 1994–95.

Total days of hospitalisation for public health patients during 1998–99 amounted to 16.3 million, an increase of 4.5% since 1994–95. The average length of hospital stay per patient in 1998–99 was 4.2 days. For 1994–95 the corresponding figure was 4.6, reflecting the lower numbers of same-day patients compared to 1998–99. If same-day patients are excluded, the 1998–99 average length of stay was 6.8 days, compared with 6.7 days in 1994–95.

An average of 175,535 staff (full-time equivalent) were employed at public hospitals in 1998–99, of whom 45% were nursing staff and 9% were salaried medical officers. Revenue amounted to $1,176m. Most of this revenue (62%) was from patients' fees and charges. Recurrent expenditure amounted to $13,667m, of which 63% was for salaries and wages. The difference between revenue and expenditure is made up by payments from State/Territory consolidated revenue and specific payments from the Commonwealth for public hospitals, in roughly equal proportions.

Private hospitals

There were 502 private hospitals in operation in 1998–99, comprising 286 acute hospitals, 26 psychiatric hospitals and 190 free-standing day hospital facilities. The number of acute and psychiatric hospitals has declined each year since 1994–95 when 328 of these hospitals were in operation. In contrast, day hospital facilities have shown strong growth for several years, and numbered 125 in 1994–95.

The average number of beds available at private acute and psychiatric hospitals for admitted patients increased by 6% to 23,746 between 1994–95 and 1998–99. The increase in the numbers of beds and decline in the number of hospitals indicates that these hospitals are becoming larger in size. There were 1.3 private hospital beds available per 1,000 population in 1998–99. The average number of beds or chairs at free-standing day hospital facilities (used mainly for short post-operative recovery periods) increased over the same period by 55% to 1,460. This large increase reflects the substantial growth in the numbers of free-standing day hospitals in recent years.

Private hospital separations in 1998–99 totalled 2.0 million, of which 85% were from private acute and psychiatric hospitals and 15% from free-standing day hospital facilities. Same day separations accounted for 55% of all private hospital separations (compared with 45% of public hospital separations). This higher proportion of same day separations contributed to the lower average length of stay in private hospitals (3.2 days) compared to public hospitals (4.2 days) (table 9.35).

The average number of full-time equivalent staff employed at all private hospitals was 44,372, of whom 60% were nursing staff. Total operating expenditure for private acute and psychiatric hospitals during 1998–99 amounted to $3,614m. Some 58% of this amount was spent on salaries and wages (including on-costs). Revenue received during the year was $3,798m, of which 91% was received as payments from or in respect of patients. Total operating expenditure for free-standing day hospital facilities during 1998–99 amounted to $137m, and revenue received during the year was $161m.

9.35 PUBLIC AND PRIVATE HOSPITALS—1998–99

	Unit	Public(a)	Private(b)	**Total**	Private hospitals as a proportion of total hospitals (%)
Bed supply					
Facilities	no.	755	502	**1 257**	39.9
Beds/chairs(c)	no.	53 885	(d)25 206	**(d)79 091**	31.9
Activity					
Total separations	'000	3 859	1 986	**5 845**	34.0
Same day separations	'000	1 718	1 094	**2 812**	38.9
Total patient days	'000	16 274	6 343	**22 617**	28.0
Average length of stay	days	4.2	3.2	**3.9**	n.a.
Average length of stay excluding all same-day separations	days	6.8	5.9	**6.5**	n.a.
Average occupancy rate	%	82.7	(e)69.7	**(e)78.8**	n.a.
Non-admitted patient occasions of service	'000	34 450	1 733	**36 183**	4.8
Staff (full-time equivalent)(c)	'000	176	44	**220**	20.2
Revenue	$m.	1 176	3 959	**5 135**	77.1
Recurrent expenditure	$m.	(f)13 677	3 751	**17 428**	21.5

(a) Acute and psychiatric hospitals. (b) Acute and psychiatric hospitals and free-standing day hospital facilities. (c) Annual average. (d) Including beds, chairs, recliners at free-standing day hospital facilities. (e) Excluding free-standing day hospital facilities. (f) Excluding depreciation.

Source: Australian Hospital Statistics, 1998–99, Australian Institute of Health and Welfare; Private Hospitals, Australia, 1998–99 (4390.0).

Hospital care under Medicare

Under the Australian Health Care Agreements between the Commonwealth Government and the State/Territory Governments, all eligible people are entitled to free accommodation, medical, nursing and other care as public patients in public hospitals.

Alternatively, patients may choose to be private patients in public hospitals, enabling them to choose their doctors. Medicare-eligible patients who elect to be private patients in public hospitals are charged separate fees for medical and hospital care. If patients have private insurance, this will usually cover all or part of the charges by a public hospital. Medicare pays benefits subsidising part of the cost of doctors' charges, while private insurance pays an additional amount towards these charges and other costs (e.g. surgically implanted prostheses) incurred as part of the hospital stay.

Private patients in private hospitals are charged doctors' fees and are billed by the hospital for accommodation, nursing care and other hospital services. If the patient holds private health insurance, it will contribute to the payment of these costs. Eligible Medicare patients in private hospitals generally attract Medicare benefits for doctors' fees.

The rate of Medicare benefit for doctors' services provided to a private patient in hospital, or an approved day surgery, is 75% of the Medicare Benefits Schedule (MBS) fee. The MBS lists a wide range of medical service items with a scheduled fee for each item. Registered private health insurers offer insurance to Medicare-eligible patients for the difference between 75% and 100% of the Schedule fee, and in some cases an additional amount agreed with the hospital and doctor to ensure that the patient has no out-of-pocket medical cost.

Medicare benefits for private doctors' and optometrists' services

Costs incurred by patients receiving private doctors' services, and some optometrists' services, are generally reimbursed, either fully or in part, through Medicare benefits. These benefits are administered by the Health Insurance Commission through its Medicare Offices.

MBS fees are used to calculate Medicare benefit entitlements, but doctors are able to determine their own fees, provided the service is not 'bulk-billed'. If the service is bulk-billed by agreement between the doctor and patient, the doctor must accept the Medicare benefit, paid directly to the doctor, as payment in full.

The rate of benefit for outpatient medical services, such as visits to doctors in their rooms, is 85% of the MBS fee. Once the difference between the Schedule fee and benefit is more than $50.90 (indexed annually) the benefit is the Schedule fee less $50.90.

In any year, if the sum of the 'gap' payments (being payments above the benefit level and up to the level of the Schedule fee) for non-hospital services for an individual or registered family exceeds a specified amount ($285 for 2000), all further benefits for the remainder of that year are paid at 100% of the Schedule fee.

For private medical services provided in hospital, Medicare benefits are payable at a different rate, as described in the preceding section.

Private insurers are prohibited from insuring all or part of non-hospital services which attract Medicare benefits. They may insure part of the fee for in-hospital medical services, as described in the preceding section.

Pharmaceutical Benefits Scheme (PBS)

The Commonwealth Government provides Medicare eligible persons with affordable access to a wide range of necessary and cost effective prescription medicines through the PBS. The following details relate to charges and safety net levels applying at 1 January 2000.

Medicare eligible-patients who do not hold a Health Care Card, Pensioner Concession Card or Commonwealth Seniors Health Card, are required to pay the first $20.60 for each prescription item. Concessional patients who hold a concession card must pay $3.30 per prescription item.

Individuals and families are protected from large overall expenses for PBS listed medicines by safety nets. For general patients (non-cardholders), once the eligible expenditure of a person and/or their immediate family exceeds $631.20 within a calendar year, the additional payment the patient has to make per item (co-payment) decreases from $20.60 to the concessional co-payment rate of $3.30.

For concessional and pensioner patients (cardholders), once their total eligible expenditure exceeds $171.60 within a calendar year, any further prescriptions are free for the remainder of that year. All pensioners continue to have their pensions supplemented by a pharmaceutical allowance of $2.80 per week payable fortnightly, or $145.60 per year, to help defray their out-of-pocket pharmaceutical expenses. The allowance is not paid to other concessional beneficiaries.

Patients may pay more than the relevant co-payment where there is more than one brand of the same drug or alternative product that produces similar results. The Government subsidises on the basis of the lowest priced drug and any difference in price due to brand or product preferences must be met by the patient. The premium is not eligible to be counted towards the patient's safety net.

In 1999–2000 the PBS dealt with over 138 million benefit prescriptions, representing a cost to the Government of $2,795.6m and a total cost, including co-payments, of $3,187.2m.

The number of PBS prescriptions per capita in 1999–2000 was 7.2, compared with 6.8 in 1998–99. The number of benefit prescriptions increased by 7.1% over the previous year, and the cost to government of these prescriptions grew by 14% at current prices.

The rate of growth in prescription numbers and their cost continues to reflect the ongoing trend towards the prescription of newer and more costly medicines. The average dispensed price (in current dollars) for PBS medicine in 1999–2000 was $27.82, compared with $26.36 in 1998–99. Average PBS dispensed price as a percentage of Average Weekly Earnings remained effectively constant at 3.6% in 1999–2000, compared to 3.7% in 1998–99.

9.36 PERSONS WITH PRIVATE INSURANCE, Proportion of Total Population

	June						
	1990	1992	1994	1996	1997	1998	1999
	%	%	%	%	%	%	%
With private hospital cover	44.5	41.0	37.2	33.6	31.9	30.5	30.5
With private ancillary cover	39.9	37.5	34.5	32.9	31.6	31.7	31.9

Source: Private Health Insurance Administration Council, Quarterly Statistics, June 1999.

Private health insurance

Private health insurance is offered by 44 registered health insurers, giving a voluntary option to all Australians for private funding of their hospital and ancillary health treatment. It supplements Australia's Medicare system, which provides a tax-financed public system that is available to all Australians. Depending on the type of cover purchased, private health insurance provides cover against all or part of hospital theatre and accommodation costs in either a public or private hospital, medical costs in hospital, and costs associated with a range of services not covered under Medicare including private dental services, optical, chiropractic, home nursing, ambulance and natural therapies.

The private health sector funds around one-third of all health care in Australia. A sustainable balance is being sought between the public and private health care sectors to ensure a high level of access and choice now and into the future.

Health insurance coverage

The proportion of the population with private health insurance has continued to decline over the last decade. At June 1999, 31% of the population had private hospital cover, and 32% held ancillary cover (table 9.36).

Rebate on private health insurance premiums

In response to declining coverage of the population by private health insurance, from 1 January 1999 the Commonwealth Government introduced a 30% Rebate on premiums paid for private health insurance. All Australians eligible for Medicare and covered by a health insurance policy offered by a registered health fund are eligible for the Rebate. The Rebate gives people 30% of the cost of private health insurance premiums on hospital cover, ancillary cover and a combination of both. Since the Rebate is set at 30% of the actual cost of premiums, it keeps pace with any increases in individual fund or product premiums. The Rebate can be taken as a direct premium reduction, a refundable tax rebate or a direct payment available from Medicare offices.

Community rating and reinsurance

Community rating is the underlying principle of the current private health insurance system. Community rating means that people cannot be discriminated against in obtaining health insurance on the basis of health risk. Community rating requires that in setting premiums, or paying benefits, private insurers cannot discriminate between contributors on the basis of health status, age, race, gender, sexuality, use of hospital or medical services, or general claims history.

The principle of community rating is supported by a reinsurance system within the private health insurance industry.

Reinsurance supports the principle of community rating by sharing between health insurers the hospital and medical costs of high risk members admitted to hospital. Insurers with a greater proportion of low risk members (generally the young) pay contributions into the reinsurance pool while those with a greater proportion of high risk groups (the chronically ill and the aged) receive transfers from the pool.

Recent initiatives in private health insurance

Recent initiatives include the following.

- Developing 'no gap' or 'known gap' products—uncapped medical bills charged by practitioners to privately insured hospital patients have raised issues concerning the amount of the 'gap' fee, as well as the fact that patients may be unaware of the likely financial implications until after their treatment is complete. Private insurers are required to have in place 'no gap' and 'known gap' products by July 2000.
- Simplified billing—this addresses the problems of multiple bills and unforeseen out-of-pocket costs for private patients. Simplified billing encourages hospitals, doctors and health funds to work together to simplify the billing process and make sure that patients are informed about any out-of-pocket costs they may have

before they go into hospital. Patients benefit by receiving only one or two bills, rather than many from various doctors, and claims from health funds and Medicare are made on the patient's behalf.

- Lifetime Health Cover—this allows health funds to charge different premiums based on a person's age when they first take out hospital cover. People taking out hospital cover early in their lives will pay lower premiums than those taking it out later in life. This rewards membership loyalty and early joining while deterring people who join health funds knowing they will need to claim for health services in the near future, but drop their membership soon afterwards. Under Lifetime Health Cover, the premium paid by people entering private health insurance will be based on the age at which they first join and, once set, remains at that rate relative to premiums for people entering at different ages. In other respects the principle of community rating is maintained.
- Other reforms addressing affordability, product innovation and industry efficiency include:
  - a reduction of in-hospital pharmaceutical gap fees;
  - discounted premiums for group members, when the discount reflects administrative savings;
  - loyalty bonus schemes, that will allow health funds to develop rewards for members based on length of membership;
  - private sector trials of coordinated care and early discharge programs;
  - a private health insurance consumer information service; and
  - regulation of the private health insurance industry, which will put private health insurance on a more commercial footing.

Household expenditure on health and medical care

Average household expenditure on health and medical care has increased steadily between 1984 and 1998–99. As a proportion of total household expenditure on goods and services, health and medical care increased from 3.9% in 1984 to 4.7% in 1998–99 (table 9.37).

The Household Expenditure Survey (HES) provides estimates of expenditure on medical care and health by households across Australia. Expenditure is net of any refunds and rebates received from Medicare, private health insurance companies and employers. The ABS has undertaken the HES at five-yearly intervals since 1984. Average expenditure in this survey is calculated across all households, not just those households that spent money on specific goods or services.

Expenditure on accident and health insurance has accounted for the largest percentage of total expenditure on health and medical care in each of the survey periods. However, this percentage has declined markedly between 1993–94 and 1998–99 (from 50% to 41%) reflecting the decrease in hospital, medical and dental insurance from 44% of total health expenditure in 1993–94 to 35% in 1998–99. This decrease is largely due to the falling health insurance coverage, and has occurred despite increases in private health insurance costs between the surveys.

While the proportion of household health expenditure spent on health practitioner's fees has remained relatively constant since 1984, expenditure on individual items have fluctuated. In particular, general practitioner doctor's fees have decreased from 3.8% of total health expenditure in 1984 to 2.4% in 1998–99, while specialist doctor's fees have increased from 3.9% to 7.8%.

The proportion of total health expenditure spent on medicines, pharmaceutical products and therapeutic appliances has increased from 20% in 1984 to 25% in 1998–99.

Table 9.38 shows that in 1998–99 average expenditure on health and medical care per household increased in each quintile of gross household income. Households reporting the highest 20% of gross income spent around three times the amount spent by the lowest 20% of households on health and medical expenses ($53 compared to $17). This differential increases when comparing the household expenditure of the highest and lowest gross income quintiles on accident and health insurance ($24 to $6), reflecting that people in the top quintile are more likely to have health insurance. The largest difference in average expenditure between the highest and lowest income quintiles is expenditure on health practitioner's fees ($17 compared to $4).

9.37 EXPENDITURE PER HOUSEHOLD ON MEDICAL CARE, Percentage of Total Health Expenditure—1984 to 1998–99

Expenditure category	1984 %	1988–89 %	1993–94 %	1998–99 %	1998–99 $/week
Accident and health Insurance	50.1	44.4	49.6	40.6	13.18
Hospital, medical and dental insurance	45.7	40.0	43.9	35.0	11.37
Sickness and personal accident insurance	3.3	3.5	4.5	4.6	1.48
Health practitioner's fees	26.5	31.9	24.7	30.7	9.96
General practitioner doctor's fees	3.8	3.6	2.3	2.4	0.77
Specialist doctor's fees	3.9	6.2	5.5	7.8	2.53
Dental charges	10.6	13.3	10.4	13.5	4.37
Medicines, pharmaceutical products and therapeutical appliances	20	20.5	22.9	24.9	8.09
Prescriptions	6.2	6.1	8.0	9.1	2.94
Other medical care and health expenses	2.2	3.2	2.8	3.8	1.23
Hospital and nursing home charges	2.2	3.1	2.5	3.0	0.96
Health as proportion of total expendititure on goods and services	**3.9**	**4.3**	**4.5**	**4.7**	**. .**

Source: Unpublished data, Household Expenditure Surveys (various).

9.38 EXPENDITURE PER HOUSEHOLD ON MEDICAL CARE, By Gross Income Quintile—1998–99

Expenditure category	Bottom quintile $	Second quintile $	Third quintile $	Fourth quintile $	Highest quintile $	All households $
Accident and health Insurance	6.04	8.44	11.03	16.16	24.18	13.18
Hospital, medical and dental insurance	5.44	7.78	9.52	13.86	20.18	11.37
Sickness and personal accident insurance	0.44	0.41	1.12	1.89	3.55	1.48
Health practitioner's fees	3.90	6.67	9.33	12.65	17.19	9.96
General practitioner doctor's fees	0.28	0.38	0.73	1.15	1.32	0.77
Specialist doctor's fees	0.83	1.54	2.79	3.11	4.35	2.53
Dental charges	1.69	2.98	3.95	5.37	7.84	4.37
Medicines, pharmaceutical products and therapeutical appliances	5.66	7.86	7.42	9.55	9.91	8.09
Prescriptions	2.16	2.78	2.54	3.81	3.42	2.94
Other medical care and health expenses	1.63	0.73	0.87	1.36	1.63	1.24
Hospital and nursing home charges	1.43	0.61	0.61	1.00	1.16	0.96
Total expendititure per household on health and medical expenses	**17.23**	**23.71**	**28.65**	**39.72**	**52.91**	**32.47**

Source: Household Expenditure Survey, Australia: Detailed Expenditure Items, 1998–99 (6535.0).

Health work force

In 1999–2000, about 328,000 people were employed in health occupations in Australia, comprising about 3.7% of the total number of employed persons (table 9.39). The largest components of the health work force were registered nurses (151,200) and medical practitioners (38,000 general medical practitioners and 17,200 specialist medical practitioners). Females comprised 72% of the health work force, due to the predominance of females in the nursing occupations.

The average hours worked per week by those in the health work force was slightly lower than for the total work force (35.9 hours compared with 37.4 hours). This reflects the high proportion of females in the health work force, who are more likely to work part-time. This pattern is evident in the majority of occupations within the health sector. For example, specialist medical practitioners have a high proportion of males (76%) and recorded the longest average working week (49 hours). In contrast, those occupations (such as dietitians) that have a high proportion of females, recorded a relatively short average working week.

The median age of the health work force was 40 years compared to 37 years for the total work force. Dietitians recorded the lowest median age of all occupations within the health work force (28 years). This possibly reflects the recent rise in concern within the Australian community over nutrition intake. Specialist medical practitioners recorded the highest median age within the health work force (48 years) which may reflect the number of years of training and the experience required to be a specialist.

9.39 EMPLOYED PERSONS IN HEALTH OCCUPATIONS—Averages over 1999–2000(a)(b)

Occupation	Number '000	Males %	Average hours worked/week no.	Median age years
Health services managers	4.5	27.5	47.2	45
Generalist medical practitioners	38.0	65.9	47.3	41
Specialist medical practitioners	17.2	76.0	49.2	48
Nurse managers	5.1	19.6	39.1	45
Nurse educators and researchers	2.4	9.0	32.6	40
Registered nurses	151.2	7.6	31.5	40
Registered midwives	10.4	0.0	31.5	40
Registered mental health nurses	3.9	44.3	36.5	42
Registered developmental disability nurses	0.3	14.2	26.0	33
Dental practitioners	6.8	74.7	37.6	41
Pharmacists	15.0	51.5	41.6	43
Occupational therapists	5.7	8.8	29.9	35
Optometrists	2.3	69.4	38.7	31
Physiotherapists	10.7	23.2	33.3	35
Speech pathologists	4.9	11.8	31.1	33
Chiropractors and osteopaths	3.6	68.3	36.4	39
Podiatrists	0.9	64.0	35.0	30
Medical imaging professionals	8.1	25.8	35.6	36
Dietitians	2.4	10.1	29.3	28
Natural therapy professionals	3.7	30.4	28.9	44
Other health professionals	5.5	7.8	32.0	40
Occupational and environmental health professionals	8.5	56.5	40.9	36
Ambulance officers and paramedics	6.3	78.0	42.1	37
Dental associate professionals	5.6	52.0	36.0	40
Aboriginal and Torres Strait Islander health workers	0.9	57.0	33.7	33
Massage therapists	4.2	31.5	27.0	41
Total employed in health occupations	*328.0*	*28.4*	*35.9*	*40*
Total employed	**8 886.5**	**56.4**	**37.4**	**37**
Health as % of total employed	3.7	. .	. .	. .

(a) Average calculated on quarterly estimates. (b) When numbers are less than 4,400, errors over 25% may occur.

Source: Unpublished data, Labour Force Survey.

Two surveys of the private medical practice industry were conducted by the ABS in respect of the 1994–95 financial year. Information from these surveys on medical practitioners who work in private practice in Australia is contained in *Chapter 21, Service Industries*.

International organisations

World Health Organization (WHO)

WHO is a specialised agency of the United Nations having as its objective the attainment by all peoples of the highest possible level of health. Australia is a member of the Western Pacific Region, one of WHO's six geographic regions, and sends representatives to attend the annual World Health Assembly meeting in Geneva as well as Western Pacific Regional Committee Meetings. Australia's assessed contribution to WHO's core budget for 1999 was US$5.9m.

International Agency for Research on Cancer (IARC)

The IARC was established in 1965 within the framework of the WHO. The headquarters of the agency are located in Lyon, France. The objectives and functions of the agency are to provide for international collaboration in planning, promoting and developing research in all phases of the causation, treatment and prevention of cancer. Australia's contribution to the IARC for 1999 was US$0.9m.

Australian Government

Health and Community Services Ministerial Council

The Health and Community Services Ministerial Council incorporates the Australian Health Ministers' Conference (AHMC), Australian Health Ministers' Advisory Council (AHMAC),

Community Services Ministers' Conference (CSMC) and the Standing Committee of the Community Services and Income Security Administrators (SCCSISA).

The Health and Community Services Ministerial Council was formed in 1993 by a decision of the Council of Australian Governments (COAG), bringing together the Australian Health Ministers' Conference and the Community Services Ministers' Conference. This combined Council meets as necessary to deal with the wider framework of health and community service issues of interest to members of both AHMC and CSMC.

The AHMC and its advisory body, the AHMAC, provide a mechanism through which the Commonwealth, State and Territory and New Zealand Governments can discuss matters of mutual interest concerning health policy, services and programs. The AHMC comprises the Commonwealth, State, Territory and New Zealand Ministers responsible for health. Neither the Conference nor the Council has statutory powers, and decisions are reached by consensus.

In 1999, Health Ministers continued to focus on: National Public Health Partnerships, Aboriginal and Torres Strait Islander people's health, national health priorities, national rural health strategies, environmental health, and a uniform national framework for control of radiation. Ministers also focused on safety and quality in Australian health care, health information management and technological development, health and medical research, a range of health industry workforce issues and medical disaster coordination.

Similarly, the CSMC and its advisory body, the SCCSISA, provide a mechanism through which the Commonwealth, State and Territory, New Zealand and Papua New Guinea Governments can discuss matters of mutual interest concerning community services, and welfare policy and programs. The CSMC comprises the Commonwealth, State, Territory and New Zealand Ministers responsible for community services and welfare, with an open invitation to the Papua New Guinea Ministers. Neither the Conference nor the Council has statutory powers, and decisions are reached by consensus.

In 1999 Community Services Ministers discussed a wide range of issues relating to child protection and family reunification, care for children with intensive support needs, foster care, cross-jurisdictional issues, youth and youth homelessness, aged care and ageing, and a national families strategy. Ministers also continued negotiations and discussions on renewal of the Supported Accommodation Assistance Program.

Ministers with responsibilities for disability services continued discussions on the future directions of disability services.

Department of Health and Aged Care

The Commonwealth Department of Health and Aged Care provides policy advice and implements Commonwealth government policies on public health, health care, health care funding and aged care, including the links between aged care and health.

The Department provides national coordination and monitoring of health and aged care. It promotes outcome-focused planning by governments, and investment in prevention of and early intervention in disease, providing incentives for efficient, best practice care. The Department also represents and promotes Australia's health and aged care achievements and capabilities internationally.

The Department's role in policy advice, and the administration and financing of Commonwealth government health and aged care programs, encompasses the following areas:

- public health and medical research;
- health promotion and disease prevention;
- national drug abuse strategy;
- primary health care of Aboriginal and Torres Strait Islander people;
- health benefits schemes (including Medicare benefits and pharmaceutical benefits);
- general practice and other medical workforce issues;
- acute care;
- mental health;
- regulation of therapeutic goods;
- hearing services;
- services for the aged, including carers; and
- community care.

The Department works in association with other agencies in the Portfolio, including the Health Insurance Commission, the Australian Institute of

Health and Welfare, the Australian Hearing Services Authority, Health Services Australia, the Australian Radiation Protection and Nuclear Safety Agency, the Private Health Insurance Administration Council, the Private Health Insurance Complaints Commissioner and the Director of Professional Services Review.

Australian Institute of Health and Welfare (AIHW)

AIHW is a statutory authority within the Commonwealth Health and Aged Care portfolio. The Institute's mission is to inform community discussion and decision making through national leadership in the development and provision of authoritative and timely information on and analysis of the health and welfare of Australians. The AIHW works closely with other agencies which collect data, produce statistics and undertake research and analysis in the health, welfare and housing assistance fields.

The AIHW also provides support to the States and Territories in the health and welfare areas, primarily through the Australian Health Ministers' Advisory Council, the Standing Committee of Community Services and Income Security Administrators, and State and Territory housing authorities.

The Institute's major divisions are located in Canberra. The Institute also supports three collaborating units: the AIHW National Perinatal Statistics Unit (Sydney); the AIHW Dental Statistics and Research Unit (Adelaide); and the AIHW National Injury Surveillance Unit (Adelaide). In addition, the AIHW jointly funds, with the ABS, the Aboriginal and Torres Strait Islander Health and Welfare Information Unit within the ABS National Centre for Aboriginal and Torres Strait Islander Statistics, Darwin. The National Centre for Classification in Health (which has sites in Sydney and Brisbane) also receives joint funding from the AIHW, the ABS, the Department of Health and Aged Care and the Queensland University of Technology.

National Health and Medical Research Council (NHMRC)

NHMRC is a statutory authority, within the Commonwealth Health and Aged Care portfolio, which provides advice to the Commonwealth Government, the State and Territory Governments and the community on matters relating to individual and public health and on health ethics issues. It also advises the Minister for Health and Aged Care on funding for medical and public health research.

The NHMRC statement of strategic intent is that the NHMRC will work with others for the health of all Australians. This statement is an important step in realising the NHMRC's role in providing collaborative leadership throughout the health sector.

The Council comprises nominees of Commonwealth, State and Territory health authorities, and a nominee of the Aboriginal and Torres Strait Islander Commission, as well as members with expertise in business, trade union, health professional education, medical and allied health services, consumer, environmental and welfare issues.

Cancer registries

Cancer is a notifiable disease in all States and Territories, and is the only major disease category for which an almost complete coverage of incidence data is available. Good information on the occurrence of different types of cancer, on characteristics of patients, and on survival and mortality, is essential to provide a sound basis for epidemiological studies and the initiation of new prevention and treatment programs.

The only effective method of obtaining cancer incidence data is through universal registration of cancer cases. Cancer incidence data are available from cancer registries which operate in each State and Territory. These registries are supported by a mix of State and Territory government and anti-cancer council funding.

The National Cancer Statistics Clearing House, operated jointly by the Australian Institute of Health and Welfare and the Australasian Association of Cancer Registries, compiles data produced by State and Territory registries on an ongoing basis, and produces national statistics on cancer incidence and mortality.

Communicable Diseases Network—Australia New Zealand

The Communicable Diseases Network—Australia New Zealand (CDNANZ) was established in 1990 to enhance the capacity of both countries for communicable disease surveillance and control. It comprises: Commonwealth, State, Territory and New Zealand public health officers; representatives from the Australian Defence Force, the Department of Agriculture, Fisheries and Forestry–Australia, the Australian Institute of Health and Welfare, the Australia New Zealand Food Authority and the National Centre for Epidemiology and Population Health; and experts in epidemiology and communicable disease

control. The Network coordinates the surveillance of communicable diseases through the National Notifiable Diseases Surveillance System and a number of specialised surveillance systems. It also facilitates and coordinates communicable disease control activities where a national response is required.

To complement the CDNANZ, the Public Health Laboratory Network (PHLN) was established in 1997 as a collaborative group of laboratories nominated by State and Territory health departments. They have expertise in public health microbiology and are major providers of public health laboratory services. The aim of the PHLN is to provide strategic advice, define priorities and share expertise at the national level in order to enhance the national capacity for the laboratory based surveillance and outbreak management of communicable diseases in Australia.

Australian non-government

Australian Drug Foundation

The Australian Drug Foundation (ADF) is an independent, non-profit organisation working to prevent and reduce alcohol and drug problems in the Australian community. The ADF's core business is to provide information to public and professional groups and practical assistance to organisations and communities. This is done by:

- assisting schools to develop programs designed to educate teachers, parents and students;
- using media and other communications techniques to influence public policy, law and legislation;
- conducting research and managing projects for local, State and national clients; and
- assisting communities wishing to develop projects and campaigns aimed at addressing alcohol and drug abuse.

The ADF offers a number of services, including:

- DRUG*info*, a service available to the Victorian public that provides general information about alcohol and drug use;
- an extensive library and information service that is available to professionals from a variety of fields; and
- sponsorship of arts and sporting events to reach young people and adults with messages about alcohol and other drugs.

Heart Foundation

The Heart Foundation is a charity—an independent, Australia-wide, non-profit organisation funded almost entirely by donations.

The Heart Foundation's purpose is to improve the heart health of all Australians and to reduce disability and death from heart and blood vessel disease by:

- promoting and conducting research to gain and apply knowledge about heart and blood vessel disease, its prevention and treatment; and
- promoting and influencing behaviour which improves heart and blood vessel health by conducting education and other programs directed at health professionals, those with heart disease and the Australian community at large.

Bibliography

ABS publications

Apparent Consumption of Foodstuffs and Nutrients, Australia (4306.0).

Causes of Death, Australia (3303.0).

Causes of Infant and Child Deaths, Australia (4398.0).

Children's Immunisation, Australia (4352.0).

Deaths, Australia (3302.0).

Deaths Due to Diseases and Cancers of the Respiratory System (3314.0).

Disability and Handicap, Australia (4120.0).

Hospitals, Australia (4391.0).

How Australians Measure Up (4359.0).

Household Expenditure Survey, Australia, 1993–94 (6537.0)

Household Expenditure Survey, Australia: Detailed Expenditure Items, 1998–99 (6535.0).

National Health Survey 1989–90: Health Related Actions, Australia (4375.0).

National Health Survey 1995, published and unpublished data, including:

—*Aboriginal and Torres Strait Islander Results, Australia, 1995* (4806.0).

—*Cardiovascular and Related Conditions, Australia, 1995* (4372.0).

—*Diabetes, Australia, 1995* (4371.0).

—*Injuries, Australia, 1995* (4384.0).

—*Private Health Insurance, Australia, 1995* (4334.0).

—*SF36 Population Norms, Australia, 1995* (4399.0).

—*Summary of Results* (4364.0).

National Nutrition Survey, Selected Highlights, Australia, 1995 (4802.0).

National Nutrition Survey, Foods Eaten, Australia, 1995 (4804.0).

National Survey of Mental Health and Wellbeing of Adults 1997, published and unpublished data, including:

—*Mental Health and Wellbeing: Profile of Adults, Australia* (4326.0).

Private Hospitals, Australia (4390.0).

Suicides, Australia (3309.0).

The Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples, Australia, 1999 (4704.0).

Women's Health (4365.0).

Other publications

Australian Institute of Health and Welfare:

—1998a, *Australian hospital statistics 1996–97*, AIHW Cat. no. HSE 5 (Health Services Series no. 10), AIHW, Canberra.

—1998b, *Breast and cervical cancer screening in Australia 1996–1997*, AIHW Cat. no. CAN 3, Cancer Series number 8, AIHW, Canberra.

—1999, *Australia's Welfare 1999: services and assistance*, AIHW, Canberra.

—2000, *Australia's Health 2000: the seventh biennial health report of the Australian Institute of Health and Welfare*, AIHW, Canberra.

—*Health Expenditure Data Base*.

Australian Institute of Health and Welfare and Australasian Association of *Cancer Registries* 1999, *Cancer in Australia 1996: incidence and mortality data for 1996 and selected data for 1997 and 1998*, AIHW Cat. no. CAN 7, AIHW (Cancer series), AIHW, Canberra.

Australian Institute of Health and Welfare and Commonwealth Department of Health and Family Services 1997, *First Report on National Health Priority Areas 1996*, AIHW Cat. no. PHE 1, AIHW and DHFS, Canberra.

Australian Health Ministers' Conference 1993, *National Mental Health Policy; Australian Health Ministers April 1992*, AGPS, Canberra.

Commonwealth Department of Health and Aged Care:

—*Communicable Diseases Intelligence*, Vol. 23, No. 1, January 1999.

—1998, *National Mental Health Report 1997: National Mental Health Strategy, Fifth Report*, AGPS, Canberra.

Commonwealth Department of Health and Family Services:

—*Australian Childhood Immunisation Register*, National Centre for Disease Control.

—*Drug Utilisation Sub-Committee (DUSC) database 1997*.

—*Evaluation of the National Mental Health Strategy: Final Report, December 1997*.

Deeble, J., Mathers, C., Smith, L., Goss, J., Webb, R. and Smith, V. 1998, *Expenditures on Health Services for Aboriginal and Torres Strait Islander People*, Cat. no. HWE 6, AIHW, DHFS & NCEPH, Canberra.

Human Rights and Equal Opportunity Commission 1993, *Human Rights and Mental Illness. Report of the National Inquiry into the Human Rights of People with Mental Illness*, AGPS, Canberra.

ISAAC Steering Committee, "Worldwide variation in the prevalence of symptoms of asthma, allergic rhinoconjunctivitis and atopic eczema", ASAAC, *Lancet, 1998*, 351:1225–32.

Mathers, Colin D., Vos, Theo E., Stevenson, Chris E., and Begg, Stephen J., "The Australian Burden of Disease Study: measuring the loss of health from diseases, injuries and risk factors", *The Medical Journal of Australia*, Vol. 172, 19 June 2000.

McCarthy, D. J., Zimmet, P., Dalton, A., Segal L. and Welborn, T. A. 1996, *The Rise and Rise of Diabetes In Australia: A review of statistics, trends and costs*, 2nd printing, Diabetes Australia, Canberra.

National Centre in HIV Epidemiology and Clinical Research, *HIV/AIDS and Related Diseases in Australia, Annual Surveillance Report 1999*.

National Health and Medical Research Council:

—1991 *Dietary Guidelines for Australians*.

—1997 *Clinical practice guidelines: depression in young people*, reproduced in AIHW 2000, *Australia's Health 2000*, AIHW, Canberra.

Olshansky, S.J., and Ault, A.B. 1986, "The fourth stage of the epidemiologic transition: the age of delayed degenerative diseases", *The Milbank Quarterly*, Vol. 64, No. 3, 1986.

Omran, A.R. 1971, "The epidemiologic transition, a theory of the epidemiology of population change", *The Milbank Quarterly*, Vol. 49, No. 4, 1971, Part 1.

Private Health Insurance Administration Council (PHIAC), *Quarterly Statistics*, June 1998.

Thomson J. et al. 1999, *Australia's Notifiable Disease Status, 1998: Annual Report of the National Notifiable Diseases Surveillance System*, Commonwealth Department of Health and Aged Care, Canberra.

United Nations 1982, *Country monograph series No.9, Population of Australia, volume 1.* Economic and Social Commission for Asia and the Pacific, Bangkok, Thailand.

World Health Organization:
—*International Classification of Diseases, 9th Revision (1975), Volume 1*, Geneva.
—1997, *World Health Statistics Annual 1995*, Geneva.
—1998, *World Health Statistics Annual 1996*, Geneva.

Internet sites

Australian Institute of Health and Welfare, *http://www.aihw.gov.au*
Commonwealth Department of Health and Aged Care, *http://www.health.gov.au*
World Health Organization, *http://www.who.int*

Child health since Federation

*Professor Fiona J. Stanley**

Professor Fiona J Stanley AC is the Director, TVW Telethon Institute for Child Health Research, and Variety Club Professor of Paediatrics, the University of Western Australia. Professor Stanley graduated in medicine from the University of Western Australia in 1970 and sought further training in epidemiology, biostatistics and public health in the UK and USA.

On her return to Perth in 1977 she, along with other researchers in the NH&MRC Epidemiology Unit, established the WA Maternal and Child Health Research Data Base, a unique collection of data on births from the entire State that supports most of the research by her group.

Professor Stanley became the founding Scientific Director of the TVW Telethon Institute for Child Health Research in 1990. The Institute fosters collaboration between basic, clinical and population-based research to address complex childhood diseases, with a strong commitment to translating the findings into better health and health care in the community. Professor Stanley serves on the Prime Minister's Science, Engineering and Innovation Council and is Australia's representative on the WHO Western Pacific Advisory Committee for Health Research.

> "The state of individual health is constantly being influenced by numerous factors. The racial stock to which the individual belongs may direct the general course of his health, the prenatal condition of maternal health, the quality or sufficiency of food taken as an infant and indeed throughout life are factors in which the relationship between cause and effect is direct; the presence in the community of other racial stocks, age composition of the population, the existence of communicable diseases in adjacent countries, the social conditions generally, and even the forms of government, have an influence no less important although indirect. In considering the public health in any community, it is clearly necessary that a study should be made of each of these aspects of social life with an attempt to estimate the extent of the influence of each on the aggregate total of individual health in the community." J.H.L. Cumpston, Director General of Health, Commonwealth of Australia, 1928 (Cumpston 1989).

Introduction

A male child born at the beginning of the 20th century (1901–1910) had a life expectancy at birth of 55.2 years and one born at the end (1995–1997) of 75.7 years. For females the figures were 58.8 and 81.4 years respectively. At age 5 years the life expectancy was 57.9 years for males and 60.8 years for females in 1901 and 71.3 and 76.9 years respectively in 1995–97. These dramatic improvements over the last 100 years result from reductions in mortality at all ages, but particularly in early childhood, as shown by the impact in removing under fives mortality from the life expectancy calculations—the improvement in life expectancy at age five compared to life expectancy at birth was significantly greater in the early 1900s than in the 1990s.

* The staff of the Perth office of the Australian Bureau of Statistics (Elena Mobilia and Daniel Christensen) worked hard to obtain much of the data for this article. Dr Peter Winterton and Professor Geoffrey Bolton suggested books on medical history and commented on the text. Dr Natalia Bilyk, Barbara Moore and Colleen Moylan provided library and clerical support. I am also grateful to my colleagues in the Population Sciences Division at the Institute for Child Health Research for the research they do and the environment they provide for work such as this.

THE PRIVILEGE OF AGE

"Lor' luv me, aint I dirty?"
"I'm a sight dirtier en you."
"O! well, so yer orter be—yer two years older en me."

Source: The Bulletin Magazine (originally published on 21 April 1900).

On the whole these increases were the result of considerable environmental and social changes early in the 20th century, with resulting improvements in the health of mothers and children.

Indigenous life expectancy was not available for 1901–1910, but in 1995–97 it was only 54.1 years for males and 61.2 for females at birth—lower than for all children born 100 years ago.

The social and economic environment around 1901 was harsh and difficult for many families; many children were malnourished and likely to die from infectious diseases such as gastroenteritis and pneumonia. The considerable social, educational and income changes over the century (described in Centenary Articles associated with *Chapters 5 Population*, *7 Income and welfare* and *10 Education and training*), together with the conscientious efforts of those committed to improving maternal and child health in the early decades by community interventions, have had as much influence on reducing deaths and illnesses in children as has the extraordinary rise in knowledge in biomedical science in later decades, with its resulting improvements in diagnosis, treatments and prevention of disease (particularly by mass vaccination). In many ways, this last century has been a glorious one in which to have been involved as a child and public health professional.

While the perinatal and infant period is still one of life's most risky, the chances of survival now are much higher than 100 years ago, and once through to the end of the first year, the risk of dying in childhood is very low and only starts to rise again in older teenagers (15–19 years old), particularly in males. However, there is now possibly excessive emphasis on using expensive technologies to prevent death in children who are severely compromised, with much less effort into researching the antecedents to prevent the conditions which lead to the problems in the first place. And in later childhood and adolescence, risks are dominated by factors associated with lifestyle and mental health problems which require a complex range of preventive strategies over many years.

This article is an overview of the changes in some markers of child and adolescent health throughout the 20th century and those trends which have been most influential. Many aspects will not be covered adequately and some left out completely, due to limitations of space and time. The hope is that the messages about the most important aspect of our future as a nation—the health of our children—will be heard and responded to.

Child mortality in the 20th century

Mortality as a measure of health

One major way in which epidemiologists measure health is actually to measure death. "This preoccupation is not so morbid as it sounds. In modern times the news has been almost entirely good. Western countries have doubled their life expectancies from around 40 years in the mid-nineteenth century to almost 80 years at the end of the twentieth. If we were to enter one of those competitions to nominate the greatest advance of the latter part of the millennium, it would be difficult to overlook the pushing back of the frontiers of death and the guarantee that most people will live to old age" (Caldwell 1999). The data on mortality below have been compiled by the Australian Institute of Health and Welfare (AIHW) Mortality Monitoring System from official death registrations.

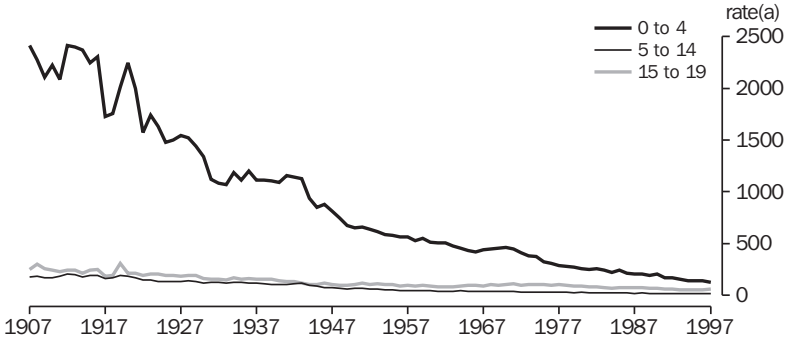
The under five mortality fell from 2,604 per 100,000 in males and from 2,214 in females in 1907 to 137 and 111 respectively in 1998 (graph C6.1). More than 50% of the fall had occurred by 1930 and most (more than 80%) by 1960. The rates at the end of the century are very low. The most important contribution to under 5 mortality was death in infancy (see below). The death rates in 1–4 year old children were much lower throughout the last 100 years, although the pattern of their fall was similar to infant death rates. Once a child survived beyond its first year, even in early 1900s, its chances of survival were good. Now they are excellent. In children aged 5–14 and 15–19 years the rates were initially much lower than in younger children and have fallen steadily. For 5–14 year old males the rate was 187 in 1907 and 17 in 1998; for females 172 falling to 12. In 15–19 year old males, the rate was 267 in 1907 and 75 in 1998; for females 237 and 37 respectively.

Infant mortality

Infant mortality, defined as deaths in children from birth to the first year of age per 1,000 live births, has been viewed traditionally as an important social indicator, reflecting general population health and wellbeing. It is of great interest to those assessing the social development of communities as groups with more advanced development in terms of social circumstances, educational level and income tend to have lower rates of infant mortality than those with less development.

Infant mortality is strongly related to fertility rates and to life expectancy at birth. Falls in infant and childhood deaths have been shown to be followed by declines in fertility (Caldwell 1999). Infant mortality, influenced by preventive health measures, which include social improvements, is used as a measure of such services for a population.

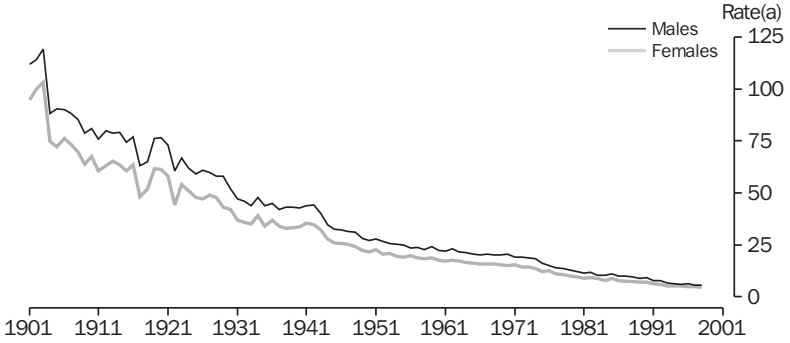
C6.1 DEATH DUE TO ALL CAUSES, By Age of Child



(a) Rate per 100,000 population.

Source: AIHW Mortality Monitoring System.

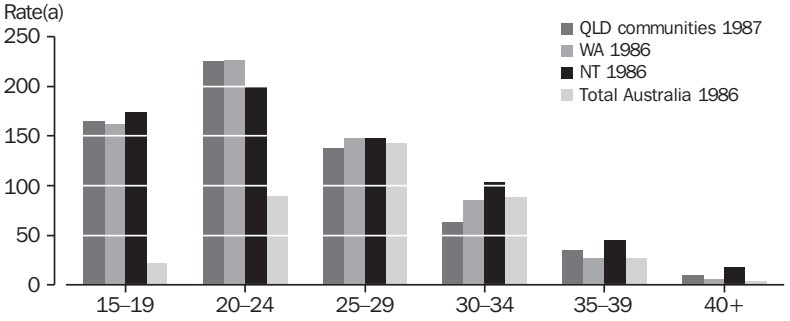
C6.2 INFANT MORTALITY, By Sex—1901–1998



(a) Rate per 1,000 live births.

Source: Death registrations.

C6.3 AGE-SPECIFIC FERTILITY RATES, Aboriginal and Total Australian Population



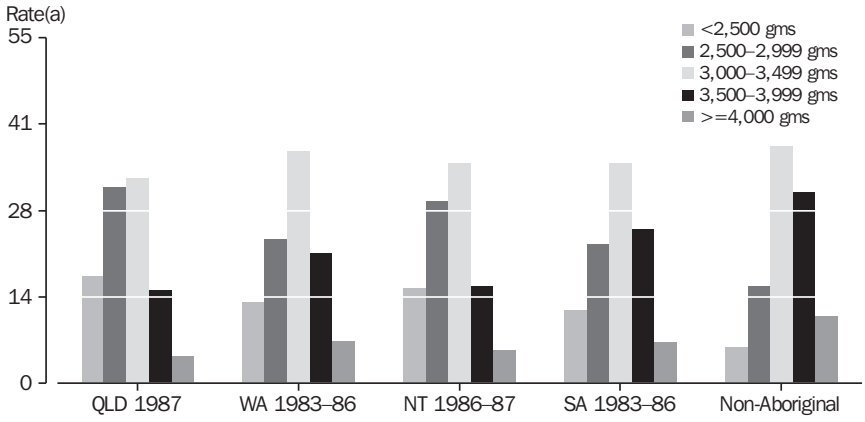
(a) Live births per 1,000 females.

Source: Thomson 1991.

Graph C6.2 shows the infant mortality rate per 1,000 live births from 1901 to 1998. Female death rates are always lower than male rates for reasons that are still not clear. The rate fell from around 120 for males and 100 for females at the beginning of Federation to below 60 in the late 1920s. Both male and female rates have remained below 10 since 1986, and the overall rate was 5 in 1998. This compares well with other developed countries. Population data on Indigenous infant mortality have only been available since the 1970s, although Thompson noted that the Northern Territory in the 1960s reported rates of around 150 per 1,000 live births. The best estimates are around 70–80 in the 1970s falling to around 25 in 1980s (Thomson 1991). In 1994–96 it was 18.6, still much higher than that for non-Indigenous infants.

Deaths from all causes, particularly from SIDS and respiratory system diseases, are much more common in Indigenous infants. Poor socioeconomic circumstances and living conditions, higher rates of teenage fertility and of low birthweight babies, all contribute to this higher rate (see graphs C6.3 and C6.4). The children born in conditions which result in higher infant mortality are likely to have poorer health throughout their lives. Low birth weight and other early problems may well relate to many of the diseases seen in higher frequency among Indigenous adults such as cardiovascular disease, diabetes and renal failure (Mathews 1997).

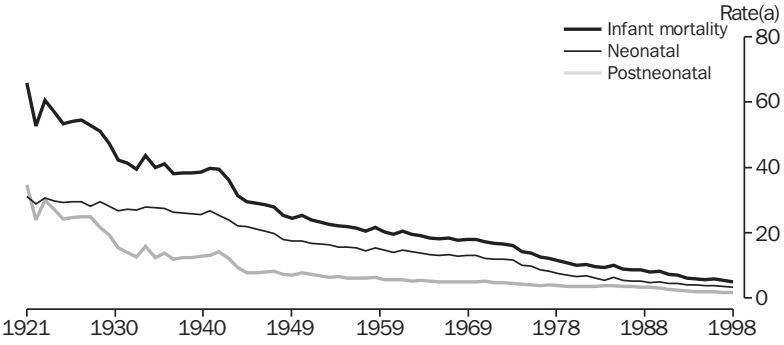
C6.4 BIRTHWEIGHT DISTRIBUTION, Aboriginal and Non-Aboriginal Persons



(a) Percentage of total live births.

Source: Thomson 1991.

C6.5 INFANT, NEONATAL AND POSTNEONATAL MORTALITY RATES



(a) Rate per 1,000 live births.

Source: Causes of Infant and Child Deaths (4398.0); Deaths, Australia (3302.0).

The components of infant mortality—neonatal and postneonatal deaths

Neonatal deaths are those infant deaths occurring in the first 28 days of life, while postneonatal deaths are those occurring from one month to one year. The factors responsible for the decline in infant mortality varied according to the age at which an infant died and across different time periods throughout the 20th century. Early in the century, over 50% of infant deaths were postneonatal. It was dominated by gastroenteritis and other infections, and thus these rates fell rapidly in response to major public health interventions and improved social conditions. By the 1930s, less than a third of infant deaths were postneonatal and these rates, still dominated by infectious diseases, responded further in the 1940s and 1950s as mass vaccination and antibiotics became available. As graph C6.5 shows, by the 1990s the postneonatal death rate was 2.1 per 1,000 live births (now only 38% of all infant deaths) with very few from infections. Three causes accounted for nearly 80% of postneonatal deaths at the turn of this century—SIDS, birth defects and perinatal conditions.

While their causes on the whole are unknown, they differ markedly from the adverse social conditions in infancy which

caused so many babies to die in 1901–1920. The modern causal pathways to postneonatal death start early in development, and while some may still be socially related, they are complex and preventive solutions are not currently obvious.

Neonatal mortality has always been influenced by pregnancy complications and fetal growth and development. Thus its reduction had to await new methods to treat the end-stage complications in the neonate, as primary prevention was not possible in ignorance of causality. Most neonatal deaths occurred in the first days of life and this pattern is still seen today. Neonatal mortality rates have fallen steadily from the 1920s as better knowledge resulted in effective treatments for high risk pregnancies, obstetric care in labour and, particularly since 1970s, neonatal care of preterm and low birthweight babies. As graph C6.5 also shows, in the late 1990s the neonatal mortality rate was under 4 per 1,000 live births (now 62% of infant deaths); 60% of these occurred on the day of birth. Most were due to extreme prematurity and poor fetal growth, congenital malformations and complications of pregnancy.

Thus the challenges facing us to further reduce neonatal mortality are similar to those for postneonatal deaths. Both demand research into the many causes of preterm birth, intra-uterine growth restriction and developmental anomalies. As most children born with these problems today do not die, but have significant morbidity and disabilities, knowledge leading to prevention is of considerable importance. While neonatal mortality in certain low gestation and birthweight categories has been used in the past to evaluate the quality of newborn intensive care, this is no longer a reasonable index.

Recently in Australia, there has been a tendency in the media to use infant mortality, as well as mortality at older ages, to judge the appropriate levels of expenditure on medical, particularly hospital, services. This is inappropriate as the antecedents and major contributors to these rates today have little to do with hospital services. As in 1901, the causal pathways to infants dying in the 1990s commenced well before hospital services have any influence. Preventive solutions thus lie elsewhere and demand investment in research in early causal pathways.

Deaths in childhood

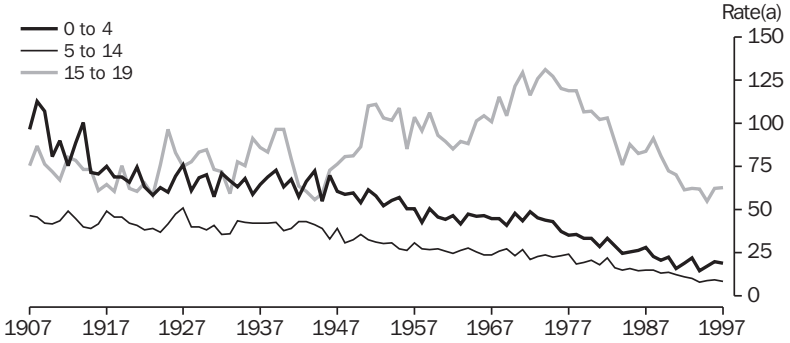
The death rates in children (1–4 and 5–14 years) have always been far lower than those among infants and are now very low in Australian children (only 14 deaths occur in every 100,000 5–14 year olds) (graph C6.1). However the major causal grouping, i.e. childhood accidents, poisoning and violence (nearly 50% of all deaths), is of public health importance as these are potentially avoidable. The commonest causes of accidental death in children are motor vehicle accidents, drowning and inhalation of foreign bodies. Decreases in accidental deaths due to traffic accidents and drowning in the 1980s and 1990s followed legislation to restrain young children in cars and to make swimming pool fencing compulsory. Changes in Western Australia which have relaxed the policing of swimming pool fencing have resulted in increases in child drowning in that State recently (Eastough and Gibson 1999; Silva, Palandri et al. 1999). Children in poorer families and in Indigenous families are more likely to have accidents than those in other families.

Other causes of childhood deaths include congenital anomalies (particularly those of the heart and nervous system, and chromosomal defects such as Downs Syndrome) and cancers. Medical science has made significant contributions to falls in all these causes of death by more accurate diagnosis, improved surgical techniques and chemotherapy.

Causes of death in teenagers

The causes of death in older children (5–14 years) and teenagers (15–19 years) were dominated in the early part of the century by infectious diseases. And particularly among males, accidental and violent death has always been an important contributor. The most common causes of death in the age group 15–19 years in the 1990s were accidents and suicides. The most worrying trend in all of those shown in this article is the increasing rate of suicides in young Australian males.

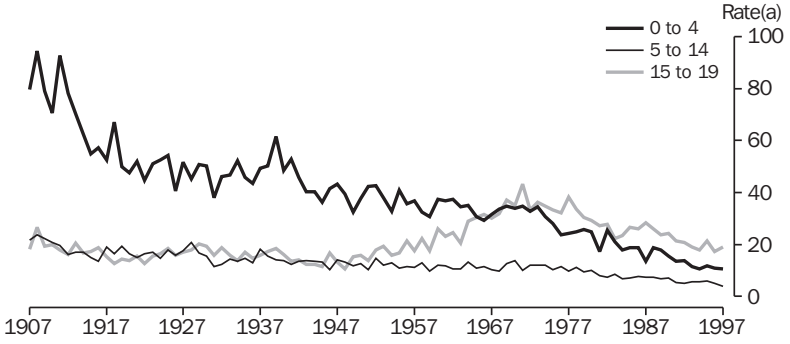
C6.6 DEATHS FROM ALL EXTERNAL CAUSES IN MALES, By Age



(a) Rate per 100,000 population.

Source: AIHW Mortality Monitoring System.

C6.7 DEATHS FROM ALL EXTERNAL CAUSES IN FEMALES, By Age



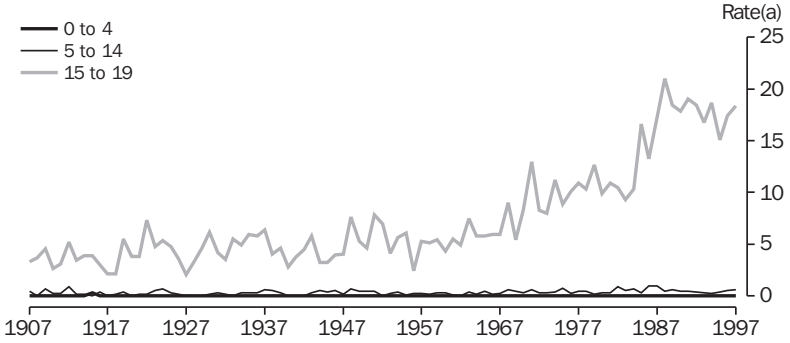
(a) Rate per 100,000 population.

Source: AIHW Mortality Monitoring System.

'External' causes of death include accidents (injury and poisoning), suicides and homicides. All other causes of deaths have shown marked falls over the century since Federation. This group of causes was high among all male children in the early 1900s. The rates for children have fallen steadily whereas those for teenage males rose to a peak in the mid 1970s before falling in 1990s to levels just below those in 1907 (graph C6.6). For females the rates are lower and the pattern is different: high rates in the 0–4 year old girls in the early decades of the 20th century with steady falls in both child age groups over time. Among teenage girls the rate was steady until an increase similar to that for males (but at a much lower rate) was observed from 1955 to 1985, with falling rates since then (graph C6.7). In 1998 it was the same as in 1907!

Much of the increase and decrease in these rates is explained by accidents, and recently by road accidents. The fall in recent times reflects successful legislation (seatbelts, drink driving) and public education programs to avoid accidents of all kinds, including work safety, particularly aimed at young people. These death rates are markers for the high rate of injuries sustained in accidents resulting in serious and often permanent trauma and disability. Accidents remain a huge cost to Australian society.

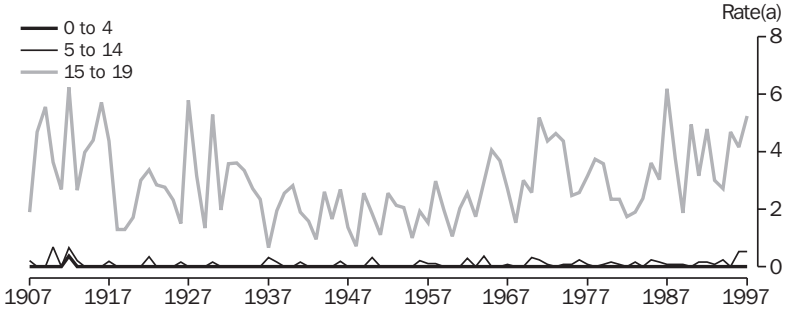
C6.8 SUICIDE RATES IN MALES, By Age—1907 to 1998



(a) Rate per 100,000 population.

Source: AIHW Mortality Monitoring System.

C6.9 SUICIDE RATES IN FEMALES, By Age—1907–1998



(a) Rate per 100,000 population.

Note: Different Y axis scale for females cf. males.

Source: AIHW Mortality Monitoring System.

Graphs C6.8 and C6.9 show the increasing rates of suicide in Australian males aged 15–19 years; rates for females are much lower but may also be increasing. In 1907 fewer than 5 per 100,000 male teenagers took their own lives in spite of the difficulties of the times. From 1973–74 the male rate has climbed and is now around 20. The rate for females is more variable due to the small numbers, hovering between 2 and 6 per 100,000. Deaths from suicide have been more common in males than those from motor vehicle accidents since 1990, due to increases in suicide and falls in the accidental deaths. Beneath these death rates lie much larger numbers of children and young people with severe depression and other mental health problems. While female suicide rates are much lower, more females attempt suicide than males (Zubrick, Silburn et al. 1995).

The significant social changes in families, the increasing level of child and adolescent mental health problems, the increased availability and use of addictive drugs and alcohol, the ready availability of guns and other means of suicide, and possibly other factors as well, have all contributed to these rising rates of mental health morbidities. Indigenous teenagers have particularly high rates (Youth Suicide Advisory Committee 1998).

Reasons for the decline in child mortality since Federation

Better living conditions and enhanced public health awareness

The decline in mortality in infants and children since Federation is obvious, the reasons for it less so. Caldwell (Caldwell 1999) quoted Alfred Marshall (1890) who attributed mortality declines in the 19th century to "the growth of temperance, of medical knowledge, of sanitation and of general cleanliness". Thomas McKeown in the UK (McKeown 1979) and Douglas Gordon in Australia (Gordon 1976) both suggested that changes in living conditions, particularly better nutrition (which would have increased host resistance to infection) and improved hygiene (reducing contact with infecting organisms) played a more important role than improved medical knowledge. This was in the first few decades of the 20th century when falls in deaths in infancy and childhood were due mainly to fewer children dying from gastroenteritis, respiratory and other infections (Lancaster 1956a; Lancaster 1956b).

Evidence for improved nutrition comes from the observed increase in the mean height and weight of school children (Cumpston 1989). Thus children grew taller and, one imagines, healthier and more capable of resisting infections than their earlier born, less well fed and shorter parents. As these young women entered the child bearing age, they would have been more likely to have healthy pregnancies. Armstrong (1939) described the early infant welfare activities in NSW which were the "first developed in the Southern hemisphere, and derived from and modelled upon the operation of similar activities in England and France''. He wrote about the policies and legislation for improving maternal and child health (MCH), driven by a commitment to reduce the Australian "infantile mortality rate (which) was greater than that of London and as high as in most of the world's great cities". His aim was somewhat delayed as his energies were diverted into an outbreak of plague in Sydney at the turn of the century! The main intervention was to encourage mothers to breastfeed, with many supports to enable this to happen, including trained health workers visiting all new mothers. "Each day the clinic obtained from the district registrar a list of the births in the district, and these were all visited" (Armstrong 1939). His slogan was: "There is no feeding equal to breast feeding". He was convinced from his international observations that breastfeeding was the most important protection from gastroenteritis which killed so many infants. His own investigations in Sydney showed that the mortality among infants under 3 months of age from diarrhoeal diseases was between 10 and 15 times as great among those artificially fed as among those entirely breastfed. Armstrong maintained that breastfeeding was the most important influence on infant mortality from the early 1900s to 1914 (table C6.10). However, he also acknowledged both improved sanitation and "the great wave of social betterment which spread over Australia after Federation, and which expressed itself in rising wages and industrial expansion with greatly improved conditions of living" (Armstrong 1939).

C6.10 RECORDS OF NEWLY BORN CHILDREN VISITED IN THE CITY AND SUBURBS OF SYDNEY—1904 to 1914

	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914
Percentage entirely breastfed	72	77	79	80	82	83	84	85	86	91	94
Number entirely breastfed	564	1 114	977	1 019	958	2 636	3 042	3 006	4 026	3 522	4 166
Number visited	781	1 455	1 240	1 272	1 175	2 636	3 653	3 549	4 686	3 891	4 425

Source: Armstrong 1939.

Mothers were educated about infant welfare, particularly the importance of breastfeeding, personal hygiene and clean environments. Mothers of sick children were advised to seek medical help and public hospitals treated children free. Special hospitals for sick babies, most with gastroenteritis, were also established, such as the Lady Edeline Hospital for Babies at 'Greycliff' in Vaucluse. Infant welfare clinics and the home visitor program expanded to postgraduate training for nurses in baby health (infant welfare) at 'Tresillian centres', which sprang up all over the country and were the beginning of community child health in Australia.

As MCH improved over the century, breastfeeding became less vital for survival. And artificial feeding was less worrying because special infant formulas became available and the water to make them up was clean. Milk became safer as pasteurisation was introduced in the 1930s. While data on the prevalence of breast feeding at the time of discharge from the hospital of birth are fragmentary, it is recorded that only 40–45% of mothers were initiating breastfeeding in 1970s, a fall from over 50% in 1950s and much lower than the 90% in Armstrong's day. Hospital staff were less educated about the importance of breastfeeding, and perhaps there was an influence of it not being fashionable as well! Following intensive community campaigns to reeducate women about breastfeeding, there has been a steady upward trend with recent figures in the 1990s of around 76% of new mothers initiating breastfeeding, with over 50% still fully breastfeeding at 3 months (Jain 1996).

Maternal education and child health

The seminal work of Australian social demographer Caldwell and his colleagues at ANU has described the important effect of parental, particularly maternal, educational level on improved outcome for a child. Even when controlling for family income and access to health services, a child's chance of survival improves with higher levels of parental education, the relationship with maternal educational level being the strongest (Caldwell 1999). Similar associations are seen with morbidity as well (Silburn, Zubrick et al. 1996). An educated mother is one who is more rational, able to be informed about ways to improve child health, is likely to breastfeed and immunise her child, seek help early if the child is sick and follow instructions in terms of health care. Along with higher levels of education in the first 50 years since 1900 would have come an increasing knowledge about, and belief in, modern medical science and what it could deliver for health. "Educated people for most of the time up to the present have been more likely to use soap, to isolate family members with infectious diseases, to guard their children from danger, to use safe water or to boil it, to boil milk for babies use, to accept immunisation for their children, to take sick children for medical treatment and to follow the prescribed course of treatment'' (Caldwell 1999). More recently more women being educated reflects female empowerment, which has been associated with greater control over their own lives and better health for them and their children. This is particularly pertinent to today's Indigenous families in Australia. Education is now so widespread that its continued importance to child health and care is often taken for granted.

Changing concepts about death

Caldwell (1999) developed a theory of 'health transition' to explain the changes taking place in traditional societies and communities with high mortality and high fertility to the low levels of both as countries develop. Mortality declined through improved public health, social and behavioural changes, and the use of medical and other technology. A change in the way death is viewed culturally has driven this commitment to survival, with death being viewed as the worst of all possible outcomes (Simons 1989). In eras with high mortality rates, death was not regarded as unusual, whereas as the capacity to survive became possible, there was a strong commitment to reducing risks and to avoid death.

Income, material wellbeing and mortality

There is a clear ecological relationship between material wellbeing, measured by income or disposable household income for families with children, and their health status. The extent to which one influenced the other and how more income translated into better outcomes is not known. More disposable income for families resulted in better food, clothes, education and better housing—all of which have been associated with improved child mortality and morbidity.

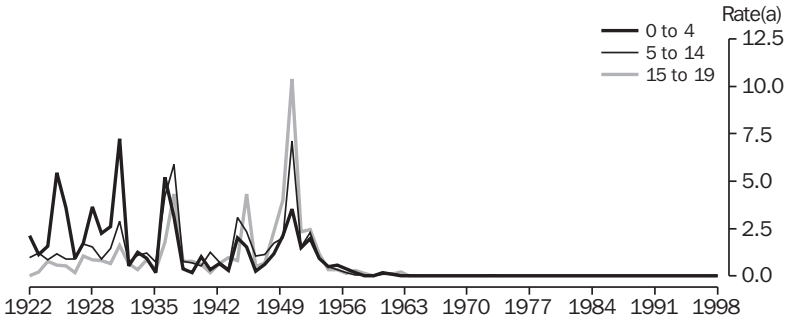
Fertility, family size and overcrowding

As the fertility of women decreased, the average number of births for women less than 45 years old fell from around seven before 1900 to three in 1920s (Williams 1989). This meant fewer children to look after, less crowding in housing and better provision of those things essential for good health for the children. In 1920s and 1930s there were still many living in crowded and poor industrial areas of large cities and in poor rural areas in inadequate housing and conditions, and unemployment made it hard for families, even those of smaller size, to provide for their children.

Advances in medical science

Throughout the century, scientific discoveries started to impact upon health and medical services. Before World War II few vaccines were available, the most significant for children being diphtheria and tetanus antitoxoid. Pertussis, polio and other viral vaccines soon followed. The impact of polio on deaths in young children and teenagers is shown in graph C6.11; the graph does not show the large numbers of young people permanently paralysed due to this virus. The effect of vaccination was dramatic (Ada and Isaacs 2000).

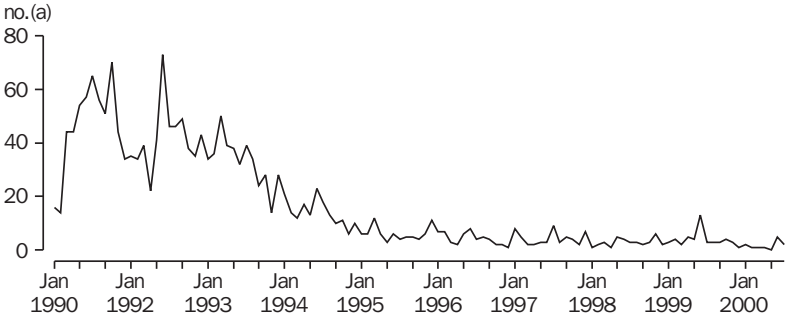
C6.11 DEATHS DUE TO POLIOMYELITIS, By Age—1922 to 1998



(a) Rate per 100,000 population.

Source: AIHW Mortality Monitoring System.

C6.12 INVASIVE HIB DISEASE IN AUSTRALIA



(a) Number of cases.

Source: Communicable Diseases Network–Australia New Zealand—National Notifiable Diseases Surveillance System.

There continue to be success stories with new and effective infant vaccines. In 1980s Haemophilus influenzae (Hib) was the most serious infection in young children (graph 6.12). Invasive Hib disease (meningitis, septicaemia) had a high case fatality, particularly among Indigenous infants, and left many surviving children with severe intellectual and physical disabilities (Hanna 1992).

Parents' fear of polio in the 1950s and of meningitis in the 1990s resulted in high levels of participation in these vaccination programs. As the incidence and severity of infections has fallen, parents have become apathetic about vaccination and some actively oppose it. Because of its very effectiveness, vaccination is regarded by a significant proportion of the community as unnecessary or dangerous. Yet its success to prevent disease depends upon high rates of participation. Current rates of vaccination in Australian children are less than those in Viet Nam; this is another public health challenge for us in the 21st century.

Sulphonamides to treat infections were introduced in early 1940 and penicillin, dramatically effective against Streptococcal infections including bacterial meningitis, became available immediately after World War II. Other antibiotics followed, and the death and complication rates of all bacterial infections fell markedly (Williams 1989). However the excessive use of antibiotics has resulted in increasing numbers of organisms resistant to their effects. This situation is extremely worrying and makes the case for primary prevention even more powerful.

From 1945 until 2000, with infectious disease rates very low, and other public health measures almost taken for granted, medical care began its revolutionary impact on illness and death. Children were to be beneficiaries of new knowledge in biomedical science as well as from the specialisation in paediatric care.

The sciences of physiology, biochemistry and pathology blossomed throughout the 20th century, following fast on the tracks of bacteriology. Knowledge about how the body worked and how diseases were caused meant that diagnosis became accurate and treatments more focused and effective. X-rays, surgery and anaesthesia, fluid and electrolyte metabolism, chemotherapy and other drugs such as those for epilepsy, pain relief and many disorders, have been so effective that many now believe that everything can be cured or will be very soon. Public health, once centre stage and still vital, is often ignored.

Child illnesses in the 20th century

Morbidity and disability

While death rates in the early decades of 20th century probably reflected the occurrence of illness reasonably well, the rarity of death among children now means that death rates do not reflect the burden of illness and disability affecting our children and youth. Morbidity data for all Australian children are available via surveys, such as the National Health Survey, and from data collated by AIHW. And some States, such as WA, have good record-linked and special survey data to describe the recent pattern of child and adolescent morbidity (Stanley, Read et al. 1997).

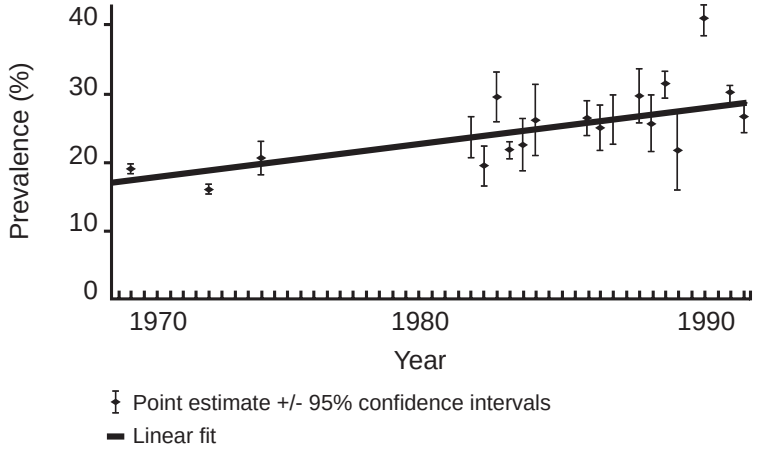
The rise of complex disease—the challenge of the late 20th century

Improvements in social and economic circumstances in Australia have changed the face of child health. Similar to other developed countries, we have observed increases in 'complex' diseases in the cohorts of children born in the last three decades. Suicide and mental health morbidities have been described already and appear to be related to the social changes in our communities. The increased rates of cerebral palsy in very preterm and low birthweight survivors following the introduction of intensive care are an unwelcome outcome of effective technologies aimed at reducing deaths (Stanley, Blair et al. 2000).

Two other examples are asthma and juvenile diabetes, both of which have increased considerably. They head a list of complex disorders which have taken over from infectious diseases as the most serious threats to the health of our young people.

A review of population data and national health surveys (Bauman 1993) showed an increase in asthma symptoms, such as recent and cumulative wheeze and diagnosed asthma between the 1970s and 1990s (graph C6.13).

C6.13 TRENDS IN CUMULATIVE LIFETIME WHEEZE PREVALENCE IN PRIMARY SCHOOL CHILDREN



Source: Bauman 1993.

Asthma is now the leading cause of hospital admission in children and is costly to treat. It was the leading problem (present in nearly 20% of children aged 4–16 years) reported in the WA Child Health Survey in 1992 (Zubrick, Silburn et al. 1995). While some of this increase may be due to changes in diagnosis and more awareness, research is now concentrating on the variable and complex causal pathways to this major allergic disease in relatively healthy communities.

Insulin dependent diabetes mellitus has also increased. In 0–14 year old Western Australian children the rate rose from around 12 per 100,000 (in 1985–91) to 22 in more recent years (Kelly, Russell et al. 1994). Many other centres are now reporting similar increases.

Both asthma and diabetes are lifelong illnesses with significant morbidity and need for complex treatments. Primary prevention, as with all these complex problems, is obviously the way forward, but will only come from further research into causes.

Population data on disability in childhood are not readily available, but suggest increases in both incidence and prevalence of several impairments across the range of severity. Some of this is clearly related to increased survival of high risk newborns and of children with established disability (Blair and Shean 1996).

The proportion of children aged 0–14 years with intellectual disability has fallen from 1970 to 1990. Antenatal diagnosis and termination of affected Down Syndrome and Fragile X affected fetuses, newborn screening for phenylketonuria and congenital hypothyroidism, and vaccination against congenital rubella and Hib, have been the main contributors; improved social conditions may also have contributed.

Increases in autism, behaviour problems and learning disabilities in children have been reported over the 1980s and 1990s (Alessandri, Leonard et al. 1997); it is not clear the extent to which these are all true rises or due in part to parental concerns and changing fashions in diagnosis.

Lifestyle risk factors for poor health

Tobacco and alcohol

Smoking and alcohol abuse are recognised as the leading drug problems in Australia, and influence deaths and illness at all ages. Due to clever advertising by cigarette companies internationally, and peer pressure, children and teenagers are starting to experiment with these drugs at earlier and earlier ages. Once addicted they put themselves at increased risk of smoking related illnesses such as cancer, heart disease, stroke and those risks

associated with alcohol such as accidents, unsafe sex, suicide and mental illness.

Regular nationwide surveys of school children document recent levels of tobacco and alcohol use in Australia (Hill, White et al. 1999). Between a quarter and a third of 15 year old males and a third of females admit to smoking in the past week (table C6.14). There is little improvement over time, most of it in males (Hill, White et al. 1993; Hill, White et al. 1995).

C6.14 PROPORTION OF 15 YEAR OLD AND SECONDARY SCHOOL CHILDREN SMOKING IN THE PAST WEEK

	Males	Females
Year	%	%
1984	29	33
1987	25	28
1990	22	28
1993	24	28

Source: Hill, White et al. 1995.

Table C6.15 shows, by age and gender, the proportions of school children classifying themselves as drinkers. By 14 years of age, over half of the boys and girls have started drinking, some on a regular basis.

The dramatic increase in females smoking and drinking over the last 50 years has been a major social change. Such behaviour in women was unusual in the early and middle years of last century; now we are faced with the prospect of more young girls smoking and as many drinking alcohol as young boys. With the knowledge about the effects of these on the future health of both boys and girls and for girls, on that of their babies, this is a major public health concern.

Australia has been a leader in legislation and health education to reduce cigarette smoking levels in the community. Legislation banning cigarette advertising of any kind was introduced earlier in Australia than in other countries. Recent laws have banned smoking in work and public places, but novel ways need to be found to counteract the clever subliminal advertising of cigarette companies (Daube 2000).

Similarly legislation and education about drinking and driving seems to have impacted on accident rates in young people.

Obesity, poor physical fitness

In the last 20 years, concern has been expressed nationally about the increasing levels of obesity and lack of physical fitness in children and adolescents in Australia (O'Connor and Eden 2000). Two studies (Wake, Lazarus et al. 1999; Lynch, Wang et al. 2000) reported temporal increases in Body Mass Index (BMI, a measure of weight for height) in both Sydney and Melbourne children from age 7 to 18 years, with about 25% of children being overweight. Researchers blame the sedentary lifestyles and diets of children; the intake of fruit and vegetables and of physical activity decreases throughout adolescence (Wake, Lazarus et al. 1999). At the other extreme, there is an epidemic of eating disorders and weight concerns with a desire for thinness among girls, and increasingly among boys as well. Over 30% of 8–12 year old girls have already tried to lose weight (Rolland, Farnill et al. 1997). The longer-term effects of poor adolescent growth are now starting to be described, particularly on bones and on mental health.

Importance of social factors in child health

Family structure and interactions, employment and incomes

There have been changes in our communities that have had a profound effect on child and adolescent health and wellbeing.

C6.15 PROPORTION OF SCHOOL CHILDREN REPORTING THEIR ALCOHOL INTAKE(a), By Age—1984 and 1987

	Males		Females	
	1984	1987	1984	1987
Age group	%	%	%	%
12 years	42	30	23	20
13 years	46	43	36	36
14 years	54	53	51	52
15 years	66	68	65	67
16 years	75	75	74	76
17 years	80	80	77	80

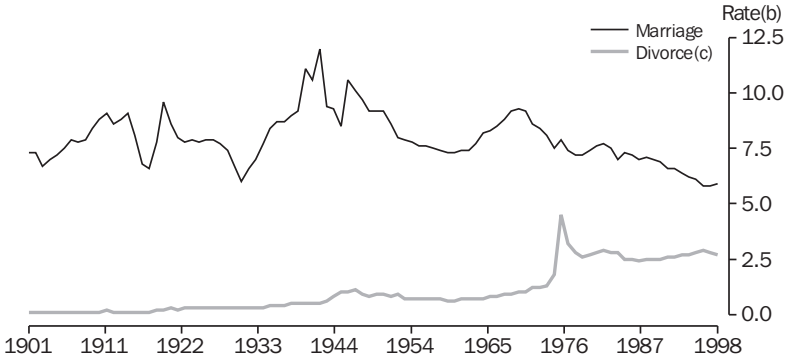
(a) "Occasional, light, party or heavy" drinking.

Source: Hill, White et al. 1990.

The marriage rate reflects the prevailing economic and social conditions. It increased in times of prosperity such as the early 1900s, rose before each world war, fell during it and rose again after it, and fell in times of adversity such as in the 1930s during the Depression. It rose again around the time of the Viet Nam war. Over the last 20 years marriage rates have fallen, and age at first marriage and age at first birth have increased dramatically (graph C6.16). In contrast divorce rates rose in the 1970s, stabilised in the 1980s and have increased slightly through the 1990s. Coincident with the fall in marriage rates, there has been an increase in de facto relationships, which have become more socially acceptable in the last 20 years, even if children are involved. The proportion of births which are ex-nuptial has risen from around 6% in 1901 to 29% in 1998 (graph C6.17); at least half of these births are to women in de facto relationships.

The median age at first marriage was around 27 years for males and 24 for females in the 1920s, remained high during the 1930s Depression years and fell dramatically after 1940. It continued to fall until around 1975 when, associated with marked changes in the professional and social development of women, age at marriage increased again to levels similar or even higher than those seen in 1920s. Age of mothers at first birth closely mirrors the trend for age of mothers at first marriage (graphs C6.18 and C6.19).

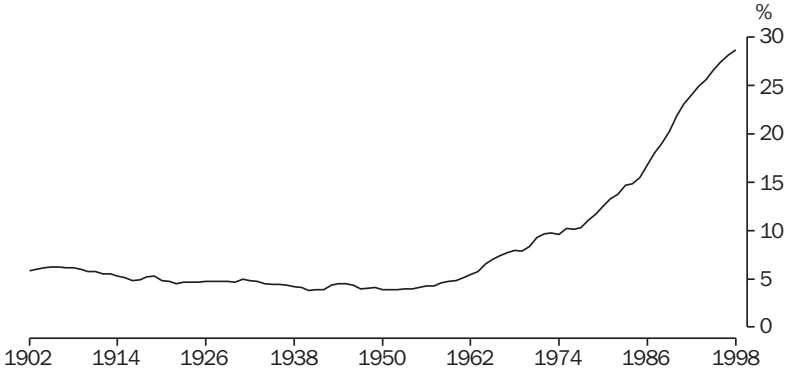
C6.16 CRUDE MARRIAGE AND DIVORCE RATES, Australia(a)—1901 to 1998



(a) Excludes full-blood Aborigines prior to 1966. (b) Rate per 1,000 population.
(c) The peak is due to the introduction of the Family Law Act in 1976.

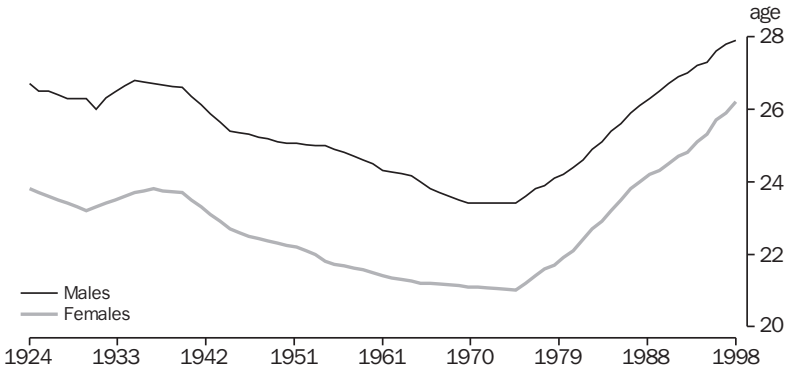
Source: Marriage registrations; divorce registrations.

C6.17 EX-NUPTUAL BIRTHS—1902–1998



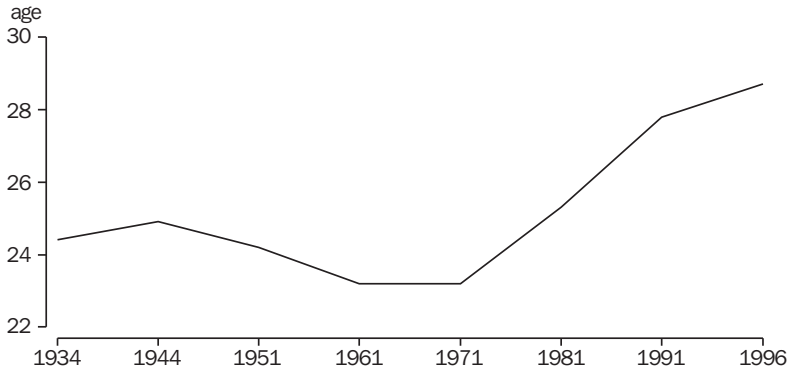
Source: Birth registrations.

C6.18 MEDIAN AGE AT FIRST MARRIAGE, By Sex



Source: Social Indicators 1992 (4101.0).

C6.19 MEDIAN AGE OF MOTHERS AT FIRST NUPTIAL BIRTH—1934 to 1996



Source: Birth registrations.

Late in the 19th century the fertility rate was falling; it picked up again as the new century progressed, falling rapidly after the 1929 Depression. Fertility increased to 3 babies per woman in 1947 and peaked at 3.6 in 1961—during this period (1947–61) 3 million babies were born in what has been referred to as the baby boom! The widespread introduction of the contraceptive pill gave women easier and more sure control over their fertility, which fell along with changes in desired family size. Since the 1970s fertility has declined to its lowest rate ever. An increasing part of this fall is contributed by women who decide to remain childless; in the 1990s 27% of women did not have any children. Of those who do, 40% will have 2 children, the most common family size, and only 12% of women would have one child.

While there is under-registration or recognition of Indigenous births, some data are available. During the 1960s Indigenous women had a total fertility rate of around 6 babies per woman, which fell during 1970s to about 3 and in the 1990s to 2.4. The age distribution of births is very different for Indigenous mothers compared with non-Indigenous, with many more teenage births (graph C6.3).

Divorce and effects on child health and welfare

Until 1940 the level of divorce in Australia was negligible, with less than 2 per 1,000 married women. By 1947 when marriages in haste before the war had started to be tested, the rate had risen to around 5. After a decline in the 1950s, divorces started to increase in the 1960s and climbed sharply in 1976, following the introduction of the Family Law Act and 'no-fault' divorce. This allowed only one ground for divorce—an irretrievable breakdown in the marriage measured by the separation of the spouses for at least one year. Divorce rates have been consistently higher in the 1980s and 1990s than at any time before 1975. The most common themes associated with marital breakdown are listed here because of the impact they are likely to have had on children before the divorce occurred:

- unemployment and work related problems;
- high risk factors within marriages such as addictive behaviours, chronic illness, or death of a child;
- blended families;
- marriage and relationship breakdown in the extended family;
- a redefinition of gender roles and the feminist agenda of equality;
- the growth of individualism;
- poor communication skills;
- poor parenting skills;
- domestic violence; and
- social isolation.

Most of these factors have a negative effect on the care and mental health of children (Zubrick, Silburn et al. 1995; Silburn, Zubrick et al. 1996), and suggest that community

support systems may be less available than in the past.

The proportion of children involved in divorces has risen slightly, from around 9.7 per 1,000 children aged less than 18 in 1988 to 10.9 in 1998; the number of children involved in divorce each year increased from 44,400 to 51,600. After separation, children of all ages were more likely to live with their mother than their father, but could have regular contact with the other parent. The ABS Family Characteristics Survey of 1997 found that there were 978,000 children living with only one natural parent; most (88%) lived with their mother in either one-parent (68%) or in step or blended families (20%). Remarriage rates increased after the 1976 divorce peak and have declined slightly since then. Fathers were more likely to remarry than mothers.

Many studies have observed the detrimental effects of divorce and single parenthood on child health and wellbeing (Fergusson, Horwood et al. 1981; Fergusson 1984; Zubrick, Silburn et al. 1995). The data suggest that children in single parent families fare less well socially, educationally and physically than children in two parent families (adopted as well as natural). Single parents are more likely to be young, poor, and have low educational levels and other social risk factors. Thus the critical issue is not necessarily how many parents a child has but the social and environmental context in which the single parent family operates (Fergusson 1984). Also problems can be exacerbated if the parent remarries or enters into a new situation with a blended family.

The costs to Australia of family breakdowns were assessed at about $3b per year, through legal and social support schemes, and when all indirect costs and the personal and emotional trauma to children is added to these figures, the cost to the nation is enormous.

Data from the WA Child Health Survey (Zubrick, Silburn et al. 1995) suggested that three factors worked to protect children from higher levels of mental health morbidity: two parent family structures (compared with one); higher parental incomes (why is not fully understood and needs more research); and the presence of excellent or good relationships between adult caregiver and another adult. Rates of mental health morbidity were highest when adult relationships were rated poor or fair.

C6.20 SUBSTANTIATIONS OF CHILD ABUSE AND NEGLECT, Australia

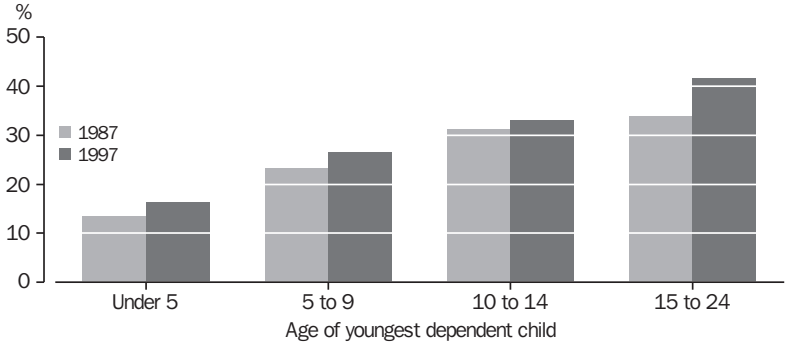
Year	Number of cases
1988–89	18 816
1989–90	n.a.
1990–91	20 868
1991–92	21 371
1992–93	25 630
1993–94	28 711
1994–95	30 615
1995–96	29 833
1996–97	(a)
1997–98	26 025

(a) National data could not be calculated due to differences in timeframes between States.

Source: Australia's Welfare, 1999 (AIHW).

Coincident with these changes in families and communities, the incidence of child abuse—physical, emotional and sexual—is thought to have risen over the last three decades. However the data are incomplete as much goes unrecorded even in those States with mandatory reporting of abuse. Data from the Australian Institute of Health and Welfare show increases in abuse and neglect up to 1994–95, with small falls in later years (table C6.20). All paediatric hospitals now have teams of highly skilled professionals to diagnose and manage these children and their families. In the majority of cases the perpetrator is a close family member or friend. The tragedy of this is illustrated by the proportions of post-neonatally acquired cerebral palsy due to non-accidental injury in WA children, which rose from 3.4% to 14.9% between 1956–75 and 1980–92 (Stanley, Blair et al. 2000). Deaths and cerebral palsy are the 'tip of the iceberg' of damaged children; prevention will need research to identify the best ways to avoid unwanted pregnancies, help young parents, avoid isolation of single parents and provide social support.

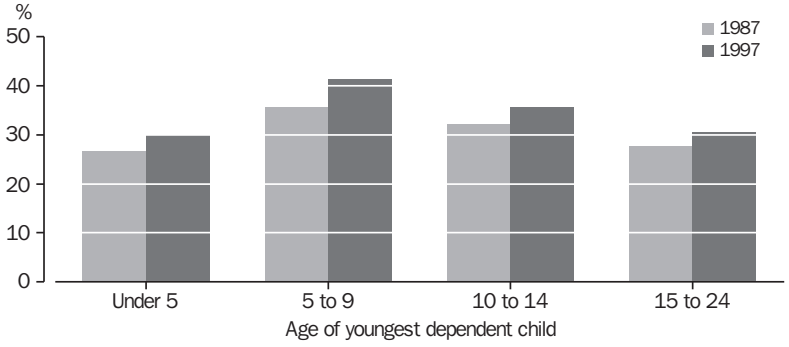
C6.21a EMPLOYMENT RATES OF MARRIED(a) WOMEN WITH CHILDREN, Full-time



(a) Includes those with de facto marriage partners.

Source: Australian Social Trends 1998 (4102.0).

C6.21b EMPLOYMENT RATES OF MARRIED(a) WOMEN WITH CHILDREN, Part-time



(a) Includes those with de facto marriage partners.

Source: Australian Social Trends 1998 (4102.0).

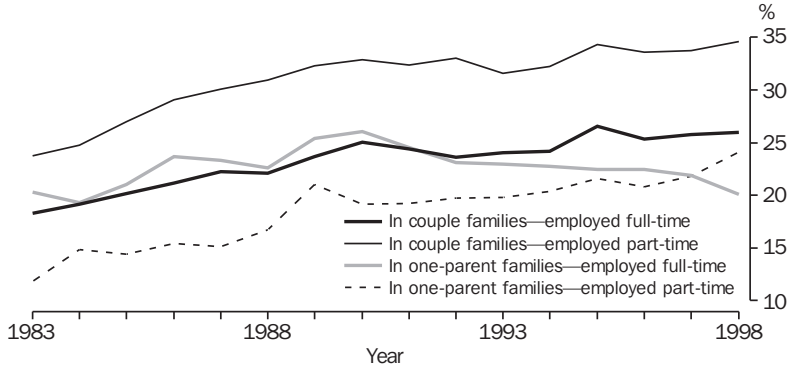
Employment

Apart from the periods of unemployment in the depressions and recessions of the 20th century, the most significant influences in employment impacting on children have been increases in women working (see *Characteristics of the labour force* in *Chapter 6, Labour*, and graphs C6.21a, C6.21b and C6.22).

The era of 'liberation' of women has been associated with more reaching higher levels of education, in professional work and in the workforce generally. Other pressures on women to work have been changes in community attitudes to possessions and needs. The increase in divorce, and consequent rise in single parent families in financial need, has also been a factor. The majority of women with young children now work, either part- or full-time. Arrangements for child care vary, as does the quality of this care and so its impact on the child's social and physical welfare. In the WA Child Health Survey, 73% of children had attended day care by the age of 3 years (Zubrick, Silburn et al. 1995).

The increase in women working has decreased the availability of the 'volunteer' community workforce, so important for schools, care of the aged and other activities. More of this may now need to be provided by local government (see later).

C6.22 EMPLOYMENT STATUS OF MOTHERS WITH DEPENDANTS



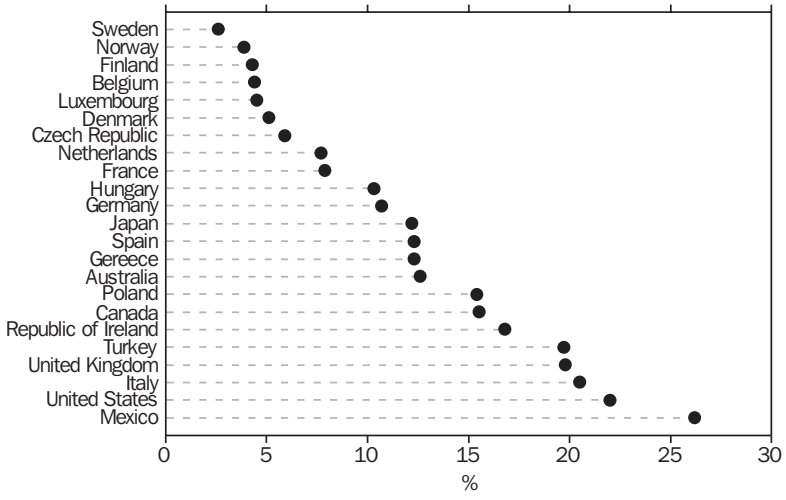
Source: Children, Australia 1999 (4119.0).

Poverty, child health and social security

The levels of poverty and disadvantage around 1900 were a powerful influence on the low levels of child health and high death rates of that time. As Australia has grown and developed over the century, the changes have mainly been towards significant improvement. However, as we move into the new millennium, increasing levels of inequity in social and health status are worrying.

One in six of the developed world's children live in relative poverty, i.e. below the national poverty line in their country (UNICEF 2000).

C6.23 CHILDREN LIVING IN 'RELATIVE'(a) POVERTY, World



(a) Children living in households with incomes below 50% of national median.

Source: UNICEF, http://www.unicef-icdc.org.

Australia ranks 15th of the 23 'rich' countries listed, with 12.6% of its children living in households with incomes below 50% of the national median. Sweden had the least (2.6%), and countries with higher levels than Australia included Poland, Canada, UK and USA. Many European countries had lower relative poverty rates than Australia (graph C6.23).

Of enormous importance to child health is the marked increase in the number of low-income families dependent on benefits because of unemployment or sole parenthood and of the increasing numbers of children in relative poverty.

Many more Indigenous families are living in relative poverty than non-Indigenous families (table C6.24), and some are living in real deprivation. The overall poverty rate among Indigenous families is almost three times that among non-Indigenous families; half of all Indigenous children were living in poverty in 1986 and the same pattern is seen for both groups, i.e. increased risk of poverty with sole parents and unemployed parents.

At the end of the 20th century, these social changes in families, as well as those mentioned above, have implications for social security and child health (Cass 1986). Economic and social attitudes have driven the decrease in size of Australian families, and the increases in sole parent families and in the workforce participation rate of women with children.

Future directions for reform include family income support, redistributing income to all families with children to improve and maintain their position. Australia needs to reassess the value which it places on children, and focus on the concept of shared parental and community obligation (Clinton 1996). Those making policy about family income support need to recognise the increased costs which parents bear, particularly those with young or disabled children, those with large families, and those who are sole parents and/or who are on low incomes (Cass 1986).

C6.24 POVERTY, SEVERE POVERTY AND NEAR POVERTY, Aboriginal and non-Aboriginal income units with children—1986

	Severe poverty (income below 80% poverty line)		Poverty (income below 100% poverty line)		Near poverty (income below 120% poverty line)	
	Aboriginal	Non-Aboriginal	Aboriginal	Non-Aboriginal	Aboriginal	Non-Aboriginal
Income Unit	%	%	%	%	%	%
Couples with						
1 child	6.8	2.4	12.2	3.6	33.8	13.6
2 children	5.2	1.9	27.3	8.0	44.2	12.8
3 children	19.6	2.4	50.0	14.2	67.4	33.8
4 or more children	30.8	16.7	48.7	25.1	71.8	47.6
Sole parents with						
1 child	34.3	14.2	46.3	25.8	77.6	58.1
2 children	15.9	13.5	77.3	51.0	95.5	73.5
3 or more children	34.6	40.8	92.3	82.1	96.2	86.2
All families with children	*18.5*	*5.8*	*43.2*	*15.0*	*63.5*	*28.2*
Percentage of children	20.4	7.0	49.9	18.0	67.9	31.5

Source: Ross and Whiteford 1992.

Schools, preschool and education

During the 19th century, the church dominated education, initially only available to selected groups. By 1900 education was firmly established on a non-sectarian basis in all States, and by 1910–20 governments also developed technical and high schools. Distance and transport influenced Australian education, and correspondence schools date back to 1914. Use was quickly made of radio, and the pedal wireless was introduced soon after, along with the Flying Doctor service (Gandevia 1978).

Preschool education and the kindergarten movement started in NSW in 1895, and were in all States by 1910. Twenty years later Lady Gowrie preschool centres supported by Commonwealth grants commenced, and in 1938 the Australian Association of Preschool Child Development was formed.

After 1900 the public health concern for infant welfare expanded to preschool and school aged children. School Medical Services were operating in all States by 1920. Education was given about personal hygiene, cleanliness, physical education and fresh air, good food and healthy thoughts. School doctors and nurses inspected children for spinal curvature, visual defects, dental caries and other abnormalities. Science and domestic economics were taught to girls to enable them to be good mothers. This commitment to improved conditions, healthy environments and educating future mothers certainly contributed to the early declines in child mortality in Australia.

However there was obviously a difference of opinion between the public health advocates in schools and the teachers, highlighted in a quote from J.W. Springthorpe who, in 1914, attributed the decline in the physique and health of the current generation to "teacherdom which neglected the bodies, which never qualified itself to impart the knowledge of protection from health and disease …. the same teacherdom is with us now, resisting the medical inspection of schoolchildren… prattling of child-soul gardens, and manufacturing child-body cess-pools; spending years in teaching how to model baby-elephants in plasticine, and never an hour on how to use a toothbrush; dawdling over book-learnt nature study, in dark, overcrowded classrooms, redolent with the air-sewage of unwashed children" (quoted in Gandevia 1978). This commitment to school health reflected the medical feeling of the time about the close relationship between environment, health and disease (both mental and physical), and a rapidly growing interest in preventive medicine.

Screening and surveillance of school children and the provision of preventive services through schools continues today. The WA Child Health Survey identified that 20% of 12–16 year olds had a significant mental health problem (table C6.25).

C6.25 MENTAL HEALTH PROBLEMS(a), Western Australian Child Health Survey

	%
Males	20.0
Females	15.4
4 to 11 years	16.0
12 to 16 years	20.6

(a) Delinquent, attentional and social problems, aggressive, anxiety/depression, withdrawn, thought disorders.

Source: Zubrick, Silburn et al. 1995.

Thus one in five teenage school children will have a mental health problem and most will not seek or receive treatment. The implications for school health services is that this level of morbidity demands a preventive approach, aimed at reaching large numbers of children and adolescents. In addition to the detection and surveillance of disabilities in school children and giving them health education, there is a huge unmet need to provide preventive strategies—both in and out of school.

Infancy and early childhood are critical times for the social and physical development of the child, and his/her resiliency and success as an adult. By the age of 4–5 years, when most Australian children are about to start school, the stage for good or bad health and educational outcomes has been set. Research around parenting and its impact on this early period has also highlighted how important it is for that child's own capacity as a parent. This research must be considered when designing appropriate interventions—the earlier the better if we wish to make real differences to child development and adult competencies.

This research also suggests that any activities that undermine parents, or interfere with their capacity to be good and loving parents

and to create a nurturing environment for their child, should be avoided at all costs. The policy of removing half-caste Indigenous children from their families was certainly devastating to generations of children and families, and it continues to have effects on today's parents and families (Human Rights and Equal Opportunity Commission 1997).

The role of health and medical research—some case studies illustrating the advances in the 20th century

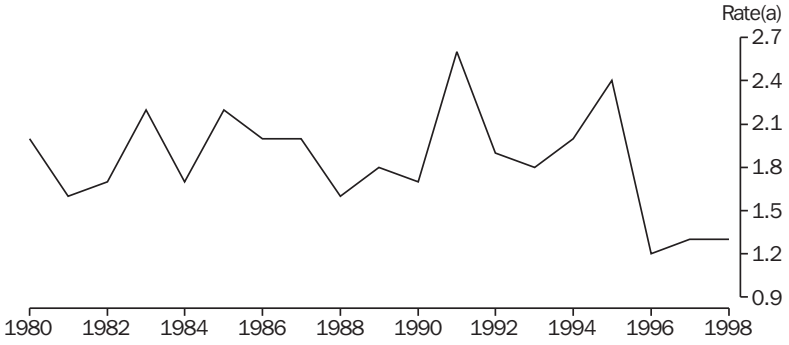
The special case of neural tube defects

Birth defects (congenital malformations) are now one of the commonest reasons for deaths in early infancy and childhood, for hospitalisations, for other care of and disabilities in children. Little is known about the causes of most malformations, which limits our capacity to prevent them.

One of the most common burdensome birth defects results from failure of closure of the developing neural tube in the developing embryo. The resulting defects of anencephaly, spina bifida and encephalocoele, collectively called neural tube defects, cause death or often lifelong disability. Antenatal diagnosis (ultrasound and blood tests) followed by offering termination to mothers of affected fetuses was the only 'preventive' strategy.

Research throughout the 1980s, in Australia as well as internationally, elucidated the protective effect of a maternal diet rich in or supplemented by folate, a B vitamin, found commonly in leafy green vegetables (Bower and Stanley 1996). The impact of increasing maternal folate around the time of conception in WA is shown in graph C6.26.

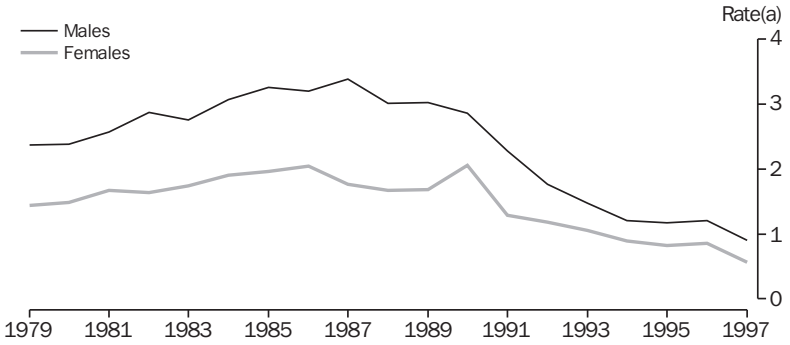
C6.26 PREVALENCE OF NEURAL TUBE DEFECTS, Western Australia



(a) Rate per 1,000 births.

Source: Bower 1999.

C6.27 DEATHS DUE TO SUDDEN INFANT DEATH SYNDROME, By Sex—1979 to 1997



(a) Rate per 1,000 live births.

Source: Death registrations.

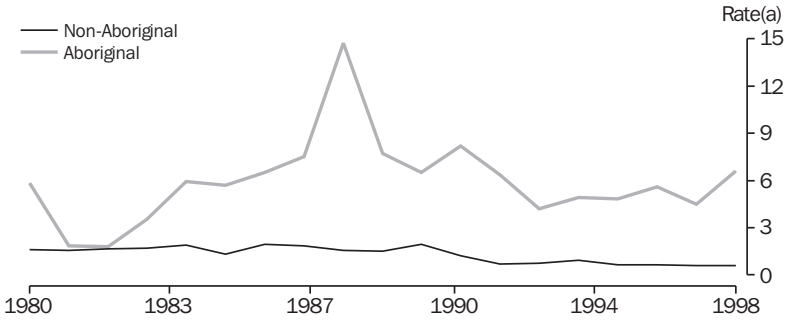
The special case of SIDS

Sudden infant death syndrome (SIDS) or cot death was not a classifiable ICD cause of death until the 1970s. Graph C6.27 shows the Australian SIDS rates from 1979 to 1997.

The rate peaked in the late 1980s in males to above 2.5 per 1,000 live births and was 1.5 for females. Australian research from Tasmania, published in 1989 (Dwyer, Ponsonby et al. 1991) clearly demonstrated the risk of laying babies on their tummies to sleep. Other risks including wrapping the baby up too warmly, smoking and not breastfeeding. A major education campaign to 'Reduce the risks' was run in the early 1990s, which resulted in a dramatic reduction of the rates to around 0.5 per 1,000.

The rate of SIDS in Indigenous babies (graph C6.28) was higher than in Caucasian babies and even after the campaign, has remained high (Alessandri, Read et al. 1996). Possibly other causal pathways to SIDS may be more important in these infants.

C6.28 DEATHS DUE TO SUDDEN INFANT DEATH SYNDROME IN WESTERN AUSTRALIA, By Race



(a) Rate per 1,000 live births.

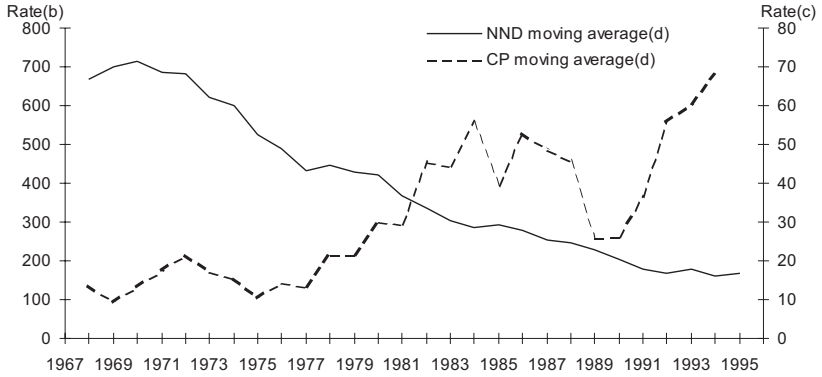
Source: Alessandri, Read et al. 1996.

The special case of preterm births and NICU

The increasing survival of very preterm infants with more and more expensive neonatal intensive care, but with worrying levels of disability, has been debated and questioned internationally. In the US this has been referred to as the perinatal paradox: "the basic incongruity in American perinatal care lies in our superb ability to care for the individual patient and our dismal failure to address the problems of the larger society" (Rosenblatt 1989). The rates of death in smaller and smaller preterm neonates have fallen since the introduction of neonatal intensive care, and the rates of motor disability such as severe cerebral palsy have risen in the survivors (Stanley, Blair et al. 2000). This is also illustrated in graph C6.29.

Meanwhile the proportion of all births born preterm has not changed, suggesting that our efforts have been concentrated on treating the sick preterm newborns rather than on trying to increase the numbers born at term. We must put as much effort into researching the causal pathways to preterm births and other causes of low birth weight as we have into the biomedical research that has had such a wonderful effect on their survival.

C6.29 VERY LOW BIRTHWEIGHT(a), NEONATAL DEATH AND CEREBRAL PALSY RATES IN WESTERN AUSTRALIA—1967 to 1996



(a) Birthweight less than 1,500g. (b) Neonatal death rates per 1,000 live births less than 1,500g. (c) Cerebral palsy rates per 1,000 live births less than 1,500g. (d) 3-year moving averages; note that CP moving average rate for 1994 is derived from 2 years' data only.

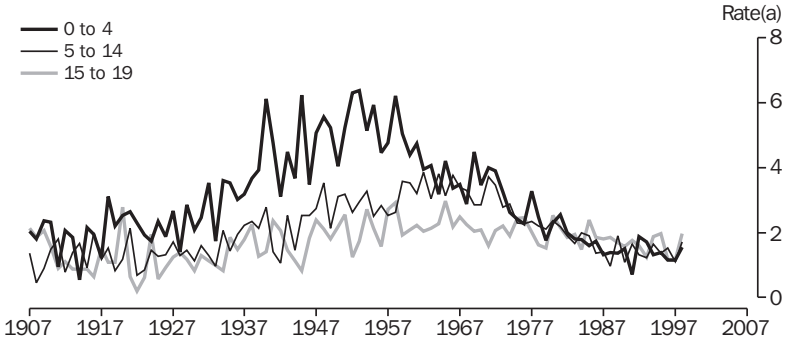
Source: Cerebral Palsy Register, Institute for Child Research, Perth; Unpublished data.

The special case of childhood leukaemia

Cancer as a cause of mortality and morbidity has always been low in children. Mortality increased from 1907 to the 1950s, probably reflecting better ascertainment and more children surviving infancy rather than a real increase in incidence. The falls from around the 1950s to the 1990s are due to more effective therapy. As yet we do not know how to avoid cancers in children. The rates for deaths due to leukaemia are shown in graph C6.30.

There are several important points to make about the reasons for the substantial improvements in cancer survival shown in graph C6.31. One is a wonderful lesson of the demonstration of the importance of randomised controlled trials to ascertain better clinical practice. Another is the multidisciplinary teamwork needed for both research to identify better drugs and to implement best practice. Australian children have benefited from participating in these international research groups.

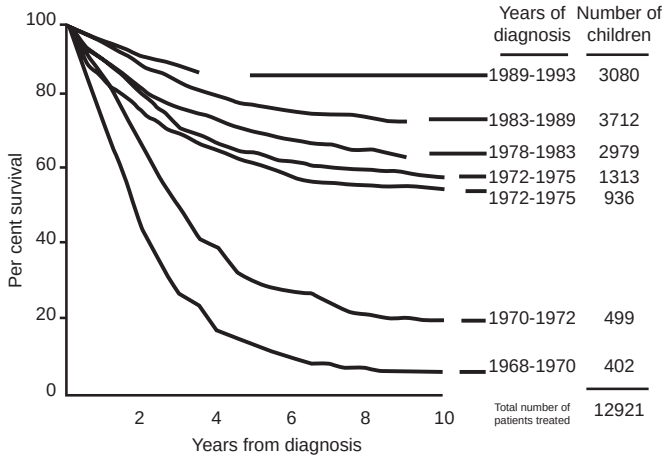
C6.30 DEATHS DUE TO LEUKAEMIA, By Age—1907 to 1998



(a) Rate per 100,000 population.

Source: AIHW Mortality Monitoring System.

C6.31 SURVIVAL OF CHILDREN WITH ACUTE LYMPHOBLASTIC LEUKAEMIA, Children's Cancer Group Studies, USA



Source: Bleyer 1997.

Cumpston—the father of public health in Australia

Improvements in MCH and Australia's commitment to public health in the early 20th century is inextricably entwined with the career of J.H.L. Cumpston. Cumpston (1880–1954) was Australia's first Commonwealth Director-General of Health. A medical graduate from Melbourne and working in the Melbourne Hospital in 1903, he was influenced by the numbers of cases of preventable infectious and parasitic diseases he saw (such as typhoid and hydatids). He set about training himself overseas (UK, France, India) for a career in preventive medicine, "the medicine of the future" as he called it.

How right he was. He oversaw the most spectacular falls in mortality and morbidity ever seen in Australia. With J.S.C. Elkington and R.W. (later Sir Raphael) Cilento, he played the most significant role in the improvements in public health in the first fifty years after Federation. These changes and the ideology which drove them (social, economic and hygienic improvements aimed at "the physical efficiency of the population") were similar to that in Britain and America at the time.

Essential to this movement was an expert bureaucracy to research, create and administer policy: Federation and the income divide between the States and the Commonwealth led to the growth of both State and Commonwealth bureaucracies (discussed later) and, as importantly, legislation to improve public health. Other essential ingredients for the success of the public health movement was a competent and independent (from State) group of medical practitioners, devoted to the care of the sick, but willing to accept State interventions for both public health improvements and care (the latter of course on their terms).

The Labor party of the 1920s was committed to collective responsibility and equitable access with respect to public health. The conservative parties emphasised individual responsibility more, so a reformist Labor Party was also helpful to Cumpston's aims.

Also of course, the explosion in knowledge in the sciences underpinning medicine and public health was to play a major role. The theory of 'miasmas' in public health had led to major environmental changes such as sanitation, fresh water and better living conditions, which started to have an impact on reducing illness and death from infections in the late 19th century. Throughout the early 20th century, as bacteriology developed, knowledge grew of the role of organisms in disease, and the focus of public health shifted to identifying disease in individuals and control by isolation (quarantine), which opened the way to mass vaccination.

Cumpston's contribution can be divided into three phases since 1901. The first, from 1901 to WWI, focused on disease prevention and control in individuals, and in groups of signal importance to the productive and reproductive needs of the community (the 'physical efficiency' referred to earlier)—i.e. mothers and children and, to a lesser extent, the workforce.

The second phase, from WWI to 1930s, resulted in a Commonwealth Department of Health promotion of national public health via 'cooperative Federalism' (see discussion in the next section).

His last phase, from the 1930s to the end of WWII, concerned the creation of a national health service, which did not come to fruition before he died in 1954. His and Cilento's dream was for a national health service which was state financed, allowed universal access, integrated the usually separate areas of preventive and curative medical practice, but did not get rid of private medicine. This sounds an almost perfect world!

M.J. Lewis (1989) edited Cumpston's 1928 writings (Cumpston 1989) and noted: "he was well read in the history of English public health. In appreciating the importance of the political and socio-economic context of public health, he was also well informed about the history of Australia's political and social mores and institutions". His writing has been described as "historically oriented epidemiology", and he acknowledged that this approach was crucial to the understanding of future crises.

While Cumpston concentrated on infectious diseases, which was logical given the prevailing epidemiology of his day, a public health approach is equally crucial to today's epidemics of complex diseases and psychosocial morbidities. They are calling out for a modern day Cumpston.

Governments and child health in the 20th century

Politics and health systems are integrally related, as legislation and government funding have been influential in the overall approach, strategies and management of health care as well as influencing the roles of the different professions in its provision. Knowledge of the political system remains important if people are to be effective in influencing child health policy and allocation of resources. As a researcher dedicated to improving child health I feel that it is vital to ensure that good research in child health gets funded and that it is used to improve services. Given how much we now know about the relationship of income, employment, child care provision, family support, educational level and housing to the general health and welfare of our children, government policies at all levels—Commonwealth, State/Territory and local—are important.

Federal system

How has the unique Australian Federal system influenced the delivery of health care and other policies affecting children? Federalism, the constitutional division of power between the Commonwealth and State Governments, has affected all aspects of Australian life. Throughout the 20th century, there has been an increase in the power of the Commonwealth Government, but the States have also become increasingly independent, with resulting multiplying and complex inter-governmental arrangements which have not always served the health care system well.

As mentioned earlier, Cumpston, as our first Commonwealth Director-General of Health, was a strong supporter of social medicine and convinced that unemployment, poor housing and inadequate social security were detrimental to health (Gillespie 1991). The era of infectious disease public health broadened under his influence, in the first few decades since 1900, to include the new knowledge of physiology and biochemistry which underpinned the nutritional solutions to prevent and treat diseases such as pellagra and anaemia.

Cumpston and others responded to the new public health by replacing the ineffective Federal Health Council with a stronger and more independent National Health and Medical Research Council (NH&MRC) in 1937. This was both to fund the nation's fledgling medical research and to drive decision making in the States about public health. Medical care (hospitals and private practice) was kept closely within the medical profession and within State jurisdictions. Attempts to bring in national health insurance were strongly opposed by doctors and other groups. Initial funding for the NH&MRC came from the Commonwealth Jubilee Fund Appeal for Maternal Welfare and Lord Nuffield's Gift for Crippled Children. By 1938 the allocation was £30,000 (Gillespie 1991).

The council was dominated by the Heads of State Health Departments and chaired by Cumpston who said, "preventive health is the centre of the NH&MRC's program leading to a widespread national campaign which will ensure complete and adequate supervision of an intelligent kind over the bodily health of infants, pre-school children and school children, over the physical culture of the school child and over the diet of the community" (quoted in Gillespie 1991).

W. Hughes as Federal Minister of Health from 1934 to 1937 actively promoted the concept that Australia had to "populate or perish". Thus maternal and infant welfare was a top priority. Lady Gowrie centres were established to train mothers in the care and instruction of the preschool child. They also provided samples of children for surveys of nutrition and growth!

NH&MRC had both nutrition and physical fitness as its major national thrust in the 1930s. Malnutrition was of major concern, with mention of rickets in urban slums and goitre in rural areas as well as the rapid deterioration of the health of Indigenous people in contact with whites (Gandevia 1978). The main activities of the NH&MRC were dominated by the political program of national hygiene and, as the threat of war deepened, the NH&MRC launched a national fitness campaign. They strongly influenced physical education in schools with the aim of producing "a race of strong, virile, stalwart individuals who would provide an invincible bulwark for defence at times of crisis or emergency…" (Gillespie 1991). Thus it seems that a major reason for growing healthy children was to ensure they could fight in a war!

The Commonwealth became increasingly dominant due to the 'power of the purse'; in 1926 the Loan Council helped to ensure dominance with grants to the States, and in 1933 the Commonwealth Grants Commission was established to continue and expand the trend. However Australia throughout the last century was a nation of States, and continues to function with very few truly national organisations or institutions in the health area. The supposedly ideal model of Federalism is one in which each level of government acts independently of the other. This does not exist in practice: working for and representing the same groups means overlap and one impinging on the other. Modern transport and technology means that communications and collaborations between States are facilitated, resulting in more uniform legislation across Australia including policies relating to children, families and health. However, Canberra makes and enforces social and some health policy with varying degrees of "cooperation, conflict and competition with the states. There has been frequent duplication, bureaucratic rivalry, buck passing and lack of accountability" (Rydon 1995).

Attempts by several Labor governments to implement a national health service were opposed by doctors, and so a system of universal health insurance was not signed up by all States until 1975 when Medibank was created. This, to satisfy the doctors, retained the concept of fee-for-service for general and specialist practitioners, with salaried staff in public hospitals (which were free) and in community health.

The complexities of State—Commonwealth services funding and control remain today, with little hope of any great simplification of government roles. Some would say that this situation is a considerable impediment to effective health policy in Australia.

Public health and local government

Local government has played a crucially important role in preventive maternal and child health over the last 100 years. While local government has been mentioned in a somewhat derogatory manner as dealing with ''roads, rates and rubbish or ditches, dunnies and drains" (Smith 1995), in the late 19th and early 20th centuries the role of ensuring a safe and healthy environment was paramount. The fall in infant and child mortality, as mentioned earlier, was in major part initially a result of improved hygiene.

Infant welfare was the first human (rather than property) service in which local government became involved, establishing Baby Health centres or Infant Welfare clinics staffed by nurses. These focused on keeping children healthy with advice to, and support for, parents. This movement commenced at the beginning of the 20th century, aimed at reducing infectious diseases and improving the nutritional and physical condition of children, and was one of the most successful public health initiatives, being the forerunner of our current child and family health services.

Immunisation clinics were almost totally run by local government until relatively recently, when there has been a shift to State and Commonwealth funding of specific programs (such as the 1998–89 measles vaccination campaign), with increasing use of State government personnel and of local general practitioners.

The role of local government in public health could become as important in the 21st century as it was at the beginning of the last century. Public health again is being perceived as requiring an intersectoral response with the development of healthy public policy, involving work, education, town planning and community services as well as health. Thus local government programs and facilities, which might lure children to exercise, watch less TV and participate in activities which build self-esteem, could be powerful in improving child and adolescent health in 2000 and beyond. Local government might also be best placed to provide support for high-risk families such as safe, cheap, enriched childcare or parenting programs. "The close relationship between Local government and public health in Australia is seen in their origins and historical development. The new understanding of health, rather than simply illness, may require a further examination of this relationship and the development of a new framework" (Smith 1995). Perhaps the only area where local government has failed public health has been in the provision of basic services to Indigenous communities. In many of these, particularly in remote areas, conditions are reminiscent of 19th century poverty with the resulting disease patterns described earlier.

Summary

As we begin a new century, certain problems in child and adolescent health are presenting us with a set of challenges similar to those of the social and environmental situations in 1901. Coincident with the changes in our modern society in family life, in employment and in the economy, and the inequalities in wealth which have occurred particularly over the past four decades, we are observing epidemics of mental health problems such as suicides, risk taking behaviours, depression and eating disorders in our young people. As families break down and reform, we are seeing increases in violence against and abuse of children, which resonates with the abuse of children 100 years ago. More and more young people are seduced to watch television, sit at computers, eat and drink unhealthily, smoke cigarettes, drink alcohol excessively and drive dangerously, and so we have the adverse effects of these lifestyles to combat as well.

Issues in relation to poverty and child health have not left Australia's shores in the new century either, in spite of us being one of the most developed countries in the world. Many Indigenous families with children are living in conditions of real deprivation, not unlike those in the 19th and beginning of the 20th century. Their rates of death and illness are higher than those of non-Indigenous children, although there have been improvements recently. This is a uniquely Australian problem, which other colonial powers, New Zealand, USA and Canada, have handled better, with increased life expectancies in their Indigenous groups although still facing considerable problems. And we are faced with more children of all kinds living in relative poverty, with observable disparities in health status between the 'haves' and the 'have-nots'. This is a common problem in wealthier countries all over the world.

Today's social and environmental influences, as with those 100 years ago, are far more powerful in child health and disease than are the drugs or medical care facilities we have at our disposal to treat them. Are we going to respond to change our social, emotional and economic environments to improve child health as effectively as did our forebears in the years after Federation? There are changes starting to happen generally in society as a reaction to the excesses of this era, such as the desire of the people to protect the environment, to be better parents and value families, to work less for our own income and more for the community. Will these start to improve child health the way that decreases in poverty, better food and access to fresh water and sewage disposal affected malnutrition and infectious disease in the 1900s? We must all work to make it happen.

References

Ada, G. and Isaacs, D. 2000, *Vaccination: the facts, the fears, the future*, Allen & Unwin, St Leonards, NSW.

Alessandri, L., Leonard, H. et al. 1997, *Disability Counts: A profile of people with disabilities in Western Australia*, Disability Services Commission, Perth.

Alessandri, L., Read, A. et al. 1996, "An analysis of sudden infant death syndrome in Aboriginal infants", *Early Human Development* 45: 235–244.

Armstrong, W. G. 1939, "The infant welfare movement in Australia'', *Medical Journal of Australia* 2: 641–648.

Australian Bureau of Statistics:

—*Births, Australia* (3301.0).

—*Causes of Infant and Child Deaths, Australia, 1982–96* (4398.0).

—*Children, Australia: A Social Report* (4119.0).

—*Children's Immunisation, Australia, 1995* (4352.0).

—*Marriages and Divorces, Australia* (3310.0).

—*Social Indicators, 1992* (4101.0).

—*Social Trends, 1998* (4102.0).

Bauman, A. 1993, "Has the Prevalence of Asthma Symptoms Increased in Australian Children", *Journal of Paediatrics & Child Health* 29(6): 424–428.

Blair, E. M. and Shean, R. E. 1996, "Trends in childhood disability", *Medical Journal of Australia* 165: 206–208.

Bleyer, W. A. 1997, "The U.S. Pediatric Cancer Clinical Trials Programmes: International implications and the way forward", *European Journal of Cancer* 33: 1439–1447.

Bower, C. 1999, *Report of the Birth Defects Registry of Western Australia 1980–1998*, King Edward Memorial Hospital, Perth.

Bower, C. and Stanley, F. J. 1996, "Issues in the prevention of spina bifida", *Journal of the Royal Society of Medicine* 89: 436–442.

Caldwell, J. C. 1999, *Cunningham Lecture 1999: Pushing back the frontiers of death*, Academy of the Social Sciences in Australia.

Cass, B. 1986, *Social Security Review: Income Support for Families with Children*, Australian Government Publishing Service, Canberra.

Clinton, H. R. 1996, *It takes a village (to raise a child)*, Simon & Schuster, Touchstone.

Cumpston, J. H. L. (ed. M.J. Lewis) 1989, *Health and Disease in Australia: A History*, Australian Government Publishing Service, Canberra.

Daube, M. 2000, *Submission to House of Representatives Standing Committee on Family and Community Affairs—Substance Abuse in Australian Communities Inquiry*.

Dwyer, T., Ponsonby, A. et al. 1991, "Prospective cohort study of prone sleeping position and sudden infant death syndrome", *Lancet* 337(8752): 1244–1247.

Eastough, N. and Gibson, M. 1999, *Western Australian Child and Youth Health Goals and Targets: A Progress Report with National Comparisons*, Health Information Centre, Health Department of Western Australia, Perth.

Fergusson, D. M. 1984, "Annotation: Single parent families", *Australian Paediatric Journal* 20: 169–170.

Fergusson, D. M., Horwood, L. J. et al. 1981, "Birth placement and childhood disadvantage", *Social Science and Medicine* 15E: 315–326.

Gandevia, B. 1978, *Tears Often Shed: Child Health and Welfare in Australia from 1788*, Pergamon Press, Rushcutters Bay, NSW.

Gillespie, J. A. 1991, *The Price of Health: Australian Governments and Medical Politics 1910–1960*, Cambridge University Press, Cambridge.

Gordon, D. 1976, *Health, sickness and society: theoretical concepts in social and preventive medicine*, University of Queensland Press, St Lucia.

Hanna, J. 1992, "The epidemiology and prevention of Haemophilus influenzae infections in Australian aboriginal children", *Journal of Paediatrics & Child Health* 28: 354–61.

Hill, D., White, V. et al. 1999, "Tobacco use among Australian secondary students in 1996", Australian & New Zealand Journal of Public Health 23: 252–9.

Hill, D., White, V. et al. 1995, "Prevalence of cigarette smoking among Australian secondary school students in 1993'', *Australian Journal of Public Health* 19: 445–449.

Hill, D., White, V. et al. 1993, "Tobacco and alcohol use among Australian secondary school students in 1990", *Medical Journal of Australia* 158: 228–234.

Hill, D. J., White, V. M. et al. 1990, "Tobacco and alcohol use among Australian secondary school students in 1987", *Medical Journal of Australia* 152: 124–128.

Human Rights and Equal Opportunity Commission 1997, *Bringing Them Home. Report of the National Inquiry into the Separation of Aboriginal and Torres Strait Islander Children from Their Families*, AGPS, Canberra.

Jain, S. K. 1996, *Breastfeeding in Australia*, Australian Bureau of Statistics, Canberra.

Kelly, H. A., Russell, M. T. et al. 1994, "Dramatic Increase in Incidence of Insulin Dependent Diabetes Mellitus in Western Australia", *Medical Journal of Australia* 161: 426–429.

Lancaster, H. O. 1956a, "Infant mortality in Australia", *Medical Journal of Australia* 2: 100–108.

Lancaster, H. O. 1956b, "The mortality of childhood in Australia: Part I. Early childhood", *Medical Journal of Australia* 2: 889–894.

Lynch, J., Wang, X. L. et al. 2000, "Body mass index in Australian children: recent changes and relevance of ethnicity", *Archives of Disease in Childhood* 82: 16–20.

Mathews, J. 1997, "Historical, social and biological understanding is needed to improve Aboriginal health", *Recent Advances in Microbiology* 5: 257–334.

McKeown, T. 1979, *The role of medicine: Dream, mirage or nemesis?* Basil Blackwell Publisher Ltd, Oxford.

O'Connor, H.T. and Eden B. D. 2000, "Recommendations for nutrition and physical activity for Australian children", *Medical Journal of Australia* 173 (Supplement): S1–S16.

Rolland, K., Farnill D. et al. 1997, "Body figure perceptions and eating attitudes among Australian school children aged 8 to 12 years", *International Journal of Eating Disorders* 21: 273–278.

Rosenblatt, R. 1989, "The perinatal paradox: doing more and accomplishing less", *Health Affairs* 8: 158–68.

Ross, R. and Whiteford, P. 1992, "Poverty in 1986: Aboriginal families with children", *Journal of Social Issues* 27: 91–111.

Rydon, J. 1995, "The Federal System", in H. Gardner (ed.) *The Politics of Health: The Australian Experience*, Churchill Livingston, Melbourne: 8–30.

Silburn, S. R., Zubrick, S. R. et al. 1996, *Western Australian Child Health Survey: Family and Community Health*, Australian Bureau of Statistics and the TVW Telethon Institute for Child Health Research, Perth.

Silva, D., Palandri, G. et al. 1999, *Specific Child and Adolescent Health Problems in Western Australia*, Health Department of Western Australia and TVW Telethon Institute for Child Health Research, Western Australia.

Simons, J. 1989, "Cultural dimensions of the mother's contribution to child survival", in *Selected readings in the cultural, social and behavioural determinants of health*, Health Transition Centre, Australian National University, Canberra: 132–145.

Smith, J. 1995, "Public health and local government", in H. Gardner (ed.) *The Politics of Health: The Australian Experience*, Churchill Livingston, Melbourne: 306–322.

Stanley, F., Blair, E. et al. 2000, *Cerebral Palsies: Epidemiology and Causal Pathways*, Mac Keith Press, London.

Stanley, F., Read, A. et al. 1997, "A population maternal and child health research database for research and policy evaluation in Western Australia", *Seminars in Neonatology* 2: 195–201.

Thomson, N. 1990, *Overview of Aboriginal health status. Report to the Royal Commission into Aboriginal Deaths in Custody*, Australian Institute of Health, Canberra.

Thomson, N. 1991, "A review of Aboriginal health status", in J. Reid and P. Trompf (eds) *The Health of Aboriginal Australia*, Harcourt Brace and Company, Sydney: 37–79.

UNICEF 2000, *A league table of child poverty in rich nations*, Florence, Italy. Also available as 'poverty.pdf' from the UNICEF Internet site at *http://www.unicef-icdc.org*

Wake, M., Lazarus, R. et al. 1999, "Are Australian children getting fatter?" (abstract), *Journal of Paediatrics and Child Health* 35: A7.

Williams, H. 1989, "Perspectives on family and child health in a changing society: 1788–1988", in *Community Child Health: an Australian Perspective*, Churchill Livingstone, Melbourne: 7–33.

Youth Suicide Advisory Committee 1998, *Working together to stop Aboriginal suicide and self-harm in Western Australia: Report to the Hon. Kevin Prince MLA LLB Minister for Health from the Youth Suicide Advisory Committee*, Health Department of Western Australia, Perth, Western Australia.

Zubrick, S. R., Silburn, S. R. et al. 1995, *Western Australian Child Health Survey: Developing Health and Well-being in the Nineties*, Australian Bureau of Statistics and the Institute for Child Health Research, Perth (WA).

10 Education and training

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Introduction

The term 'education' has traditionally been used to denote the processes of obtaining knowledge, aptitudes, skills, or socially valued qualities of character and behaviour. Education is regarded as a lifelong process, initiated at birth, developed in schooling and subsequent formal pathways of learning, and continued thereafter. 'Training' is a more specific type of learning, whereby certain skills are developed for subsequent application in the workplace. The value of training lies in its practical relevance.

Historically, education has usually been conducted in formal institutions such as schools and universities, while training occurred in vocationally focused institutions or in the workplace. However, in recent times the distinction between education and training has been diminishing, with education extending beyond the formal institutions, and training extending beyond vocational institutions and the workplace. Training is becoming available in schools, with senior secondary school students able to study for vocational certificates as part of their school work. Both education and training are now perceived to be parts of a lifelong learning process that enables individuals to take their places in a skilled and changing labour force, to lead fulfilling lives, and to become active members of the community.

Education then and now

Education in Australia has changed greatly since Federation. In 1900 the Colonies had 6,900 State schools to service their 3.8 million population, with an enrolment of 623,700 pupils. A further 153,400 students were apparently enrolled in private schools—however, these numbers were not considered reliable. In 1900 secondary schooling was a privilege offered only to a small minority of young people. In 1910 the Commonwealth Statistician said that "the average boy or girl simply leaves the State School at the age of fourteen or thereabouts, and the State apparently no longer concerns itself with them".[1] At the start of Federation, technical education had not been fostered for some time. In Victoria, "it was not until after the publication of the Report of the Royal Commission on Technical Education (which was appointed in 1899) that many defects were remedied".[2] Also, there were only four universities, those of Sydney, Melbourne, Adelaide and Tasmania, with around 2,000 students in total.

In 1999 Australia had 3.2 million school students, of whom 2.2 million were in Government schools and 1.0 million in private schools. Vocational Education and Training (VET) was well patronised with 1.6 million clients, and there were 42 publicly-funded higher education institutions attended by 686,300 higher education students.

The 1911 Census found 31,700 persons employed in education, who made up 1.6% of civilian 'breadwinners'. In contrast, the May 2000 Labour Force Survey estimated employment in education at 615,400, representing 6.8% of the civilian labour force.

1 Commonwealth Bureau of Census and Statistics 1911, *Official Year Book of the Commonwealth of Australia No.4*, McCarron, Bird & Co. Printers, Melbourne: p. 892.

2 Commonwealth Bureau of Census and Statistics 1908, *Official Year Book of the Commonwealth of Australia No.1*, McCarron, Bird & Co. Printers, Melbourne: p. 745.

Commonwealth and State government responsibilities in education and training

At Federation, the governments of the six Australian States maintained their responsibility for most education and training. This arrangement continues today for both the States and Territories. It includes the administration and substantial funding of primary and secondary education, as well as the administration and major funding of Vocational Education and Training (VET).

The Commonwealth Government has special responsibilities in education and training for Aboriginal and Torres Strait Islander peoples, migrants, international relations in education, and assistance for students. It is also principally responsible for the funding of higher education

institutions, and provides supplementary funding for schools and for VET. The States and Territories also receive special grants from the Commonwealth Government for areas of particular need. Apart from its significant financial role, the Commonwealth is also involved in promoting national consistency and coherence in the provision of education and training across Australia.

For 1998–99, total operating expenses on education under accrual measures (table 10.30) for all Australian governments were $31,546m and comprised 5.3% of Gross Domestic Product (GDP). Total expenditure on non-financial assets, a cash measure, for all Australian governments was $1,718m, 0.3% of GDP. Cash-based private expenditure on education (final consumption expenditure plus gross fixed capital formation) amounted to $9,019m and comprised 1.5% of GDP. Because total operating expenses are an accrual measure, while both expenditure on non-financial assets and private expenditure on education are cash measures, the three should not be aggregated together.

Preschool education

All States and Territories have a policy of making preschool education available for children in the year prior to school entry. However, there is no national policy on the provision of preschool education and there are considerable differences among the States and Territories in the regulation, administration and organisation of preschools. The age at which children may attend preschool varies between three and five years, reflecting the different school commencement ages in each State or Territory.

In recent years, the differences between preschool and long day care centres have become less distinct, with many long day care centres offering a preschool program as part of their services, and some preschools extending their hours. These circumstances have made it difficult to clearly determine the number of children attending preschool.

The 1999 Child Care Survey provides information on children attending preschool. In this survey, preschool refers to a type of formal care generally available in school hours during school terms for children from three years of age (younger children are sometimes accepted) up to the school starting age. Children usually have fixed attendance times. In 1999, 231,600 children attended preschools in Australia. Of those aged three to five years, 30% attended preschool. Almost half (49%) of children aged four years were attending preschool. This pattern is related to the fact that preschool generally lasts one year and most of the States and Territories require children to be five years old to start school.

Primary and secondary education

School attendance

School attendance is compulsory throughout Australia between the ages of 6 and 15 years (16 years in Tasmania). Most children start primary school at five years of age. Compulsory attendance was introduced by Western Australia in 1871, with other States introducing similar legislation around the same time, and with the ages for compulsory education varying between six and 14 years of age.

Each State and Territory has developed its own approach to schooling, particularly in relation to the structure of pre-Year One education and the transition from primary to secondary schooling. Primary schooling in most States and Territories begins with a preparatory or kindergarten year, followed by six or seven primary grades, then a further five or six years to complete a full secondary course of study. In total, most States and Territories have 13 years of schooling (except Queensland and Western Australia, which have 12). While the final two years of schooling generally fall outside the compulsory stage of education, in 1999, 86% of students remained at school until Year 11 and 72% remained until Year 12.

School organisation and operation

Primary schooling provides a general elementary program lasting for seven or eight years until Year 6 or 7. Students enter secondary schools at Year 7 in some State (or Territory) systems and at Year 8 in others. Primary and secondary schools are usually separate institutions, but in some areas there are central or area schools which provide both levels of schooling. In Tasmania and the Australian Capital Territory, attendance for the final two years of government schooling is at separate secondary colleges.

Generally, schools in Australia have a considerable degree of autonomy. Most States and Territories have established regional administrations which are responsible for matters such as planning school buildings and deploying staff, while a central curriculum unit provides

general guidelines on course planning. Typically, individual schools determine teaching and learning approaches within the given guidelines and offer various course options. The assessment of students varies across States and Territories, with some having a completely school-based system, while others combine school-based assessment with external examinations.

Primary schooling

In early primary education, the main emphasis is on the development of basic language and literacy skills, simple arithmetic, moral and social education, health training and some creative activities.

In the upper primary years the focus is on development of the skills learned in earlier years. English, mathematics, social studies, science, music, art and craft, physical education and health are studied. There are also optional subjects such as religious instruction, foreign and community languages, and instrumental music.

Secondary schooling

In some systems the first one or two years of secondary school consist of a general program which is followed by all students, although there may be some electives. In later years, a basic core of subjects is retained, with students being able to select additional optional subjects. In other systems, students select options from the beginning of secondary school.

In senior secondary years, a wider range of options is available in the larger schools and there is an increasing trend towards encouraging individual schools to develop courses suited to the needs and interests of their students, subject to accreditation and moderation procedures. There is also an increasing emphasis on the incorporation of vocational programs into the senior secondary curriculum. School students may obtain vocational education and training sector certificates as part of their senior study and undertake some parts of their programs in the workplace.

Students reaching the minimum school leaving age may leave school and seek employment, or enrol in a vocational course with a Vocational Education and Training (VET) institution, such as a Technical and Further Education (TAFE) institution or a private business college. For many VET courses, completion of Year 10 of secondary school is a minimum entry requirement. For those continuing to the end of secondary school (Year 12), opportunities for further study are available in higher education institutions, VET institutions and other tertiary institutions. Students' eligibility to enter higher education institutions is assessed during, or at the end of, the final two years of secondary schooling.

Schools, students and teaching staff

Around 9,600 schools were operating in Australia in August 1999; approximately 7,000 (73%) of these were government schools and 2,600 (27%) were non-government schools. There were 150,500 (70%) full-time equivalent (FTE) teaching staff employed in government schools, and a further 65,200 (30%) employed in non-government schools (table 10.1).

10.1 SCHOOLS, STUDENTS AND TEACHING STAFF—1999

		Non-government schools				
	Government schools	Anglican	Catholic	Other	Total	All schools
	%	%	%	%	%	'000
Schools	72.7	1.4	17.7	8.2	27.3	9.6
Students(a)						
Males	70.0	3.2	19.5	7.4	30.0	1 640.1
Females	69.3	3.1	20.0	7.7	30.7	1 586.5
Persons	*69.7*	*3.1*	*19.7*	*7.5*	*30.3*	*3 226.7*
FTE of teaching staff(b)						
Males	68.7	4.7	17.1	9.6	31.4	73.0
Females	70.3	3.2	18.6	7.9	29.7	142.7
Persons	*69.8*	*3.7*	*18.1*	*8.5*	*30.2*	*215.7*

(a) Full-time students only. (b) Full-time teaching staff plus full-time equivalent (FTE) of part-time teaching staff.

Source: Schools, Australia (4221.0).

10.2 STUDENTS(a), By Category of School and Sex

	1984	1989	1994	1997	1998	1999
	'000	'000	'000	'000	'000	'000
Government schools						
Males	1 163.0	1 124.0	1 133.5	1 140.9	1 144.8	1 148.4
Females	1 097.6	1 070.4	1 081.4	1 089.2	1 094.6	1 099.2
Persons	*2 260.6*	*2 194.4*	*2 214.9*	*2 230.1*	*2 239.4*	*2 247.7*
Non-government schools						
Males	379.7	420.2	445.8	473.9	482.4	491.7
Females	377.4	416.8	438.7	467.7	476.9	487.3
Persons	*757.1*	*837.0*	*884.4*	*941.6*	*959.3*	*979.0*
All schools						
Males	1 542.6	1 544.2	1 579.2	1 614.8	1 627.2	1 640.1
Females	1 475.0	1 487.2	1 520.1	1 556.9	1 571.4	1 586.5
Persons	*3 017.6*	*3 031.4*	*3 099.4*	*3 171.6*	*3 198.7*	*3 226.7*

(a) Full-time students only.

Source: Schools, Australia (4221.0).

In 1999, 3.2 million students were attending primary and secondary schools on a full-time basis, comprising 2.2 million (70%) in government schools and 1.0 million (30%) in non-government schools. The number of students attending government schools increased by 8,300 (0.4%) from the previous year while the number of students attending non-government schools increased by 19,700 (2%) (table 10.2).

In 1984, the full implementation of the National Schools Statistics Collection allowed for greater comparability of school statistics between the States and Territories. Table 10.2 illustrates that from 1984 until 1999 there was an increase of 209,000 (7%) students attending school. The number of students attending government schools between 1984 and 1989 fell by 66,200 (3%), but then increased by 53,300 (2%) in the ten year period between 1989 and 1999. Attendance at non-government schools increased by 80,000 (11%) between 1984 and 1989, and 141,900 (17%) between 1989 and 1999. In 1984 non-government schools comprised 25% of the student population. In 1999 this had increased to 30%.

Table 10.3 shows the number of students in 1999 by level of education. Of all primary school students, 27% went to non-government schools, compared with 35% of all secondary school students. One-fifth of all school students went to non-government Catholic schools (19% of primary school students and 21% of secondary school students).

Graphs 10.4 and 10.5 provide a historical perspective by showing the proportion of government and non-government schools, students and staff for the years 1949 and 1999. Care should be taken when comparing data from these two years, as prior to 1984 there was no national framework governing definitions and collection methods.

Between 1949 and 1999, the proportion of the non-government share has grown in each category: by 8% for total schools, 7% for total students and 6% for total teaching staff (full-time teaching staff plus full-time equivalents of part-time teaching staff).

Between 1949 and 1999, the number of government schools has fallen by 904 (11%), while non-government schools have increased by 777 (42%). The numbers of students at such schools have increased by 1.3 million (132%) and 0.7 million (234%) respectively. The numbers of teachers in government and non-government schools have increased by 110,800 (279%) and 52,700 (421%) respectively. The teacher/student ratio has decreased for both government schools (from 1:24 to 1:15) and non-government schools (from 1:23 to 1:15).

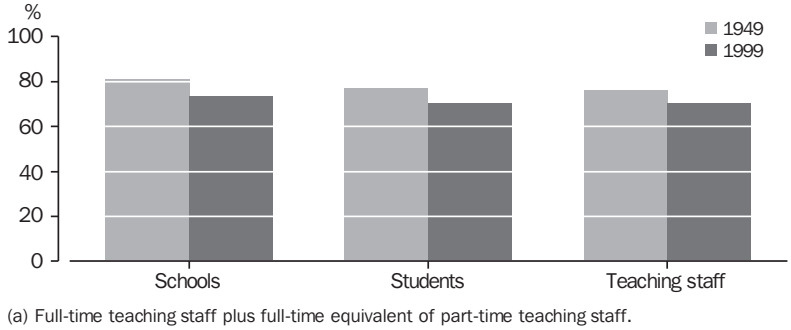
10.3 NUMBER OF STUDENTS, By Level of Education—1999

		Non-government schools				All schools		
	Government schools	Anglican	Catholic	Other	Total	Males	Females	Persons
Level/year of education	%	%	%	%	%	%	%	'000
Primary								
Pre-year 1(a)	72.3	1.6	20.3	5.8	27.7	51.4	48.6	191.8
Year 1	73.5	1.6	19.2	5.8	26.5	51.4	48.6	269.5
Year 2	73.7	1.6	19.0	5.8	26.3	51.3	48.7	266.0
Year 3	73.3	1.7	19.2	5.8	26.7	51.1	48.9	265.5
Year 4	73.1	1.9	19.2	5.9	26.9	51.2	48.8	262.1
Year 5	72.6	2.2	18.9	6.2	27.4	51.1	48.9	260.0
Year 6	72.2	2.4	18.9	6.5	27.8	51.0	49.0	256.2
Year 7 (Qld, SA, WA, NT)	74.1	2.9	15.8	7.3	25.9	51.2	48.8	98.3
Ungraded	85.0	0.0	1.8	13.3	15.1	64.7	35.3	15.9
Total primary	*73.1*	*1.9*	*18.9*	*6.1*	*26.9*	*51.3*	*48.7*	*1 885.4*
Secondary								
Year 7 (NSW, Vic., Tas., ACT)	63.8	4.2	23.0	9.0	36.2	51.3	48.7	156.3
Year 8	65.0	4.6	21.0	9.4	35.0	51.1	48.9	256.8
Year 9	65.7	4.6	20.6	9.2	34.3	50.8	49.2	256.9
Year 10	65.3	4.8	20.7	9.2	34.7	50.5	49.5	249.5
Year 11	64.2	5.4	20.5	10.0	35.9	48.7	51.3	219.9
Year 12	61.6	5.8	21.9	10.6	38.4	47.0	53.0	182.5
Ungraded	87.8	1.2	3.4	7.6	12.2	59.7	40.3	19.3
Total secondary	*64.8*	*4.8*	*20.9*	*9.5*	*35.2*	*50.1*	*49.9*	*1 341.3*
Total	**69.7**	**3.1**	**19.7**	**7.5**	**30.3**	**50.8**	**49.2**	**3 226.7**

(a) Pre-year 1 does not exist in Queensland or in Western Australia.

Source: Schools, Australia (4221.0).

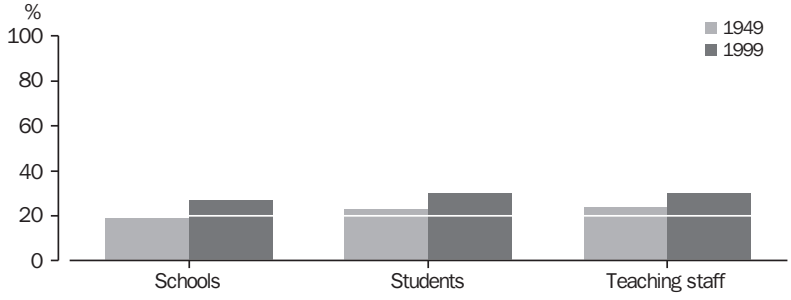
10.4 PERCENTAGE OF GOVERNMENT SCHOOLS, STUDENTS, AND SCHOOL STAFF (FTE(a))—1949 and 1999



(a) Full-time teaching staff plus full-time equivalent of part-time teaching staff.

Source: Schools, Australia (4221.0); Official Year Book of the Commonwealth of Australia No. 39, 1953 (Commonwealth Bureau of Census and Statistics).

10.5 PERCENTAGE OF NON-GOVERNMENT SCHOOLS, STUDENTS, AND SCHOOL STAFF (FTE(a))—1949 and 1999



(a) Full-time teaching staff plus full-time equivalent of part-time teaching staff.

Source: Schools, Australia (4221.0); Official Year Book of the Commonwealth of Australia No. 39, 1953 (Commonwealth Bureau of Census and Statistics).

Other schooling arrangements

Children may be exempted from the requirement of compulsory attendance at a school if they live too far from a school or have a disability.

Some Indigenous children in remote areas of the Northern Territory, who live in small decentralised communities such as out-stations or homeland centres, receive schooling from Indigenous teaching assistants supported by visiting teachers from established schools.

Over time, various schemes have extended schooling to remote or sparsely settled areas, and addressed the needs of minority groups. From 1867, New South Wales had 'provisional' and 'half-time' schools in localities with fewer than 25 school-aged children. Itinerant teachers were allocated teaching rounds, going from house to house, in sparsely settled areas. Development of the 'pedal radio' after World War II made Schools of the Air possible for isolated pastoral families. Today these children receive tuition through a variety of educational delivery mechanisms, including distance education, Schools of the Air, and use of computer and facsimile technologies.

For children with physical or developmental disabilities, 'special education' is available in all States and Territories. Special education is provided by government and non-government authorities in special classes or units in regular schools, by withdrawal from regular classes for periods of intensive assistance by special staff, or in specialist schools. In all States and Territories, and particularly in New South Wales, Queensland and Victoria, parents have formed voluntary organisations to establish additional schools catering for their children's special needs. The Commonwealth Government provides funds to States and Territories, non-government authorities and community groups to assist in the provision of services and upgrading of special education facilities.

Boarding facilities are available at some non-government schools, mainly in the larger towns and cities. A small number of government schools, in particular those catering for groups such as Indigenous people, have residential hostels close by.

Apparent retention rates

Apparent retention rates are important measures of the performance of education systems and related government policies. The apparent retention rate is an estimate of the percentage of students of a given cohort who continued to a particular level or year of education. In graph 10.6, apparent retention rates have been calculated for full-time students who continued to Year 12 from their respective cohort at the commencement of their secondary schooling.

The apparent retention rate of secondary school students to Year 12 fell from 77% in 1993 to 72% in 1999. As in previous years, the apparent retention rate for female students (79%) was higher than the corresponding rate for males (66%).

Apparent retention rates increased continually over the period 1967 to 1992, when they peaked at 77%. Year 12 was not universally available in government secondary schools in 1967. In that year only 15% of female students completed Year 12. In government schools, the female

retention rate to Year 12 has exceeded the male rate since 1975. In non-government schools, the female rate has exceeded that of males since 1982.

Care should be taken in interpreting apparent retention rates since a range of factors affecting their calculation has not been taken into account. At the national level these include the effects of students who repeat a year of education, migration, and changing characteristics of the school population, such as the growing number of full-fee paying overseas students.

Comparisons between government and non-government schools should also be made with caution because of the net transfer of students from government to non-government schools, which tends to inflate the apparent retention rates in non-government schools and reduce the government school rates.

Funding of schools

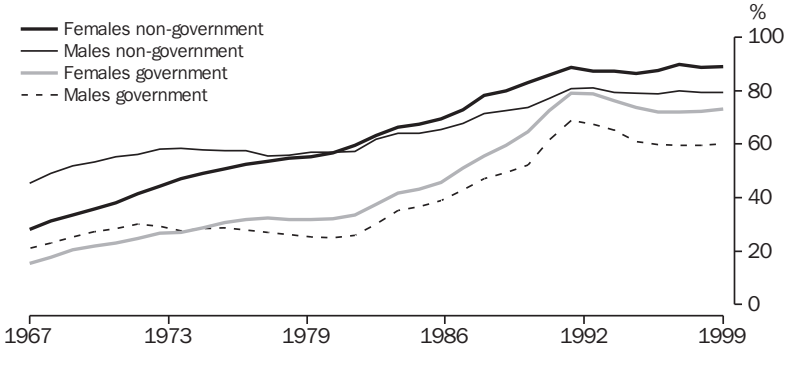
On an accrual basis, the primary and secondary education expenses of Australian governments totalled $16,870m in 1998–99. Preschool and other special education expenses added $1,173m. State, Territory and local governments also spent large sums on other aspects of schooling such as transporting students. Preschool, primary, secondary, and other special education expenses were largely met by State, Territory and local governments (table 10.29). The change from a cash to an accrual basis makes 1998–99 estimates difficult to compare with those for previous years.

Unpublished data from the Ministerial Council on Education, Employment, Training and Youth Affairs show that in 1998, non-government schools derived 43% of their income from private sources, 40% from the Commonwealth Government, and 17% from State grants. Non-government schools operate under conditions determined by government authorities, usually registration boards, in each State and Territory. These conditions require that minimum education standards are met and that the schools have satisfactory premises. The majority of non-government schools are Catholic, and there is a Catholic Education Commission in each State and Territory and at the national level. Most other non-government schools are under the auspices of, or run by, other religious denominations.

Primary and secondary education is free in government schools in all States and Territories. However, fees may be charged for the hire of text books and other school equipment (particularly in secondary schools) and voluntary levies may be sought from parents.

Most State and Territory Governments provide financial assistance to parents for educational expenses, under specified conditions. Assistance includes scholarships, bursaries, transport and boarding allowances, many of which are intended to assist low-income families. The Commonwealth Government also provides a number of schemes of assistance to facilitate access to education.

10.6 APPARENT RETENTION RATES TO YEAR 12, from Year 7/8—1967–1999



Source: Department of Employment, Education and Training, 'Retention and Participation in Australian Schools 1967 to 1992'; Schools, Australia (4221.0).

Adelaide Declaration on National Goals for Schooling in the Twenty-first Century

In April 1999, the State, Territory and Commonwealth Ministers of Education met as the Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA). At that meeting in Adelaide, Ministers endorsed a new set of National Goals for Schooling in the Twenty-First Century. The new goals were released in April 1999 as *The Adelaide Declaration (1999) on National Goals for Schooling in the Twenty-First Century*.

The Adelaide Declaration (1999) arose from a Discussion Paper published in 1998, reviewing The Hobart Declaration of 1989, and supersedes these earlier documents.

Below is the complete text of the Adelaide Declaration (1999).

Preamble

Australia's future depends upon each citizen having the necessary knowledge, understanding, skills and values for a productive and rewarding life in an educated, just and open society. High quality schooling is central to achieving this vision.

This statement of national goals for schooling provides broad directions to guide schools and education authorities in securing these outcomes for students.

It acknowledges the capacity of all young people to learn, and the role of schooling in developing that capacity. It also acknowledges the role of parents as the first educators of their children and the central role of teachers in the learning process.

Schooling provides a foundation for young Australians' intellectual, physical, social, moral, spiritual and aesthetic development. By providing a supportive and nurturing environment, schooling contributes to the development of students' sense of self-worth, enthusiasm for learning and optimism for the future.

Governments set the public policies that foster the pursuit of excellence, enable a diverse range of educational choices and aspirations, safeguard the entitlement of all young people to high quality schooling, promote the economic use of public resources, and uphold the contribution of schooling to a socially cohesive and culturally rich society.

Common and agreed goals for schooling establish a foundation for action among State and Territory governments with their constitutional responsibility for schooling, the Commonwealth, non-government school authorities and all those who seek the best possible educational outcomes for young Australians, to improve the quality of schooling nationally.

The achievement of these common and agreed national goals entails a commitment to collaboration for the purposes of:

- further strengthening schools as learning communities where teachers, students and their families work in partnership with business, industry and the wider community
- enhancing the status and quality of the teaching profession
- continuing to develop curriculum and related systems of assessment, accreditation and credentialling that promote quality and are nationally recognised and valued
- increasing public confidence in school education through explicit and defensible standards that guide improvement in students' levels of educational achievement and through which the effectiveness, efficiency and equity of schooling can be measured and evaluated.

These national goals provide a basis for investment in schooling to enable all young people to engage effectively with an increasingly complex world. This world will be characterised by advances in information and communication technologies, population diversity arising from international mobility and migration, and complex environment and social challenges.

The achievement of the national goals for schooling will assist young people to contribute to Australia's social, cultural and economic development in local and global contexts. Their achievement will also assist young people to develop a disposition towards learning throughout their lives so that they can exercise their rights and responsibilities as citizens of Australia.

Goals

1. Schooling should develop fully the talents and capacities of all students. In particular, when students leave schools they should:

1.1 have the capacity for, and skills in, analysis and problem solving and the ability to communicate ideas and information, to plan and organise activities and to collaborate with others

1.2 have qualities of self-confidence, optimism, high self-esteem, and a commitment to personal excellence as a basis for their potential life roles as family, community and workforce members

1.3 have the capacity to exercise judgement and responsibility in matters of morality, ethics and social justice, and the capacity to make sense of their world, to think about how things got to be the way they are, to make rational and informed decisions about their own lives and to accept responsibility for their own actions

1.4 be active and informed citizens with an understanding and appreciation of Australia's system of government and civic life

1.5 have employment related skills and an understanding of the work environment, career options and pathways as a foundation for, and positive attitudes towards, vocational education and training, further education, employment and life-long learning

1.6 be confident, creative and productive users of new technologies, particularly information and communication technologies, and understand the impact of those technologies on society

1.7 have an understanding of, and concern for, stewardship of the natural environment, and the knowledge and skills to contribute to ecologically sustainable development

1.8 have the knowledge, skills and attitudes necessary to establish and maintain a healthy lifestyle, and for the creative and satisfying use of leisure time.

2. In terms of curriculum, students should have:

2.1 attained high standards of knowledge, skills and understanding through a comprehensive and balanced curriculum in the compulsory years of schooling encompassing the agreed eight key learning areas:

- the arts;
- English;
- health and physical education;
- languages other than English;
- mathematics;
- science;
- studies of society and environment;
- technology;

and the interrelationships between them.

2.2 attained the skills of numeracy and English literacy, such that every student should be numerate, able to read, write, spell and communicate at an appropriate level

2.3 participated in programs of vocational learning during the compulsory years and have had access to vocational education and training programs as part of their senior secondary studies

2.4 participated in programs and activities which foster and develop enterprise skills, including those skills which will allow them maximum flexibility and adaptability in the future.

3. Schooling should be socially just, so that:

3.1 students' outcomes from schooling are free from the effects of negative forms of discrimination based on sex, language, culture and ethnicity, religion or disability, and of differences arising from students' socio-economic background or geographic location

3.2 the learning outcomes of educationally disadvantaged students improve and, over time, match those of other students

3.3 Aboriginal and Torres Strait Islander students have equitable access to, and opportunities in, schooling so that their learning outcomes improve and, over time, match those of other students

3.4 all students understand and acknowledge the value of Aboriginal and Torres Strait Islander cultures to Australian society and possess the knowledge, skills and understanding to contribute to, and benefit from, reconciliation between Indigenous and non-Indigenous Australians

3.5 all students understand and acknowledge the value of cultural and linguistic diversity and possess the knowledge, skills and understanding to contribute to, and benefit from, such diversity in the Australian community and internationally

3.6 all students have access to the high quality education necessary to enable the completion of school education to Year 12 or its vocational equivalent and that provides clear and recognised pathways to employment and further education and training.

Tertiary education

Tertiary education is mainly provided through universities and Vocational Education and Training (VET) institutions such as Technical and Further Education (TAFE) institutions, secretarial colleges, and private business or commercial colleges.

There were 42 higher education institutions which received operating grants from the Commonwealth Department of Education, Training and Youth Affairs (DETYA) in 1999, as well as the Australian Film, Television and Radio School, the National Institute of Dramatic Art and the Australian Defence Force Academy. The private Bond University in Queensland also provides teaching at the higher education level.

Apart from the Australian National University and the Australian Maritime College, which are established under Commonwealth legislation, Australian universities operate under State or Territory legislation. However, they are autonomous bodies responsible for their own governance and make their own decisions on allocation of funding, staffing, and academic courses.

Most VET in Australia is provided in government-administered colleges. In some States and Territories these are referred to as Colleges or Institutes of TAFE. To a lesser extent, VET may also be provided by: Institutes of Technology; some higher education institutions; schools and agricultural colleges; adult and community education authorities; private providers of education (such as business colleges); and employers. Primary responsibility for administration of the VET system lies with the State and Territory Governments. In 1999, there were 85 TAFE and other government institutes with 1,132 provider locations delivering VET training. A further 1,075 community education providers and 2,465 other providers delivering VET were at least partly publicly funded. Between 1998 and 1999 there was an 87% increase in the number of community education providers and a 29% increase in the number of other providers.

Higher education

Staff

Table 10.7 shows the number of higher education staff. In 1999 there were almost equal proportions of women and men. This has changed somewhat over the last decade; in 1989, 56% of all higher education staff were male.

Higher education staff may be classified as academic or non-academic. In 1999 there were more non-academic than academic staff. The largest numbers of academics were at the lecturer and senior lecturer levels.

While there were more male than female academics in 1999, the proportions were closer than they were a decade earlier. In 1989, 72% of academics were men, compared to 65% in 1999. At all academic levels except 'below lecturer', the proportion who were women had substantially increased. The 'below lecturer' level was the only academic level at which women outnumbered men.

10.7 HIGHER EDUCATION STAFF, By Classification and Sex—1989 and 1999

	1989				1999			
	Males	Females	Persons	Persons	Males	Females	Persons	Persons
	%	%	%	no.	%	%	%	no.
Academic staff								
Above senior lecturer	92.1	7.9	100.0	4 528	84.4	15.6	100.0	6 626
Senior lecturer	85.6	14.4	100.0	6 772	72.1	27.9	100.0	8 114
Lecturer	65.7	34.3	100.0	10 308	56.6	43.4	100.0	11 302
Below lecturer	49.0	51.0	100.0	4 912	48.2	51.8	100.0	6 364
Total academic staff	*72.2*	*27.8*	*100.0*	*26 520*	*64.5*	*35.5*	*100.0*	*32 406*
Non-academic staff	44.1	55.9	100.0	38 443	39.1	60.9	100.0	43 634
Total	**55.6**	**44.4**	**100.0**	**64 963**	**49.9**	**50.1**	**100.0**	**76 040**

Source: Department of Employment, Education and Training, 'Selected Higher Education Statistics 1989'; Department of Education, Training and Youth Affairs, 'Staff 1999: Selected Higher Education Statistics'.

10.8 HIGHER EDUCATION STUDENTS, By Level of Course and Field of Study(a)—1999

Field	Postgraduate degree	Postgraduate diploma or equivalent	Bachelor degree	Diploma and advanced diploma	Other education	Total courses
	'000	'000	'000	'000	'000	'000
Agriculture, animal husbandry	1.4	0.4	6.8	2.7	0.1	11.5
Architecture, building	1.3	1.2	12.9	0.1	—	15.4
Arts, humanities and social sciences	18.3	6.2	138.7	1.9	2.5	167.7
Business, administration, economics	27.4	13.2	136.2	0.6	1.4	178.8
Education	11.4	9.6	49.3	0.8	1.1	72.4
Engineering, surveying	5.8	1.2	42.8	0.7	0.1	50.6
Health	11.4	7.7	57.8	0.8	0.1	77.7
Law, legal studies	2.7	1.4	26.8	2.5	—	33.4
Science	13.0	5.5	90.5	1.1	0.9	111.0
Veterinary science	0.3	—	1.5	—	—	1.8
Total	**92.9**	**46.6**	**522.1**	**11.1**	**13.6**	**(b)686.3**

(a) DETYA changed the method of compiling these data in 1998. Students undertaking combined courses are now counted in each field they are studying. Because of this, the field of study components will not necessarily add to All students. (b) Includes students in non-award courses.

Source: Department of Education, Training and Youth Affairs, 'Students 1999: Selected Higher Education Statistics'.

Students and courses

The basic undergraduate course at most institutions is a bachelor degree of three or four years' duration. At some institutions, courses may also be offered at the diploma or advanced diploma level. Most institutions also offer postgraduate level study. One to two years of full-time postgraduate study are required for a master's degree and three to five years for a doctoral degree. Postgraduate diplomas and certificates are offered in some disciplines. In 1999, 76% of higher education students were enrolled in bachelor courses, with a further 20% enrolled in higher degree and other postgraduate courses (table 10.8). Candidates for master's degrees (by research or course work) were the largest single group among post-graduate students (10% of all higher education students).

Higher education institutions offer a great variety of courses embracing such areas as agriculture, architecture, arts, business, dentistry, economics, education, engineering, health, law, medicine, music, science and veterinary science. Fields of study with the largest numbers of award course students in 1999 were Business, administration and economics (26%); Arts, humanities and social sciences (24%); and Science (16%) (table 10.8).

The proportion of higher education students who were female was virtually unchanged between 1994 and 1999 (54% and 55% respectively) (table 10.9). Higher education students were predominantly in the younger age groups, with 60% less than 25 years old.

10.9 HIGHER EDUCATION STUDENTS(a), By Age and Sex

	1994	1995	1996	1997	1998	1999
	'000	'000	'000	'000	'000	'000
19 and under						
Males	69.8	70.7	73.2	76.0	76.6	77.8
Females	92.0	94.0	98.6	102.4	104.8	107.7
Persons	*161.7*	*164.7*	*171.8*	*178.4*	*181.4*	*185.5*
20–24						
Males	92.4	94.2	97.3	101.0	103.0	105.2
Females	98.8	101.5	106.6	112.8	117.3	121.9
Persons	*191.2*	*195.7*	*203.9*	*213.8*	*220.4*	*227.2*
25–29						
Males	36.2	37.7	40.0	42.5	44.0	44.8
Females	35.1	37.9	41.3	44.4	46.7	48.1
Persons	*71.3*	*75.6*	*81.3*	*86.9*	*90.7*	*92.9*
30 and over						
Males	73.6	76.3	79.4	80.7	80.8	81.1
Females	87.6	92.0	97.7	99.1	98.6	99.6
Persons	*161.2*	*168.3*	*177.2*	*179.8*	*179.4*	*180.7*
Total						
Males	272.0	278.8	289.9	300.2	304.4	309.0
Females	313.4	325.4	344.2	358.7	367.5	377.3
Persons	*585.4*	*604.2*	*634.1*	*658.8*	*671.9*	*686.3*

(a) Includes students in enabling and non-award courses.

Source: Department of Education, Training and Youth Affairs, 'Selected Higher Education Student Statistics 1998'; Department of Education, Training and Youth Affairs, unpublished data, Higher Education Student Collection.

Most higher education institutions provide full-time and part-time courses. In addition, some institutions offer courses which associate full-time study with periods of employment. External or distance education courses are also offered.

In 1999, 59% of students were enrolled in full-time study, 27% in part-time study and 14% in external studies. Between 1989 and 1999 the total number of students rose by 56%, with the strongest increase (94%) for those studying externally (table 10.10).

Students can also enrol in higher education courses through Open Learning Australia (OLA). In the year to March 1999 there were around 6,400 students enrolled in OLA programs.

Funding

Most higher education institutions are funded by the Commonwealth under the *Higher Education Funding Act 1988*. In 1998 the operating revenue of these institutions amounted to $8.5b, 51% of which came from Commonwealth Government grants. This was down from 57% in 1995. Commonwealth Government funding is also provided to higher education institutions through various research programs, mostly on the advice of the Australian Research Council (ARC).

In addition to government funding, institutions receive payments from students who are required to contribute to the cost of their education through the Higher Education Contribution Scheme (HECS), and from other fee paying students. Higher education fees and charges have increased in importance in recent years. In 1998, 17% of operating revenue was raised from HECS, while other fees and charges accounted for a further 16% of income. These fees and charges included $70m (half of the fee income) from fee-paying overseas students. The Royal Melbourne Institute of Technology University, which received some 24% of its revenue from these fee-paying overseas students, stands above the overall national average of 8.3%. The corresponding figures for 1997 were 15% from HECS, and 15% from other fees and charges. Other higher education income sources include investments, State government grants, donations and bequests.

10.10 HIGHER EDUCATION STUDENTS, By Type of Enrolment and Sex—1989 and 1999

	1989			1999		
	Male	Female	Persons	Male	Female	Persons
	PER CENT					
Internal						
Full-time	61.3	62.1	61.7	59.1	59.4	59.3
Part-time	28.2	26.5	27.3	27.8	26.4	27.0
External	10.5	11.4	11.0	13.1	14.2	13.7
	NUMBER '000					
Total	211.3	229.8	441.1	309.0	377.3	686.3

Source: Department of Education, Training and Youth Affairs, 'Students 1999: Selected Higher Education Statistics'.

Vocational education and training

Vocational Education and Training institutions

The Vocational Education and Training (VET) sector is quite diverse, and is represented in many rural towns across Australia. For example, of the twenty Victorian TAFE institutes, four are both higher education and VET institutions, six offer programs in gaols, and four have overseas campuses. Some universities in Queensland, Western Australia, and the Northern Territory also provide VET.

Table 10.11 shows the number of teachers working in VET institutions in 1999–2000. Of all VET teachers, 55% were employed full-time; of all full-time VET teachers, 56% were male. In contrast, 70% of part-time VET teachers were female.

10.11 VOCATIONAL EDUCATION TEACHING STAFF—1999–2000(a)

	Full-time staff	Part-time staff	**All teaching staff**
	'000	'000	**'000**
Males	7.6	3.4	**11.0**
Females	6.0	7.8	**13.8**
Persons	13.6	11.2	**24.8**

(a) Average over the financial year.

Source: Unpublished data, Labour Force Survey, May 2000.

VET institutions offer a wide range of non-vocational and vocational training programs, ranging from recreation and leisure, through basic employment and educational preparation, to trades, para-professional and professional levels. Training programs are classified according to 12 fields of study on the basis of similar emphasis or subject matter orientation. These are broadly consistent with the fields of study covered by higher education institutions.

Table 10.12 shows participation in publicly-funded vocational education and training programs. While there were more males than females in VET courses overall and particularly in the younger ages, from the age group 30–39 years on there were more women undertaking VET courses than men.

10.12 VOCATIONAL EDUCATION AND TRAINING(a) CLIENTS(b), Vocational and Preparatory Courses(c)—1999

	Males	Females	Persons(d)
Age group	'000	'000	'000
Under 16	17.4	14.2	31.7
16	35.8	29.2	65.0
17	44.4	34.1	78.7
18	52.5	39.9	92.6
19	47.5	34.3	82.0
20–24	144.1	112.5	257.2
25–29	100.7	91.8	193.1
30–39	162.2	166.6	329.7
40–49	117.2	146.8	264.8
50–59	58.4	68.6	127.3
60–64	11.2	11.8	23.1
65 and over	11.6	13.0	24.6
Not stated	32.1	40.7	77.3
Total clients	**835.1**	**803.7**	**1 647.2**

(a) Includes all VET delivery by TAFE and other government providers, registered community providers, some VET delivered in schools, and publicly-funded delivery by private providers. Fee for service by private providers has been excluded. (b) A client is any individual participating in a specific enrolment or training contract with a specific organisation. (c) Courses leading to a vocational award. (d) Includes sex not stated.

Source: National Centre for Vocational Education Research, 'Australian Vocational Education and Training Statistics 1999: In Detail'.

10.13 VOCATIONAL EDUCATION AND TRAINING COURSE ENROLMENTS, Field of Study by Sex—1999

	Males	Females	Persons(a)
	'000	'000	'000
Land and marine resources, animal husbandry	75.2	27.8	103.3
Architecture, building	89.6	10.9	100.5
Art, humanities and social sciences	50.7	94.1	145.5
Business, administration, economics	152.6	270.0	426.2
Education	19.6	27.1	46.8
Engineering, surveying	243.2	30.6	274.1
Health, community services	52.2	120.5	173.7
Law, legal studies	6.5	6.2	12.7
Science	66.1	59.5	125.9
Veterinary science, animal care	0.4	3.3	3.7
Services, hospitality, transportation	126.4	133.7	262.2
VET multi-field education	146.4	170.7	317.7
Total enrolments(a)	**1 028.8**	**954.3**	**1 992.2**

(a) Includes sex not stated.

Source: National Centre for Vocational Education Research, 'Australian Vocational Education and Training Statistics 1999: In Detail'.

Table 10.13 shows the number of course enrolments in each field of study in 1999. Clients may be enrolled in more than one activity. The more popular fields of VET study include: Business, administration and economics; Engineering and surveying; and Services, hospitality and transportation.

VET operating revenue is provided primarily by the State and Territory Governments (59% in 1999), with additional funds being provided by the Commonwealth Government (22%). The balance of revenue (19%) came from fee-for-service activities, ancillary trading, and student fees or charges.

All States and Territories charge most students some form of administration fee for VET courses. This varies according to the type of course and its duration. Nationally, in 1999 around 4% of operating revenue for VET institutions was provided by student fees and charges. Another 9% was received as fee-for-service revenue from full-fee paying overseas clients, employers and other individuals or organisations.

Apprenticeships and traineeships

Half of all apprentices and trainees in training at 31 December 1999 were in the broad occupational group Trades and related workers, including Construction (11%) and Automotive trades (9%). Another 18% of apprentices and trainees were in Intermediate clerical, sales and service occupations, and 10% were Labourers and related workers (table 10.14).

10.14 APPRENTICES AND TRAINEES, In Training at 31 December 1999

	Males	Females	Persons	Total
	'000	'000	'000	%
Managers and administrators	2.1	0.6	2.7	1.0
Professionals	0.4	1.1	1.5	0.6
Associate professionals	4.7	2.3	6.9	2.7
Trades and related workers				
Mechanical and fabrication engineering	18.7	0.2	19.0	7.3
Automotive	21.9	0.4	22.4	8.6
Electrical and electronic	17.5	0.2	17.8	6.8
Construction	27.4	0.3	27.7	10.7
Food	15.1	4.7	19.7	7.6
Skilled agricultural and horticultural workers	3.7	0.4	4.1	1.6
Hairdressers	1.0	9.1	10.1	3.9
Other	7.9	1.1	9.1	3.5
Total	*113.3*	*16.5*	*129.8*	*50.0*
Advanced clerical and service workers	—	—	0.1	—
Intermediate clerical, sales and service workers	12.9	33.9	46.8	18.0
Intermediate production and transport workers	8.8	1.2	10.0	3.8
Elementary clerical, sales and service workers	16.5	19.2	35.7	13.7
Labourers and related workers	19.9	6.5	26.4	10.2
Total	**178.6**	**81.2**	**259.9**	**100.0**

Source: National Centre for Vocational Education Research, 'Australian Vocational Education and Training Statistics 1999: In Detail'.

Education and training characteristics of the population

Educational attainment

In May 1999, 5.5 million people aged 15–64 (44% of this population) had completed a recognised post-school qualification. A further 6.4 million (51%) had no recognised post-school qualification, and the remaining 0.7 million people (5%) were still at school (table 10.15).

Of those with post-school qualifications, 1.4 million (26%) held a skilled vocational qualification (such as a trade qualification), and a further 1.4 million people (26%) reported holding bachelor degrees. The smallest category comprised those with a higher degree, reported by 0.2 million people (4% of those with post-school qualifications).

The most common post-school qualification reported by 15–24 year olds was a bachelor degree, but fewer 15–24 year olds held post-school qualifications than any other age group. In comparison, 25–34 year olds and 35–44 year olds were the age groups most likely to hold qualifications. Bachelor degrees were the most common qualifications for 25–34 year olds (31% of all those with post-school qualifications) while skilled vocational qualifications were slightly more common for 35–44 year olds (26% of all those with post-school qualifications). From the age group 35–44 on, skilled vocational qualifications were the most common post-school qualifications.

Graph 10.16 shows the proportions of males and females for each category of post-school qualifications in May 1999. Similar proportions of men and women held bachelor degrees and associate diplomas. Women were more likely to have qualifications at the basic vocational, undergraduate diploma and postgraduate diploma levels. Men were more likely to have qualifications at the skilled vocational and higher degree levels.

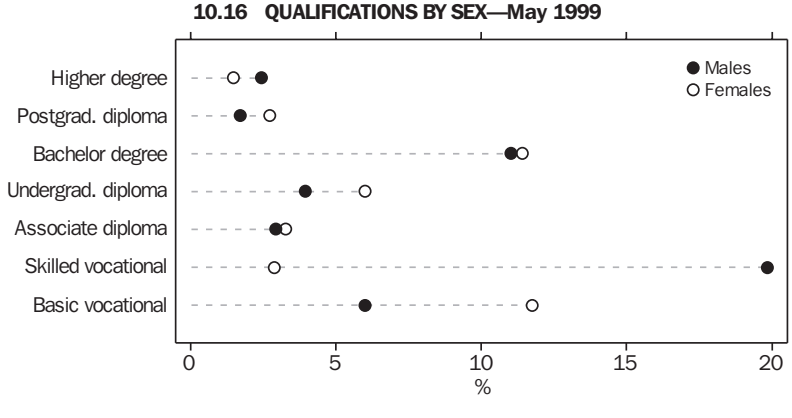
10.15 PERSONS AGED 15–64, By Educational Attainment—May 1999

	Age group (years)					
	15–24	25–34	35–44	45–54	55–64	Total
Educational attainment	'000	'000	'000	'000	'000	'000
With post-school qualifications						
Higher degree	*2.2	45.8	81.8	83.9	31.1	244.8
Postgraduate diploma	11.2	64.4	90.5	83.9	26.6	276.5
Bachelor degree	172.5	458.3	378.1	278.4	113.9	1 401.2
Undergraduate diploma	63.5	135.8	176.6	159.6	84.0	619.5
Associate diploma	53.0	113.5	107.5	80.6	30.8	385.4
Skilled vocational	125.3	386.2	404.3	297.7	204.8	1 418.3
Basic vocational	172.3	289.2	290.2	226.4	128.5	1 106.6
Total	*600.0*	*1 493.2*	*1 529.1*	*1 210.5*	*619.6*	*5 452.4*
Without post-school qualifications						
Completed highest level of school						
Attending tertiary in May 1999	541.8	85.7	37.0	9.3	*3.5	677.3
Not attending tertiary in May 1999	336.7	436.3	337.5	304.9	184.0	1 599.3
Total	878.5	522.0	374.5	314.2	187.4	2 276.6
Did not complete highest level of school						
Attending tertiary in May 1999	125.9	49.7	44.1	20.2	*5.1	245.1
Not attending tertiary in May 1999	369.0	753.4	934.3	945.7	816.2	3 818.7
Total	494.9	803.1	978.5	965.9	821.3	4 063.8
Total(a)	*1 374.6*	*1 326.9*	*1 355.1*	*1 283.1*	*1 014.1*	*6 353.7*
Still at school	673.8	*1.8	**0.6	**0.3	**0.0	676.5
Total	**2 648.4**	**2 821.8**	**2 884.8**	**2 493.9**	**1 633.7**	**12 482.6**

(a) Includes persons who never attended school.

Source: Transition from Education to Work, Australia (6227.0).

10.16 QUALIFICATIONS BY SEX—May 1999



Source: Unpublished data, Transition from Education to Work Survey.

10.17 PERSONS AGED 15–64, Education Participation Rates—May 1999

	Age (years)				
	15–19	20–24	25–44	45 and over	All 15–64
	%	%	%	%	%
Attending					
School	50.8	*0.2	*0.1	**0.0	5.4
Tertiary					
Full-time	18.4	20.2	2.6	0.4	5.4
Part-time	6.9	11.4	6.5	2.0	5.6
Total tertiary	25.3	31.6	9.1	2.4	11.0
Total attending	*76.1*	*31.8*	*9.2*	*2.4*	*16.4*
Not attending	23.9	68.2	90.8	97.6	83.6
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Unpublished data, Transition from Education to Work Survey.

Participation in education

While participation in education may occur at any age, many people obtain some qualifications in the years immediately after they leave school. Depending on whether or not they plan to obtain tertiary education (as well as the type they wish to undertake) some leave school immediately after completing compulsory schooling (until 15 years of age, or 16 in Tasmania) while others go on to complete Years 11 and 12. Table 10.17 shows that in 1999, 51% of 15–19 year olds were still at school while a further 25% were in tertiary education. In all, 69% of 15–19 year olds were either still at school or were in full-time tertiary education.

By the age of 20–24 years there is a substantial decline in the proportion of people participating in education, with 32% of this age group in tertiary education. However, of those in education, a higher proportion were in full-time than in part-time education (64% and 36% respectively). Of the few people who participate in education from their mid-twenties on, most are in part-time education.

Educational attendance and the labour force

In May 1999, over 2 million people aged 15–64 years attended an educational institution, either part-time or full-time, in order to obtain a recognised qualification (table 10.18). Of these, 62% were also participating in the labour force—that is, they were employed or unemployed.

Most people attending an educational institution full-time were either not in the labour force (53%) or were employed part-time (37%). On the other hand, most people attending an educational institution part-time were employed full-time (70%). There were 30,000 persons who combined full-time study and full-time employment.

Graph 10.19 indicates the labour force status of students aged 15–64 who were studying in May 1999 to gain a recognised educational qualification. Some 61% of school students were not in the labour force while 31% were employed. In contrast, 26% of tertiary students were not in the labour force and 68% were employed.

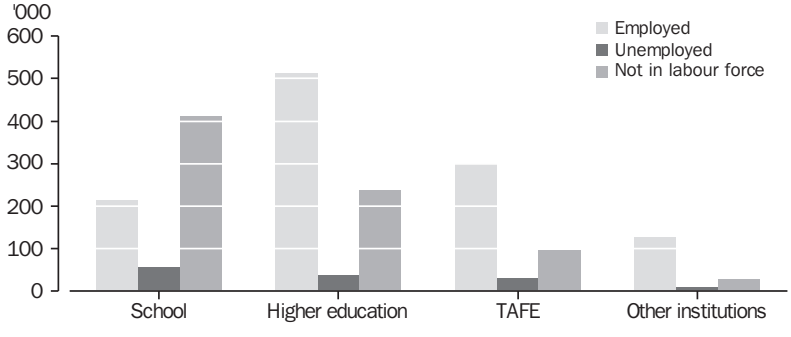
10.18 PERSONS AGED 15–64, Whether Attended an Educational Institution(a) and Labour Force Status—May 1999

	Attended an educational institution				
Labour force status	Full-time	Part-time	Total	Not attending	Total
	NUMBER '000				
In the labour force					
Employed					
Full-time	30.0	494.5	524.5	5 752.4	6 276.9
Part-time	503.3	120.0	623.3	1 626.8	2 250.0
Total	533.3	614.4	1 147.8	7 379.2	8 526.9
Unemployed	104.0	28.8	132.7	552.7	685.5
Total	*637.3*	*643.2*	*1 280.5*	*7 931.9*	*9 212.4*
Not in the labour force	711.9	59.6	771.5	2 498.7	3 270.2
Total	**1 349.2**	**702.8**	**2 052.0**	**10 430.6**	**12 482.6**
	PER CENT				
Unemployment rate	16.3	4.5	10.4	7.0	7.4

(a) To study for a recognised qualification.

Source: Transition from Education to Work, Australia (6227.0).

10.19 PERSONS AGED 15–64 ATTENDING AN EDUCATIONAL INSTITUTION—May 1999



Source: Unpublished data, Transition from Education to Work Survey.

Adult and community education

Adult and community education (ACE) is the most decentralised of the education sectors. ACE refers to the provision of those general adult education programs and activities which fall outside, but complement, the formal programs and qualification pathways provided by the school, Vocational Education and Training (VET) and higher education sectors. ACE focuses on the provision of learning opportunities at a community level, rather than work-related training.

The community education and VET sectors are the largest providers of adult recreational and leisure courses.

Recreation, leisure, and personal enrichment enrolments are mainly with community-based providers (82% of students in 1999), with the balance almost entirely enrolled with government VET providers. The client group is large, and mainly female (275,500 students, 73% female).

Courses range from general interest, recreational and leisure activities, personal development, social awareness and craft through to vocational, remedial and basic education. Community-based adult education is open to all, and its non-formal characteristics demonstrate the capacity of the community to develop alternatives to institutionalised education. In 1999, 39% of students enrolled in ACE courses were enrolled in arts, humanities and social sciences courses, 20% were enrolled in health and community services courses, and 19% were enrolled in VET multi-field education courses (table 10.20).

10.20 COURSE ENROLMENTS IN PERSONAL ENRICHMENT PROGRAMS, By Sex—1999

Field of study	Males '000	Females '000	Persons(a) '000
Land and marine resources, animal husbandry	1.7	2.8	4.6
Architecture, building	2.3	4.8	7.3
Art, humanities and social sciences	18.0	67.5	86.4
Business, administration, economics	3.6	5.4	9.1
Education	0.4	0.6	1.0
Engineering, surveying	2.1	4.1	6.3
Health, community services	8.8	33.5	43.0
Law, legal studies	0.1	0.4	0.5
Science	3.2	5.4	8.7
Veterinary science, animal care	0.2	0.3	0.5
Services, hospitality, transportation	2.9	8.5	11.4
VET multi-field education	13.9	27.2	41.1
Total	**57.3**	**160.6**	**220.0**

(a) Includes sex not stated.

Source: Unpublished data, National Centre for Vocational Education Research.

Indigenous education

Indigenous school students

In 1999, there were 73,200 Indigenous students reported as attending primary school and 33,400 Indigenous students attending secondary school.

Most Indigenous students (88%) attended government schools in 1999. Of the 12% attending non-government schools, most were attending Catholic schools (67%) (table 10.21). The increase in ungraded students between primary and secondary education is mostly attributable to the classification of secondary-age students in Northern Territory remote Aboriginal schools as ungraded. This is due to the difficulty of classifying such students in terms of the normal urban secondary grade structure.

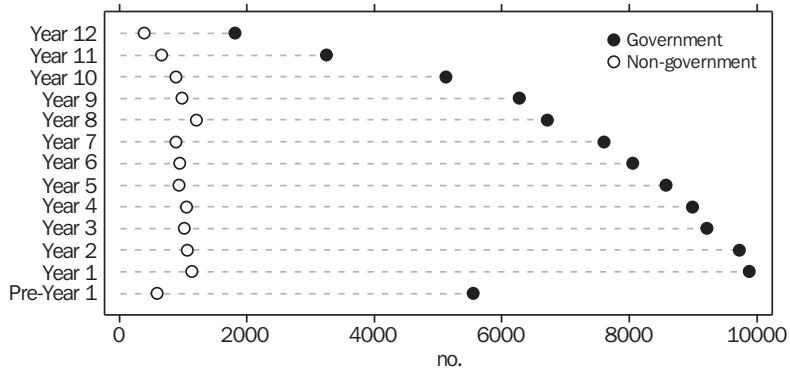
10.21 INDIGENOUS FULL-TIME STUDENTS, By Category of School and Level/Year of Education—1999

		Non-government schools			
Level	Government schools no.	Catholic no.	Other no.	Total no.	All schools no.
Primary					
Pre-year1(a)	5 543	477	114	591	6 134
Year 1	9 883	844	290	1 134	11 017
Year 2	9 728	801	260	1 061	10 789
Year 3	9 210	760	258	1 018	10 228
Year 4	8 984	798	254	1 052	10 036
Year 5	8 579	703	230	933	9 512
Year 6	8 056	697	251	948	9 004
Year 7 (Qld, SA, WA, NT)	4 698	435	166	601	5 299
Ungraded	980	13	196	209	1 189
Total Primary	*65 661*	*5 528*	*2 019*	*7 547*	*73 208*
Secondary					
Year 7 (NSW, Vic., Tas., ACT)	2 903	226	59	285	3 188
Year 8	6 707	772	432	1 204	7 911
Year 9	6 278	635	348	983	7 261
Year 10	5 126	570	314	884	6 010
Year 11	3 243	371	295	666	3 909
Year 12	1 817	254	135	389	2 206
Ungraded	2 164	216	555	771	2 935
Total Secondary	*28 238*	*3 044*	*2 138*	*5 182*	*33 420*
Total	**93 899**	**8 572**	**4 157**	**12 729**	**106 628**

(a) Pre-year 1 does not include Queensland and Western Australia.

Source: Schools, Australia (4221.0).

10.22 INDIGENOUS FULL-TIME SCHOOL STUDENTS—1999



Source: Schools, Australia (4221.0).

Graph 10.22 shows a decline in government school attendance from Year 1 onwards in 1999. The number of Indigenous students attending non-government schools remained relatively stable across each grade until an increase in Year 8 students, followed by a slow decline to Year 12.

Australia experienced a 65% increase in Indigenous students between 1990 and 1999 (table 10.23), with an increase in the number of Indigenous people attending each level of school in every State and Territory. Tasmania and the Australian Capital Territory had the greatest increases (172% and 121% respectively), albeit from a very small base. The smallest increases were in the Northern Territory and Western Australia (27% and 41% respectively). During the five year period of 1994 to 1999, the largest increase in Indigenous students was in Victoria (62%), and the smallest increase was in the Northern Territory (11%). The overall increase was 28%.

In 1990, 1994 and 1999 there were generally more Indigenous males in primary education than females, but more Indigenous females in secondary education than males.

Indigenous Vocational Education and Training clients

In 1999, there were 70,500 Indigenous enrolments in Vocational Educational and Training (VET) courses, representing an 11% increase since 1994 (table 10.24).

Almost one-third of Indigenous VET students are enrolled in a VET multi-field course (these include school courses offered in VET institutions), the next most common field being Business administration and economics (13%). The highest percentage increase in attendance between 1994 and 1999 was in the Education area (from 300 to 2,000 students), followed by Law-related studies (from 100 to 400 students), and Health and community services (from 2,000 to 7,000 students).

Some 27% of Indigenous clients were located in remote areas compared to 4% of all clients; 27% of Indigenous clients were located in capital cities compared with 56% of all clients (table 10.25).

The number of male Indigenous clients was 6% greater than the number of female Indigenous clients, although this varied by geographic area.

The number of enrolments in table 10.24 differs from the number of clients in table 10.25 because one client may be enrolled in more than one course.

Indigenous higher education students

In 1999, 8,000 students were attending higher education courses. Table 10.26 shows that in 1999, Indigenous students were more likely to choose social or community-oriented courses, such as Arts, Education and Health (comprising 78% of students). Arts, Humanities and Social Science courses had the highest percentage of Indigenous student enrolments (35%), with the second largest enrolment (30%) being in Education courses.

10.23 INDIGENOUS FULL-TIME SCHOOL STUDENTS, By Level of Education, Sex and State—1990, 1994 and 1999

	NSW	Vic.	QLD	SA	WA	Tas.	NT	ACT	Aust.
	no.	no.	no.	no.	no.	no.	no.	no.	no.
Primary									
Male									
1990	5 403	836	5 773	1 477	4 228	458	3 984	151	22 310
1994	7 867	1 234	7 856	1 917	5 131	958	4 630	221	29 814
1999	10 319	1 838	10 420	2 302	6 098	1 321	4 981	259	37 538
Female									
1990	4 905	805	5 377	1 411	4 101	474	4 026	119	21 218
1994	7 390	1 105	7 640	1 927	5 053	946	4 448	193	28 702
1999	9 914	1 791	9 839	2 255	5 805	1 265	4 547	254	35 670
Total Primary									
1990	10 308	1 641	11 150	2 888	8 329	932	8 010	270	43 528
1994	15 257	2 339	15 496	3 844	10 184	1 904	9 078	414	58 516
1999	20 233	3 629	20 259	4 557	11 903	2 586	9 528	513	73 208
Secondary									
Male									
1990	3 089	537	3 080	531	1 792	319	1 103	50	10 501
1994	3 933	489	3 552	568	1 922	621	1 371	93	12 549
1999	5 247	911	4 565	785	2 299	876	1 732	145	16 560
Female									
1990	3 167	581	3 125	645	1 690	349	1 096	53	10 706
1994	3 797	566	3 473	600	1 891	649	1 274	96	12 346
1999	5 276	967	4 585	834	2 427	883	1 721	167	16 860
Total Secondary									
1990	6 256	1 118	6 205	1 176	3 482	668	2 199	103	21 207
1994	7 730	1 055	7 025	1 168	3 813	1 270	2 645	189	24 895
1999	10 523	1 878	9 150	1 619	4 726	1 759	3 453	312	33 420
Total									
All Indigenous students									
1990	16 564	2 759	17 355	4 064	11 811	1 600	10 209	373	64 735
1994	22 987	3 394	22 521	5 012	13 997	3 174	11 723	603	83 411
1999	30 756	5 507	29 409	6 176	16 629	4 345	12 981	825	106 628

Source: Schools, Australia (4221.0).

Table 10.27 shows the distribution of Indigenous higher education students across States and Territories in 1999. New South Wales, Queensland and Western Australia had the largest number of Indigenous students, with the Australian Capital Territory and Tasmania having the lowest. This pattern is similar to the distribution of Indigenous students in primary and secondary schools (table 10.23).

Females comprised 63% of Indigenous higher education students in 1999, compared to 55% of the total higher education student population.

Graph 10.28 illustrates the increasing trend in Indigenous participation in higher education over the past decade. Between 1989 and 1999 the number of Indigenous students increased from 3,300 to 8,000 (142%). The largest annual increase of Indigenous students was between 1990 and 1991 (33%).

10.24 VET COURSE INDIGENOUS ENROLMENTS, By Field of Study and Year—1994 and 1999

Field of study	1994 '000	1999 '000
Land and marine resources, animal husbandry	1.6	5.5
Architecture, building	1.1	2.9
Art, humanities and social sciences	2.5	8.2
Business, administration, economics	4.4	9.3
Education	0.3	2.0
Engineering, surveying	2.2	5.1
Health, community services	2.0	7.0
Law, legal studies	0.1	0.4
Science	0.8	1.8
Veterinary science, animal care	—	—
Services, hospitality, transportation	2.1	5.5
VET multi-field education	15.0	22.8
Total enrolments	**32.2**	**70.5**

Source: National Centre for Vocational Education Research, 'Australian Vocational Education and Training Statistics 1999: In Detail'.

10.25 VET CLIENTS, By Geographic Region of Client Address and Sex—1999

	Capital city	Other metropolitan	Rural	Remote	Other	Total
			NUMBER '000			
Indigenous clients						
Males	7.1	1.5	9.6	6.7	1.1	26.0
Females	6.4	1.5	9.2	6.7	0.8	24.6
Persons	13.6	3.0	18.8	13.5	1.9	50.8
			PER CENT			
All Indigenous clients	26.7	5.9	37.0	26.5	3.7	100.0
All clients	55.7	6.8	28.7	3.5	5.4	100.0

Source: National Centre for Vocational Education Research, 'Australian Vocational Education and Training Statistics 1999: In Detail'.

10.26 INDIGENOUS HIGHER EDUCATION STUDENTS, By Broad Field of Study and Level of Course—1999

Field of study	Postgraduate degree no.	Postgraduate diploma and equivalent no.	Bachelor degree no.	Diploma and advanced diploma no.	Other education no.	Total no.
Agriculture, animal husbandry	3	2	58	49	10	122
Architecture, building	4	10	41	—	—	55
Arts, humanities and social sciences	170	43	1 635	562	373	2 783
Business, administration, economics	86	57	544	73	3	763
Education	90	70	908	350	982	2 400
Engineering, surveying	10	4	88	5	—	107
Health	63	75	601	287	36	1 062
Law, legal studies	24	5	360	43	8	440
Science	28	18	379	10	61	496
Veterinary science	1	—	16	—	—	17
Non-award	—	—	—	—	36	36
Total(a)	**478**	**284**	**4 351**	**1 379**	**1 509**	**8 001**

(a) The data take into account the coding of combined courses to two fields of study. As a consequence, counting both fields of study for combined courses means that the data in the total row may be less than the sum of the data aggregated down each column.

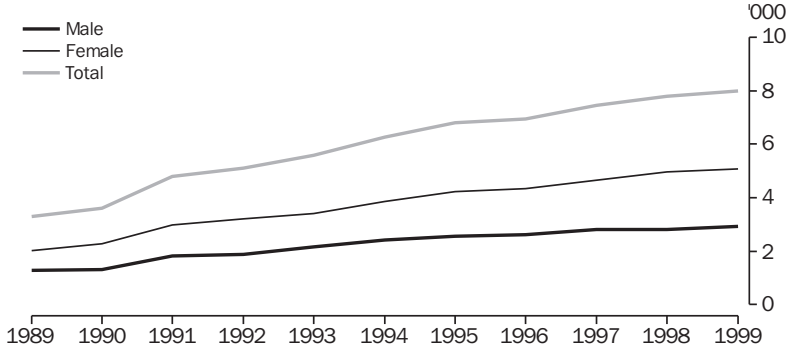
Source: Department of Education, Training and Youth Affairs, 'Students 1999: Selected Higher Education Statistics'.

10.27 INDIGENOUS HIGHER EDUCATION STUDENTS, By State and Sex—1999

	Commencing Indigenous students			All Indigenous students		
	Males	Females	Persons	Males	Females	Persons
State/Territory	no.	no.	no.	no.	no.	no.
NSW	413	737	1 150	833	1 431	2 264
Vic.	109	169	278	241	394	635
Qld	268	438	706	583	903	1 486
WA	350	551	901	589	1 039	1 628
SA	118	152	270	214	350	564
Tas.	74	75	149	106	151	257
NT	155	363	518	226	558	784
ACT	30	29	59	87	77	164
Multi-State	26	83	109	49	170	219
Total	**1 543**	**2 597**	**4 140**	**2 928**	**5 073**	**8 001**

Source: Department of Education, Training and Youth Affairs, 'Students 1999: Selected Higher Education Statistics'.

10.28 ALL INDIGENOUS HIGHER EDUCATION STUDENTS, By Sex—1989 to 1999



Source: Department of Education, Training and Youth Affairs, 'Students 1999: Selected Higher Education Statistics'.

Measuring education in Australian Censuses—1911 to 2001

The history of the education questions in the Census of Population and Housing provides an interesting insight into how education was perceived and valued in the past. Questions on education have included: whether able to read and write; current participation; age left school; highest level of education; and highest post-school education. Since Federation, various attempts have been made to measure the level of educational achievement in the population. However, obtaining reliable and accurate data proved challenging at times, particularly when measuring highest education levels.

Prior to Federation, each colony was responsible for its own Census collection. To determine the degree of education in the population, most used the categories of 'read and write', 'read only' and 'cannot read'. Some used the same categories for other languages to avoid classifying non-English speakers as illiterate if they could not read or write in English. There were also various attempts to gain data on the number of people within the population who held university degrees. For example, in Victoria in 1891, the degrees of university graduates were determined by the letters placed against a person's name. In Western Australia in 1891, data were obtained on university graduates through the Householder's Schedule, which requested information on people who were "graduates of any University, together with the designations of their respective degrees, and of the Universities at which they were severally conferred."[1] The Census held during the first year of Federation,

1901, was again collected by each State separately, with the questions remaining similar to those in previous years.

1911 Census of the Commonwealth of Australia

The first national Census collected information on current schooling. Schooling at that time meant school or university. The four possible responses for those receiving education were University (U), State School (S), any other school (P, analysed as Private School) or Home Schooling (H). Two responses commonly used in the 1901 Census schedule, 'colleges' and 'denominational' were removed, due to varying definitions.

In the Census in 1911, questions were also asked about education level in terms of whether a person could read and write. The query on the Census Card appeared as follows:

> "13. Education....."

And the corresponding instruction was:

> "Line 13.— Write CR for cannot read, R for read only, and RW for read and write. If not able to read English, but able to read a foreign language write RF and if not able to read and write English but able to read and write a foreign language write RWF."

However, in the Statistician's report on this Census, the use of a question on reading and writing was challenged. Previous Census findings that Australian literacy levels had risen from 58% in 1861 to 80% in 1901[2], had led to the belief that compulsory schooling, first introduced in Western Australia in 1871 with the other States following soon after, was the contributing factor behind increased literacy. It was also believed that, "with the enforcement of compulsory education the number of cases in which persons reach mature age unable to read is necessarily very small and relatively insignificant".[3] The following two censuses in 1921 and 1933 both contained a question on reading and writing, but were used to identify language use rather than for education level.

As part of the same question, an attempt was made to obtain data on the highest level of achievement (in order to gain some insight into the prevalence of university graduates). The instruction on the Census Card in relation to Question 13 (above) was:

> "If the person to whom the card relates has obtained a University degree, state the degree, and give the name of the University and country in which it was obtained."

This initial attempt at obtaining a measure of university attainment was seen as unsuccessful and withdrawn from use. This was partly a result of the Statistician's view that the data were neither reliable nor accurate. The Statistician's report on the Census stated that:

> "Not only were there many cases in which known holders of degrees had failed to furnish the desired information, apparently through failure to carefully read the instructions, but there were many cases in which existing and non-existent degrees of existing and non-existent Universities were recorded as possessed by persons whose acquaintance with a University must have been a negligible quantity."[3]

The Census cards of alleged university degree holders were sorted out for tabulation, but were not processed further as it was deemed that the "tabulation of such data would not only be labour wasted, but would be actually misleading." [3]

It was not until 1966 that another attempt was made to broaden the scope of education questions and gain information on qualifications held.

1966 Census of the Commonwealth of Australia

In 1966 the first attempt to achieve the highest level of schooling completed (up to secondary school) was trialed. The query on the Census Card appeared as follows:

> "For each person state the highest level of schooling completed."

The corresponding instruction was provided according to the State in which the person resided, in order to deal with problems of differing school systems. Generally the instruction was:

> "For each person state the highest level of schooling completed. If passed at Leaving or Matriculation level, write 'M'. If passed at Intermediate level, write 'J'. If attended secondary school (e.g. high, technical, non-government) but passed no examinations

at Intermediate level or above, write 'H'. If attended or completed infants' or primary school or passed final primary examinations such as Qualifying Certificate (Q.C.) or Merit, write 'P'. If never attended school, write 'N'."

This attempt was not completely successful due to a misunderstanding of the instruction. People still at school were expected to answer 'H' (attended secondary school but passed no examinations). However, use of past tense wording for attendance, rather than present tense, resulted in some people who were attending secondary school being coded as having only attended primary school, or the level of schooling was not stated. The topic was again covered in the census in 1971 and was resolved in 1976 by the inclusion of a 'still at school' category.

A second attempt (the first since 1911) to retrieve information on qualifications obtained was also made during this census with the aim of determining two additional levels of completed education, university degree and other tertiary qualifications. This time the information was requested in a separate question, with the query being:

"State the person's qualifications, trade training or other qualifications and the institution at which obtained."

Examples were also provided, including Bachelor of Engineering, University of Sydney; Diploma of Architecture, South Australian Institute of Technology; and Five years' Apprenticeship.

This attempt led to similar questions being included in each subsequent Census, with some expansion of information requested.

1976 Census of Population and Housing

In 1976, the wording of the question regarding highest level of schooling was changed to ask the age at which the person left school. This change was deemed necessary in order to address the discrepancies between the schooling systems across Australia.

The first question to directly request information on highest education qualifications was introduced in this census. The wording was:

"Has this person obtained a trade or other qualification since leaving school?"

The subsequent question asked for details of the highest qualification obtained. While it was specified that only the details of the highest qualification should be provided, some respondents still provided details of all their qualifications.

1991 Census of Population and Housing

The 1991 Census introduced the Australian Bureau of Statistics *Classification of Qualifications (ABSCQ)*, which was developed during the late 1980s to provide a systematic and statistically balanced approach to education classification. Its purpose was to enhance comparability of education statistics from different sources within the ABS, and potentially those outside the Bureau. Its main function was to bring together the elements of level of attainment and field of study. Prior to the introduction of the ABSCQ, fields of study were developed for each level of attainment. The ABSCQ was the result of the development of one set of field of study classifications which could be applied to every level of attainment.

1996 Census of Population and Housing

In 1996 the Census question regarding the highest qualification obtained was changed to the highest qualification completed, to reduce the number of respondents stating qualifications for which they were still studying. Examples provided were also changed, from Registered Nursing Certificate and Bricklaying Trade Certificate, to trade certificate, bachelor degree, associate diploma and doctorate. This was deemed necessary as the examples used previously had caused some confusion for respondents with these degrees as to whether or not their qualification was included. In another change, the non-government category for primary and secondary schools was expanded into Catholic and Other non-government, reflecting an increase in the need for more information by clients.

2001 Census of Population and Housing

The 2001 Census will see the introduction of the *Australian Standard Classification of Education (ASCED)*. This classification will also be implemented nationally in education research and collections so that data on qualifications from various sources will be comparable.

Other changes to the education section of the 2001 Census include changing the question regarding 'age left school' back to a question similar to the 1966 query of 'highest year of schooling'. However, respondents will not be required to enter a code based on the level of school attained, but will instead be provided with options, including 'Still at school', 'Did not go to school', 'Year 8 or below', 'Year 9 or equivalent' and so on until Year 12. Examples of highest qualification will also be changed, with doctorate being removed, and certificate and advanced diploma included.

References

1 Gale, Walter A. 1892, *Census Western Australia, April, 1891: General Report with Appendices*, R. Pether Government Printer, Perth, p. 10.

2 Commonwealth Bureau of Census and Statistics 1908, *Official Year Book of the Commonwealth of Australia No.1*, McCarron, Bird & Co. Printers, Melbourne.

3 Commonwealth Statistician 1917, *Census of the Commonwealth of Australia 3rd April, 1911, Vol 1: Statistician's Report Including Appendices*, McCarron, Bird & Co. Printers, Melbourne, p. 166.

Expenditure on education

This section provides estimates of government expenditure on education, which have been compiled in accordance with national accounting concepts. An explanation of these concepts is contained in *Australian National Accounts: Concepts, Sources and Methods* (5216.0); *Government Finance Statistics: Concepts, Sources and Methods* (5514.0); *Information Paper: Developments in Government Finance Statistics* (5516.0); *Information Paper: Accruals-based Government Finance Statistics* (5517.0); and *Expenditure on Education, Australia* (5510.0).

The accrual-based estimates in tables 10.29, 10.30, and 10.31 are not comparable with the cash-based estimates published in past editions of Year Book Australia. Under accrual recording, revenues, expenses, lending, and borrowing are recorded as they are earned, accrued, or incurred. A new conceptual framework, derived from the international standard *System of National Accounts 1993*, is used for these accrual-based estimates.

The emphasis given to the outlays of the public sector reflects not only the relative importance of that sector in the provision of educational services, but also the lack of detailed accrual information relating to expenditure on educational activities in the private sector.

Table 10.29 presents the total education expenses of governments in 1998–99, by purpose. Operating expenses for university education comprised 28%, followed by primary and secondary education (each 23% of total operating expenses). Technical and further education accounted for 11% of the total operating expenses for government education. Total operating expenses do not include expenditure on non-financial assets, a component of the consolidated financial statements.

Table 10.30 shows the components of operating expenses on education by economic transaction in 1998–99. Wage and salary expenses accounted for 49%, with the balance largely in non-employee expenses (22%), and grants plus personal benefit payments (19%).

Table 10.31 summarises the importance of Commonwealth grants for education to the States and Territories, and to universities. Two-fifths (42%) of Commonwealth grants for education are directed to universities. From tables 10.29 and 10.31, 43% of university funding is from Commonwealth grants, as is a quarter of funding both for primary and secondary schooling (25%), and technical and further education (26%).

10.29 EDUCATION EXPENSES INCURRED BY GOVERNMENT, By Purpose—1998–99

Purpose	Commonwealth $m	State and local $m	Multi-jurisdictional(a) $m	Total sectors $m	Intra-sector transfers $m	Australia $m
Primary and secondary education						
Primary education	—	7 310	. .	7 310	–26	7 284
Secondary education	652	6 591	. .	7 243	–3	7 240
Other primary and secondary education	4 296	2 299	. .	6 595	–4 249	2 346
Total primary and secondary education	*4 948*	*16 200*	. .	*21 148*	*–4 278*	*16 870*
Tertiary education						
University education	4 757	92	8 271	13 120	–4 231	8 889
Technical and further education	1 227	3 026	. .	4 253	–878	3 375
Other tertiary education	174	38	. .	212	—	212
Total tertiary education	*6 158*	*3 156*	*8 271*	*17 585*	*–5 109*	*12 476*
Preschool, special, and other education						
Preschool education	—	346	. .	346	—	346
Special education	—	545	. .	545	—	545
Other education not definable by level	261	150	. .	411	–129	282
Total preschool, special, and other education	*261*	*1 041*	. .	*1 302*	*–129*	*1 173*
Transportation of students						
Transportation of non-urban school students	—	173	. .	—	—	173
Transportation of other students	—	581	. .	—	—	581
Total transportation of students	—	*754*	. .	*754*	—	*754*
Other education expenses	157	116	. .	273	–1	272
Total education expenses	**11 524**	**21 267**	**8 271**	**41 062**	**–9 516**	**31 546**

(a) The multi-jurisdictional sector currently contains only universities.

Source: Unpublished data, Public Finance collection.

10.30 GOVERNMENT OPERATING EXPENSES ON EDUCATION, By Economic Transaction——1998–99

Economic transaction	Commonwealth $m	State and local $m	Multi-jurisdictional(a) $m	Total sectors $m	Intra-sector transfers $m	Australia $m
Employee expenses						
Funded superannuation expenses	—	7	373	380	–93	287
Unfunded superannuation expenses	—	307	117	424	–43	381
Wages, salaries, and supplements	134	11 379	4 006	15 519	—	15 519
Other employee expenses	39	237	257	533	—	533
Total	*173*	*11 930*	*4 753*	*16 856*	*–136*	*16 720*
Non-employee expenses						
Bad debts written off	13	—	4	17	—	17
Benefits to households in goods and services	116	499	—	615	—	615
Other non-employee expenses	166	3 512	2 622	6 300	–3	6 297
Total	*295*	*4 011*	*2 626*	*6 932*	*–3*	*6 929*
Depreciation and amortisation						
Depreciation of fixed assets	3	1 017	586	1 606	—	1 606
Amortisation	85	4	—	89	1	90
Total	*88*	*1 021*	*586*	*1 695*	*1*	*1 696*
Current transfer expenses						
Current grant expenses	8 835	3 893	12	12 740	–8 735	4 005
Subsidy expenses	—	26	6	32	—	32
Current monetary transfers to households	1 783	245	44	2 072	—	2 072
Tax expenses	—	12	243	255	–255	—
Other current transfer expenses	—	—	2	2	—	2
Total	*10 618*	*4 176*	*307*	*15 101*	*–8 990*	*6 111*
Capital transfer expenses						
Capital grant expenses	348	122	—	470	–388	82
Other capital transfer expenses	—	6	—	6	—	6
Total	*348*	*128*	—	*476*	*–388*	*88*
Total	**11 523**	**21 267**	**8 271**	**41 061**	**–9 515**	**31 546**

(a) Multi-jurisdictional sector currently includes only universities.

Source: Unpublished data, Public Finance collection.

10.31 COMMONWEALTH GRANTS FOR EDUCATION—1998–99

	$m
Current grants to States and Territories	
Primary and secondary education	3 937
Technical and further education	866
Other education not definable by level	119
Total	*4 922*
Capital grants to States and Territories	
Primary and secondary education	305
Other education not definable by level	10
Total	*315*
Total grants to States and Territories	
Primary and secondary education	4 242
Technical and further education	866
Other education not definable by level	129
Total	*5 237*
Grants to universities	
Current grants	3 764
Capital grants	32
Total	*3 796*
Total	**9 033**

Source: Unpublished data, Public Finance collection.

Bibliography

ABS publications

Census of Population and Housing Forms 1911 to 1991 (microform).

Child Care, Australia (4402.0).

Education and Training in Australia, 1998 (4224.0).

Government Finance Statistics, Australia (5512.0).

Government Finance Statistics, Education, Australia (5518.0).

Government Financial Estimates, Australia (5501.0).

Information Paper: Accruals-based Government Finance Statistics (5517.0).

Information Paper: 1976 Population Census: Classification of Educational Qualifications (2115.0).

Information Paper: 2001 Census of Population and Housing: ABS views on Content and Procedures (2007.0).

Information Paper: 2001 Census of Population and Housing: Nature and Content of the Census (2008.0).

1976 Census of Population and Housing: Making Sense of the Census (2129.0).

1996 Census of Population and Housing: Nature and Content of the Census (2008.0).

1996 Census Dictionary (2901.0).

Schools, Australia (4221.0).

Transition From Education to Work, Australia (6227.0).

Other publications

Commonwealth Bureau of Census and Statistics:

—1908, *Official Year Book of the Commonwealth of Australia No.1*, McCarron, Bird & Co. Printers, Melbourne.

—1911, *Official Year Book of the Commonwealth of Australia No.4*, McCarron, Bird & Co. Printers, Melbourne.

—1953, *Official Year Book of the Commonwealth of Australia No. 39*, Commonwealth Bureau of Census and Statistics, Canberra.

—1969–1973, *Census of the Commonwealth of Australia 1966*, Commonwealth Bureau of Census and Statistics, Canberra.

Commonwealth Department of Employment, Education and Training:

—1990, *Selected Higher Education Statistics 1989*, AGPS, Canberra.

—1993, *Retention and Participation in Australian Schools 1967 to 1992*, AGPS, Canberra.

Commonwealth Department of Education, Training and Youth Affairs (DETYA):

—1999a, *Selected Higher Education Finance Statistics 1998*, available at *http://www.detya.gov.au/highered/statpubs.htm/*

—1999b, *Staff 1999: Selected Higher Education Statistics*, available at *http://www.detya.gov.au/highered/statpubs.htm/*

—2000, *Students 1999: Selected Higher Education Statistics*, available at *http://www.detya.gov.au/highered/statpubs.htm/*

Commonwealth Statistician 1917, *Census of the Commonwealth of Australia 3rd April 1911, Vol 1: Statistician's Report Including Appendices*, McCarron, Bird & Co. Printers, Melbourne.

Gale, Walter A. 1892, *Census Western Australia, April 1891: general report with appendices*, R. Pether Government Printer, Perth.

Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA):

—1999a, *National Report on Schooling in Australia 1998*, Curriculum Corporation, Melbourne.

—1999b, *Adelaide Declaration on National Goals for Schooling in the Twenty-first Century*, available at *http://www.curriculum.edu.au/mceetya/nationalgoals/*

National Centre for Vocational Education Research (NCVER):

—2000a, *Australian Vocational Education and Training Statistics 1999*: *In Detail*, NCVER, Leabrook.

—2000b, *Australian Vocational Education and Training Statistics 1999: Financial Data*, NCVER, Leabrook.

Office of the Government Statist, Victoria 1893, *Census of Victoria 1891: general report by the Government Statist*, Robert S. Brain Government Printer, Melbourne.

State and Territory Education Departments:

—The annual reports of the State and Territory Education Departments also provide detailed statistical information.

Internet sites

Australian National Training Authority, *http://www.anta.gov.au*

Australian Student Traineeship Foundation, *http://www.astf.com.au*

Commonwealth Department of Education, Training, and Youth Affairs, *http://www.detya.gov.au*

Open Learning Australia, *http://www.ola.edu.au*

National Centre for Vocational Education Research, *http://www.ncver.edu.au*

Ministerial Council on Employment, Education, Training and Youth Affairs, *http://www.curriculum.edu.au/mceetya*

Australian schools: participation and funding 1901 to 2000

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Introduction

Education is not included as a Commonwealth power in the Constitution, and therefore it remains the responsibility of the States. However, the Commonwealth with its greater revenue base, especially after 1941, became involved in assisting with the funding of tertiary students and universities and then, notably from the 1960s, of the school system itself, in both public and private sectors. By the end of the century it provided over 40% of all public funds for education, had a dominant role in higher education and substantial influence and funding in vocational education and in schooling

This article has a limited scope. It examines participation in education, particularly secondary schooling, in Australia during the twentieth century and the funding system that underpins it. This necessarily involves comment on the quality of the education system in relation to the needs of the students of all social backgrounds and the Australian economy and society. And it involves outlining some of the key changes that occurred in the twentieth century and the political and policy issues that underlay them.

Although the Australian colonies readily embraced and almost implemented universal education in the last quarter of the nineteenth century, the challenges of secondary education, and the participation and destinations of adolescents in this stage of formal schooling, have dominated educational politics and planning during the entire twentieth century. Perhaps this was unavoidable because of the nature and position of secondary education in a modern democratic society. Of all the stages in schooling, secondary education is the most sensitive to both personal aspirations and societal demands. As the first national survey of secondary education (*The Education of the Adolescent in Australia*) observed in 1935: "Australian secondary education is still in the stage of transition. Perhaps it will never be in any other".

Australian education in 1901

In 1901 Australian education, except in Western Australia, was suffering from the financial effects of the long economic depression. But there was an abundance of schools and pupils. Some 15,000 of these pupils, from New South Wales' public schools, provided the choral accompaniment to the first Governor-General's signing of the new Oath of Allegiance in Centennial Park, Sydney on 1 January 1901.

Of the 9,353 schools with a total enrolment of 887,137 pupils, most were 'free' public (state) schools, and the bulk of these were one-teacher schools with enrolments of between 10 and 30 students. The 'peculiarity' of Australian education, noted Monroe's *A Cyclopedia of Education* in 1911, was the absolute centralised control by the State of each public education system, and "since local interest is fitful, the external equipment of the schools is usually of an inferior character". This international review also observed that it was "perhaps unfortunate" that an education constitutional power had not been included in "the act of federation" in 1900.

Compulsory attendance laws for children, generally for those between 6 and 13 years, were at last in place (Queensland having introduced its law in 1900), but they were

not strictly enforced and, as well, remained out of reach of the most isolated communities and were inapplicable to Indigenous peoples. Schools were open at least 220 days a year, which was regarded as progressively high for a non-industrial society. Roman Catholic parish schools, established in the 1880s by the bishops to counteract the secular ('godless') public schools, and other private schools in towns and cities, appeared much more effective in maintaining regular attendance of pupils, attaining an average pupil attendance of 81% of their enrolments, compared with 70% for pupils in government schools.

Two free kindergartens had recently opened in Sydney, but no system yet provided school medical and related services. Nonetheless, in 1901 Sydney and Hobart schoolboys were surveyed to find that for their ages they were taller than their English counterparts, but had smaller chests than European boys. Among the diverse range of secondary schools in the cities and the larger towns, only five were state-controlled institutions (four in New South Wales, one in Adelaide) but, like the private providers, namely endowed grammar schools and denominational religious schools, they attracted low and fluctuating enrolments from fee-paying secondary school students. Overall, the diffusion of popular education over the previous decades, as measured by national literacy rates (percentage of 5–14 year olds who could read and write), was 80% in 1901, an increase of some 4% from 1891; it would rise to the acceptable level of 90% in 1911.

There were 22,213 teachers working in Australian schools in 1901, two-thirds employed by State education departments. Nearly two-thirds of all school teachers were women or girls; it had been a higher figure, but married women and many female pupil teachers in the public school systems had been systematically retrenched as part of the economy measures in the 1890s. Most schoolteachers had never trained at a teachers' college, instead they had obtained certification in a State system after an apprenticeship as pupil teachers. Queensland, Western Australia and Tasmania did not have training institutions in 1901, while the Victorian Government only permitted the education department to reopen its college in Carlton in 1900 after a six years' recess.

Western Australia had established its first technical college the same year, thereby providing technical education of the 'central' technical model or the 'school of Mines/Arts' model in each of the new States. Except for New South Wales, none were under direct State control, but this would occur increasingly throughout the decade. Western Australia, and also Queensland, were without a university in 1901. Each other State had one small university located in the capital, which on 'modern' British lines closely regulated and administered various levels of public examinations for the schools, and offered higher studies for degrees in the liberal arts, the old and some of the new professions like engineering or dentistry, as well adjunct extension classes for adults. In 1901 there were 33 professors in the four Australian universities and some 2,500 undergraduate students, many of whom were part-time enrolees.

The formation of the new nation, occurring as it did during an economic crisis, invoked a widespread questioning of the status and functions of all public institutions. Education was part of this restlessness, especially evident during official inquiries into State education systems, teacher union conferences and public fora like the Federal Educational Congress convened by the Victorian State department and the teachers union in January 1901. Reformers, who bemoaned the loss of educational ideals that had been enshrined in the foundation public education acts of the 1870s and the 1880s, advocated the modernisation of public education to satisfy the aspirations of the new nation. In particular, reformers (public officials and private citizens) called for the liberalisation of the rigid elementary schools' methods and curriculum, the replacement of 'pupil-teacher' system by pre-service college training and the direct intervention by the state in secondary (and technical) education. Such intervention, it was argued, was critical so that this stage of formal schooling would meet both the skill requirements of an emerging industrial economy and the nationhood needs of a democratic political system. These could be achieved by the States legislating for increases in their minimum school leaving ages and the establishment of different secondary schooling sites in the public education systems that would offer 'free' or almost 'free' secondary education to young Australians of the new century.

Foundations of public secondary education

The policy problem before State Governments and education departments was the question of access to the first 2–3 years of a secondary education, or what was termed the '12–14 years old' problem. Different types of new schools or classes within primary schools had to be designed and developed with curricula to meet the different abilities and occupational expectations of this age group. Generally some form of externally validated examination at the last year of primary school was required to sort the different destinations of pupils. The main focus of departmental energies, however, was not devoted to this question, but remained fixed on the establishment of a few academic high schools. These new institutions, often established originally to prepare school pupils for State school teaching, in fact provided a new, public pathway for academic students to progress through a modern secondary school curriculum. Students of ability, who paid fees which were lower than those charged by private schools, were able to access these schools in capital cities (often gender differentiated schools) and provincial centres by successfully completing qualifying or entrance examinations. Those who completed the secondary education course would compete with private school students at public examinations and, if successful, would 'matriculate' for entrance to the universities and technical colleges. The curriculum, teaching methods and school organisational culture was unashamedly 'grammar school', which had been transplanted from Britain to the Australian private schools in the 19th century. Thus secondary school competition was created between the public and private sectors, even though most education departments initially conceded that they would not locate the new public high schools in private school catchment areas. The larger established private schools later agreed to the competition because States like Victoria (1905) and NSW (1916) introduced regulation of teachers and schools in private schools. This dramatically reduced the number of small, often family-owned, private academies, which until then had attracted significant numbers of students to this sphere of the secondary school market.

The high schools, often more selective and cheaper than private schools, appealed to the new middle classes, who understood the importance of a meritocratic school system that also embedded the ethos, activities and social networks of the private school. These new schools, especially those in the capital cities, were to produce a new constituent of the social elite; indeed in NSW and Western Australia, but less so in Victoria, products of the selective high schools later emerged as the leading members of the local professional elites.

However, the public high school system, established as it was in each State between 1905 and 1915, ahead of the resolution of the '12–14 years old' problem, did little to advance mass educational opportunities or socially inclusive and democratic secondary schooling in Australia. The success of the State high school in creating a new academic education market encouraged other departmental leaders to argue for the introduction of secondary school structures that would provide an accessible and relevant curriculum to most 12–14 year olds. Initially this was done by extending the primary school into a central or superior school, that was to provide vocational emphases in technical, commercial or domestic economy, balanced with some features of an early general secondary education. The objective was to provide preparation for semi-skilled work, vocational training or a technical education. But the difficulties of imposing this type of curriculum on schools dominated by the primary school curriculum and teaching ensured that in most States the vocational aspects would be surrendered inevitably to a general education, without sufficient or adequate preparation in the new work skills. Agricultural education was to suffer the most, but it was not alone, and gradually in States like New South Wales, vocationalism in secondary education was subsumed by a general academic curriculum in the superior public schools and district high schools.

Victoria, on the other hand, because of the strength of the vocational education lobby (and its dismay at what had happened to the vocational streams in public high schools), created separate technical schools in its public secondary system. These schools, established after 1911, were controlled by the education department's new technical education directorate, which designed a pre-vocational curriculum that was linked directly to entry into industrial training,

work, or technical college education. The 'junior' technical school became one of the major innovations of the Victorian education system and it influenced the growth of similar schools in Tasmania.

The promotion of such early specialisation in adolescents' education disturbed the new generation of departmental leaders in Victoria. By the mid-1920s they were positioned to merge all technical schools into the high schools. They would have succeeded, but for the election of a State Labor Government in 1929. It heeded the pleas of the Trades Hall Council, the Chamber of Manufacturers and *The Age*, and retained the technical schools system. Another Labor government would eventually incorporate the technical schools into a new secondary college system in the mid-1980s. Tasmania abolished its junior technical schools in the 1950s.

The Victorian technical schools system also created a small number of girls' technical schools, but like elsewhere in Australia, the main vocational stream for working class girls in non-academic courses was in domestic arts classes or schools. These were to prepare girls 12–15 years old for home-making, after unskilled work as adolescents. Most girls left these schools on reaching the school leaving age. In Victoria's eleven domestic arts schools in 1929, 2,467 of the girls were 14 years and under, and only 912 were over 14 years.

Public secondary education after the school leaving age was found to be the most inclusive in the multilateral or omnibus high school which developed during the 1920s in the larger country towns. These non-selective schools did attempt to meet some of the specific vocational needs of non-academic stream students, while extending an academic education for students who stayed even one year beyond the school leaving age. Indeed, within the State system the country high school became the dominant mode of secondary schooling in the period between World Wars I and II. In Victoria in 1928 only six (three selective) schools out of 60 high and intermediate high schools were in the Melbourne metropolitan area, while in South Australia the figure was four out of 24. In Sydney, where the public high school had developed more than in any other Australian city, only 48% of all State secondary students attended its metropolitan schools. Tasmania attempted genuine educational innovation in the late 1930s, when it introduced area schools that offered a pronounced bias in practical agriculture geared to local rural industries in the first two years of the secondary school curriculum. This type of schooling proved so popular with local communities that by 1942 fifteen area schools had been established across the State.

The fees question

The public provision of secondary education was constantly the subject of debate about tuition fees. It was apparent that when fees were increased, extended or reintroduced, as in almost all States during the Depression, secondary school enrolments fell markedly. There was both a psychological impact on families that secondary school appeared unaffordable, and a material impact as a result of the collapse of family incomes in the 1930s. The reintroduction of fees as a 1930s emergency measure came at a critical time because primary school enrolments, which had increased significantly in the mid-1920s, could not be matched by the anticipated expansion of secondary school enrolments and retention rates between 1931 and 1936. Thus many young Australians were cruelly denied access to an extended secondary education or the opportunity to complete it in this decade.

New South Wales, as the leading public provider of secondary education, was potentially the most vulnerable to the economic emergency of the 1930s. Its rapid expansion in the previous decade, which had seen State secondary school enrolments treble between 1917 and 1927 (but school accommodation barely doubling), continued during the first years of the Depression. The Government resisted pressure to reimpose fees, and as a result, while State secondary school enrolments fell in 1933 and 1934, they quickly returned to 1932 levels in 1936, and then evened out for the remainder of the decade as a result of the declining birthrate after 1927. The absence of fees in public high schools also had the effect of attracting and retaining students from private schools, whose overall enrolments collapsed by nearly 20% between 1930 and 1934, again as the result of the reduction in family incomes. Nevertheless, the Depression took its toll on all secondary schooling opportunities, because in 1936 New South Wales' secondary education systems could not account for

about 40% of children who had completed their primary schooling in 1934.

In South Australia, Tasmania and Victoria, which reintroduced secondary school fees in the early 1930s, high school enrolments fell by 9–11% between 1933 and 1936. But the Victorian Government's decision to maintain free technical schooling resulted in an increase in these schools' enrolments by 21% in the same period. For the entire decade, Victorian high school enrolments increased by only 13%, compared with a 42% increase for the technical schools. Obviously the pre-vocational aspect of these schools encouraged families to invest in a system that promised some skill preparation for a revived industrial economy at the end of the 1930s. The overall impact of the 1930s Depression on Australian secondary schooling can be found in the results of a 1946 survey by ACER; it estimated that only 88% of the 13–14 year olds were at full-time school, 57% of 14–15 year olds, 27% of 15–16 year olds and 7% of 16–17 year olds. "Australia has far to go before it attains anything approaching secondary school for all" (Cunningham 1947 p. 344).

The beginnings of reform of State secondary education in this period did allow the elementary school to be reshaped into a primary school as a stage in formal education and not a terminus. The Australian primary school, as distinct from its 19th century antecedent, concentrated on the growth and experiences of the child as an individual personality. The emergence of public secondary education gave the primary school the space to implement the pedagogical and curriculum innovations that had been part of the 'New Education' movement at the turn of the century. Access to primary schooling in the remote areas also had been improved by the introduction of correspondence education around 1916, and the extension and retention of the one teacher school, even though it was four times as expensive per pupil to operate as an ordinary school. Departmental and party political adherence to the small school, except in NSW and Tasmania, seriously impeded the consolidation of these schools by use of road transport for outlying pupils. At the end of the 1930s some two-thirds of Australia's State schools still employed only one teacher, even though these primary schools attracted less than 15% of State school enrolments. The growth of a progressive primary school pedagogy was also inhibited by the poor quality of teacher pre-service training, and by shortages of books, materials and instructional equipment necessary to promote individual and social learning. These difficulties were to be accentuated by the Depression, wartime austerity and postwar shortages. Indeed it would not be until around 1960 that the Australian primary school fully embraced the progressive ideals of the 1900s.

The financial context in the late twentieth century

To take the discussion of schools and participation into the second half of the nineteenth century it is necessary to sketch the main features of educational finance.

In 2000 governments still provide the bulk of funds for education. Public primary and secondary schooling is provided without tuition fees. Small tuition fees have been charged in recent years for public vocational education and training after being removed in the 1970s. The Commonwealth abolished tuition fees in higher education in 1974 when it assumed responsibility for public funding for higher education, previously shared with the States. It began to reintroduce fees in the late 1980s, and in 1989 it brought in the Higher Education Contribution Scheme (HECS), which offers an income-contingent loan, later repayable through the tax system, to cover the fee. The fee was then about 20% of course costs. It has since been increased and now varies across courses. Fees covering the costs of tuition are charged for most postgraduate coursework degrees, for a very small proportion of the undergraduate degree courses taken by Australian students, and for overseas students at all levels of education.

Nearly all institutions in higher education and Technical and Further Education are owned by State and Territory Governments, though there are substantial numbers of private providers in Vocational Education and in English language provision. There are two private universities, Bond and Notre Dame, but they provide only a tiny fraction of higher education. The Australian Catholic University is funded by the Federal Government as a public institution.

The Commonwealth provides an important but minority share of the funds for publicly

funded vocational education. The Commonwealth provides means tested grants for full-time students in schools and in tertiary education, for those aged 16 and over.

About 70% of school students are in government schools, about 20% in Catholic schools and about 10% in Other non-government schools. Government schools are largely funded by State and Territory Governments from their own resources (which include Commonwealth financial assistance grants to the States and Territories). No tuition fees are charged, though many government schools seek contributions from parents for a range of materials and services. About 12% of spending on government schools in the States comes from the Commonwealth allocation specifically for government schools—as general funds for schools and for some specific purpose equity programs and as capital grants for building. The Commonwealth did not provide any funds directly for government schools in the States before 1964.

In the late 1990s, *on average* about 54% of the spending of non-government schools is financed by government grants (Commonwealth 36%, States 18%) and 46% from private sources such as fees. The amount that a school receives from governments depended on a measure of the school's resources (provided from its private income, especially fees which are around $2,500 per annum at a typical Catholic secondary school, but about $10,000 at the high fee Other non-government schools; (there are an increasing number of Other non-government schools at the middle to lower fee range).

The economic context of the post-war period was one of full employment and relatively high rates of economic growth until the mid 1970s. The support for public expenditure on education remained strong and a rising share of the nation's resources were allocated to it. The expansion was most marked in the late 1960s and early 1970s. Outlays leapt by 1% of GDP in one year in the mid 1970s, a combination of the Whitlam Government's policies for higher education and schools and the continuing rising expenditures of the States.

The stagflation of the late 1970s and 1980s led to restrictions on public expenditure and efforts to make the education and training system more efficient. Table C7.1 provides an overview of the the overall size of public and private expenditure on education from the late 1940s, drawing on the pioneering estimates of Karmel (1962 and 1967) and Mathews (1968) and subsequent ABS data. The table shows that public expenditure as a share of Gross Domestic Product waxed until the late 1970s and then waned. Private funding has expanded notably in the last decade. Cash benefits for students expanded in the late 1980s following the introduction of a new system, which in particular extended to 16 and 17 year olds at school the types of student assistance available to tertiary students.

C7.1 PUBLIC AND PRIVATE EXPENDITURE ON EDUCATION, Australia—1948–49 to 1997–98

	1	2	3	4 = 1 + 2 + 3	5	6	7 = 4/5	8 = 4/6
	Cash benefits and transfers	Public expenditure	Net private expenditure	Public and private outlays	GNP or GDP	Revised GDP	Outlays as percentage of GDP	Outlays as percentage of revised GDP
Year	$m	$m	$m	$m	$b	$b	%	%
1948–49	2	59	15	76	4.5	. .	1.7	. .
1953–54	6	161	35	202	9.0	. .	2.2	. .
1958–59	8	304	68	380	12.5	. .	3.0	. .
1963–64	17	533	116	666	18.0	. .	3.7	. .
1972–73	215	1 774	252	2 241	41.9	. .	5.4	. .
1975–76	352	4 120	305	4 777	72.8	. .	6.6	. .
1977–78	392	5 370	344	6 106	90.3	. .	6.8	. .
1978–79	392	5 794	382	6 568	102.1	. .	6.4	. .
1983–84	681	10 048	635	11 364	194.6	. .	5.8	. .
1988–89	1 340	14 242	1 623	17 205	339.9	351.0	5.1	4.9
1994–95	1 839	20 174	3 326	25 339	. .	474.6	. .	5.3
1997–98	1 892	23 109	4 577	29 578	. .	566.0	. .	5.2

Source: Mathews 1968 (for data to 1963–64); Commonwealth Department of Education; ABS.

C7.2 SCHOOL ENROLMENTS, By Type of School, Australia—1963 to 1999

		Non-government			
	Government	Catholic	Other non-government	All	**Total**
Year	'000	'000	'000	'000	**'000**
1963	1 752	451	98	549	**2 301**
1964	1 797	463	102	565	**2 362**
1969	2 111	490	112	602	**2 712**
1974	2 253	494	124	618	**2 872**
1979	2 332	513	138	651	**2 983**
1984	2 261	567	190	757	**3 018**
1989	2 194	594	243	837	**3 031**
1994	2 215	602	282	884	**3 099**
1999	2 248	636	343	979	**3 227**

Source: Schools, Australia (4221.0).

C7.3 RECURRENT GRANTS PER STUDENT(a) TO NON-GOVERNMENT SCHOOLS, Commonwealth and Victorian Governments—1967 to 1999

	Primary				Secondary			
	Commonwealth		Victoria		Commonwealth		Victoria	
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
Year	$	$	$	$	$	$	$	$
1967	0	0	5	5	0	0	10	10
1973	62	62	51	51	104	104	72	72
1976	76	223	130	130	113	355	214	214
1983	342	684	374	374	543	1 068	611	611
1996	466	2 014	282	657	740	2 942	415	1 024
1999	525	2 437	303	708	832	3 560	447	1 102

(a) Supplementation for price increases may not be included in all data in this table.

Source: Commonwealth and State Departments, and independent and Catholic school sources.

Over 60% of outlays on education are for schools. The changing size and distribution of school enrolments across government, Catholic and other non-government schools is shown in table C7.2 for the period since 1963, in which comprehensive Australian statistics on school enrolments have been compiled. Government schools enrolled nearly 80% of students in the mid 1970s, but since then all the growth in enrolments has been in non-government schools. Government enrolments in 1999 are at the level they were in 1974 and non-government enrolments are some 60% higher. The growth is especially in other non-government schools, which enrolled less than 5% of all students in the early 1960s but over 10% by 1999.

The growth in school enrolments in the 1960s was still driven by the postwar baby boom and was largely absorbed by the government systems, which alone had access to government funds. The demographic push eased with the sharp temporary decline in births in the early 1960s. The return of government funding for non-government schools from 1964 and its sharp increase in the 1970s were factors in the increase in their share of enrolments. For the low resource Catholic schools, Commonwealth capital grants were crucial in allowing them to expand their provision. The recurrent grants allowed them to do so with improving resource levels per student. The growing pattern of public recurrent funding of non-government schools is given in table C7.3.

As indicated, both the Commonwealth and the States provide recurrent support for non-government schools. However, as the States differ in their form of support, an example for Victoria is shown. In 1999 a high income non-government secondary school would have received the minimum amounts of $832 from the Commonwealth and $447 from the State, a total of $1,279 per student. Most Catholic system schools received close to the maximum or about $4,500 per student.

The years chosen for the table are of significance. The figure for 1973 shows the funding determined by the Gorton and McMahon Coalition Governments: there was a flat per capita grant varying only by level of education. The figures for 1976 are the legacy of Whitlam Labor Government: it expanded funding very greatly for low resource, mainly Catholic, schools. The figures for 1983 show the policy of the Fraser Government: to expand the funding of the high income non-government schools proportionately the most, but to increase the absolute funding of the low resource schools most of all.

The 1996 figures indicate the Hawke and Keating Governments' policies: in real terms they cut the grants to the high income non-government schools and increased them to the low income schools. The 1999 figures show the effects of the first years of the Howard Government: it has relatively increased its funding of the low resource schools. However, in 2000 it revised the method of making grants to non-government schools, except for the Catholic systems. Other private schools and systems from 2001 will receive grants based on the socioeconomic status of the areas in which the parents of their children reside, rather than the resource levels of the school. The total grants for non-government schools will be substantially increased and the increases on average will be largest among the high fee schools. The government funding of such schools will no longer be affected by the resources they acquire from fees or donations. A Liberal spokesman has referred to the new system as making 'an historic correction' in funding.

The introduction of government funding for non-government schools was not at least initially at the expense of funding for government schools. Table C7.4 summarises the growth in the government and non-government sectors in enrolments and expenditure per student. It also provides approximate estimates by the authors of the change in total recurrent expenditures and in expenditure per student in constant 1998 prices.

The table shows that, over the whole period from the 1974, expenditure per student has increased in real terms a little more in non-government than in government schools. In both sectors it more than doubled. The table shows the massive expansion in the resources in government schools in the late 1970s—an increase of nearly 40% in real resources per student in five years. It is in the period of the 1980s and especially the 1990s that the non-government schools increased their expenditures more rapidly than government schools. Overall, because of the rapid expansion of enrolments, the total

expenditure of non-government schools has increased much more than in government schools.

Another way of viewing the resources of schools is to focus on the major resource, teachers. Table C7.5 shows the changes that have occurred in the period from 1973 to 1999 in the ratios of students to teachers. In government schools the most rapid reduction in ratios was in the 1970s, but it also was rapid in Catholic schools. Government schools took advantage of a decline in primary school enrolments due to low births in the 1970s to reduce ratios in the 1980s and 1990s, but secondary ratios have altered little since the beginning of the 1980s. Catholic and Other non-government schools have continued to reduce the average ratios at both primary and secondary levels. At secondary level the ratios in Catholic schools which were nearly 40% higher than in government schools in 1973 were less than 10% higher in 1999. The ratios in Other non-government schools, which were higher than in government schools in the early 1980s at secondary level, are now once more lower.

It might also be noted that non-government schools with high levels of resources tend to spend a lower proportion of their funds on teachers than low resource non-government schools or government schools. The gap in expenditure between Catholic schools and Other non-government schools is proportionately larger than the gap in student teacher ratios shown in table C7.5.

Secondary schooling for all

The period of the long economic boom, 1945–1970, fostered a transformation in secondary education in Australia. Before 1945 State secondary school provision was dysfunctional, and the so-called 'ladders' of educational opportunity were still missing rungs and feet. After 1945 State secondary education is defined by the magnitude and pace of its physical expansion and the genuine attempts to introduce from overseas practice a comprehensiveness in location, curriculum and culture, for at least the 12–15 years old cohort. Nevertheless, some high schools that were highly selective in scholastic and social composition were retained in all States. Special purpose schools like Victoria's junior technical schools, or domestic arts schools, were also retained, and both extended the years of provision and offered a more general curriculum which made it easier for students to transfer between different types of schools in a secondary system.

This transformation in secondary schooling was driven by social demands for extended education. Industrialisation, immigration, full employment policies and new levels of urbanisation helped create a silent social revolution, where secondary education was 'consumed' for personal economic advancement. Families, "the depression or wartime generations", were willing and economically able to support their children (especially boys) undertaking secondary schooling beyond the compulsory leaving age to improve their credentials and opportunities for non-manual and skilled manual employment. This demand can be seen in NSW government schools' retention of students from year 7 to year 10: it increased from 13% in 1948 to 48% in 1958 to 72% in 1968.

C7.4 GOVERNMENT AND NON-GOVERNMENT SCHOOLS, Recurrent Expenditures(a)—1974 to 1999

	Government schools				Non-government schools			
Year	Students '000	$ per student	Index of total expenditure(b)	Index of expenditure per student (b)	Students '000	$ per student	Index of total expenditure(b)	Index of expenditure per student(b)
1974	2 253	521	1.00	1.00	618	523	1.00	1.00
1979	2 332	1 303	1.44	1.39	651	1 074	1.20	1.14
1989	2 194	3 523	1.79	1.84	837	3 213	2.26	1.67
1999	2 248	5 652	2.07	2.08	979	5 892	3.41	2.16

(a) Expenditure data from government and non-government schools differ in scope and there are changes in collection over time. (b) At constant 1998 prices.

Source: Data from MCEETYA and DETYA; estimates by authors.

C7.5 RATIOS OF FULL-TIME STUDENTS TO TEACHERS, By Type and Level of Schooling, Australia—1973 to 1999(a)

			Non-government					
	Government		Catholic		Other non-government		All schools	
Year	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary
1973	25.1	16.2	29.6	22.2	17.1	14.2	27.5	18.2
1981	20.0	12.3	23.6	16.2	17.5	13.2	22.4	15.1
1989	18.2	12.2	21.4	14.2	17.1	12.4	18.7	12.6
1999	17.0	12.5	19.4	13.5	15.8	11.5	17.3	12.6

(a) Definitional changes affect comparisons over time. Special school enrolments are included largely in Primary up to 1981. Student: teacher ratio is the ratio of the total number of school students to the total number of school teachers, including school principals, deputy principals, careers teachers etc. It is not a measure of class size.

Source: Schools, Australia (4221.0) and related earlier publications (ABS); Schooling in Australia: Statistical Profile No 1, 1987 (DEET).

State Governments in the immediate postwar years assisted the extension of State secondary education by abolishing entrance examinations at the end of primary school as well as all tuition fees, extending the school leaving age, and increasing the number of school scholarships and subsidies for school transport, especially in country areas. They also encouraged the liberalisation of the school curriculum for all but the last two years of the secondary school. More than anything else education departments and governments raised community expectations that secondary schooling for all adolescents was a desirable end in itself, and a direct means for students to obtain the skills and credentials to move into meaningful employment, training or higher education. This establishment of a favourable precondition for "the revolution in rising expectations" would resonate with State authorities, Roman Catholic school leaders and the school reform movement well into the 1960s. But as one observer wrote in 1962, "public secondary education … is still regarded by many as something of a new-comer" (Bassett 1963, p. 305).

Another disappointment, which was much more widespread, was with the inaction of the Federal Government. The Labor Government of the 1940s, which had introduced federal subsidies for disadvantaged university students as a wartime manpower control and as postwar reconstruction initiative, also contemplated a similar assistance scheme for low income secondary school students in the final two years of school. The defeat of Labor in 1949 sidelined this proposal and, while the Menzies Government continued and expanded the university scholarships scheme, it was not until 1964 that it came to the financial assistance of the schools, with a scholarship scheme to support students to stay on at secondary school. The decision, and the Commonwealth Science Laboratories and Libraries schemes, ushered in the current era of State Aid to school education. The secondary schools scholarship did not provide significant support to students from working class backgrounds or in country high schools to complete their schooling because, being awarded on academic merit rather than economic needs, they favoured students from elite private schools and government and Roman Catholic schools in middle class communities in metropolitan areas. For example, in 1968 Victorian Year 10 students in high schools obtained only 5% of all Commonwealth secondary scholarships, compared with 15% of non-Catholic private school students (Fensham 1972). An exception was in Victoria's technical schools, which catered for working class children where the principals argued that they provided a different curriculum and obtained an allocation of scholarships proportional to their enrolments.

Most States reorganised their secondary school system on a comprehensive model. In doing so they not only reformed the middle years of the secondary school but anticipated the flow from there to senior years, so that a fully comprehensive secondary school would be ready to meet further demands. The pace and trajectory of these reforms in Australia can be seen in the ten or more years that it took NSW to reorganise its secondary education system. Known as the 'Wyndham Scheme' after its Director-General of Education, the scheme brought to fruition many of the ideas that had been formally debated in NSW as early as 1933. Departmental postwar reconstruction planning after 1946, a public inquiry and survey between 1953 and 1957, the

introduction of new school legislation in 1961 and the implementation of the 'scheme' between 1962 and 1964, suggest something of the process and pace of major school reform in Australia.

New South Wales' planners had to accommodate serious opposition from within the State Government's ranks, from the social elite who had graduated from the State's selective schools, from teachers' industrial and professional associations, and from some elite private schools and university academics. Ultimately the reforms were accepted by the education community because they preserved aspects of the traditional systems, while laying the template for the structure of today's secondary education in NSW. In contrast, the Queensland Government was able to dispense with its obsolete State secondary system within three years. Its *Education Act 1964* raised the minimum school leaving age to 15, abolished the primary school scholarship examination and the university's control over most of the secondary school curriculum, and encouraged the growth of comprehensive State high schools.

Nevertheless, this transformative period of "secondary schooling for all" should not be identified with equality of educational opportunities through extended access to secondary education. The conservation of the all-pervasive academic curriculum, the persistence of external examinations, still largely based on competitive selection for university, and the role of the Commonwealth and States' financial aid to non-elite private schools, and especially for Roman Catholic schools to modernise their curriculum and teaching, meant that participation and success in public secondary schooling were highly differentiated by social geography and gender. Thus despite the rapid expansion of high school facilities and resources in Victoria between 1950 and 1975, social inequalities within the State system prevailed. Studies of Melbourne's high schools by Teese (1989) claim that, for 1972, completion rates for secondary schooling were 25% lower for students attending schools in the working class suburbs than for those attending schools in middle class locations. Moreover, for both locations, girls had completion rates that were half those of boys, suggesting that girls were still being 'ghettoed' into terminal streams in high schools, and dropping out of school earlier and more frequently than boys.

Universal secondary education?

The increase in secondary education capacity across all sectors between the late 1960s and late 1970s offered portents of a second silent revolution in education towards the end of the century. Specifically, the restructuring of the Australian secondary school, especially in curriculum and teaching, and the funding of these changes by the States and the Commonwealth, could provide the springboard for the introduction of universal secondary education in Australia, i.e. the level of education where almost all 16–17 year olds stayed on at schooling, either at secondary schools, alternative educational sites or programs, or in a combination of part-time education, training and work.

Secondary schooling underwent its most pronounced forms of modernisation in this period. Public examination reform both reflected this process and was affected by it, especially in the large number of students who remained at secondary school, where once their cohort would have exited full-time schooling at the end of Year 10. The notable reforms of this period included the abolition of external examinations except for the final year, a shift towards school-based examinations, including recognition of alternative curriculum pathways, and the introduction or extension of school system certification. Furthermore the use of external assessment was modified by a mix of external and teacher-based school assessment, with much more emphasis on ongoing assessment and moderation of standards by teacher peers in conjunction with an examination by authorities. In the latter, Queensland hosted the most radical reforms, while other States moved more slowly, if at all.

The dismantling or partial dismantling of public examinations systems indicated a newfound trust by authorities in the professionalism of secondary school teachers. This had been assisted by the recognition that for the first time these teachers were adequately prepared professionally for teaching by the universities and the teachers' colleges, the latter now free of education department control. There was also a recognition that professional development time was available for teachers,

subsidised by Commonwealth initiatives, and that teachers could develop curricula that were responsive to the range of abilities, interests and destinations of students. The Commonwealth Government, through its Schools Commission (established 1973) also initiated special national programs such as for education of girls, students of non-English speaking backgrounds and Indigenous secondary students.

To support students of low income families or those disadvantaged from communities, the Commonwealth Government directly funded a secondary allowances scheme for these groups (which replaced the scholarship scheme in 1974), though it was fairly small in value and confined to the lowest income groups and the disadvantaged schools program.

But above this, the Labor Government in 1974 abolished tuition fees at universities, advanced colleges and the new TAFE sector which, although controlled by the State and Territory Governments, was increasingly supported by the Commonwealth Government. These measures again made a psychological more than a material impression as many students had been exempt from fees, but nonetheless raised expectations in secondary education that a tertiary education was within the reach of many Australian families.

The decade 1968–78 is seen as the crucial period for laying the foundations for the eventual drive towards universal secondary education. But it also contained the fault lines that would eventually disrupt its advancement.

The Whitlam expansion of funds for both public and private education resuscitated Australia's dual education system. Subsequent funding policies helped the private secondary schools to survive to such an extent that they offered an attractive and affordable product to parents. Moreover, the Karmel Report (1973), which outlined the reforms and expansion of Commonwealth funding for schools, also recognised the 'individual rights' movement. Originally cast as the 'rights of the child' or the 'rights of the student' in education, it was appropriated by more conservative thought to become the 'rights of parents' to select the school of their choice for their children. The schools chosen would be subsidised by public funds. The Fraser Government (1975 to 1983) emphasised the notion of choice in schooling to shift Commonwealth recurrent funds away from the States' public education systems to both the poorer Catholic schools and the better resourced private schools. It also added 'excellence' to its strategy for encouraging 'choice', not only as a way of justifying the transfer of federal funds away from public education, but to re-establish the supremacy of the academic curriculum in secondary schooling.

During the same period, Commonwealth and State Governments also felt the first winds of reaction, or what J. K. Galbraith calls "the revolt of the rich" in affluent industrial societies. Taxpayers did not wish or expect to keep on paying for the maintenance, let alone the growth, of the modern welfare state, including public education systems.

Finally, as mentioned earlier, the fiscal adjustments of governments to high inflation from the mid-1970s onwards produced an expansion of unemployment, particularly among youth. One of the official responses to this problem was the claim that the public secondary school curriculum was failing students, or that it was contributing to the problem. This questioning of the new functions of secondary education brought both a parental revolt, that in a period of uncertainty they were prepared to transfer their children from public to private institutions, and a student revolt, of students leaving schooling before they entered Year 12.

Table C7.6 presents apparent school retention rates: the numbers in Year 12 in a particular year as a percentage of the entrants to secondary school five or six years earlier, depending on the State. Transfers among schools can cause the apparent retention rate to exceed 100%, which it does on occasion for Other non-government schools. Retention, which had been increasing rapidly since the mid-1960s, declined for boys in government secondary schools between 1975 and 1982, though an offsetting factor was the strength of apprenticeships as a post school destination for boys in this period.

During the 1980s, State and Federal Labor Governments revived the Whitlam Government's distributive justice stance to the continuing inequalities in secondary education, but without its commitment to investing heavily in public education. However, special Commonwealth programs

to increase participation and equity strategies in public high schools, and a major extension of the student assistance scheme, helped stem the retreat from secondary education. The benefit level was increased and the income test on parents eased. The numbers receiving at least some assistance expanded rapidly from 145,000 in 1988, or about 40% of those aged 16 and over, to 235,000 in 1992 or about 55% of those 16 and over.

School retention began to rise again in the mid 1980s and continued rapidly to the early 1990s, fostered by the financial assistance and in the early 1990s by a severe recession that affected job prospects for school leavers. Retention rates peaked in 1992 at 77%–72% for boys and 82% for girls. The rates have since fallen to 72%–66% for boys and 79% for girls in 1999. The decline is most noticeable among boys and in the government sector.

In the 1960s the participation of females was considerably lower than for males. This is shown in table C7.7. By the mid 1970s there was little difference, and from the 1980s females have had distinctly higher rates of participation. This carries through into higher education.

School participation should be seen in the context of overall participation in education and training. Table C7.8 shows that the proportion of 15 to 19 year olds in schools rose nearly 8 percentage points in the period 1984 to 1994. Participation in higher education rose 4 percentage points, but there was little change in participation in TAFE for this age group.

C7.6 APPARENT RETENTION TO YEAR 12, by Type of School, Australia—1967 to 1999

	Government	Catholic	Other non-government	All schools
Year	%	%	%	%
1968	20.4	27.5	76.3	22.7
1971	25.9	33.9	81.7	30.6
1974	27.3	39.1	90.3	32.9
1979	28.9	44.1	87.1	34.7
1984	38.4	54.6	92.7	45.0
1989	54.3	66.0	97.9	60.3
1992	73.8	76.0	101.5	77.1
1994	70.6	75.3	97.3	74.6
1999	66.4	77.4	95.5	72.3

Source: ABS and DETYA.

C7.7 PARTICIPATION IN SCHOOL, By Age(a) and Sex, Australia—1964 to 1999

	Age 15		Age 16		Age 17		Ages 18 and 19	
	Males	Females	Males	Females	Males	Females	Males	Females
Year	%	%	%	%	%	%	%	%
1964	70	63	42	34	20	13	8	3
1974	82	81	55	53	31	28	10	6
1984	89	90	64	65	36	39	12	8
1994	91	94	77	83	57	63	17	14
1999	92	94	78	84	58	66	15	13

(a) Persons aged over 18 are included in the 18–19 category for 1984 and earlier years.

Source: ABS and DETYA.

C7.8 EDUCATION PARTICIPATION RATES(a), Persons Aged 15–19 years, Australia—1975 to 1997(b)

Year	Schools %	TAFE %	Higher Education %	**Total %**
1975	36.3	15.2	6.5	**58.0**
1984	40.8	20.9	6.1	**67.8**
1989	43.9	19.6	8.4	**71.9**
1994	48.6	19.6	10.1	**78.3**
1997	49.5	20.1	10.7	**80.3**

(a) Includes part-time enrolments. (b) Changes in scope and definition affect comparisons over time.

Source: DETYA.

Major changes to senior school curricula, modelled on the middle school reforms of the earlier period, were left to the States' and Territories' education departments. Again the main targets were changes to assessment procedures, the broadening of the curriculum in the senior years and establishing alternative pathways to the traditional academic core of the secondary school. As in the past, the nature of these changes required intricate negotiations with private and public academic schools, examination authorities, universities, subject associations and parents (as voters) who had become increasingly anxious, not only that their economic world was changing too fast, but also that of secondary and post-secondary education. Again, as in earlier periods, curriculum and organisational reform for the secondary school in a new post-industrial society was overtaken by a wave of new enrolments in Years 11 and 12.

The many students who willingly and otherwise remain in the public systems have become the recipients or legatees of the substantial increase in resourcing of private school systems. As a consequence, student achievement levels in the final years of secondary schooling are still based on social geography rather than social equity.

References

Bassett, G. W. 1963, "Education", in A. L. McLeod, (ed.) T*he pattern of Australian Culture,* Oxford Univerisity Press, Melbourne.

Cole, P. R. (ed.) 1935, "Introduction", in *The Education of the Adolescent in Australia*, Melbourne University Press, Melbourne, p.11.

Cunningham, K. S. 1947, "Education", in C. Hartley Grattan (ed.) *Australia*, Berkeley, University of California Press, p. 344.

Fensham, P. 1972, "School and family factors among Commonwealth Secondary Scholarship Winners in Victoria, 1964–1971", in D. Edgar (ed.) *Sociology of Australian Education: A Book of Readings*, McGraw-Hill, Sydney, pp. 26–40.

Karmel, P. 1962, S*ome Economic Aspects of Education*, F. W. Cheshire, Melbourne.

Karmel, P. 1967, "Some Arithmetic of Education", *Melbourne Studies in Education 1966*, in E.L. French (ed.) Melbourne University Press, Melbourne pp. 3–34.

Karmel, P. (Chair) 1973, *Schools in Australia, Report of the Interim Committee for the Australian Schools Commission*, Australian Government Publishing Service, Canberra.

Mathews, R. L. 1968, "Finance for education", *Economic Papers*, No 27, June 1968.

Monroe, P. (ed.) 1911, *'Australia', A Cyclopedia of Education*, Macmillan, New York. pp. 301–02.

Teese, R. 1989, "Gender and Class in the Transformation of the Public High School in Melbourne 1946 to 1985", *History of Education Quarterly*, Vol.29, No.2, pp. 237–259.

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Introduction

This chapter provides an overview of the Australian criminal justice system. Where possible, the data presented are based on national crime and justice statistics produced by the Australian Bureau of Statistics. These are sourced from surveys such as the Crime and Safety Survey and administrative by-product collections, covering crimes recorded by police, caseflow information for criminal courts, and information on prisoners dealt with by correctional services agencies. The objective of national crime and justice statistics is to standardise data in order to make them comparable across the different systems of criminal law in Australia, and so provide indicators of the level and nature of crime and the activities of criminal justice agencies.

The criminal justice system

The criminal justice system consists of the State/Territory and Commonwealth institutions, agencies, departments and personnel responsible for dealing with the justice aspects of crime, victims of crime, persons accused or convicted of committing a crime, and related issues and processes.

In all States and Territories, two systems of criminal justice exist: the federal criminal justice system, based on offences against Commonwealth laws, and the relevant State system, based on offences against State laws. Criminal law is administered principally through the federal, State and Territorial police forces, the National Crime Authority, the courts and State and Territory corrective or penal services. There is no independent federal corrective service, and the relevant State or Territory agencies provide corrective services for federal offenders.

The States and Territories have independent legislative powers in relation to all matters that are not otherwise specifically vested in the Commonwealth of Australia, and it is the statute law and the common law of the States and Territories that primarily govern the day-to-day lives of most Australians.

The States and Territories have powers to enact their own criminal law, while the Commonwealth has powers to enact laws, including sanctions for criminal offences, in relation to its responsibilities under the Constitution. Thus, in effect, there are nine different systems of criminal law in existence in Australia.

The various agencies that comprise the criminal justice system can be seen as acting within a broader process in which criminal incidents and offenders move through a number of stages. Figure 11.1 indicates these broad stages and the points at which the different justice agencies make their contribution.

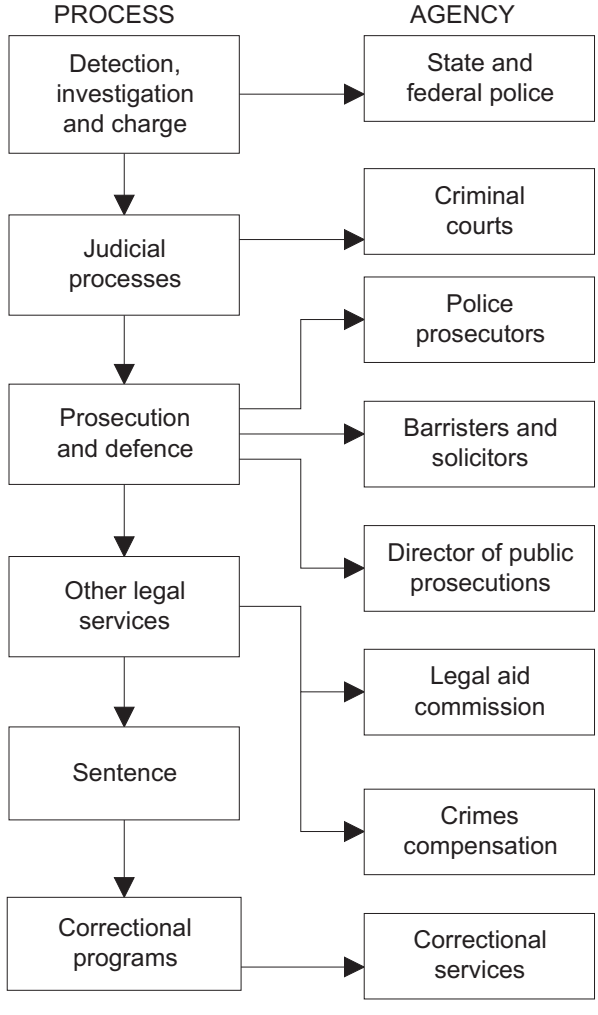
Police agencies are responsible for the prevention, detection and investigation of crimes. Where an alleged offender is detected by police, charges may then be laid before a criminal court. The court, consisting of a judicial officer, a jury (in the higher courts), the prosecution and the defence, determines the guilt or innocence of the defendant.

In addition to the court itself, a number of other agencies are involved in the court process. These include legal representatives for the prosecution and defence. Police Prosecutors are generally responsible for less serious matters heard before courts of summary jurisdiction, while Crown Prosecutors normally handle prosecution of the more serious matters dealt with at the Supreme or Intermediate (District or County) court levels. For defendants, legal aid may be available to handle their defence.

Following the hearing of the charges, in cases where a finding of guilt is made by the court a sentence may be imposed. Fines and bonds are the most common penalties handed down by the courts. The more serious sentences are administered by correctional services agencies. These may include imprisonment, community work of various kinds and some types of bonds. A number of jurisdictions have also introduced new penalties such as home detention or work outreach camps which are also administered by correctional agencies.

For victims of crime, compensation may be available through the courts, and this is normally handled through a special tribunal. The State provides compensation to victims who can demonstrate an injury or suffering as a result of a criminal incident. The State will then seek these funds from the offender, if they have been identified and convicted.

11.1 THE CRIMINAL JUSTICE SYSTEM



Source: National Centre for Crime and Justice Statistics, ABS.

Expenditure on justice

Total recurrent expenditure on justice in 1998–99 was almost $6b (equivalent to $310 per person). Police services accounted for the majority of this expenditure ($4b); corrective services were the next largest sector with expenditure of just over $1b.

Expenditure between 1994–95 and 1998–99 grew fastest in real terms for corrective services (annual average growth rate of 7.1%), and most slowly for criminal courts administration (annual average growth rate of 2.0%).

11.2 GOVERNMENT EXPENDITURE ON JUSTICE(a)(b)

Justice sector	1994–95 $m	1995–96 $m	1996–97 $m	1997–98 $m	1998–99 $m	Real average annual growth rate %
Police services	3 252	3 451	3 596	3 636	3 971	5.1
Court administration—criminal	354	355	336	361	383	2.0
Court administration—civil(c)	344	362	414	416	449	6.9
Corrective services(d)	891	947	1 012	1 091	1 174	7.1
Total justice system	**4 842**	**5 115**	**5 359**	**5 504**	**5 977**	**5.4**

(a) In 1998–99 dollars. (b) Recurrent expenditure plus depreciation less revenue from own sources. (c) Excludes the costs of probate hearings. (d) Excludes WA community corrections expenditure during 1994–95 and 1996–97. NT prison and community corrections did not deduct revenue from own sources between 1994–95 and 1996–97. Excludes expenditure on ACT prisons in 1994–95.

Source: Report on Government Services 2000.

The police

Australia is served by eight police forces: one in each State, the Northern Territory, and the Australian Federal Police who are also responsible for policing the Australian Capital Territory. The National Crime Authority also has a policing role.

The principal duties of the police are the prevention and detection of crime, the protection of life and property, and the enforcement of law to maintain peace and good order. They may perform a variety of additional duties in the service of the State, including the prosecution of summary offences, regulation of street traffic, and acting as clerks of petty sessions, Crown land bailiffs, mining wardens and inspectors under the Fisheries and other relevant Acts.

With the exception of the Australian Federal Police and the National Crime Authority, police forces in Australia are under the control of the State Governments and Northern Territory Government, but their members perform certain functions on behalf of the Commonwealth Government, such as the registration of aliens, and in conjunction with the Australian Federal Police and other Commonwealth officers they enforce various Commonwealth Acts and Regulations.

Commonwealth policing agencies

Australian Federal Police (AFP)

The AFP is a Commonwealth statutory authority brought into existence by the *Australian Federal Police Act 1979*. The AFP has its headquarters in Canberra. Its Criminal Investigations Program is conducted through six Regional Commands, its Headquarters Investigations Department and its numerous Liaison Officers in many overseas countries.

The AFP is responsible for the prevention, detection and investigation of criminal offences such as drug offences, money laundering and organised crime, identifying the proceeds of crime, and investigation of fraud against Commonwealth revenue and expenditure such as social security and taxation fraud. In the Australian Capital Territory, the AFP provides a full range of general community policing services, including traffic control, special operations, search and rescue services and conventional crime investigations.

National Crime Authority (NCA)

The NCA was established by the Commonwealth Government in July 1984 through the *National Crime Authority Act 1984*. Similar legislation was passed in each State, the Northern Territory and subsequently the Australian Capital Territory, to underpin the work of the NCA in those jurisdictions, making the NCA the only law enforcement agency in Australia whose investigations are not limited by jurisdictional or territorial boundaries.

The decision to establish the NCA was taken in response to the findings of several Royal Commissions conducted in the late 1970s and early 1980s, which revealed the extent of organised criminal activity in Australia. The NCA's mission is to counteract organised criminal activity and reduce its impact on the Australian community, working in cooperation and partnership with other agencies.

Size of police forces

The number of sworn police officers in the various Australian police forces is shown in table 11.3. The figures in the table are not directly comparable (for example, the figures for NCA and AFP do not differentiate between full-time and part-time officers, while the figures for the States and Territories are on a full-time equivalent basis).

11.3 SIZE OF POLICE FORCES(a)

Police force	At 1 July 1998 no.	At 1 July 1999 no.
National Crime Authority	114	124
Australian Federal Police	1 931	1 887
ACT	*666*	*664*
NSW	13 407	13 304
Vic.	9 750	9 556
Qld	6 813	6 981
SA	3 437	3 443
WA	4 705	4 676
Tas.	1 018	1 122
NT	866	876

(a) Includes sworn police officers only.

Source: NCA Annual Report; AFP Annual Report; Queensland Police Service for 1998 Qld figure; Report on Government Services 2000 for all other State and Territory figures.

Further detail on the operations of each force may be found in the police forces' annual reports to their Ministers.

National crime statistics

The aim of national crime statistics is to provide comparable data across the States and Territories. These statistics cover selected crimes recorded by State and Territory police forces in Australia and provide a measure of the level and nature of crime in Australia.

Two sources of national statistics provide a picture of crime in Australia: crimes recorded by police, and crime victimisation surveys. Crimes recorded by police relate to offences that have become known to and have been recorded by police. These offences may have been reported by a victim, witness or other person, or they may have been detected by police. These statistics do not provide a total picture of crime, as not all crimes come to the attention of police. In addition, care should be taken in interpreting police statistics, as fluctuations in recorded crime may be a reflection of changes in community attitudes to recording crime, changes in police procedures or changes in crime recording systems, rather than a change in the incidence of criminal behaviour. Significant events occurring in particular years may also contribute to fluctuations in recorded crime.

To gain a more comprehensive picture of the nature and extent of crime, police statistics are complemented by information from other sources such as crime victimisation surveys. These surveys are conducted on a household basis and collect information on crimes that people do not report to police, or that are not recorded on crime reports (e.g. matters dealt with as family incidents). Crime victimisation surveys allow crime information to be related to personal and household characteristics, and allow for the study of patterns of victimisation over time and across crime categories.

Not all types of crime are suitable for measurement by household surveys. No reliable information can be obtained about crimes without specific victims, such as trafficking in narcotics. Crimes of which the victim may not be aware cannot be measured effectively; some instances of fraud and attempted crimes of many types may fall into this category. It may also be difficult to obtain information about some crimes, such as sexual offences and assault by other household members, so that some of these crimes are not fully reflected in the data collected. Finally, no reliable data can be collected by household surveys on crimes against commercial establishments.

In essence, crime victimisation surveys are more suitable for measuring crimes against individuals or households with specific victims who are aware of and recall what happened to them and how it happened, and who are willing to relate what they know.

Crime and safety

The Crime and Safety Survey, a national survey of households, was conducted in April 1998, principally to obtain information on the level of victimisation in the community for selected offences. Information was collected from individuals and households about their experience of selected crimes, whether these crimes were reported to police and crime related risk factors.

For household crimes, information was collected on households that had experienced a break-in to their dwelling, that had found signs of an attempted break-in, and that had any motor vehicles stolen in the 12 months prior to the survey.

For personal crimes, information was collected on individuals who had experienced being physically attacked or threatened with violence when someone stole or tried to steal property from them (robbery), and on individuals who had force or violence used, attempted, or threatened against them (assault) in the 12 months prior to the survey. For females aged 18 years and over, information was also collected on sexual assaults experienced in the 12 months prior to the survey.

Incidence of crimes affecting household and person victims

Households and individuals in Australia experience a diverse range of crimes. The Crime and Safety Survey focuses on those categories of more serious crime that affect the largest number of people: household break-in, motor vehicle theft, assault (including sexual assault) and robbery.

In the 12 months prior to the 1998 Crime and Safety Survey, an estimated 5.0% of households in Australia had at least one break-in to their home, garage or shed (table 11.4). About 3.2% of households found signs of at least one attempted break-in, and 7.6% of households were victims of either a break-in or an attempted break-in in the 12 months prior to the survey.

About 1.7% of households experienced at least one motor vehicle theft in the 12 months prior to the survey.

An estimated 0.5% of persons aged 15 years and over were victims of robbery and 4.3% of persons aged 15 years and over were victims of assault in the 12 months prior to the survey. An estimated 0.4% of females aged 18 years and over were victims of sexual assault in the same time period.

Dwelling security

The 1998 Crime and Safety Survey also collected information about neighbourhood and dwelling characteristics which may affect the level of risk of a break-in to a dwelling. Graph 11.5 shows the extent of use of dwelling security features by households in April 1998.

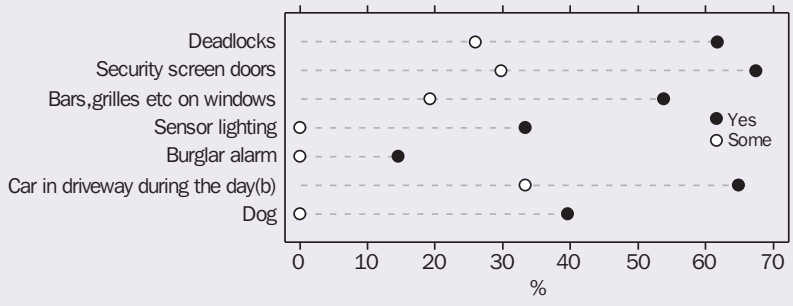
11.4 VICTIMS OF CRIME—12 months Prior to April 1998

			Victimisation prevalence rates	
	Victims	Relevant populations	1993	1998
Type of crime	'000	'000	%	%
Break-in(a)	349.9	7 031.2	4.4	5.0
Attempted break-in(a)	226.4	7 031.2	3.1	3.2
Break-in/attempted break-in(a)	534.1	7 031.2	6.8	7.6
Motor vehicle theft(a)	117.9	7 031.2	1.7	1.7
Robbery(b)	79.1	14 456.0	. .	0.5
Assault(b)	618.3	14 456.0	. .	4.3
Sexual assault(c)	30.1	6 937.4	0.6	0.4

(a) Households. (b) Persons aged 15 years and over. (c) Females aged 18 years as over.

Source: Crime and Safety, Australia, April 1998 (4509.0).

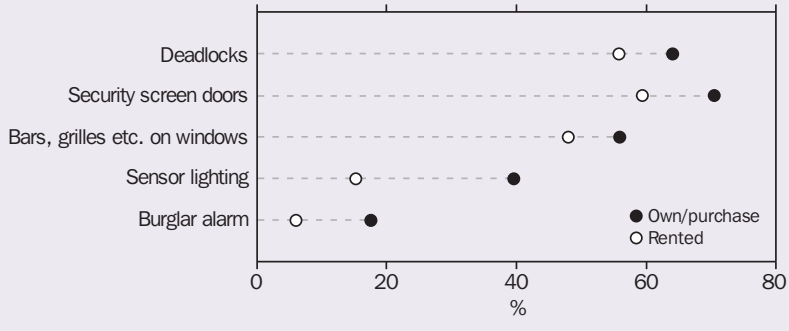
11.5 HOUSEHOLDS WITH SECURITY FEATURES(a)—April 1998



(a) Includes 'all' and 'some' for deadlocks, security screen doors, and bars, grilles etc. on windows.
(b) 'Yes' means always/most of the time, 'some' means sometimes..

Source: Crime and Safety, Australia, April 1998 (4509.0).

11.6 HOUSEHOLDS WITH SECURITY FEATURES(a), By Type of Home Ownership—April 1998



(a) Includes 'all' and 'some' for deadlocks, security screen doors, and bars, grilles etc. on windows.

Source: Crime and Safety, Australia, April 1998 (4509.0).

The proportion of households with particular dwelling security features was generally lower for those who were renting their dwelling than for those who owned or were purchasing their dwelling (graph 11.6). The largest difference between households who owned or were purchasing their dwelling and those who were renting was in the proportion of households with sensor lighting. The lack of sensor lighting is compensated for to some extent by the finding that 31% of households who rented left the outside light on all evening, compared with 16% of households who owned or were purchasing their dwelling.

At the time of the survey, proportionally more victim than non-victim households had deadlocks on all doors, security on all windows, and burglar alarms (graph 11.7). There was little difference in the proportion of victim and non-victim households in the use of other dwelling security features.

However, proportionally more victim than non-victim households had installed security features in the course of the year, for all types of security feature (graph 11.8). About 57% of household victims did not increase their security during the year.

Prevalence of repeated incidents of crime

Repeat victimisation over the 12-month period was more likely to occur with assault than for the other crimes covered in the survey. Assault victims experienced an average of 2.5 incidents in the 12-month period, compared with an

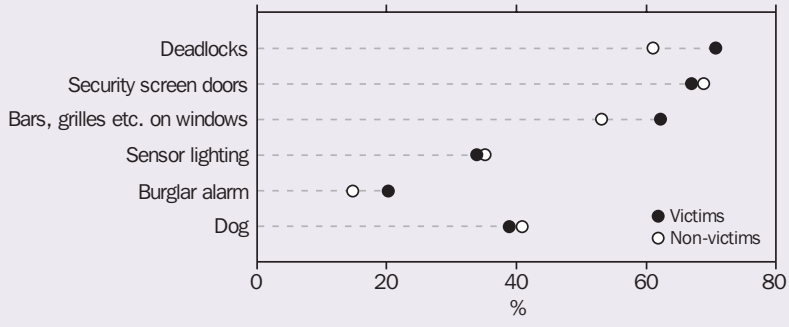
average of 1.3 incidents for household victims of break-in and 1.1 incidents for household victims of motor vehicle theft (table 11.9).

Household crime

Of households that experienced a break-in during the 12 months prior to the survey, 20% experienced two or more break-ins, which accounted for 39% of all the break-ins that occurred in the 12-month period (as estimated from the survey). About 5% of households experienced three or more break-ins, accounting for 16% of all incidents.

Repeat victimisation was a more evident feature of attempted break-in; some 24% of household victims of attempted break-in experienced two attempts and 9% experienced three or more attempts.

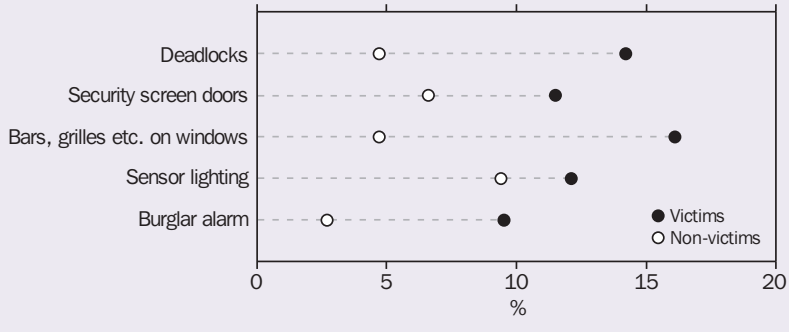
11.7 VICTIM AND NON-VICTIM HOUSEHOLDS(a), Use of Security Features—April 1998



(a) Households that had lived in dwelling for one year or more.

Source: Crime and Safety, Australia, April 1998 (4509.0).

11.8 VICTIM AND NON-VICTIM HOUSEHOLDS(a), Installation of Security Features—12 Months Prior to April 1998



(a) Households that had lived in dwelling for one year or more.

Source: Crime and Safety, Australia, April 1998 (4509.0).

11.9 VICTIMS EXPERIENCING A GIVEN NUMBER OF INCIDENTS—12 Months Prior to April 1998

	One	Two	Three or more	
Type of incident	%	%	%	Average number of incidents per victim
Break-in(a)	80.2	15.2	4.7	1.3
Attempted break-in(a)	67.1	24.4	8.5	1.6
Motor vehicle theft(a)	90.8	7.3	1.9	1.1
Robbery(b)	77.3	14.5	8.2	1.5
Assault(b)	54.6	21.3	24.2	2.5
Sexual assault(c)	73.0	*9.9	*17.1	1.6

(a) Households. (b) Persons aged 15 years and over. (c) Females aged 18 years as over.

Source: Crime and Safety, Australia, April 1998 (4509.0).

11.10 VICTIMS(a) OF ROBBERY, Number of Incidents Experienced—12 Months Prior to April 1998

	Victims		Incidents	
Incidents per victim	'000	%	'000	%
One	61.1	77.3	61.1	52.0
Two	11.5	14.5	22.9	19.5
Three or more	6.5	8.2	33.5	28.5
All victims	79.1	100.0	117.6	100.0

(a) Persons aged 15 years and over.

Source: Crime and Safety, Australia, April 1998 (4509.0).

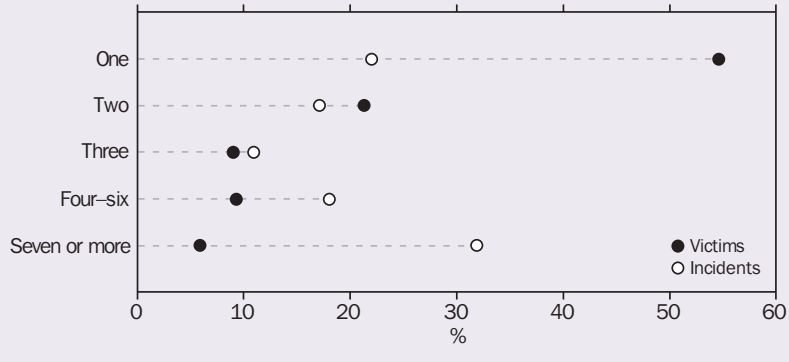
11.11 VICTIMS(a) OF ASSAULT, Number of Incidents Experienced—12 Months Prior to April 1998

	Victims		Incidents	
Incidents per victim	'000	%	'000	%
One	337.5	54.6	337.5	22.0
Two	131.4	21.3	262.8	17.1
Three	55.9	9.0	167.6	10.9
Four to six	57.2	9.3	276.7	18.0
Seven or more	36.3	5.9	488.7	31.9
Total	618.3	100.0	1 533.3	100.0

(a) Persons aged 15 years and over.

Source: Crime and Safety, Australia, April 1998 (4509.0).

11.12 NUMBER OF ASSAULT INCIDENTS EXPERIENCED—12 Months Prior to April 1998



Source: Crime and Safety, Australia, April 1998 (4509.0).

Robbery

During the 12 months prior to the survey there were an estimated 117,600 incidents of robbery of persons aged 15 years and over in Australia (table 11.10). Of all robbery victims, 23% experienced two or more incidents of robbery in the 12 months prior to the survey, accounting for 48% of all robbery incidents (as estimated from the survey). About 8% of robbery victims experienced three or more incidents, accounting for 29% of all robberies.

Assault

There were an estimated 1.5 million incidents of assault in the 12 months prior to April 1998 (table 11.11). The majority of all incidents of assault were experienced by people who were repeat victims of assault, that is, the 45% of assault victims who experienced two or more assaults in the 12-month period accounted for 78% of all incidents of assault. Those assault victims who experienced four or more assaults accounted for 50% of all assault incidents. About 6% of assault victims experienced seven or more incidents, accounting for 32% of all incidents (graph 11.12).

Assault victims who experienced high levels of repeated assault victimisation were: those aged 20–24 years (victims in this age group experienced an average of 3.4 incidents per victim); and separated and divorced persons, who experienced an average of 3.5 and 3.3 incidents per victim respectively.

Three or more incidents were more likely to be experienced by assault victims who were:

- female (27% compared to 22% of male assault victims);
- aged 45–54 years (29% compared to 20% of assault victims aged 15–19 years and 22% of assault victims aged 20–24 years);
- separated or divorced (41% of separated assault victims and 32% of divorced assault victims compared to 20% of never married victims and 25% of married victims);
- Australian-born (25% compared to 22% of assault victims born overseas); and
- victims where the most recent incident was classified as family violence (35%) or work/study violence (31%).

Sexual assault

There were an estimated 47,300 incidents of sexual assault experienced by females aged 18 years and over, in the 12 months prior to the survey (table 11.13). Of sexual assault victims, 27% experienced two or more incidents in the 12 months prior to the survey, accounting for 54% of all incidents of sexual assault.

Two or more incidents were more likely to be experienced by sexual assault victims who were:

- aged 35 years and over (49% of sexual assault victims aged 35 years and over compared to 18% of females aged 18–34 years);
- married/de facto and separated/divorced (47% and 27% respectively compared to 18% of never married sexual assault victims);
- not in the labour force (42% compared to 29% of unemployed sexual assault victims and 21% of employed sexual assault victims); and
- born in Australia (29% compared to 21% of overseas born sexual assault victims).

11.13 FEMALE VICTIMS(a) OF SEXUAL ASSAULT—12 Months Prior to April 1998

	Victims		Incidents	
Incidents per victim	'000	%	'000	%
One	22.0	73.0	22.0	46.4
Two	*3.0	*9.9	*6.0	*12.6
Three or more	5.1	17.1	19.4	41.0
All victims	30.1	100.0	47.3	100.0

(a) Aged 18 years and over.

Source: Crime and Safety, Australia, April 1998 (4509.0).

Selected crimes recorded by police

From January 1999 the classificatory basis of offences has changed for recorded crime statistics from the *Australian National Classification of Offences (ANCO)* to the *Australian Standard Offence Classification (ASOC)*. This new offence classification has led to significant improvements in the comparability of crime statistics on both the State and national level.

In 1999 the number of victims recorded by police decreased from the previous year for all the offence categories except murder, assault, kidnapping/abduction and other theft (not including motor vehicle theft) (table 11.14). Nationally, offences against property (unlawful entry with intent, motor vehicle theft and other theft) were far more common than offences against the person (murder, attempted murder, manslaughter, assault, sexual assault and kidnapping/abduction).

Personal crime

Assault is the most common category of offences recorded against the person. Table 11.14 shows that police recorded 133,602 victims of assault during 1999, representing a victimisation rate of 705 victims per 100,000 persons. There were 14,074 cases of sexual assault recorded, a rate of 74 victims per 100,000 persons, and 342 victims of murder, a rate of 1.8 victims per 100,000 persons. The increase in murder victims from 1998 was due, in part, to the Snowtown incident in South Australia as well as two incidents of murder/suicide in Western Australia. Males had higher recorded assault rates than females across all age groups and were more likely to be victims of murder, attempted murder and robbery (both armed and unarmed). Females had higher recorded sexual assault rates than males across all age groups, with one in five female victims aged 15–19 years. The overall victimisation rate for females from sexual assault was more than four times the victimisation rate of male sexual assault victims. Females were also more likely to be victims of kidnapping/abduction than males.

Nationally, victimisation rates were generally highest for the 15–19 year age group (table 11.15). This age group had the highest victimisation rates for driving causing death, sexual assault, kidnapping/abduction and robbery. Victims aged 20–24 years had the highest victimisation rates for attempted murder, manslaughter and assault, while victims aged 25–34 years had the highest victimisation rates for murder and blackmail/extortion.

Property crime

In 1999 there were 415,600 offences recorded nationally by police relating to unlawful entry with intent—the unlawful entry of a structure with the intent to commit an offence (including theft, property damage and any offence against an individual). Of these offences, 322,913 (78%) involved unlawful entry resulting in the taking of property. The remaining 92,687 offences (22%) were recorded as unlawful entry with intent, but not resulting in the taking of property.

A total of 129,865 motor vehicles were recorded stolen in Australia during 1999. This represents a decrease of 1.3% compared with motor vehicle theft in 1998. A total of 610,276 other theft offences, the largest category of all property offences, were recorded in 1999, an increase of 8.3% from 1998.

11.14 SELECTED OFFENCES RECORDED BY POLICE, Number and Rate

Offence category	1997(a)	1998(a)	1999
	NUMBER		
Homicide			
Murder	321	285	342
Attempted murder	318	387	358
Manslaughter	39	47	39
Driving causing death(b)	n.a.	276	206
Assault	124 500	130 903	133 602
Sexual assault	14 353	14 336	14 074
Kidnapping/abduction	562	705	763
Robbery			
Armed robbery	9 054	10 850	9 439
Unarmed robbery	12 251	12 951	13 151
Blackmail/extortion	360	272	256
Unlawful entry with intent			
Involving the taking of property	332 525	339 512	322 913
Other	89 044	94 864	92 687
Total	*421 569*	*434 376*	*415 600*
Motor vehicle theft	130 138	131 587	129 865
Other Theft	530 881	563 482	610 276
	RATE PER 100,000 POPULATION		
Homicide			
Murder	1.73	1.52	1.80
Attempted murder	1.72	2.07	1.89
Manslaughter	0.21	0.25	0.21
Driving causing death(b)	n.a.	1.47	1.09
Assault	672.21	699.00	704.52
Sexual assault	77.50	76.55	74.22
Kidnapping/abduction	3.03	3.76	4.02
Robbery			
Armed robbery	48.89	57.94	49.77
Unarmed robbery	66.15	69.15	69.35
Blackmail/extortion	1.94	1.45	1.35
Unlawful entry with intent			
Involving the taking of property	1 795.39	1 812.94	1702.80
Other	480.77	506.56	488.76
Total	*2 276.17*	*2 319.49*	*2 191.57*
Motor vehicle theft	702.65	702.65	684.81
Other theft	2 866.37	3008.90	3 218.14

(a) Revised on the basis of the new Australian Standard Classification of Offences (ASOC). (b) Complete counts and rate details for the offence Driving causing death are not available for 1997.

Source: Recorded Crime, Australia (4510.0).

11.15 VICTIMISATION RATES(a) OF SELECTED CRIMES(b), By Age Group (Years) of Victim—1999

Offence category	0–9	10–14	15–19	20–24	25–34	35–44	45–54	55–64	65+	Total
					MALES					
Murder	1.50	0.15	1.32	3.74	4.56	2.88	2.11	2.13	1.18	2.34
Attempted murder	0.52	0.30	2.19	5.62	6.49	4.31	1.72	1.18	0.78	2.78
Manslaughter	0.37	0.15	0.58	0.86	0.48	0.14	—	0.12	—	0.28
Driving causing death	0.22	0.30	3.95	2.74	1.73	1.37	0.94	0.95	1.18	1.38
Assault	121.30	701.23	1639.47	1648.36	1444.33	902.16	537.29	302.04	111.93	807.47
Sexual assault	58.22	72.53	55.40	27.50	20.52	8.01	3.37	1.54	0.88	25.44
Kidnapping/abduction	5.24	6.23	8.48	5.04	2.14	0.96	0.47	0.24	0.10	2.84
Robbery(c)	3.37	137.49	475.25	286.41	142.46	91.33	64.98	51.72	29.63	120.91
Blackmail/extortion(c)	—	0.15	2.63	1.58	3.11	1.44	2.43	1.54	0.69	1.64
					FEMALES					
Murder	1.50	—	0.92	2.10	1.39	2.05	0.88	0.48	1.15	1.26
Attempted murder	0.63	0.16	0.92	1.80	1.52	1.77	0.32	0.84	0.31	0.99
Manslaughter	0.24	0.31	0.31	0.15	0.07	—	—	0.12	0.15	0.13
Driving causing death	0.63	0.47	1.85	1.65	0.97	0.41	0.56	0.60	0.69	0.79
Assault	76.73	420.70	1213.27	1261.21	1059.12	658.20	320.18	139.20	49.06	547.85
Sexual assault	146.21	354.86	408.07	191.79	116.36	58.25	26.12	9.40	5.91	118.97
Kidnapping/abduction	5.28	12.30	20.00	11.26	5.96	2.25	0.96	0.36	0.38	5.18
Robbery(c)	1.03	22.88	123.87	126.51	86.37	67.46	67.13	57.97	46.68	64.22
Blackmail/extortion(c)	—	—	0.46	1.35	1.25	0.95	0.64	0.36	0.38	0.65
					PERSONS					
Murder	1.50	0.08	1.12	2.94	2.97	2.46	1.50	1.31	1.16	1.80
Attempted murder	0.58	0.23	1.57	3.75	4.01	3.04	1.03	1.02	0.52	1.89
Manslaughter	0.31	0.23	0.45	0.51	0.28	0.07	—	0.12	0.09	0.21
Driving causing death	0.42	0.38	2.92	2.20	1.35	0.89	0.75	0.78	0.90	1.09
Assault	100.83	566.93	1442.47	1470.10	1260.23	785.11	433.29	222.79	77.22	704.52
Sexual assault	101.56	210.75	228.64	108.69	68.83	33.31	14.80	5.49	3.70	74.22
Kidnapping/abduction	5.26	9.19	14.09	8.08	4.05	1.61	0.71	0.30	0.26	4.02
Robbery(c)	2.53	81.87	304.96	209.51	115.04	79.65	66.40	55.00	39.41	94.23
Blackmail/extortion(c)	—	0.08	1.57	1.47	2.18	1.20	1.54	0.96	0.52	1.14

(a) Rate per 100,000 population. (b) As recorded by police forces in all jurisdictions. (c) For Robbery and Blackmail/extortion where the victim can be an organisation, figures shown only include person victims.

Source: Recorded Crime, Australia, 1999 (4510.0).

Firearms

Table 11.16 and graph 11.17 present national statistics on the use of weapons in the commission of selected offences in 1998 and 1999. A weapon was used in 64% of recorded murders and 79% of recorded attempted murders in 1999, a slight decrease from 1998 figures of 71% and 84% respectively. Weapon use in robbery also decreased from 46% in 1998 to 42% in 1999. The proportion of offences where a firearm was used decreased for both murder and robbery in 1999, but firearms use increased in attempted murders (from 19% in 1998 to 32% in 1999). The use of firearms in assaults and sexual assaults was less than 1% in both.

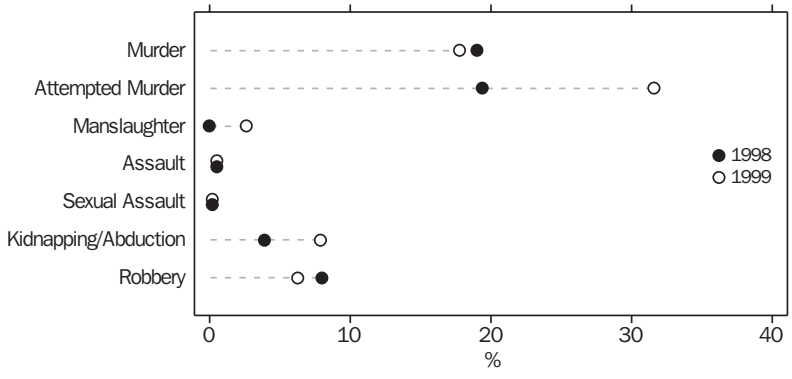
11.16 VICTIMS OF REPORTED CRIME(a), By Use of Weapon in Commission of Offence

Offence category	Firearm %	Other weapon %	Weapon n.f.d.(b) %	Total weapons %	No weapon %	Total %
			1999			
Homicide						
Murder	17.8	43.9	2.0	63.7	36.3	100.0
Attempted murder	31.6	47.8	—	79.3	20.7	100.0
Manslaughter	2.6	5.1	2.60	10.3	89.7	100.0
Assault	0.5	10.3	0.4	11.2	88.8	100.0
Sexual assault	0.2	1.7	—	2.0	98.0	100.0
Kidnapping/abduction	7.9	15.1	0.4	23.3	76.7	100.0
Robbery	6.3	31.7	3.7	41.8	58.2	100.0
			1998			
Homicide						
Murder	18.9	49.1	3.2	71.2	28.8	100.0
Attempted murder	19.4	64.3	0.5	84.2	15.8	100.0
Robbery	8.0	33.0	4.3	45.6	54.4	100.0

(a) Victims of armed robbery refers to individual persons or organisations. All other offence categories used in this table refer to individual persons. (b) No further details.

Source: Recorded Crime, Australia, 1998 (4510.0); Recorded Crime, Australia, 1999 (4510.0).

11.17 RATES OF CRIME RECORDED BY POLICE, By Use of Weapon—1998 and 1999



Source: Recorded Crime, Australia, 1999 (4510.0).

Drug offences

The traffic in and abuse of illicit drugs results in significant costs to individuals and the community in general. To minimise the harm associated with illicit drug activity there is close cooperation between the Commonwealth Government, the State and Territory Governments, the various police forces and other law enforcement agencies. Included in these is the Australian Customs Service, which has responsibility for the enforcement of laws controlling illicit importing and exporting of drugs. These agencies direct particular attention to monitoring the popularity of the various types and forms of illicit drugs, and identifying emerging patterns of use, through the analysis of law enforcement data on illicit drug seizures and arrests.

A total of 83,533 offenders were arrested/proceeded against for drug related offences in Australia during the period 1 July 1998 to 30 June 1999, 0.7% fewer than in the previous financial year. As table 11.18 shows, by far the largest category of drug offences involved cannabis, with 58,131 offenders (69.6% of the national total). This represents a 10% fall in this category from the previous year. The most significant increase in any category was in offences involving heroin, with 14,341 offenders (17.2% of the national total), an increase of 38% from the previous financial year.

Information on the widespread problems arising from drug abuse in Australia, and on how these problems are being approached, is presented in the *Australian Illicit Drug Report* produced by the Australian Bureau of Criminal Intelligence.

11.18 TOTAL OFFENDERS, By Drug Type—1 July 1998 to 30 June 1999

Drug type	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	**Aust.**
				NUMBER					
Cannabis	15 738	9 286	13 386	11 968	6 087	736	693	237	**58 131**
Cocaine	497	70	24	10	17	—	—	—	**618**
Heroin	4 659	8 153	766	340	314	25	1	83	**14 341**
Amphetamine	2 352	1 028	1 814	623	695	7	42	23	**6 584**
Hallucinogens	139	—	108	247	73	—	1	3	**571**
Steroids	53	—	28	—	2	—	2	2	**87**
Other drugs	840	855	1 190	179	63	61	11	2	**3 201**
Total	24 278	19 392	17 316	13 367	7 251	829	750	350	**83 533**
				PROPORTION (%)					
Cannabis	64.8	47.9	77.3	89.5	83.9	88.8	92.4	67.7	**69.6**
Cocaine	2.0	0.4	0.1	0.1	0.2	—	—	—	**0.7**
Heroin	19.2	42.0	4.4	2.5	4.3	3.0	0.1	23.7	**17.2**
Amphetamine	9.7	5.3	10.5	4.7	9.6	0.8	5.6	6.6	**7.9**
Hallucinogens	0.6	—	0.6	1.8	1.0	—	0.1	0.9	**0.7**
Steroids	0.2	—	0.2	—	0.0	—	0.3	0.6	**0.1**
Other drugs	3.5	4.4	6.9	1.3	0.9	7.4	1.5	0.6	**3.8**
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	**100.0**

Source: Australian Bureau of Criminal Intelligence, Australian Illicit Drug Report, 1998–99.

Outcomes of police investigations

Statistics about the outcomes of investigations describe the status of the processes of police investigation that are initiated following the reporting or detection of an offence. The status of investigations includes:

- investigations that were not finalised (i.e. were still continuing, were pending or suspended);
- investigations that were finalised without an offender being proceeded against because the reported offence was not verified, the complaint was withdrawn, or the alleged offender could not be proceeded against because of some statutory or procedural bar; and
- investigations that were finalised and an offender was proceeded against by initiating court action or some other form of formal proceeding (e.g. a diversionary conference or a caution).

A higher proportion of offences against the person (homicide, assault, sexual assault and kidnapping/abduction) reached a finalised status within 30 days of initiation of the investigation than was the case for offences against property (unlawful entry with intent, theft and motor vehicle theft offences). Similarly, the proportion of offenders proceeded against was higher for offences against the person than for property offences.

Table 11.19 presents national statistics on the outcome of investigations, within 30 days of initiation, into selected offences recorded by police in 1999.

11.19 VICTIMS OF RECORDED CRIME, By Outcome of Investigations at 30 Days—1999(a)

	Murder	Attempted murder	Assault	Sexual assault	Kidnapping/ Abduction	Robbery(b)	UEWI(c) total(d)	Motor vehicle theft
Investigation status	%	%	%	%	%	%	%	%
Investigation not finalised	31.9	23.5	42.2	58.3	56.7	77.7	92.1	90.2
Investigation finalised								
No offender proceeded against	5.3	3.4	12.4	16.5	21.1	4.7	1.4	2.4
Offender proceeded against	62.9	73.2	45.3	25.1	22.1	17.6	7.4	7.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	no.	no.	no.	no.	no.	no.	no.	no.
Total	**342**	**358**	**133 602**	**14 074**	**763**	**22 590**	**415 600**	**129 865**

(a) For selected offences recorded by police during 1 January to 31 December 1999. (b) Robbery includes both Armed and Unarmed robbery. (c) Unlawful entry with intent. (d) UEWI total includes both UEWI–involving the taking of property and UEWI–other.

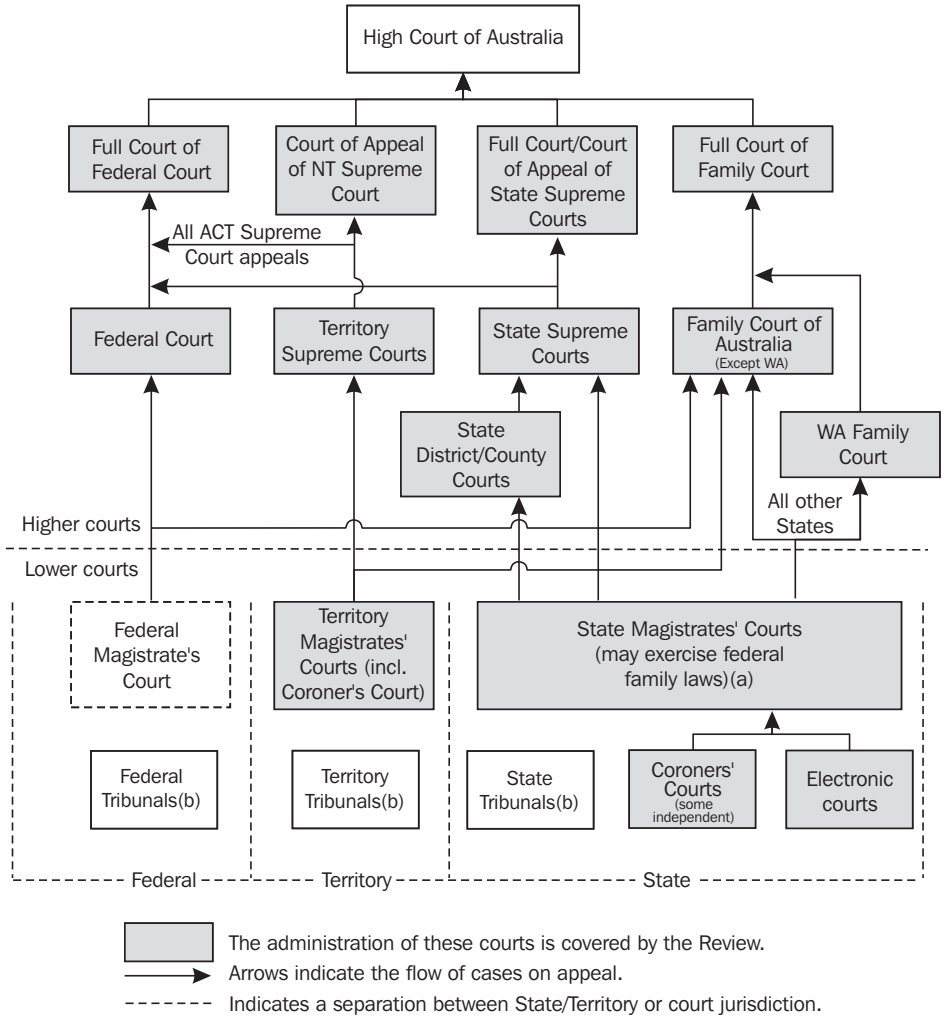
Source: Recorded Crime, Australia, 1999 (4510.0).

Courts

Courts exist in all Australian States and Territories for the hearing of both criminal and civil cases. A criminal case arises from a charge laid by police or other prosecuting authorities, and is an allegation of a breach of the criminal law. A civil case, by contrast, is a dispute between two or more individuals or corporations, in which one side is seeking a legal remedy for an injury or loss from the other party who is alleged to be liable.

The courts are arranged in a hierarchy, with the bulk of less serious matters being heard before magistrates and more serious matters being heard before judges. In the civil context, the seriousness of a case is usually determined through the amount of money sought in compensation, while for criminal matters seriousness is determined by the nature of the offence alleged. Figure 11.20 illustrates the arrangement of the court system in Australia.

11.20 HIERARCHY OF COURTS



(a) Appeals from lower courts in NSW go directly to the Court of Appeal in the NSW Supreme Court.
(b) Federal, State and Territory tribunals, while subordinate to their respective Federal Court or Magistrate's Court, may appeal to any higher court in the federal, State or Territory jurisdiction.

Source: Steering Committee for the Review of Commonwealth/State Service Provision, Report on Government Services 2000.

The hierarchy of courts also applies to the system of appeals. Appeals are available to the losing side in a civil matter, and to the defendant in a criminal matter, from all levels of court. The High Court of Australia is the highest court of appeal for both criminal and civil cases.

While the civil jurisdiction and system of appeals are important aspects of the justice system, this section focuses on the criminal jurisdiction of the courts.

Criminal courts

All Australian States and Territories have a system of courts for the hearing of criminal matters. Once charges are laid by police, the court will hear evidence by both prosecution and defence, and will make a decision as to whether or not the defendant is guilty. In cases where the defendant is found guilty, the court may also record a conviction and impose a penalty.

The courts in Australia are arranged hierarchically. The lowest level of criminal court is the Magistrate's Court or Court of Summary Jurisdiction. The majority of all criminal cases are heard in these courts. Cases heard in Magistrates' Courts do not involve a jury; the magistrate acts to determine the guilt of the defendant. This is known as a summary proceeding. Only relatively minor offences can be dealt with in this way. More serious offences are dealt with by the higher levels of court. All States and Territories have a Supreme Court, which can deal with all criminal matters. The larger jurisdictions also have an intermediate level of court, known as the District or County Court, which deals with the majority of serious offences. The Supreme Court and Intermediate Court are collectively referred to as the Higher Courts.

All offences which are dealt with by the Higher Courts have an automatic entitlement to a trial before a judge and jury. In some jurisdictions, the defendant may elect to have the matter heard before a judge alone. Offences which must be heard before a judge and jury are known as indictable offences. These include offences such as murder and drug importation as well as serious sexual offences, robberies and assaults.

The defendant in a criminal matter is entitled to appeal against the conviction or the severity of penalty imposed. Under some circumstances, the prosecution is also entitled to appeal against the leniency of the penalty. The States and Territories differ in the ways in which they deal with appeals. Some appeals from Magistrates' Courts may be heard before the Intermediate Courts. In other jurisdictions, the Supreme Court may hear these appeals. In most jurisdictions, an appeal court or Court of Criminal Appeal may be constituted to hear appeals from the Supreme or Intermediate Courts. In Australia, the highest court of appeal from all jurisdictions is the High Court of Australia.

National criminal courts statistics

The aim of national criminal courts statistics is to provide comparable data across the States and Territories. The data provided are indicators of the volume and flow of criminal matters through the Supreme and Intermediate Courts (together comprising the Higher Courts), and provide a basis for measuring changes over time.

Higher criminal courts

Table 11.21 summarises the flow of defendants through the Higher Courts during 1998–99. The workload of the criminal courts can be shown by the number of defendants involved in cases started before 1998–99 and still being processed (pending at start) and the number of defendants with cases started in the Higher Courts during 1998–99 (initiated). Excluding defendants in Queensland, there were 7,679 defendants pending at the start of 1998–99 and 11,029 defendants initiated during 1998–99, giving a total workload of 18,708 defendants who had criminal cases active at some time during 1998–99. Of this total workload, 10,831 defendants (57.9%) were finalised in the Higher Courts during 1998–99. The number of defendants initiated in Queensland during 1998–99 was 6,545; the number finalised was 7,595.

11.21 DEFENDANTS INITIATED, FINALISED AND PENDING—1998–99(a)

Status	NSW	Vic.	Qld(b)	SA	WA	Tas.	NT	ACT	Aust.
SUPREME COURT									
Pending at start	210	91	n.a.	47	78	240	160	116	n.a.
Initiated	108	88	n.a.	38	243	648	281	227	n.a.
Transferred in	1	—	n.a.	36	11	. .	. .	. .	n.a.
Transferred out	3	2	n.a.	12	8	. .	. .	. .	n.a.
Finalised	115	95	776	70	238	642	292	164	2 392
Pending at end	201	82	n.a.	39	86	246	149	179	n.a.
INTERMEDIATE COURT(c)									
Pending at start	3 647	1 210	n.a.	422	1 458	. .	. .	. .	n.a.
Initiated	3 565	1 994	n.a.	886	2 951	. .	. .	. .	n.a.
Transferred in	3	2	n.a.	12	8	. .	. .	. .	n.a.
Transferred out	1	. .	n.a.	36	11	. .	. .	. .	n.a.
Finalised	3 900	1 798	6 819	866	2 651	. .	. .	. .	16 034
Pending at end	3 314	1 408	n.a.	418	1 755	. .	. .	. .	n.a.
TOTAL HIGHER COURTS									
Pending at start	3 857	1 301	n.a.	469	1 536	240	160	116	n.a.
Initiated	3 673	2 082	6 545	924	3 194	648	281	227	17 574
Transferred in	4	2	n.a.	48	19	. .	. .	. .	n.a.
Transferred out	4	2	n.a.	48	19	. .	. .	. .	n.a.
Finalised	4 015	1 893	7 595	936	2 889	642	292	164	18 426
Pending at end	3 515	1 490	n.a.	457	1 841	246	149	179	n.a.

(a) Data exclude defendants in appeal cases. (b) Initiation data for Qld only include defendants committed; data for other methods of initiation are not currently available. The Qld data for 'finalised' exclude bench warrants being issued. Counts of defendants pending and defendants transferred are not currently available for Qld. (c) There is no Intermediate Court in Tas., the NT or the ACT.

Source: Higher Criminal Courts, Australia, 1998–99 (4513.0).

Table 11.22 indicates the methods by which defendants involved in criminal cases were finalised in the Higher Court system during 1998–99. A defendant is regarded as finalised when all the charges laid against them have been concluded in some manner. There were 18,426 defendants finalised in the Higher Criminal Courts during 1998–99. Of the 15,608 defendants finalised as a result of the charges being adjudicated (proven guilty or acquitted), 90% had at least one charge with a proven outcome (guilty verdict or guilty plea), while the remainder were acquitted.

The process involved in adjudicating criminal charges depends on how a defendant pleads to the charges laid against them. Defendants who plead guilty to all charges are not subject to a jury trial and go through a sentence hearing to determine the penalty. In contrast, defendants who plead not guilty to at least one charge are typically subject to a trial by jury which determines whether they are acquitted or found guilty. Information on the pleas entered by defendants at the start of their criminal cases provides an indication of the potential need for trials in the Higher Courts, while information on the final pleas entered by defendants provides an indication of the trials that were actually completed.

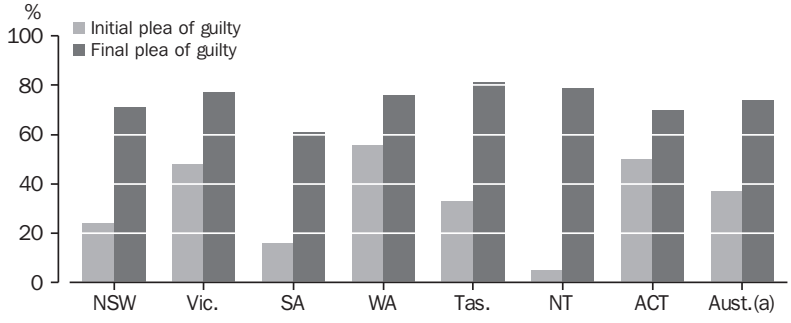
11.22 DEFENDANTS FINALISED, By Method of Finalisation—1998–99(a)

Method of finalisation	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Aust.
SUPREME COURT									
Adjudicated									
Acquitted	28	16	22	23	16	25	23	15	168
Proven guilty									
Guilty verdict	36	38	44	26	50	69	25	25	313
Guilty plea	36	40	623	16	161	414	187	93	1 570
Total proven guilty	*72*	*78*	*667*	*42*	*211*	*483*	*212*	*118*	*1 883*
Total adjudicated	100	94	689	65	227	508	235	133	2 051
Non-adjudicated									
Bench warrant issued	—	—	n.a.	1	3	34	32	4	(c)74
Withdrawn	12	1	87	4	8	86	25	23	246
Other finalisation(b)	3	—	—	—	—	14	—	4	21
Total non-adjudicated	15	1	(c)87	5	11	134	57	31	(c)341
Total defendants finalised	115	95	(c)776	70	238	642	292	164	(c)2 392
INTERMEDIATE COURT(d)									
Adjudicated									
Acquitted	484	181	374	73	228	. .	. .	. .	1 340
Proven guilty									
Guilty verdict	355	157	321	118	265	. .	. .	. .	1 216
Guilty plea	2 392	1 345	4 980	474	1 810	. .	. .	. .	11 001
Total proven guilty	*2 747*	*1 502*	*5 301*	*592*	*2 075*	. .	. .	. .	*12 217*
Total adjudicated	3 231	1 683	5 675	665	2 303	. .	. .	. .	13 557
Non-adjudicated									
Bench warrant issued	189	23	n.a.	49	128	. .	. .	. .	(c)389
Withdrawn	429	90	1 143	132	202	. .	. .	. .	1 996
Other finalisation(b)	51	2	1	20	18	. .	. .	. .	92
Total non-adjudicated	669	115	(c)1 144	201	348	. .	. .	. .	(c)2 477
Total defendants finalised	3 900	1 798	(c)6 819	866	2 651	. .	. .	. .	(c)16 034
TOTAL HIGHER COURTS(d)									
Adjudicated									
Acquitted	512	197	396	96	244	25	23	15	1 508
Proven guilty									
Guilty verdict	391	195	365	144	315	69	25	25	1 529
Guilty plea	2 428	1 385	5 603	490	1 971	414	187	93	12 571
Total proven guilty	*2 819*	*1 580*	*5 968*	*634*	*2 286*	*483*	*212*	*118*	*14 100*
Total adjudicated	3 331	1 777	6 364	730	2 530	508	235	133	15 608
Non-adjudicated									
Bench warrant issued	189	23	n.a.	50	131	34	32	4	(c)463
Withdrawn	441	91	1 230	136	210	86	25	23	2 242
Other finalisation(b)	54	2	1	20	18	14	—	4	113
Total non-adjudicated	684	116	(c)1 231	206	359	134	57	31	(c)2 818
Total defendants finalised	**4 015**	**1 893**	**(c)7 595**	**936**	**2 889**	**642**	**292**	**164**	**(c)18 426**

(a) Data exclude defendants finalised in appeal cases. (b) Includes defendants who were withdrawn by the prosecution, remitted to the Magistrate's Court or finalised by another non-adjudicated method. (c) These totals exclude Qld defendants finalised by a bench warrant being issued. (d) There is no Intermediate Court in Tas., the NT or the ACT.

Source: Higher Criminal Courts, Australia, 1998–99 (4513.0).

11.23 PROPORTION OF DEFENDANTS MAKING INITIAL AND FINAL PLEAS OF GUILTY, By State/Territory—1998–99



(a) Excludes Qld where data on both initial and final pleas were not available.

Source: Higher Criminal Courts, Australia, 1998–99 (4513.0).

A large number of defendants initially plead not guilty and then change their plea to guilty during the course of criminal proceedings in the Higher Courts. Graph 11.23 indicates the proportion of defendants whose initial and final pleas were guilty. The difference between these two proportions represents the extent to which defendants changed their plea during criminal proceedings. Information on initial and final plea was not available for Queensland. In the other States and Territories the proportion of defendants changing their plea from not guilty to guilty was highest in the Northern Territory (74.5%) and lowest in the Australian Capital Territory and Western Australia with 19.5% and 20.0% respectively.

For defendants who have been dealt with by the courts, duration figures are available that indicate the elapsed time taken to finalise all charges for a defendant from the date the defendant's case commenced. The total duration for a finalised defendant includes the time taken by the defence and prosecution to prepare their cases, the time taken to list the case and the actual time taken for any hearings.

Table 11.24 provides median duration statistics from initiation to finalisation for defendants in each State and Territory. During 1998–99, the median duration for defendants finalised in the Higher Courts was longest in New South Wales at 35.3 weeks, and shortest in Western Australia and Tasmania at 13.0 weeks and 15.1 weeks respectively. The median duration is longer for some methods of finalisation than for others: in most States and Territories it takes longer for a defendant to be finalised if they have a guilty verdict than if they plead guilty or if they are acquitted.

Defendants finalised by guilty plea are divided into those with an initial plea of guilty (i.e. initiated for sentence) and those with an initial plea of not guilty (i.e. initiated for trial). Data on initial plea were not available for Queensland. In most States and Territories, the median duration of defendants with a method of finalisation of 'guilty plea', but where the defendant had an initial plea of not guilty, was at least double that of defendants with an initial plea of guilty. The Northern Territory was the exception, where the duration for defendants with an initial plea of not guilty was 18.3 weeks, compared with 12.3 weeks for defendants with an initial plea of guilty.

Graph 11.25 shows the proportion of defendants by age group during 1998–99. The highest rate of defendants was in the 20–24 age group with 303.1 defendants per 100,000 persons in that age group. The second highest rate was the 17–19 age group with 275.1 defendants per 100,000 persons. The median age of defendants finalised was 28.4 years. Most defendants dealt with in the Higher Courts during 1998–99 were male (87.9%).

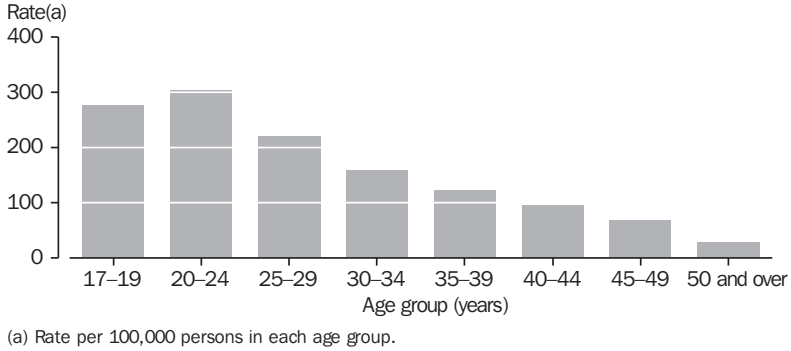
11.24 DEFENDANTS, Median Duration (Weeks) to Finalisation—1998–99(a)

Method of finalisation	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Aust.
SUPREME COURT									
Acquitted	61.4	43.0	36.4	37.6	24.4	36.0	35.1	49.6	40.0
Guilty verdict	85.4	47.6	30.0	39.2	31.0	22.1	30.3	38.0	37.4
Guilty plea	68.3	35.1	17.1	31.3	12.6	12.3	18.3	16.1	15.6
Initial plea of Not Guilty(b)	69.9	37.4	n.a.	31.3	17.1	20.1	18.3	62.4	n.a.
Initial plea of Guilty(b)	33.4	7.4	n.a.	1.8	12.1	8.1	12.3	13.9	n.a.
Other finalisation(c)	111.1	53.6	29.1	21.1	26.0	18.0	22.7	49.3	24.6
Total defendants finalised	*77.1*	*40.1*	*19.4*	*34.9*	*14.9*	*15.1*	*21.4*	*26.9*	*20.3*
INTERMEDIATE COURT(d)									
Acquitted	49.3	38.1	28.0	28.3	60.1	. .	. .	. .	38.2
Guilty verdict	65.0	46.3	31.0	27.9	58.1	. .	. .	. .	44.6
Guilty plea	27.7	17.7	17.0	17.0	10.9	. .	. .	. .	17.1
Initial plea of Not Guilty(b)	36.1	42.7	n.a.	19.6	25.6	. .	. .	. .	n.a.
Initial plea of Guilty(b)	16.1	13.0	n.a.	9.4	10.0	. .	. .	. .	n.a.
Other finalisation(c)	40.9	30.1	23.6	17.3	18.2	. .	. .	. .	25.9
Total defendants finalised	*34.3*	*22.3*	*19.0*	*19.9*	*12.7*	. .	. .	. .	*21.4*
TOTAL HIGHER COURTS(d)									
Acquitted	51.0	38.4	28.1	31.4	58.6	36.0	35.1	49.6	38.5
Guilty verdict	67.3	46.3	30.4	30.0	53.4	22.1	30.3	38.0	43.3
Guilty plea	28.1	18.0	17.0	17.0	11.1	12.3	18.3	16.1	16.9
Initial plea of Not Guilty(b)	36.5	42.1	n.a.	20.4	24.6	20.1	18.3	62.4	n.a.
Initial plea of Guilty(b)	16.1	13.0	n.a.	9.4	10.1	8.1	12.3	13.9	n.a.
Other finalisation(c)	41.4	30.2	24.0	17.4	18.6	18.0	22.7	49.3	25.6
Total defendants finalised	**35.3**	**23.3**	**19.0**	**21.0**	**13.0**	**15.1**	**21.4**	**26.9**	**21.3**

(a) Data exclude defendants finalised in appeal cases. (b) Information on both initial and final pleas was not available in Qld. (c) Includes defendants who were withdrawn by the prosecution, remitted to the Magistrate's Court or finalised by another non-adjudicated method. (d) There is no Intermediate Court in Tas., the NT or the ACT.

Source: Higher Criminal Courts, Australia, 1998–99 (4513.0).

11.25 TOTAL HIGHER COURTS—DEFENDANTS FINALISED, Proportion by Age Group(a)—1998–99



(a) Rate per 100,000 persons in each age group.

Source: Higher Criminal Courts, Australia, 1998–99 (4513.0).

11.26 CRIMINAL COURT CASES(a)(b), By Court Level—1998–99(b)

Court level	NSW '000	Vic. '000	Qld '000	SA '000	WA '000	Tas. '000	NT '000	ACT '000	Aust. '000
Supreme Court	0.7	0.5	1.4	0.5	0.5	0.6	0.3	0.3	4.9
District/County Court(c)	10.2	4.6	9.7	1.2	3.0	. .	. .	. .	28.7
Magistrate's Court	467.1	579.0	359.9	205.0	198.5	16.6	19.3	12.0	1 857.5
Total	**478.0**	**584.1**	**371.0**	**206.7**	**202.0**	**17.2**	**19.6**	**12.3**	**1 891.2**

(a) Cases are defined as one defendant with one or more criminal matters before the courts or involving more than one defendant. (b) Data include appeal and non-appeal cases. (c) The Northern Territory, the Australian Capital Territory and Tasmania do not have District/County Courts.

Source: Steering Committee for the Review of Commonwealth/State Service Provision, Report on Government Services 2000.

Total criminal cases

Table 11.26 shows the total number of criminal cases handled in the courts of Australia, including appeal and non-appeal cases. Of all the criminal cases filed in Australia during 1998–99, 98% were filed in the Magistrates' Courts, with New South Wales and Victoria contributing 56% to the national total. A large proportion of cases in the Magistrate's Court in most States and Territories are minor traffic matters.

Corrective services

Corrective services are responsible for administering the penalties handed down by the criminal courts which require some form of supervision or custody of the offender. This may include imprisonment on either a full or part-time basis, community service and other forms of supervised work, home detention or good behaviour bonds under supervision. Most persons for whom corrective services have responsibility have received a sentence from a criminal court, but some persons have been given orders pending judgement or sentencing (e.g. unsentenced prisoners).

All States and Territories operate prisons and other types of corrective services. Separate provisions exist in each State and Territory for dealing with juvenile offenders. Convicted adult prisoners from the Australian Capital Territory serve their sentences in New South Wales prisons, but local provision is made for the custody of unsentenced prisoners and periodic detainees, and for community corrections (e.g. probation and parole). The Commonwealth Government does not operate any prisons or other corrective services, as federal offenders (persons convicted of offences under Commonwealth laws) are supervised by State agencies for correctional purposes.

A number of jurisdictions have established privately operated prison facilities. These prisons operate in conjunction with State operated prisons and are monitored by the Corrective Services authorities in a similar manner to State operated prisons.

In the *Report on Government Services 2000*, Corrective Services comprise prisons, periodic detention and community corrections. Community corrections comprise home detention, community service and supervision. In 1998–99, the total number of persons under the authority of Corrective Services was 76,520, of whom 55,253 were in community corrections and 21,267 were in prison or periodic detention (table 11.27).

While the community based corrections system is an important aspect of the corrective services system, the following commentary focuses on offenders in prisons.

11.27 OFFENDERS, By Type of Detention—1998–99

Type of detention	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Aust.
				NUMBER					
Prisoners	6 884	2 856	5 044	2 685	1 383	332	624	165	19 850
Periodic detention	1 386	. .	. .	. .	. .	. .	. .	31	1 417
Community corrections(a)									
Home detention	158	. .	109	90	119	. .	20	. .	496
Fine option	310	n.a.	10 849	604	3 744	239	146	n.a.	15 892
Community service	4 162	n.a.	2 003	1 870	1 364	636	92	220	10 347
Supervision	10 378	n.a.	8 037	3 272	3 333	885	351	921	27 177
Total community corrections(b)	*13 656*	*7 246*	*19 390*	*4 298*	*7 754*	*1 308*	*998*	*604*	*55 253*
Total offenders(c)	21 926	10 102	24 434	6 983	9 137	1 640	1 622	800	76 520
				RATE PER 100,000 ADULTS(d)					
Prisoners	143.4	79.1	191.5	196.1	121.9	93.3	462.3	70.5	139.1
Periodic detention	28.9	. .	. .	. .	. .	. .	. .	13.0	. .
Community corrections	284.5	200.7	736.2	314.0	683.4	367.7	447.4	425.4	387.1
Total Corrective Services	*456.8*	*279.8*	*927.7*	*510.1*	*805.2*	*461.0*	*909.7*	*508.9*	*536.1*

(a) NSW counted each offender once, regardless of the number of orders or order types they were serving. (b) The total number of persons in community corrections will not equal the sum of persons serving each type of order because an individual may be serving more than one order. (c) Total offenders includes the following data items: prisoners, periodic detention, and total community corrections. (d) Based on average daily offender numbers in 1998–99.

Source: Steering Committee for the Review of Commonwealth/State Service Provision, Report on Government Services 2000.

Prisoners in Australia

The annual National Prisoner Census, conducted on the night of 30 June, counts all adult offenders who are held in custody in gazetted Australian prisons, including periodic detainees in New South Wales and the Australian Capital Territory. The National Prisoner Census was conducted by the Australian Institute of Criminology from 1982 to 1993, and by the ABS since 1994. The Prisoner Census provides a snapshot of the number of persons in prison, and is not representative of the flow of prisoners. The majority of prisoners in the Prisoner Census are serving long sentences for relatively serious offences, but the flow of offenders in and out of prisons consists primarily of persons serving short sentences for relatively minor offences.

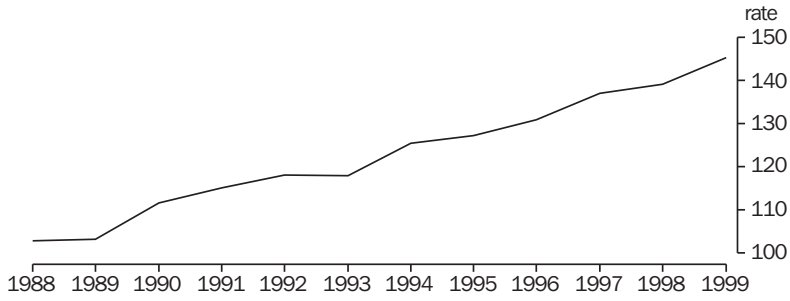
Based on the results of the Prisoner Census, the total prison population in Australia increased from 12,321 in 1988 to 21,538 in 1999. The proportion of unsentenced prisoners has increased from 13% in 1988 to 15% in 1999. Some of the factors which have influenced the size of the prison population over this period include legislative changes affecting the length of time prisoners spend in prison; the abolition of a sentence-reducing mechanism such as remission; significant court delays leading to an increase in unsentenced prisoners in some jurisdictions; changes to the ways in which minor offences are dealt with, particularly fine default; and the growth of the Australian resident population. Graph 11.28 shows a time series of the rate of adult prisoners per 100,000 adult population. The rate has steadily increased since 1989.

The majority of prisoners in Australia are young adult males. There were 20,173 male prisoners on 30 June 1999, comprising 94% of the total prisoner population. The average age of prisoners in Australia was 33 years for males and 32 years for females. Just over 60% of all prisoners were aged between 20 and 35 years, and males aged between 20 and 30 years accounted for over 40% of all prisoners.

The ABS collects monthly aggregate data on the number of prisoners, including counts of prisoners received as sentenced. Although this information is representative of the flow of prisoners in gazetted Australian prisons, it provides less detail than the annual Prisoner Census. Table 11.29 shows the average daily population of prisoners, by sex and jurisdiction. In March 2000 the daily average prison population in Australia was 20,879, an increase by 757 (4%) from March 1999.

Nationally, the average daily imprisonment rate was 145 per 100,000 adult population during March 2000 compared to 142 per 100,000 adult population in March 1999. The imprisonment rates vary between jurisdictions (graph 11.30), and in March 2000 the Northern Territory recorded the highest imprisonment rate, 465 per 100,000 adult population. This was substantially greater than the next highest rates, recorded in Western Australia and Queensland, 215 and 192 prisoners per 100,000 adult population respectively.

11.28 IMPRISONMENT RATE(a)



(a) The data are a snapshot of the prison population as at 30 June each year. The rate is per 100,000 adult persons.

Source: Australian Prisoners, Australian Institute of Criminology, 1988 to 1993; and Prisoners in Australia, 1994 to 1999, a report prepared by the ABS.

11.29 AVERAGE DAILY PRISONER POPULATION, By Sex—March 2000

Sex	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT in NSW(a)	ACT on remand	Aust.
					NUMBER					
Males	6 826	2 880	4 796	1 249	2 754	367	622	129	49	19 543
Females	459	187	342	69	234	24	15	10	6	1 336
Persons	*7 285*	*3 067*	*5 138*	*1 318*	*2 988*	*391*	*637*	*139*	*55*	*20 879*
					RATE PER 100,000 ADULTS					
Males	286.2	161.2	361.7	224.2	397.3	211.7	850.8	112.4	42.8	274.9
Females	18.7	10.0	25.4	11.8	33.7	13.3	23.8	8.5	4.8	18.3
Persons	*150.3*	*84.0*	*192.4*	*115.7*	*215.4*	*109.8*	*465.1*	*59.9*	*23.6*	*144.8*

(a) Prisoners sentenced to full-time custody in the Australian Capital Territory are held in New South Wales prisons and are included in the New South Wales figures. The Australian Capital Territory in New South Wales figures are a subset of the New South Wales figures and are not included in the totals for Australia.

Source: Corrective Services, Australia, March Quarter 2000 (4512.0).

11.30 IMPRISONMENT RATE(a), By State/Territory—March 2000

(a) Rate per 100,000 adult persons.

Source: Corrective Services, Australia, March Quarter 2000 (4512.0).

11.31 SENTENCED PRISONERS, By Most Serious Offence(a)—At 30 June 1999

Offence Category	NSW %	Vic. %	Qld %	SA %	WA %	Tas. %	NT %	ACT(b) %	Aust. %	Aust. no.
Homicide	7.1	12.1	10.6	12.3	7.4	14.2	9.5	11.3	9.1	1 667
Assault	12.9	5.2	14.6	11.3	11.1	6.9	22.9	16.6	12.1	2 212
Sex offences	9.7	14.9	15.6	8.0	14.4	11.6	6.9	10.6	12.2	2 239
Robbery	12.7	9.5	14.6	11.4	15.4	11.2	4.2	11.3	12.7	2 331
Break and enter	11.8	12.4	14.4	15.8	14.8	13.9	7.3	8.0	13.0	2 388
Fraud and misappropriation	4.5	3.4	3.4	9.0	2.4	1.0	0.7	4.6	3.9	723
Other theft	6.0	8.7	3.9	4.2	5.3	7.9	8.0	6.6	5.8	1 058
Government security(c)	12.4	12.4	4.7	8.5	7.6	15.8	4.0	9.3	9.6	1 756
Drug offences	10.8	11.7	7.6	8.1	6.8	1.7	2.7	11.9	9.1	1 663
Driving offences	6.5	0.3	2.7	2.1	3.9	5.0	11.0	3.3	4.3	780
Other offences	5.7	9.4	7.9	9.5	10.8	10.9	22.7	6.6	8.3	1 515
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	18 332

(a) The most serious offence is the offence with the longest sentence a prisoner has received. Where the sentences are equal, or the longest sentence cannot be determined, the most serious offence is the offence with the lowest Australian Standard Offence Classification (ASOC) code. (b) Prisoners sentenced to full-time custody in the ACT are held in NSW prisons and are also included in the NSW figures. (c) Government security offences include offences such as treason; they also include offences against justice procedures, such as perjury and resisting police.

Source: Prisoners in Australia, 1999—A report prepared for the Corrective Services Ministers' Council by the National Correctional Services Statistics Unit, ABS.

Most serious offence

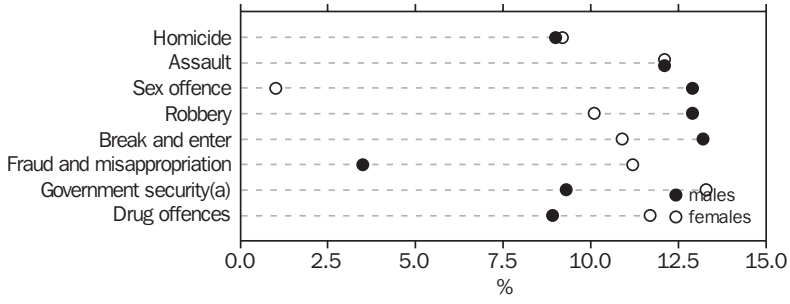
Table 11.31 shows the proportion of sentenced prisoners by most serious offence for each State and Territory at 30 June 1999. The most serious offence is the offence for which prisoners have received the longest sentence.

Nearly half (47%) of all sentenced prisoners were convicted of offences involving violence or the threat of violence, including murder (6%), other homicide (3%), assault (12%), sex offences (12%), other offences against the person (1%) and robbery (13%). Sentenced prisoners convicted of a property offence as their most serious offence represented 24% of all sentenced prisoners, including 13% sentenced for break and enter. A further 9% were serving sentences for drug offences as their most serious offence, and 4% of the national proportion of sentenced prisoners were convicted of driving offences as their most serious offence.

There were differences in the types of offences for which men and women were sentenced to imprisonment, reflecting the differences in the patterns of offending between men and women. As shown in graph 11.32, a much higher proportion of male prisoners (13%) than female prisoners (1%) were convicted of sex offences, while a higher proportion of female prisoners than male prisoners were convicted of fraud and misappropriation (11% and 4% respectively), drug offences (12% for females compared with 9% for males) and government security/justice procedure offences (13% for females compared with 9% for males).

The most common offences for males in 1999 were break and enter (13%), sex offences (13%), robbery (13%) and assault (12%). In the case of female prisoners, nearly half (47%) of the most serious offences were accounted for by four categories: government security/justice procedures offences (13%), assault (12%), fraud and misappropriation (11%) and break and enter (11%). While a higher proportion of males were convicted of a violent offence, the proportion of males and females who were convicted of homicide offences were the same (9%).

11.32 SENTENCED PRISONERS, By Sex and Selected Most Serious Offence—1999



(a) Government security offences include offences such as treason; they also include offences against justice procedures, such as perjury and resisting police.

Source: Prisoners in Australia, 1999—A report prepared for the Corrective Services Ministers' Council by the National Correctional Services Statistics Unit, ABS.

11.33 SENTENCED PRISONERS, Proportion by Aggregate Length of Sentence(a)(b)—At 30 June 1999

	NSW(c)	Vic.	Qld	SA	WA	Tas.	NT	ACT(c)	Aust.
Length of sentence	%	%	%	%	%	%	%	%	%
Less than 1 year	19.8	30.2	18.9	19.8	16.1	40.6	36.7	6.4	21.3
1 to <5 years	32.6	36.7	35.3	37.5	43.3	32.0	43.2	32.8	35.8
5 to <10 years	18.3	19.1	25.4	24.7	22.4	10.2	9.7	37.6	20.6
10 years and over	11.1	12.4	13.6	8.6	11.3	6.9	5.3	19.2	11.5
Indeterminate (e.g. life)	2.2	1.6	6.8	9.4	6.9	10.3	5.1	4.0	4.5

(a) Excludes periodic detainees. (b) The aggregate sentence is the longest period that the offender may be detained under sentence in the current episode. Charges pending which are likely to extend the current episode are ignored. (c) Prisoners sentenced to full-time custody in the ACT are held in NSW prisons and are also included in the NSW figures.

Source: Prisoners in Australia, 1999—A report prepared for the Corrective Services Ministers' Council by the National Correctional Services Statistics Unit, ABS.

Aggregate length of sentence is a measure of the sentences imposed on an offender, taking multiple offences into account. It is not measured for prisoners who receive an indeterminate type of sentence such as life, and periodic detainees' sentences are measured separately. At 30 June 1999 the average aggregate sentence of all prisoners was 4.6 years. Male prisoners were serving an average aggregate sentence of 4.7 years, compared to an average of 3.1 years for female prisoners.

Prisoners serving sentences of one year to less than five years accounted for the highest proportion of prisoners in all States and the Northern Territory (table 11.33); prisoners with indeterminate sentences made up 4.5% of all prisoners. Periodic detainees (not included in the table) represented 6%.

Indigenous prisoners

To measure Indigenous imprisonment in Australia a number of different indices are used. These include the number of Indigenous prisoners; the number as a proportion of the adult Indigenous population (rate per 100,000 adult Indigenous population); and the comparison (ratio) of Indigenous to non-Indigenous rates of imprisonment (table 11.34). Imprisonment rates per 100,000 adult Indigenous population enable the comparison of Indigenous imprisonment across the States and Territories, while the ratio indicates the extent to which the imprisonment rates of Indigenous persons exceed the imprisonment rates of non-Indigenous persons.

On 1 March 2000 there were 4,080 Indigenous prisoners in Australia (20% of the Australian prisoner population). The highest number of Indigenous prisoners was recorded in Queensland (1,173). The national rate of imprisonment for Indigenous persons was 1,755 per 100,000 adult Indigenous population. Western Australia recorded the highest imprisonment rate (2,947 Indigenous persons per 100,000 adult Indigenous population) followed by Queensland and New South Wales (1,816 and 1,815 Indigenous persons per 100,000 adult Indigenous population respectively). Nationally,

the Indigenous rate of imprisonment was 15 times the non-Indigenous rate. The highest ratios of Indigenous to non-Indigenous rates of imprisonment were recorded in Western Australia and New South Wales with Indigenous imprisonment rates 20 and 14 times the non-Indigenous rates respectively.

11.34 INDIGENOUS IMPRISONMENT—1 March 2000

	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT(a)	ACT in NSW(b)	Aust.
Number	1 156	129	1 173	176	977	43	418	8	n.a.	4 080
Rate(c)	1 815.4	928.5	1 815.5	1 347.2	2 946.7	460.4	1 273.5	n.p.	n.a.	1 754.8
Ratio(d)	14.2	11.7	11.9	13.2	19.9	5.5	5.9	n.p.	n.a.	14.9

(a) Refers to unsentenced prisoners in ACT prison custody. (b) Numbers of Indigenous persons among sentenced ACT prisoners in NSW prison custody are unavailable. (c) Rate of Indigenous prisoners per 100,000 adult Indigenous population. (d) Ratio of Indigenous to non-Indigenous rates of imprisonment.

Source: Corrective Services, Australia, March Quarter 2000 (4512.0).

Bibliography

ABS publications

Australian Standard Offence Classification (ASOC) (1234.0) (available in the Statistical Concepts Library on the ABS Internet site at *http://www.abs.gov.au*)

Crime and Safety Survey, Australia, April 1998 (4509.0).

Corrective Services, Australia, March quarter 2000 (4512.0).

Government Finance Statistics, Australia, *1998–99* (5512.0).

Higher Criminal Courts, Australia, 1998–99 (4513.0).

Information Paper: National Crime Statistics (4511.0).

National Crime Statistics, 1995 (4510.0).

Prisoners in Australia, 1999—A report prepared for the Corrective Services Ministers' Council by the National Correctional Services Statistics Unit, ABS.

Recorded Crime, Australia, 1998 (4510.0).

Recorded Crime, Australia, 1999 (4510.0).

Crime reports

Australian Bureau of Criminal Intelligence, *Australian Illicit Drug Report, 1998–99*.

Australian Institute of Criminology, *Australian Prisoners, Results of the National Prison Census*, 1988 to 1993.

Other publications

National Crime Authority, *Annual Report, 1998–99*.

Steering Committee for the Review of Commonwealth/State Service Provision, *Report on Government Services 2000*, Productivity Commission. Available from the Productivity Commission's Internet site at *http://www.pc.gov.au/service*

Internet sites

Australian sites

Australian Federal Police, *http://afp.gov.au*

Australian Institute of Criminology, *http://www.aic.gov.au*

National Crime Prevention, *http://www.ncp.gov.au*

NSW Police Service, *http://www.police.nsw.gov.au*

NT Police, *http://www.nt.gov.au/ntpf/*

Productivity Commission, *http://www.pc.gov.au*

Qld Police Service, *http://www.police.qld.gov.au*

SA Police, *http://www.sapolice.sa.gov.au*

Tasmania Police, *http://www.police.tas.gov.au*

Victoria Police, *http://www.police.vic.gov.au*

WA Police, *http://www.wapol.gov.au*

International sites

World Justice Information Network, *http://www.justinfo.net*

United Nations Online Justice Information Centre, *http://www.ncjrs.org*

Home Office, United Kingdom, *http://www.homeoffice.gov.uk*

U.S. Dept of Justice, *http://www.usdoj.gov*

Dept of Justice Canada, *http://canada.justice.gc.ca/index_en.html*

NZ Dept of Justice, *http://www.govt.nz/justice*

Crime in twentieth century Australia

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Introduction

Australia was a less violent society at the end of the twentieth century than it was at the end of the nineteenth or eighteenth centuries. Violence and theft have been part of human interaction for all of recorded history, but it is not easy to compare statistics on the extent of violence and theft across the span of the twentieth century.

Crimes that have existed across the span of the century such as homicide, burglary, assault, theft, robbery, rape and kidnapping have seen variations in definition in legislation and varying levels of attention from police and courts. Crimes such as motor vehicle theft were inconsequential at the beginning of the century, but significant at the end of the century, while crimes that involve child abuse or domestic violence were more likely to be regarded as private matters at the start of the century, yet at the end were firmly within the criminal justice sphere.

Crimes such as superannuation fraud, health insurance fraud, theft of telecommunications services, electronic vandalism and varieties of computer hacking, credit card fraud, Internet child pornography, electronic funds transfer crime and electronic money laundering were not on the criminal horizon at the start of the century. However, nude or even topless bathing, or homosexual acts between consenting adults, brought criminal sanctions, while public drunkenness comprised more than half of all offences brought before the Magistrates' courts in the early years of the twentieth century, and this persisted until the middle of the century.

While we can focus on significant differences, some similar threads run right through the century. Alcohol-related crime was a predominant cause of criminal justice involvement in 1900, while today it is substance abuse in general, but alcohol still remains a major component in criminal activity. As noted later, many of our prison population in 1900 were incarcerated principally as a result of their mental state (although many of them would have been counted under petty crime or vagrancy), and in 2000 this situation has changed very little. In 1900 young males contributed significantly to criminal activities, and at the end of the century this continues to be the case.

What mattered 100 years ago and what happens today are very different. One hundred years ago there was great concern about drunkenness, gambling and 'Chinese opium dens', whereas today concerns such as cyber crime, the international trafficking of drugs and their consequences in Australia, domestic burglary and (family) violence against women are prominent in crime discussions.

At the beginning of the century Australia's Aboriginal population was not counted in official statistics, nor did Aboriginal people feature in crime statistics. A lot of Indigenous justice was 'extra-legal' (i.e. administrative,

informal or traditional) and, except for the most serious matters, did not find its way into police or court statistics. At the end of the century Indigenous people have high rates of involvement in criminal justice both as victims and offenders, but there is no way of comparing these rates with offender and victimisation rates 100 years ago.

Over the century the criminal justice system has become much more complex. In 1900 people confronting the system faced one of three types of sanctions: absolute or conditional discharges, fines, or imprisonment, while today there is a multiplicity of sentence types and diversion processes. In addition the structure of the system has seen a more cooperative underpinning. In 1900 all criminal justice service delivery was in the hands of the States, and there was hardly any inter-jurisdictional law enforcement or administration. Today there is a significant and growing federal presence in law enforcement (e.g. Australian Federal Police, National Crime Authority, Australian Customs Service) and in some aspects of justice administration (e.g. legal aid). There is substantial cooperation between States and Territories, evidenced by the establishment of CrimTrac and the formation of six National Common Police Services. Furthermore transnational and cyber crime is emerging as one of the most significant issues for this century, but its activities are not constrained by the borders that were set in place at the beginning of Federation.

As the twentieth century opened, the Year Books were describing falls in crime. Four categories only were reported: offences against the person, those against property, drunkenness and 'other offences' (table C8.1). Three things stand out. First, there are enormous variations around the States. In 1900, for example, property offence charges against persons arrested or summonsed per 1,000 population were: New South Wales, 4.93; Victoria, 2.97; Queensland, 5.21; South Australia, 1.60; Western Australia 9.86; and Tasmania 3.91. This level of variation applied across the offence range. The second feature is the steady decline in violent and property crime. The third is that charges of drunkenness in 1900 were three times as high as charges of property crime and five times as high as charges of offences against the person.

These figures bear no resemblance to figures produced by the Australian Bureau of Statistics at the end of the century (table C8.2). The only similarity with the 1903 data is that there is still significant variation around the jurisdictions (see graphs C8.3 to C8.9 below).

C8.1 CRIME IN AUSTRALIA—1890 to 1902

	Offence against a person		Offence against property		Drunkenness		Other offences	
Year	Number	Rate per 100,000	Number	Rate per 100,000	Number	Rate per 100,00	Number	Rate per 100,000
1890	16 907	5.43	16 795	5.39	48 201	15.48	86 064	27.64
1895	10 450	2.98	14 773	4.22	38 895	11.11	76 982	21.99
1899	10 469	2.85	15 426	4.20	46 983	12.78	80 071	21.78
1900	10 319	2.75	15 764	4.21	52 286	13.96	87 147	23.26
1901	9 975	2.62	15 273	4.01	54 412	14.30	88 031	23.13
1902	9 597	2.49	16 565	4.29	50 618	13.10	87 137	22.57

Source: Victorian Year Book, 1903, pp. 304–305.

C8.2 CRIME IN AUSTRALIA—1993 to 1999

	Robbery		Assault		UEWI(a)		Other theft	
Year	Number	Rate per 100,000	Number	Rate per 100,000	Number	Rate per 100,00	Number	Rate per 100,000
1993	12 765	72.25	n.a.	n.a.	381 783	2 160.98	n.a.	n.a.
1994	13 967	78.23	n.a.	n.a.	379 505	2 125.51	n.a.	n.a.
1995	14 558	80.56	101 267	560.36	384 908	2 129.89	490 084	2 711.88
1996	16 372	89.41	114 156	623.44	402 079	2 195.87	521 762	2 849.49
1997	21 305	114.96	124 500	671.80	421 569	2 274.79	530 881	2 864.63
1998	23 801	126.95	130 903	698.23	434 376	2 316.93	563 482	3 005.57
1999	22 590	119.11	133 602	704.45	415 600	2 191.37	610 276	3 217.85

(a) Unlawful entry with intent.

Source: Year Book Australia (1301.0), years shown.

The decline in crime was noted in the first Commonwealth Year Book, yet no adequate explanations were found. The Year Book commented:

> "**Causes of Decrease in Crime**—The statistics given show that there has been a considerable decrease in crime throughout Australasia…The deterrent effect of punishment, in respect of many offences, notably drunkenness, vagrancy, petty larcenies, etc., appears to be almost negligible. In general, punishment has declined in brutality and severity, and has improved in respect of being based to a greater extent upon a scientific [penological] system, though in this latter respect there is yet much to be desired…Part of the improvement may no doubt be referred also to the general amelioration in social condition that has taken place during the last fifty years" (*Commonwealth Year Book No.1, 1908*, pp. 760–761).

Reporting on the 1999 Recorded Crime Statistics, the Australian Bureau of Statistics (Media release 82/2000, 28 June 2000) noted that robbery was down for the first time in seven years, and the report itself showed declines in most crimes: homicide (including attempted murder); sexual assault; robbery; blackmail; burglary; and motor vehicle theft. There was, however, an increase in assault and 'other theft'.

The first Commonwealth Year Book lamented the fact that Australia's statistical collections were not uniform. It noted "without uniformity there is no safety in statistics" (*Commonwealth Year Book 1908*, p. 7). It also noted that "comparisons are valueless unless the data compared are of the same type, it by no means infrequently happens that aggregates are formed from, or comparisons are made with, dissimilar data" (*Commonwealth Year Book 1908*, p. 7).

This warning is still made at the end of the century, and it has only been since 1993 that Australia has had crime statistics that can in any way be described as uniform. Even so, they cover nine sets of offences, and are confined to reports to police.

Few of the items reported at the beginning of the century can be reported on in similar terms at the end of the century. The first Commonwealth Year Book has tables of persons charged before magistrates 1901–1906, together with numbers of convictions and committals. These tables cannot meaningfully be replicated today. About 40% of the cases are for drunkenness. Different offences are now on the statute books, and some terminological changes have taken place.

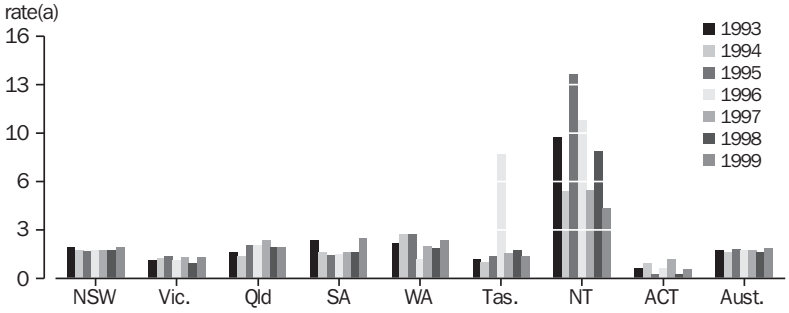
In 1988 the Australian Institute of Criminology published, as a Bicentennial project, a substantial volume entitled *Source Book of Australian Criminal and Social Statistics, 1804–1988*. Section 6 on Cases Processed at Magistrates' Courts covers 260 pages of tables and goes back to earliest times, but the tables all end in the 1970s. The book notes that most jurisdictions "have introduced substantial changes in the processing and classification of charges which have resulted in irreconcilable discontinuities in the data system" (p. 228).

Other statements in early Year Books cause much pondering. For example the 1903 Victorian Year Book claimed "of the offenders who are reported as having committed offences, generally about 50 per cent are arrested, 38 per cent are summoned, whilst about 11 per cent are still at large at the end of March of the year following that in which the offence was reported" (*Victorian Year Book 1903*, p. 299). We cannot replicate data such as this in 2000 for we do not know the ingredients behind the statement, but what we do know at the end of the century is that clear-up rates are not nearly as high as reported in 1903.

Writing in 1999, two authoritative analysts state "the majority of reported property crimes do not result in a convicted offender being charged…Accurate data on charge rates is generally not available, but most estimates for property crime charge rates are no higher than 10 per cent" (Freiberg and Ross 1999, p. 52).

In 1993 the Australian Bureau of Statistics published the first national collection of uniform crime statistics. Prior to that there were collections of crime statistics in each State and Territory. These were not good indicators of actual levels of crime, as what was included and excluded reflected changing interests and priorities over time, as well as inconsistent recording methods.

C8.3 HOMICIDE, States and Territories—1993–1999

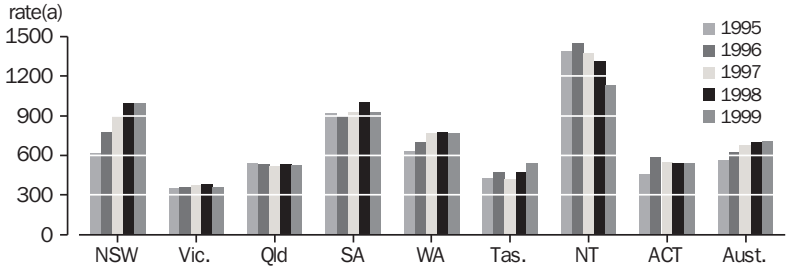


(a) Rate per 100,000 population.

Note: Homicide includes murder and manslaughter.

Source: Recorded Crime, Australia (4510.0).

C8.4 ASSAULT, States and Territories—1995–1999

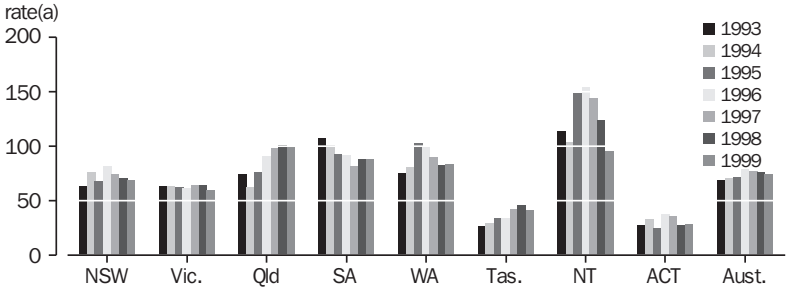


(a) Rate per 100,000 population.

Note: 1998 and 1999 recorded crime statistics for assault are not comparable with previous years for Western Australia. 1999 recorded crime statistics for assault are not comparable with previous years for the Northern Territory.

Source: Recorded Crime, Australia (4510.0).

C8.5 SEXUAL ASSAULT, States and Territories—1993–1999



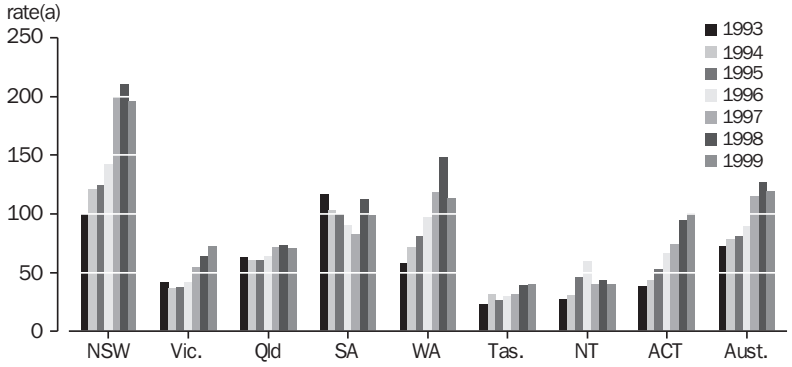
(a) Rate per 100,000 population.

Note: 1998 and 1999 recorded crime statistics for sexual assault are not comparable with previous years for Western Australia.

Source: Recorded Crime, Australia (4510.0).

Graphs C8.3 to C8.9 give us one picture only—that of crimes recorded by police. Other types of information about crime tell us about victims of crime, about offenders (those who commit crime), and about the police, courts, and correctional systems. Records over time give us little information about victims (though the ABS has conducted four national victim surveys); offender information comes from prison records (though only a very small proportion of offenders go to prison); police statistics found in annual reports reflect police priorities and judgements about where to place resources; court data give us some indication of the nature and volume of offences deemed serious enough to come this far into the criminal justice process.

C8.6 ROBBERY, States and Territories—1993–1999

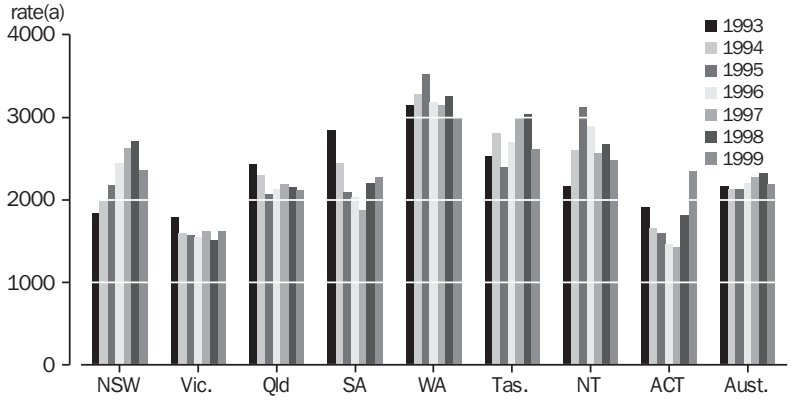


(a) Rate per 100,000 population.

Note: 1998 and 1999 recorded crime statistics for robbery are not comparable with previous years for Western Australia.

Source: Recorded Crime, Australia (4510.0).

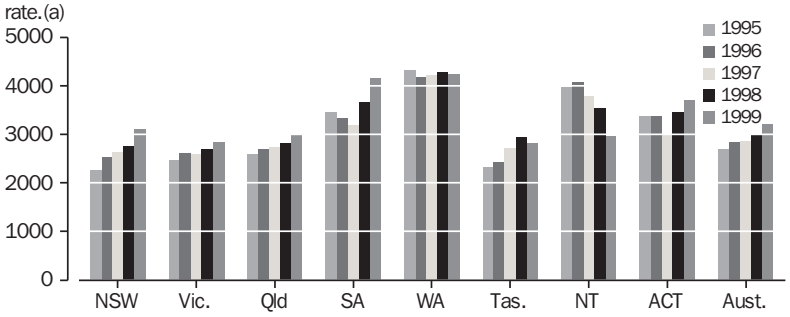
C8.7 UNLAWFUL ENTRY WITH INTENT, States and Territories—1993–1999



(a) Rate per 100,000 population.

Source: Recorded Crime, Australia (4510.0).

C8.8 OTHER THEFT, States and Territories—1995–1999

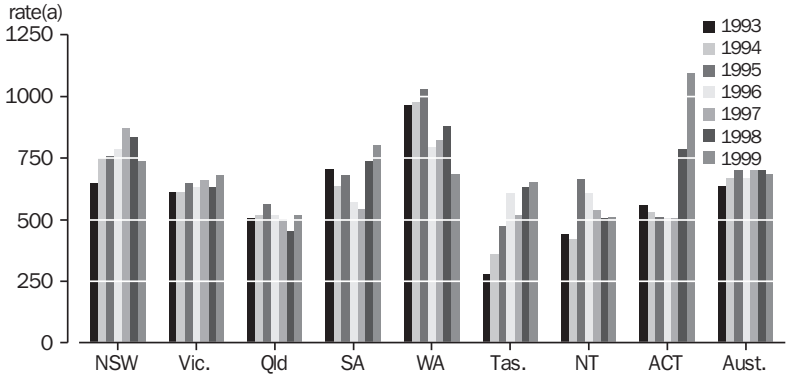


(a) Rate per 100,000 population.

Note: 1998 and 1999 recorded crime statistics for other theft are not comparable with previous years for Western Australia. 1999 recorded crime statistics for other theft are not comparable with previous years for Victoria and the Northern Territory.

Source: Recorded Crime, Australia (4510.0).

C8.9 MOTOR VEHICLE THEFT, States and Territories—1993–1999



(a) Rate per 100,000 population.

Source: Recorded Crime, Australia (4510.0).

When examining our statistics it must be remembered that not every crime is reported to the police, not every crime that is reported is recorded, not every crime that is recorded is investigated, not every crime that is investigated is cleared ('solved'), not every crime that is investigated yields a suspect, not every suspect is apprehended, not every apprehended person is charged, not every charged person is brought before the courts, not every person brought before the courts is convicted, and not every convicted person is imprisoned. (It has been estimated by Satyanshu Mukherjee that in New South Wales in 1996 "one offender was sentenced to a term of imprisonment for every 156 crimes of break and enter, motor vehicle theft, assault or robbery" (Mukherjee 1999, p. 75).

So then, taking a snapshot at any time, or taking a series of data over time on any activity (e.g. court appearances, prisoner numbers, etc.) does not tell us about crime in Australia, but rather about that particular activity or segment.

There are, however, a number of interesting features which characterise crime over the century, and they are described below. At the beginning of the century executions took place in our prisons (there were 55 executions

in the first decade of the twentieth century). The last execution in Australia was in 1967.

Homicide

Homicide covers offences of murder and manslaughter. It is one offence for which data are generally and consistently available. Nearly all homicides are reported and police always respond to homicide. Homicide has been part of human behaviour and criminal codes for a long, long time.

In 1915 in Australia, the homicide rate was 1.8 per 100,000 population. In 1998 it was 1.6 per 100,000. During the intervening years it hit a low of 0.8 in 1941 and a high of 2.4 in 1988.

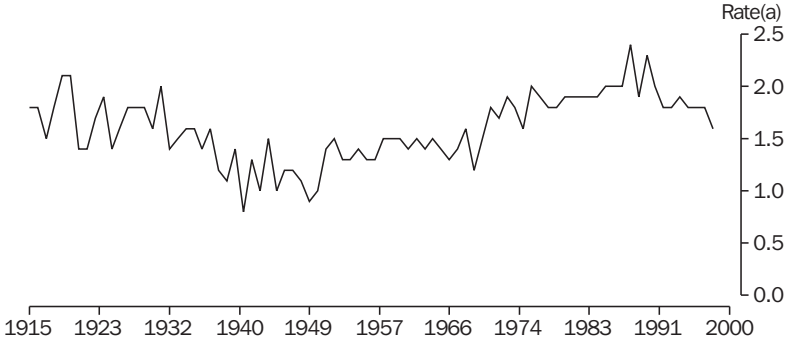
The annual homicide rates in Australia from 1915 to 1998 are displayed in graph C8.10 below. There was a long-term decline during the first half of the twentieth century, with the homicide rate being the lowest during the period of World War II (1939–1945). The rate then increased substantially to a plateau of about 1.5 per 100,000 population in the 1950s and 1960s. An upward trend occurred during the 1970s, reaching the level of around 2.0 per 100,000 population at the end of that decade. Since then, the rate has remained relatively stable, except for two temporary fluctuations in the 1980s. One of those temporary fluctuations resulted in the highest homicide rate recorded in Australia (rate of 2.4 per 100,000 population in 1988). This is more than double the rate observed in 1950.

While there has been remarkable stability in the twentieth century, and while the differences among the States are negligible, this has not always been the case. During the first hundred years of settlement, homicide rates were much higher and only fell to 'modern' levels after about 1880. Today there is little difference in homicide rates between any of the Australian States and Territories (except the Northern Territory), but in 1900 Queensland and Western Australia had much higher rates (by a factor of 3 to 10 times) than the older States.

Australia's current rate is similar to that of many northern European countries and Canada and New Zealand, but double that of Japan, Norway and Ireland. The USA has a rate about four times that of Australia, and countries like Russia, Mexico and Croatia have rates much higher than the USA. Why this is so is a real mystery to criminologists, anthropologists, psychiatrists and psychologists. What is known, however, is that homicide was a much less frequently occurring activity in the twentieth century than in previous centuries.

For the last decade of the century the Australian Institute of Criminology has monitored every homicide in Australia. The dataset shows that homicide in Australia was characterised by the following features.

C8.10 TRENDS IN HOMICIDE, Australia—1915 to 1998



(a) Rate per 100,000 population.

Source: Mouzos 2000, p. 9.

There were 3,150 homicide *incidents* over the decade, averaging 315 per year, a figure that did not fluctuate much.

Just under two-thirds of all homicide incidents (60.2%) occurred in residential premises. Nearly half of all homicide incidents occurred on Friday, Saturday, or Sunday, and over two-thirds of homicide incidents occurred between 6pm and 6am.

Eight out of 10 homicide incidents can be characterised as 'one-on-one' interactions between the victim and the offender, though there have been, on average, 15 multiple fatality incidents per year, resulting in approximately 39 victims per year.

There were 3,386 *victims* of homicide. Across the 10-year period, rates of victimisation have remained relatively constant, fluctuating between 1.7 and 2.0 per 100,000 population. Some 63.2% of victims were male and 36.8% were female. Females were killed at an average annual rate of 1.4 per 100,000 population, whereas males were killed at an average annual rate of 2.4 per 100,000 population. There has been a stable pattern of gender differentiation, with a ratio of 3 males killed for every 2 females. Male victims were more likely to have been single at the time of the incident, whereas female victims were more likely to have been married or living in a de facto relationship. Females were more likely to be killed as a result of a domestic altercation, although this proportion has declined in recent years. Males were more likely to be killed following an alcohol-related argument.

Victims of homicide were more likely to be killed with a knife or other sharp instrument than any other weapon. There was a declining trend in the proportion of victims killed with a firearm, with an average of 81 victims killed per year with a firearm.

The highest age-specific victimisation rate for females was for children less than one year of age (average rate of 2.6), whereas the highest victimisation rate for males was for young men between the ages of 24 and 26 years (average rate of 4.3). Indigenous persons were on average 8.1 times more likely to be victims of homicide than non-Indigenous persons.

Approximately 9% of all homicide victims were aged under 15, and this proportion has remained quite stable each year since 1989. Biological parents, usually the mother, were responsible for a majority of child killings in Australia. Very rarely are children killed by a stranger.

There were 3,481 *offenders* of homicide—87.2% were male and 12.8% were female. Males consistently exhibited higher rates of offending than females, with a ratio of about 7:1. The median age of male offenders was 27 years and the median age for female offenders was 29 years. Male offenders were more likely to be single, whereas female offenders were more likely to be married or living in a de facto relationship at the time of the incident.

Between 1996–97 and 1998–99, just under 2 out of 5 male offenders and just over 1 out of 5 female offenders were under the influence of alcohol at the time of the incident. Approximately 6% of homicide offenders in Australia committed suicide during or following the homicide incident.

Eight out of 10 homicides occurred between people who were known to one another. Females were more likely to be killed by an intimate partner, whereas males were more likely to be killed by a friend or acquaintance, but under 2 out of 10 homicides occurred between strangers. Approximately 13% of all homicide incidents occur in the course of other crime, such as robbery and sexual assault. One in 10 homicide incidents occurred in the course of robbery, and 3.7% occurred in the course of sexual assault. This relatively low rate of homicides committed in the course of another crime is a factor which differentiates Australia's homicide rates from those of many other countries.

While only 13% of homicides were committed by females, women who kill tend to kill men. Women are more likely to kill (in descending order of frequency) husbands, ex-husbands, de facto partners, and lovers, followed by children and other relatives. Very few women kill strangers.

In Australia, between 1 July 1989 and 30 June 1999 there were 13 mass-murder incidents (where the number of victims was 4 or more), resulting in the death of 94 persons,

though in the two most recent years of the century Australia recorded no mass-murder incidents.

Understanding homicide involves some fundamental neurological and sociological risk factors. Looking across many nations, from a policy point of view things like expanding the number of police, giving them better technology, setting longer prison sentences, imposing or abolishing the death penalty have had no effect on the homicide rate, which has remained fairly constant in most countries (Mouzos 2000).

Prisons and prisoners

In 1900 there were 4,755 prisoners in Australia, with a rate then of 126.28 per 100,000 population (table C8.11). On 1 December 1999 there were 20,455 people in Australia's prisons. This equates to a rate of 107.85 per 100,000 total population. Throughout the century the imprisonment rates were lower than they were at the beginning of the century and at the end (graph C8.12).

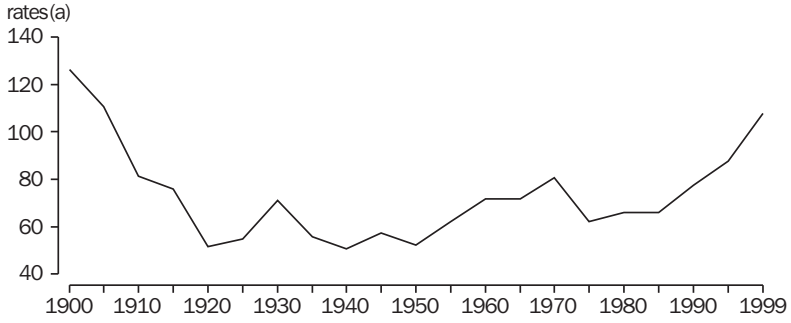
The number of people in prison at any time is a fraction of the flow of people through Australia's prisons. While the prison population stood at 20,455 on 1 December 1999, there were 10,038 sentenced offenders entering prison receptions in the December quarter 1999. In crude terms (because we do not know how many prisoners completed terms of less than three months during the quarter) about half of the prisoners in December 1999 were not there in September 1999. In 1999, 11% of prisoners were serving terms of less than six months (compared with 8.5% of prisoners a decade before). Table C8.13 summarises the number of prisoners in Australia's prisons in 1999 by length of sentence.

C8.11 PRISONERS, Daily Average Number and Rates per 100,000 Population—1900 to 1999

Year	Prisoners no.	Total population no.	Rate per 100,000 total population
1900	4 755	3 765 339	126.28
1905	4 459	4 032 977	110.56
1910	3 603	4 425 083	81.42
1915	3 777	4 969 457	76.00
1920	2 793	5 411 297	51.61
1925	3 295	6 003 027	54.89
1930	4 620	6 500 751	71.07
1935	3 767	6 755 662	55.76
1940	3 578	7 077 586	50.55
1945	4 271	7 430 197	57.48
1950	4 338	8 307 481	52.22
1955	5 787	9 311 825	62.15
1960	7 446	10 391 920	71.65
1965	8 243	11 505 408	71.64
1970	10 208	12 663 469	80.61
1975	8 683	13 968 881	62.16
1980	9 752	14 807 370	65.86
1985	10 504	15 900 566	66.06
1990	13 280	17 169 768	77.35
1995	15 973	18 187 697	87.82
1998	19 002	18 851 187	100.80
1999	20 455	18 966 788	107.85

Source: Australian Demographic Statistics, December 1998 (3101.0); Source Book of Australian Criminal and Social Statistics 1804–1988; Corrective Services, Australia (4512.0).

C8.12 PRISONER POPULATION



(a) Rates per 100,000 total population.

Source: Book of Australian Criminal and Social Statistics 1804–1988; Corrective Services, Australia (4512.0).

C8.13 PRISONERS IN AUSTRALIA, Sentence Length—1999

Aggregate sentence	no.	%
Under 1 month	136	0.8
1 to less than 3 months	502	2.9
1 to less than 6 months	1 258	7.3
Less than 6 months	1 896	11.0
6 to less than 12 months	2 008	11.7
1 to less than 2 years	2 531	14.7
2 to less than 5 years	4 037	23.5
5 to less than 10 years	3 768	22.0
10 years and over	2 100	12.2
Life and other indeterminate	826	4.8
All sentenced prisoners excluding periodic detainees	**17 166**	**100.0**

Source: Australian Prisoners 1989; Prisoners in Australia 1999.

During 1998–99 there were, in addition to the prison population, 55,253 people (average daily number) serving community correction orders. Almost half (27,177) were serving supervision orders (probation or parole), 10,347 were performing community service, 15,892 were serving fine options and 496 were in home detention (SCRCSSP 2000, p. 775).

Prisons involve substantial financial outlays. The value of prison assets in Australia is $2.008b, the average assets per prisoner being $109,005 (SCRCSSP 2000, p. 786). Recurrent costs in secure prisons across Australia average $158.95 per prisoner per day or approximately $58,000 per year, while community corrections average out at $6.45 per offender per day. Data at this level of detail are not readily available for the early part of the century.

Far more people move through the prison system in a year than are indicated in annual prison holding statistics. In essence, the 'flow' is much larger than the 'stock'. Many people have very short sentences. For example, more than a third have sentences of under a year. As a result the daily average number of prisoners cannot be calculated from the annual number of prisoners.

In 1903 the daily average number of prisoners in Victoria was 907 males and 141 females (table C8.14). In that year there was accommodation for 1,845 males and 533 females, so the male prisons were operating at half capacity while the female prisons were operating at one quarter capacity. At the end of the century there is much more efficient use of assets! The Victorian Year Book of 1903 proudly described the decrease in crime over the previous decade (p. 302).

While the daily average for males was 907, the total number of males received into the prisons in 1903 was 5,952, while for females receptions totalled 1,490 for a daily average of 141. In the years before 1903 the prison numbers in Victoria showed a steady decline, so that the number in 1903 was 26% less than in 1895.

C8.14 PRISONERS IN CONFINEMENT, Victoria—1895 to 1903

Year	Males	Females	Total
1895	1 208	216	1 424
1896	1 143	194	1 347
1897	1 044	182	1 226
1898	1 065	223	1 288
1899	1 020	215	1 235
1900	981	204	1 185
1901	951	200	1 151
1902	943	170	1 113
1903	907	141	1 048

Source: Victorian Year Book 1903, p. 314.

C8.15 AVERAGE DAILY NUMBERS IN SECURE PRISON CUSTODY, Victoria—1998 to 2000

Year	Males	Females	Total
1998	2 253	117	2 370
1999	2 371	143	2 514
2000	2 593	154	2 747

Source: Corrective Services, Australia, March Quarters (4512.0).

By the end of the twentieth century the average daily prison numbers for Victoria were 2,593 males and 154 females in secure custody (table C8.15), and a further 334 people in open prison custody. Over the century the population of Victoria increased from 1,196,213 to 4,741,468—a four-fold increase, while the male prison population increased by a factor of 2.7, and the female prison population remained constant.

There had been an Australian boom in prison buildings from 1850 to 1880. There was, in the last decade of the 20th century, another prison building boom, and these new prisons replaced the 100-year-old prisons which housed more than half of all prisoners until the late 1980s.

There are significant variations around Australia in the rate of imprisonment. As can be seen from table C8.16, the Northern Territory stands out, while Western Australia and Queensland are well above the national average. South Australia and Tasmania are well below the national average, while Victoria and the ACT have by far the lowest rates.

C8.16 PERSONS IN PRISON CUSTODY—December 1999

Jurisdiction	Rate per 100,000
New South Wales	147.4
Victoria	84.2
Queensland	190.5
South Australia	114.8
Western Australia	208.3
Tasmania	105.4
Northern Territory	445.8
Australian Capital Territory	75.7

Source: Adapted from ABS 4512.0, March 2000 p. 7.

There is considerable debate about what it is that causes prison populations to rise and fall. There are no clear explanations for variations between jurisdictions. Freiberg and Ross (1999, p. 53) note that studies which attempt to correlate crime rates with imprisonment rates have proved to be contradictory and confusing, though Victoria and Tasmania with relatively low crime rates also have relatively low imprisonment rates. Queensland, as the graphs above show, is a relatively low crime State, yet its imprisonment rate is very high.

In 1997 the State with the highest crime rate (Western Australia) had 1.7 times as much crime as the lowest ranked State (Victoria), yet the jurisdiction with the highest imprisonment rate (Northern Territory) had six times that of the lowest (Tasmania) (Freiberg and Ross 1999, pp. 61–62).

Other explanations for variations in prison rates can be found in demography—the prison population is overwhelmingly males in early adulthood; masculinity rates—the higher the rate the higher the imprisonment; the size of Indigenous populations—enormous over-representation, but insufficient to explain inter-jurisdictional differences; and prison capacity—a bed built is a bed filled, though as we saw above, in 1903 Victoria was operating at less than half capacity.

Official statistics at the beginning of the century did not deal with Aboriginality nor ethnicity.

Of the 20,455 prisoners in December 1999, 3,916 were Indigenous people (19% of the Australian prison population). The rate of imprisonment for Indigenous persons was

1,727 per 100,000 adult Indigenous population. The ABS (4512.0, December Quarter 1999, p. 5) reports that at the end of the century the Indigenous rate of imprisonment was 15 times the non-Indigenous rate.

In 1987 a Royal Commission into Aboriginal Deaths in Custody was established. This Royal Commission found that the over-representation in prisons and in their contacts with the criminal justice system was a significant factor in Aboriginal deaths in custody.

The Australian Institute of Criminology monitors all deaths in prison and police custody. From 1980 to 1999 there were 846 deaths in Australian prisons. Of these 393 (or 46.4%) were suicides. On average there have been 42.3 deaths per year over the two decades. Of the 846 deaths, 132 were of Indigenous people—15.6% of the total. Some 44% of Indigenous deaths were by suicide compared with 47% of non-Indigenous deaths (Dalton 1999; Dalton 2000).

One cause of death in prison which no longer occurs is that of execution by the state. In 1900 there were 10 executions (seven of which were in Western Australia) and in 1901 there were eight (five in Queensland and three in New South Wales). The numbers declined to between two and six for every year until 1923—the first year in over 100 years in which there were no executions. There were between one and three executions in 26 of the next 44 years (until abolition of the death penalty in 1967).

The 10 and 8 executions in 1900 and 1901 were down considerably from the peak years of 1826 to 1830 when the annual numbers of executions were 75, 59, 39, 19 and 80 (and this was in New South Wales and Tasmania only!).

While the ABS has conducted an annual census of prisoners since 1994 (and the AIC for several years before then) we know little more about prisoners than their demographic characteristics and their offences. Of the many immigrant groups in Australia nearly all have rates of imprisonment lower than that of the Australian-born population. In 1998 there were four groups that had imprisonment rates higher than those of Australian-born: those born in New Zealand and Oceania; Turkey; Viet Nam; and Lebanon (Carcach and Grant 2000).

Prison numbers have increased sharply in Australia in the 1990s, and one line of argument is that changes to our mental health system, and in particular the move to deinstitutionalisation, have put out onto the streets many who would otherwise not be at risk of minor offending and victimisation.

The conditions in prisons today are significantly better than a century ago. In the early 1890s in New South Wales those serving sentences of up to 14 days were to receive only bread and water during their term of imprisonment. Offenders serving sentences from 14 days to six months were to alternate on a weekly basis between bread and water and normal rations, while those serving sentences in excess of six months would be kept on bread and water for the final 14 days of their terms.

In addition to these dietary restrictions, offenders serving sentences of less than six months were required to sleep on a plank bed without a mattress. In 1894, with the Government's authorisation, the then Comptroller-General of Prisons reinstituted the gag in order to check the use of what he termed "blasphemous and frequently vile and filthy language". Intensive criticism saw the Government withdraw this authority in the following year (Grabosky 1977, p. 99).

A new Comptroller-General, Fredrick W. Neitenstein, was appointed in 1896 and his concern was largely with reform and rehabilitation rather than punishment, deterrence and retribution. The new century began with Neitenstein lamenting the fact that his prisons were warehouses for the cast-offs of society, people with substance abuse problems, mental illness, intellectual impairment and low levels of education and employment. A century later, these characteristics describe many in Australia's prisons today.

Drunkenness

Much of the writing on Australian history of the 18th and 19th centuries focuses on drunkenness. In Peter Grabosky's seminal history of criminal behaviour in Sydney, there are the same number of index entries for drunkenness as there are for theft, rape, robbery, murder, homosexual behaviour, and domestic violence put together (Grabosky 1977).

The first Year Book of the Commonwealth of Australia (covering the years from 1901 to 1907) had several tables on drunkenness. About 40% of all convictions in Magistrates' Courts in the first years of the century were for drunkenness. From 1901 to 1906 the number of convictions fell from 57,212 to 45,843—though convictions as a proportion of cases remained constant at around 90%. It can be seen that a great deal of police and court resources at the beginning of the century were devoted to drunkenness. So too was a great deal of statistical endeavour. The Year Books of the various States all devoted several pages to drunkenness. The first Commonwealth Year Book noted:

> "The convictions for drunkenness taken by themselves are not an altogether satisfactory test of the relative sobriety of the inhabitants of each State, forasmuch as several important factors must be taken into consideration. The age constitution, for example, of the people is by no means identical in each State, Western Australia having by far the largest proportion of adult males. The avocations of the people affect the result, since persons engaged in strenuous callings are, on the whole, more likely to indulge in alcoholic stimulants than those employed in the less arduous ones. The distribution of the population is also a factor, it being obvious that the likelihood of arrest or summons for drunkenness is greater in the more densely populated regions, and lastly, so also is the attitude of the police and public generally in regard to the offence" (Commonwealth Year Book 1908, p. 762).

It also pondered on the treatment of drunkenness as a crime:

> "Though the problem of the correct method of dealing with dipsomania is by no means an easy one, it seems fairly clear that the present plan of bringing offenders before magistrates, and subjecting them to the penalty of imprisonment or fine, has little deterrent effect, as the same offenders are constantly reappearing before the courts. Further, the casting of an inebriate into prison, and placing him in his weakened mental state in the company of professional malefactors, doubtless tends to swell the ranks of criminals and certainly tends to lower his self-respect, and examination of the prison records in New South Wales some years ago disclosed the fact that over 40% of the gaol population had commenced their criminal career with a charge of drunkenness…With regard to drunkards, however, Captain Neitenstein, the Comptroller of Prisoners in New South Wales, advocates the entire abandonment of the system of repeated fine or imprisonment in favour of a course of hospital treatment" (Commonwealth Year Book 1908, p. 762).

Concern with drunkenness did not abate, and the 1951 Year Book carried tables showing numbers of cases of drunkenness, numbers of convictions, and convictions per 10,000 population. The plaintive warning of the first Year Book (above) seems to have fallen on deaf ears, as it was repeated almost word-for-word half a century later in the 1951 Year Book (and presumably annually in the intervening Year Books!).

Towards the end of the century public drunkenness has been decriminalised, and this allows police to devote time to other priorities. This is not to say that drunkenness is not a problem. The context has changed.

In the first half of the century drunkenness was seen as a crime in itself. Today it is seen as a precipitating factor. Significant numbers of those charged with assault and other crimes against the person are affected by alcohol. At the end of the century there was concern with the drinking habits of young people, and binge drinking in particular. In 2000 the Australian Institute of Criminology completed a monograph entitled *Alcohol, Young Persons and Violence* in which topics addressed included: An indicator approach to the measurement of alcohol-related violence; Alcohol and disorder in the Australian community; Alcohol use and violent behaviour among youth: Alcohol and homicide in Australia; Reducing alcohol- related harm in and around licensed premises; and many others (Williams 2000).

At the end of the 20th century, substance abuse was a matter of considerable public policy concern. Although people were no longer arrested and processed for drunkenness, there was strong evidence of illicit drug use related to the commission of property and violence crime. The Australian Institute of Criminology conducts a national project entitled Drug Use Monitoring

Australia (DUMA) in which people detained by police are urine tested and a drug history taken (not by police, but by researchers). Alcohol is not tested for in this project.

The first DUMA report analysing data collected in 1999 showed that of those charged with violent crime 70% tested positive to any drug, 58% positive to cannabis, 18% to opiates, and 12% to amphetamines. The figures were higher for those charged with property offences. Of these detainees, 86% tested positive to any drug, 66% positive to cannabis, 43% tested positive to opiates, and 13% to amphetamines. The rate of testing positive to opiates was as high as 78% in one Sydney police lockup (Makkai 2000).

This project demonstrates the link between illicit drug usage, especially opiates, and property crime at the end of the century.

Police

Two features stand out when comparing police at the beginning and end of the century. Of Australia's 43,048 sworn police officers in 1999, 7,089 or 16.5% were women (table C8.17). At the beginning of the century none were women. While women are not well represented at senior levels, between one-quarter and one-third of constables, probationary constables, recruits and cadets are women.

The second feature is that at the end of the century there were 94,676 private police (security guards and others)—twice as many as there were public police in Australia (Prenzler and Sarre 1998).

As table C8.18 shows, the proportion of public police per 100,000 population has risen by 53% over the century (from 148.4 to 227.0). There were large rises in Victoria, South Australia and Tasmania, but interestingly the rate fell in Western Australia. Modern communications and transport now mean that fewer police can cover a larger area.

A simple description of police is that they are mainly a "body of people patrolling public places in blue uniforms with a broad mandate of crime control, order maintenance and some negotiable social service functions. They are supplemented by non-uniformed adjuncts concerned primarily with the investigation and processing of criminal offences and sundry administrative tasks" (Maguire, Reiner and Morgan 1994, p. 716).

C8.17 POLICE SERVICES, Composition—At 30 June 1999

Rank	Males no.	Females no.	Persons no.	Females %
Senior Executive(a)	81	2	83	2.4
Chief Superintendent(b)	65	2	67	3.0
Superintendent	392	17	409	4.2
Chief Inspector	131	2	133	1.5
Inspector	843	28	871	3.2
Senior Sergeant	1 724	73	1 797	4.1
Sergeant(c)	7 064	472	5 536	6.3
Senior Constable	15 063	2 691	17 754	15.2
Constable(d)	8 896	2 992	11 888	25.2
Probationary Constable(e)	899	485	1 384	35.0
Recruits	406	178	584	30.5
Cadets	57	31	88	35.2
Police Aides(f)	150	79	229	34.5
ACPO/Special Constable(g)	43	4	47	8.5
Other(h)	145	33	178	18.5
Total sworn officers	**35 959**	**7 089**	**43 048**	**16.5**

(a) Includes Commissioner/Chief Commissioner, Deputy Commissioner, Assistant Commissioner, Commander. (b) Includes Commanders in AFP and Northern Territory. (c) Includes Sergeant First Class in Western Australia, Sergeant qualified and unqualified in Tasmania. (d) Includes Constable First Class in New South Wales and Western Australia, Confirmed Constable in Victoria, Constable qualified and unqualified in Tasmania; Probationary Constable, Constable, Constable First Class and Senior Constable in the Northern Territory. (e) Includes Constable not confirmed in Victoria. (f) Includes Police Auxilliary in the Northern Territory. (g) Includes Special Constable unpaid in Western Australia and Aboriginal Community Police Officers (ACPO) in the Northern Territory. (h) Victoria includes reservists and Protective Security Officers (PSO).

Source: The Composition of Australia's Police Services—1999.

C8.18 POLICE OFFICERS, Number and Rate per 100,000 Population, Australia—1900 and 1999

Jurisdiction	no.	Rate per 100,000 population
1900(a)		
New South Wales	2 107	154.8
Victoria	1 480	123.7
Queensland	880	178.2
Western Australia	519	288.4
South Australia	363	100.2
Tasmania	250	144.6
Northern Territory	. .	. .
Australian Capital Territory	. .	. .
Australia	*5 599*	*148.4*
1999(b)		
New South Wales	13 471	210.1
Victoria	9 777	207.5
Queensland	7 519	214.1
Western Australia	4 850	260.6
South Australia	3 592	240.6
Tasmania	1 076	228.8
Northern Territory	876	454.2
Australian Capital Territory	663	213.8
Australia(c)	*43 048*	*227.0*

(a) From Source Book of Australian Criminal and Social Statistics 1804–1988. (b) Rates calculated using (ABS) Population by Age and Sex, Australian States and Territories, June 1999 (3201.0). (c) Includes AFP.

Source: Source Book of Australian Criminal and Social Statistics 1804–1988; Population by Age and Sex, Australian States and Territories, June 1999 (3201.0).

At the end of the century one of the important features in police recruitment was education. A significant proportion of new recruits are university graduates. At the beginning of the century the major qualification to become a police officer was whether one was physically big enough. At the end of the century the issue was whether one was smart enough. A lot of police work involves sitting in front of a screen because police are information dependent—their value lies in how they obtain, process, encode, decode and use information. A lot of this comes from the application of sophisticated technology. The whole structure of our information technology requires an analytical mind, and the ability to learn fast. Crime solving and dealing with evidence such as DNA typing, biochemical assay, automated database fingerprint matching, accident reconstruction, arson analysis, weapons innovation, not to mention non-coercive persuasive techniques, such as mediation, hostage negotiation and rape counselling, all requires skills that need to be upgraded regularly.

In addition to these highly sophisticated skills, many police work with complex human relations issues. Unlike many professionals, police do not work in surroundings they control. Many work where the rest of us would not want to go: dark back alleys, domestic situations that have got out of hand, and venues that are physically and socially uninviting. They work in the seamy side of life, with sleaze, lust, perversion, greed, rage and malice—not the sort of thing professionals would choose as their working context.

Young men and women, mostly under 35 years of age, continually deal with life situations that require either a very strong education in the social and behavioural sciences, or long years of life experience. The increased numbers of private security and law enforcement officers is a demonstration of the complexity of policing and the willingness of certain parts of the community to pay an additional premium for a level of protection they deem appropriate for their interests. Private law enforcement covers not only the armed guards who escort payroll or those who monitor entertainment venues, but also the many who deal with issues of computer security, hackers, cyber crime and a range of sophisticated investigators.

In 1993 Australia's Police Commissioners laid out a vision for the end of the century:

"By the year 2000", they said, "we will have a safer and more secure community. The focus will be on

- A partnership approach to policing
- An increase in community confidence in police
- A reduction in the incidence, effects and fear of crime
- An increased level of community safety".

Who knows what vision they will set for the end of this century?

Fraud

While fraud is an old crime, technological, social, demographic and economic developments have brought about changes in the form fraud takes and how it is perpetrated. In simple terms, fraud involves the use of dishonest or deceitful conduct in order to obtain some unjust advantage over another (Smith and Grabosky 1998).

Fraud is often regarded as a modern day crime, but it has been around for a very long time. Plotting the trend of the extent of fraud over this century is not a useful exercise, as many frauds are not recorded, and any attempt to suggest that the number of frauds per 100,000 population has risen or fallen is based on shaky data.

Some attribute the beginnings of fraud to the Industrial Revolution, but there seems to be little reason for thinking that it was not around before then, as any sort of trade or dealings between people seems to offer the opportunity to commit fraud.

In the early days of colonial Australia, the shortage of currency and the resultant use of promissory notes, sometimes thousands of pounds worth, gave opportunity for fraud. Other simpler cases include one Emily Syster, who was a 'begging letter imposter' some time in the early 1840s. She wrote to various prominent figures, including the Bishop, under different guises—as an old officer, a pregnant woman, a ruined tradesman. The fraud was eventually detected through her handwriting. Other examples include false insurance claims, such as claiming for the theft of four watches when in fact only two were stolen (Smith and Grabosky 1998).

In the early days of settlement in Australia, fraud was facilitated by communication methods as it is today—only in those days it was its slowness rather than the electronic rapidity of today. When one Benjamin Boyd borrowed money in England ostensibly to establish the Royal Bank of Australia in 1839, it was very difficult for his creditors to keep track of how their money was being used. Boyd must have been quite a persuasive person as he was permitted by the other directors of the Royal Bank to set off for Australia with the money that had been invested in the bank, and was granted a loan for his own use. Very little of the money was in fact used in banking operations. Boyd spent most of the money on establishing a shipping business, investing in whaling works, the setting up of a wool washing dam on Sydney Harbour and the building of Boyd Town on the southern coast of New South Wales. Apart from being able to conceal his business failures through false reports, Boyd's fraudulent activities were assisted by the length of time it took for communication to take place between one side of the world and the other (Sykes 1988).

By the end of the twentieth century, expanding computer literacy has increased the number of prospective fraud offenders, while new technologies allow easier and cheaper access to a much larger pool of prospective victims. At the end of the century, in addition to old fashioned scams we have seen evidence of Identity-related Fraud, Internet Fraud, Credit Card Fraud, Advance Fee Fraud, and Nursing Home Fraud, to mention just a few types.

These few types provide an indication of the range and complexity of dishonesty offences that come to the attention of the police in Australia. There are, of course, many others that are either not discovered or not reported. These cases also show that fraud is invariably complex, and not possible to be described in detail here.

However, many fraud types involve an international element, and rely upon modern technologies for their commission. The proliferation of electronic funds transfer systems has enhanced the risk that such transactions will be intercepted and funds diverted. Most of the large scale electronic funds transfer frauds which have been committed have involved the interception or alteration of electronic data messages transmitted from bank computers.

It would be reasonable to say that most of the fraud types that existed at the beginning of the century were still with us at the end, but new technologies, and processes of globalisation, have vastly expanded the range of frauds that exist at the end of the century.

Restorative justice

At the beginning of the century most infractions were dealt with by the courts, and the data in early Year Books document this in very great detail. By the end of the century our court statistics were not very useful, and throughout Australia processes were in place to divert many offenders (particularly young offenders) from the courts to other forms of adjudication. This will have a significant impact on future court statistics.

Courts in many jurisdictions are overloaded, and the theory being tested is that diversion is an opportunity for a second chance for many young people for whom a court appearance and the subsequent consequences may be counterproductive.

The process of restorative justice involves bringing together victims and offenders, and others who may have an interest in a particular offence, to deal collectively with how to resolve the impact of the offence, and to chart a path for the future.

In addition to the victim and the offender we might see family members and other members of their communities who may be affected or who may be able to help prevent a recurrence of the offence. These meetings are facilitated by a mediator who helps bring about a collective resolution. The goals of meetings are to heal the relationship between the victim and offender, provide restitution and healing for the victim, reassure the community, and encourage acceptance of responsibility and healing for the offender through apology and reparation.

Restorative justice seeks to 'make things as right as possible' for all parties involved. Offenders are encouraged to learn new ways of acting and participating in the community, as soon as the safety concerns of the victim, community and offender are satisfied. Restorative justice seeks maximum voluntary cooperation and minimum coercion, from all parties involved.

There are many types of restorative justice practices.

Diversion is the channelling of an offender or suspect away from the criminal justice process. This may take the form of a caution or warning, diversion at the pretrial stage for resolution of the case by some informal procedure, or alternatives to conviction or sentence following a trial.

Another restorative justice practice is family group conferencing, which can be conducted in a variety of ways. All include the young offender, the family, and the victim in the conferencing process, and others who may be deemed appropriate or desired. During the meeting the participants are encouraged to express their feelings about the offence. Agreement is then sought on appropriate forms of restitution and reparation.

An alternative to this approach is victim-offender mediation, in which only the victim and offender meet in the presence of a mediator. Although family members may be present they are not active participants in the meeting.

Around Australia at the end of the twentieth century, research is being undertaken to assess the impact and usefulness of these various approaches.

Diversionary programs introduced in Aboriginal communities in Australia show potential. The continued over-representation of Indigenous people in custody, and particularly Aboriginal young people, has led to the development of the Local Justice Initiatives Program. The program recognises that it is the members of Aboriginal communities themselves who are best placed to plan and implement effective strategies to address these problems in ways appropriate to their particular needs and circumstances.

Concluding comment

We live in a world of rapid and sometimes unfathomable change. It would be trite to list the technological developments that have changed our lives and criminal activities. What is obvious is that our ability to deal with social change lags badly behind our ability to deal with technological change.

Anticipating crime of the future and dealing with it is no easy feat. It was not very long ago that we could not have imagined crimes

like credit card fraud, superannuation fraud, computer hacking etc., nor have we had the haunting spectre of the possibility of having genetic predictions, prior to birth, of an individual's likelihood of growing up violent. Globalisation, the continuing movement of products, finance, people, firearms, illicit drugs, plants and animals, and information, will test us severely. What we know is that, however we anticipate the future, it is not going to be a continuation of the past.

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References

Australian Bureau of Statistics 1998, *Corrective Services Australia, March Quarter 1998* (4512.0).

—1999, *Corrective Services Australia, March Quarter 1999* (4512.0).

—2000, "Robbery Down First Time in 7 Years—ABS Figures", Media Release 82/2000, 28 June.

—2000, *Corrective Services Australia, March Quarter 2000* (4512.0).

—2000, *Corrective Services Australia, December Quarter 1999* (4512.0).

Carcach, C. and Grant, A. 2000, "Australian Corrections: Main Demographic Characteristics of Prison Population", *Trends & Issues in Crime and Criminal Justice*, No. 150, Australian Institute of Criminology, Canberra..

Dalton, V. 1999, "Aboriginal Deaths in Prison 1980 to 1998: National Overview", *Trends & Issues in Crime and Criminal Justice*, No. 131, Australian Institute of Criminology, Canberra.

Dalton, V. 2000, "Australian Deaths in Custody & Custody-Related Police Operations 1999", *Trends & Issues in Crime and Criminal Justice*, No. 153, Australian Institute of Criminology, Canberra.

Freiberg, A. and Ross, S. 1999, *Sentencing Reform and Penal Change: The Victorian Experience*, The Federation Press, Sydney.

Grabosky, P. 1977, *Sydney in Ferment: Crime, Dissent and Official Reaction 1788 to 1973*, Australian National University Press, Canberra.

Knibbs, G.H. 1908, *Official Year Book of the Commonwealth of Australia, No. 1 1901–1907*.

Maguire, M., Reiner, R., Morgan, R. 1994, *The Oxford Hand Book of Criminology*, 1st Edition, Clarendon Press, Oxford.

Makkai, T. 2000, "Drug Use Monitoring in Australia: 1999 Annual Report on Drug Use among Adult Detainees", *Research and Public Policy Series*, No. 26, Australian Institute of Criminology, Canberra.

Mouzos, J. 2000, "Homicidal Encounters: A Study of Homicide in Australia 1989–1999", *Research and Public Policy Series*, No. 28, Australian Institute of Criminology, Canberra.

Mukherjee, S. 1999, "Bringing to Justice" in G. Newman, (ed.) *Global Report on Crime and Justice*, Oxford University Press, New York, pp. 65–88.

Mukherjee, S., Scandia, A., Dagger, D., and Matthews, W. 1988, *Source Book of Australian Criminal and Social Statistics 1804–1988*, Bicentennial Edition, Australian Institute of Criminology, Canberra.

Prenzler, T. and Sarre, R. 1998, "Regulating Private Security in Australia", *Trends and Issues in Crime and Criminal Justice*, No. 98, Australian Institute of Criminology, Canberra.

SCRCSSP (Steering Committee for the Review of Commonwealth/State Service Provision) 2000, *Report on Government Services 2000*, AusInfo, Canberra.

Smith, R. and Grabosky, P. 1998, *Taking Fraud Seriously—Issues and Strategies for Reform*, Institute of Chartered Accountants in Australia Fraud Advisory Council, Sydney.

Sykes, T. 1988, *Two Centuries of Panic: A history of corporate collapses in Australia*, Allen & Unwin, Sydney.

The Composition of Australia's Police Services—1999, Australian Institute of Criminology Website: *http//www.aic.gov.au*

Victorian Year Book, 1903, Office of the Government Statist, Melbourne, 1903.

Williams, P. (ed.) 2000, "Alcohol, Young Persons and Violence", *Research and Public Policy Series*, No. 35, Australian Institute of Criminology, Canberra.

Wilson, R. 1951, *Official Year Book of the Commonwealth of Australia, No. 38*, Commonwealth Bureau of Census and Statistics, Canberra.

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Introduction

Cultural and recreational activities are essential to a shared sense of quality of life. They take many forms including involvement in creative and performing arts, music, literature, cultural heritage, libraries, radio, television and sports.

This chapter reviews a range of cultural and recreational activities which Australians undertake and provides a statistical summary (where available) for those activities.

Cultural and natural heritage

Australia's heritage draws on its cultural and natural environments and the history of its people. It encompasses all the things that are significant to Australians which have survived from the past.

Cultural heritage includes historic places of significance, such as: old towns and residential and commercial buildings; Indigenous ceremonial grounds and rock art galleries; shipwrecks and streetscapes; as well as paintings, objects, books, aircraft and natural history specimens. Increasingly what was formerly intangible, such as traditions, customs and habits, is being recorded and documented in photographs, films, tapes and digital records.

Movable cultural heritage refers to items of cultural heritage which are capable of being transported. Australia is one of only a few countries which has developed and published a specific policy and strategy to care for its movable cultural heritage. Through the Heritage Collections Council, governments at all levels work collaboratively with the museums sector and non-government organisations to conserve, promote, manage and provide access to Australia's collections of movable cultural heritage.

Natural heritage includes places of scientific, archaeological, aesthetic and ecological importance. It can also include geological features and landscapes. Extensive areas of coastline, forests, wetlands and deserts are included in national parks, nature reserves and wilderness areas. Many smaller sites are important habitats for native flora and fauna, enabling the conservation of threatened species. Many natural places are significant to Indigenous communities for cultural reasons.

Conservation of heritage places involves identifying them, surveying their values, and classifying and managing them. These functions are shared between all levels of government and their statutory authorities, with assistance from academic and professional bodies, individuals and community conservation organisations such as the National Trusts, and conservation councils in each State and Territory.

The Commonwealth Government works in partnership with the community and with State and Territory Governments. It undertakes heritage activities on its own account where the implications of these actions go beyond State or local boundaries. Examples of this include the nomination of sites for World Heritage listing, the protection of Aboriginal heritage, and advice about proposals which might affect places entered in the Register of the National Estate—Australia's national heritage list.

National Estate

The term 'the National Estate' was coined by William Clough Ellis, a British architect in the 1940s. It was introduced into Australia when the Federal Government set up a Commission of Inquiry into the National Estate, headed by Hon. Mr Justice R.M. Hope. The inquiry aimed to "preserve and enhance the quality of the National Estate". Following the recommendations of this inquiry, the Australian Heritage Commission Act was passed in 1975 with the support of all political parties.

'The National Estate' is defined in the legislation as:

> '' ... those places, being components of the natural environment of Australia, or the cultural environment of Australia, that have aesthetic, historic, scientific or social significance or other special value for future generations as well as for the present community''.

Both publicly and privately owned places form part of the National Estate. It encompasses places which are important to local communities, as well as those which are of regional or State significance. The National Estate also includes places which have national or international significance. Broad stretches of coastline, desert, forest and national parks, as well as isolated geological monuments and small areas which might provide habitats for endangered plant or animal species are part of the National Estate. It can cover whole villages and suburbs, streetscapes, single mansions, cattlemen's huts,

railway yards and other reminders of the evolution of Australia's society and economy. Places of Aboriginal or Torres Strait Islander significance such as rock engravings, galleries of rock art, fish traps, carved trees, meeting places, ceremonial sites and reminders of early European settlement, such as mission stations, are part of Australia's National Estate.

The Australian Heritage Commission has a statutory obligation to identify the National Estate and has established the Register of the National Estate to place on public record Indigenous, Historic and Natural places to ensure that they are appropriately managed and conserved.

During 1999–2000, the number of places in the Register of the National Estate increased by a net 253 from the previous year to 12,617. This compared with a net increase of 403 in 1998–99. Details by State and type of National Estate place, for 1999–2000 and 1998–99, are shown in table 12.1.

More comprehensive statistics on the types of places on the Register of the National Estate can be found in the annual reports of the Australian Heritage Commission.

Natural environment

The natural environment includes conservation areas and areas used for outdoor recreation such as: national terrestrial and marine parks or reserves; other natural areas on the National Estate or equivalent registers of the State or Territory Governments; and tourist caves. Management of the natural environment ensures the conservation of local flora and fauna, controls or excludes the development of the area for fishing, forestry, mining or agriculture and, where appropriate, facilitates access by the general public.

As well as establishing protected areas, governments promote protection of the broader environment through laws and funding programs. These protect the basic environmental support systems, such as waterways, and help to restore degraded areas through tree planting and bush regeneration schemes.

National parks

National parks and other protected areas are established under Commonwealth or State/Territory laws. There is no coordinating legislation, although all governments participate in national forums and cooperate in joint programs to achieve a common purpose. Most national parks and other protected areas in Australia are declared and managed by State and Territory Governments. The Commonwealth Government declares and manages parks and reserves on land owned or leased by the Commonwealth, in Commonwealth waters and on Aboriginal land leased to the Commonwealth.

Over 50 different designations are given to protected areas by the Commonwealth, State and Territory management agencies, the most common being 'national park' and 'nature reserve'. Management of these different designations varies, from strictly protected areas with limited public access, to areas where recreation is encouraged but resource development is not, to multiple use areas where resource utilisation, recreation and nature conservation are all practised.

12.1 PLACES ON THE REGISTER OF THE NATIONAL ESTATE, By Number and Type

	Indigenous places		Historic places		Natural places		Total	
State/Territory	1998–99	1999–00	1998–99	1999–00	1998–99	1999–00	1998–99	1999–00
New South Wales	218	219	2 973	3 020	443	453	3 634	3 692
Victoria	106	106	2 280	2 334	215	239	2 601	2 679
Queensland	149	152	731	736	280	304	1 160	1 192
Western Australia	74	74	916	958	244	254	1 234	1 286
South Australia news	147	147	1 165	1 155	383	385	1 695	1 687
Tasmania	65	65	1 178	1 183	237	242	1 480	1 490
Northern Territory	104	104	130	147	59	59	293	310
Australian Capital Territory(a)	27	27	157	169	30	30	214	226
External Territories	—	—	36	37	17	18	53	55
Total	**890**	**894**	**9 566**	**9 739**	**1 908**	**1 984**	**12 364**	**12 617**

(a) Includes Jervis Bay.

Source: Australian Heritage Commission.

Use of national parks

Table 12.2 gives the numbers and profile of people visiting national parks in Australia. These findings are derived from an ABS household survey, the Population Survey Monitor. Over 12 months in 1996–97 a total of 3.3 million people (25.3% of the Australian population aged 18 and over) went to a national park in the three month period preceding conduct of the survey. Of these, 1.7 million were males and 1.6 million were females.

12.2 VISITORS TO NATIONAL PARKS—1996–97

Visitors	'000
Sex	
Male	1 725
Female	1 613
Total	*3 339*
Age	
18–24 years month years	520
25–34 years	846
35–44 years	920
45–54 years	536
55–64 years	281
65 years and over	235
Birthplace	
Australian-born	2 528
Overseas-born	810

Source: Population Survey Monitor, 1996–97.

National park organisations

The ABS Survey of Zoos, Parks and Gardens in respect of 1996–97 showed that there were 684 organisations operating national parks, and recreational parks and gardens. These organisations operated 462 individual national parks, 52,164 separate recreational parks and gardens, 270 wildlife sanctuaries, 42 tourist caves, and 24 marine parks at the end of June 1997 (table 12.3). See also the section *National parks and other protected areas* in *Chapter 14, Environment*.

12.3 NATIONAL PARKS AND RECREATIONAL PARKS AND GARDENS, Key Aggregates—1996–97

	Unit	
Organisations at end June 1997	no.	684
Locations at end June 1997		
National parks	no.	462
Recreational parks and gardens	no.	52 164
Wildlife sanctuaries	no.	270
Tourist caves	no.	42
Marine parks	no.	24
Total locations	*no.*	*52 963*
Area at end June 1997		
National parks	ha	25 964 351
Recreational parks and gardens	ha	3 386 354
Wildlife sanctuaries	ha	81 970
Tourist caves	ha	8 454
Marine parks	ha	42 605 725
Total area	*ha*	*72 046 854*
Employment at end June 1997		
Full-time	no.	15 035
Part-time	no.	1 611
Total employment	*no.*	*16 646*
Volunteers during June 1997	no.	10 679
Income	$m	1 347
Expenses	$m	1 120
Industry gross product	$m	543

Source: Zoos, Parks and Gardens Industry, Australia (8699.0).

Museums and art museums

Museums are defined by the International Council of Museums as institutions, generally housed in one or more buildings, primarily engaged in the collection, acquisition, conservation and exhibition of the material evidence of people, their culture and environment, for the purpose of education and enjoyment by the general public and/or specialists. Conceptually, museums include art museums and historical theme parks, such as Sovereign Hill, but exclude commercial art galleries as they are regarded as retail outlets. However, in the discussion below and in tables 12.4 and 12.5, museums and art museums have been treated as separate entities.

In many cases, State museums and art museums were established many years before their national counterparts. As a result, a number of notable national collections are housed in museums operated by or through State Governments, rather than in the national institutions. The main national museums, art museums and cultural institutions are the National Museum of Australia, the National Gallery of Australia, the Australian National Maritime Museum, the Australian War

Memorial, the National Science and Technology Centre (Questacon), and the National Portrait Gallery. There are over 1,700 museums and art museums operating in Australia.

An on-line national access program, *Australian Museums On Line* (AMOL), has a database of information on over 1,000 museums. The site aims to offer access to information about every item held in museums in Australia. AMOL is an initiative of the Heritage Collections Council, which coordinates national approaches to caring for, and promoting access to, Australia's heritage collections. More detailed information on AMOL is shown under the heading *Multimedia* in this chapter.

Museums Australia, the peak industry association, has a membership base comprising those who work and contribute to Australia's museums and public galleries. The association's primary role is to advocate for the industry and provide a range of professional services to its members. The services are offered at a national, State and interest group level, and include professional development and training opportunities, newsletters, advocacy and representation.

Museum and art museum attendance

The Survey of Attendance at Selected Culture/Leisure Venues, conducted by the ABS in April 1999, revealed that 3.0 million people or 19.9% of the Australian population aged 15 and over, had visited a museum at least once in the previous 12 months. A total of 3.2 million people (21.2% of the Australian population aged 15 and over) had visited an art museum.

12.4 ATTENDANCE(a) AT MUSEUMS AND ART MUSEUMS—1999

	Museums	Art museums
Attendees	'000	'000
Sex		
Male	1 378.5	1 315.1
Female	1 596.9	1 844.7
Total	*2 975.4*	*3 159.7*
Age		
15–24 years	541.7	564.4
25–34 years	588.1	584.5
35–44 years	719.5	627.4
45–54 years	529.3	639.7
55–64 years	309.4	369.6
65 years and over	287.3	374.1
Birthplace		
Australian-born	2 245.3	2 348.7
Overseas-born	730.1	811.0

(a) Attendance in the 12 months prior to interview.

Source: Attendance at Selected Cultural Venues, April 1999 (4114.0).

Museums and art museums industry

The ABS conducted a survey in respect of 1996–97 of employing businesses and organisations whose main activity was the provision of museum services to the public. Also surveyed were the museum activities of local government authorities, where their operations had paid staff.

In total, there were 224 employing organisations in the museums industry at 30 June 1997. These organisations operated from a total of 352 locations. There were 69 local government authorities which provided a museum service, a further 32 organisations operated an art museum, 21 operated historic houses and 102 operated other types of museums. More detailed information from this survey is shown in *Chapter 21, Service industries*.

12.5 SELECTED MUSEUMS, Key Aggregates—1997–98

	Unit	Art museums	Historic places	Other museums	**Total**
Locations at end June 1998	no.	195	283	995	**1 473**
Admissions	'000	*5 010.0	2 158.5	6 116.6	**13 285.1**
Employment at end June 1998	no.	748	301	978	**2 027**
Volunteers during June 1998	no.	2 403	2 793	10 444	**15 640**
Income	$m	38.3	*10.9	36.2	**85.5**
Expenses	$m	35.4	8.0	33.1	**76.5**

Source: Selected Museums, Australia, 1997–98 (4145.0).

The ABS also conducted a survey in respect of 1997–98 of all museum locations other than the 260 non-government locations surveyed in respect of 1996–97. The 1997–98 survey of selected museums included: those operated by non-profit organisations and staffed by volunteers; those operated by owners or working proprietors who did not employ staff; and those which were small parts of government and corporate organisations (such as local government museums (again) and universities).

There were 1,473 of these museum locations operating at 30 June 1998 (table 12.5). Of these, 195 were art museums, including craft museums, public galleries and displays of art and craft works. There were also 283 historic places, including house museums, which housed heritage collections open to the public. Of the 995 other museums, there were 117 transport and maritime museums, 779 other social history museums/displays, 84 natural history and science museums/displays and 15 Indigenous keeping places.

Botanic gardens, zoological parks and aquaria

Botanic gardens

Botanic gardens and arboreta (tree collections) are scientific and cultural institutions established to collect, study, exchange and display plants for research and for the education and enjoyment of the public. Some botanic gardens augment the living botanical displays with a herbarium (a scientific collection of dried preserved plant specimens used for the accurate classification and identification of plants and plant material and for taxonomic studies), and some botanic gardens (those in Adelaide, Melbourne and Sydney) use annexes to extend the range of cultivated plant displays.

At the beginning of the 20th century, at the time of Federation, Australia had about 30 botanic gardens. Most of these were established with the support and encouragement of Ferdinand von Mueller, Victoria's Government Botanist in the second half of the 19th century.

At the beginning of the 21st century Australia has about 100 botanic gardens and about 20 significant arboreta. Most of these botanic gardens and arboreta were developed after the Second World War. There were two periods of focused development when public funding became available for such projects: the lead-up to the Captain Cook Bicentenary in 1970 and the Australian Bicentenary Year of 1988. Many of the recently established gardens operate under the auspices of local government community groups and have a conservation focus.

There are major botanic gardens in each capital city, managed by the State or Territory Governments (except for Brisbane, which is municipal, and Canberra, which is Commonwealth). The Commonwealth also manages the Booderee Botanic Gardens at Jervis Bay on behalf of the traditional Aboriginal owners of the land, the Wreck Bay Aboriginal Community Council, under arrangements in place since December 1995.

The Council of Heads of Australian Botanic Gardens (CHABG), with its secretariat located at the Australian National Botanic Gardens in Canberra, coordinates the liaison between the various botanic gardens in Australia and represents these gardens in national and international matters.

The Australian National Botanic Gardens occupies a 90 hectare site on the lower slopes of Black Mountain in Canberra. It contains the national collection and one of Australia's most comprehensive displays of living native plants. Officially opened in 1970, in September 1991 it was proclaimed a reserve under the *National Parks and Wildlife Conservation Act 1975*, which provided legal protection for the collections. It now operates within the framework of the *Environment Protection and Biodiversity Act 1999*. The Australian National Botanic Gardens maintains about 100,000 plants constituting about 6,500 species, one-third of the vascular plants recorded for Australia. It receives about 330,000 visitors each year, with peaks in October for the spring flowering and January for the holiday tourist season. It is on the Register of the National Estate in recognition of its importance as a research and teaching-based botanic garden established to display and interpret Australian flora. The Australian National Herbarium, containing the dried specimens of the living plants in the Gardens, is managed jointly with CSIRO Plant Industry as part of the Centre for Plant Biodiversity Research. It currently houses over one million herbarium specimens.

Attendance at botanic gardens

The 1999 Survey of Attendance at Selected Culture/Leisure Venues showed that almost 5.4 million people (36.1% of the Australian population aged 15 and over) attended a botanic garden at least once in the 12 months ending 30 April 1999 (table 12.6).

12.6 ATTENDANCE(a) AT BOTANIC GARDENS—1999

Attendees	'000
Sex	
Male	2 427.1
Female	2 952.8
Total	*5 379.8*
Age	
15–24 years	902.4
25–34 years	1 152.5
35–44 years	1 146.3
45–54 years	984.7
55–64 years	561.9
65 years and over	631.9
Birthplace	
Australian-born	3 869.1
Overseas-born	1 510.7

(a) Attendance in the 12 months prior to interview.

Source: Attendance at Selected Cultural Venues, April 1999 (4114.0).

Botanic gardens industry

The ABS Survey of Zoos, Parks and Gardens in respect of 1996–97 showed that there were 53 employing organisations operating botanic gardens at the end of June 1997. The total area of botanic gardens was 2,971 hectares (table 12.7).

12.7 BOTANIC GARDENS, Key Aggregates—1996–97

	Unit	
Organisations at end June 1997	no.	53
Locations at end June 1997		
Botanic gardens	no.	64
Arboreta	no.	8
Herbaria	no.	20
Total	*no.*	*92*
Hectares at end June 1997		
Botanic gardens	ha	2 905
Arboreta	ha	66
Total	*ha*	*2 971*
Employment at end June 1997		
Full-time	no.	948
Part-time	no.	182
Total	*no.*	*1 129*
Income	$m	82.6
Expenses	$m	70.2
Industry gross product	$m	48.2

Source: Zoos, Parks and Gardens Industry, Australia, 1996–97 (8699.0).

Zoological parks and aquaria

Zoological parks and aquaria (i.e. animal, fauna, bird life and reptile parks, aquaria, aviaries, butterfly houses and dolphinariums) are primarily engaged in the breeding, preservation, study and display of native and/or exotic fauna in captivity, enclosures or natural environments, so as to be accessible to the general public. 'Marine parks' refers to legally declared marine parks such as the Great Barrier Reef Marine Park and the Great Australian Bight Marine Park. These have been created for conservation purposes, and are treated for statistical purposes as part of the natural environment.

Melbourne was the location of the first zoo in Australia; the Melbourne Zoo was founded in 1857. There are now zoos and wildlife sanctuaries throughout Australia. As well as the four traditional zoos in Sydney, Melbourne, Adelaide and Perth, there are numerous wildlife parks and sanctuaries, some associated with urban zoos and others privately owned. Some of the better known zoological parks and sanctuaries are Healesville Sanctuary (60 km from Melbourne), the Western Plains Zoo (Dubbo), Victoria's Open Range Zoo at Werribee (a Melbourne suburb), The Territory Wildlife Park (Darwin), Monarto Zoological Park (70 km from Adelaide), Lone Pine Koala Sanctuary (Brisbane) and Currumbin Sanctuary (Gold Coast). The best known aquarium in Australia is Sea World at Surfers Paradise, Queensland.

The Australasian Regional Association of Zoological Parks and Aquaria (ARAZPA) was formally established in 1990 at Auckland Zoo, New Zealand, and was incorporated in Australia in 1991. The Australian regional office is located in New South Wales. ARAZPA is administered by a Board of Management, with committees addressing the region's species management program, ethics, budget and policy review, and animal husbandry. There are currently 45 full institutional members, which are zoological parks and aquaria, along with a large number of individual memberships. A key purpose of the association is to promote and maintain professional standards of operation in the zoological industry and to maximise its collective resources for the conservation of biodiversity.

Zoological parks and aquaria attendance

The 1999 Survey of Attendance at Selected Culture/Leisure Venues shows that over 5 million people (33.9% of the Australian population aged 15 and over) visited a zoological park or aquarium during the 12 months ending April 1999 (table 12.8). Of these, 3.1 million (20.8% of the Australian population aged 15 and over) visited a zoo at least once during the year.

12.8 ATTENDANCE(a) AT ZOOLOGICAL PARKS AND AQUARIA—1999

Attendees	'000
Sex	
Male	2 301.0
Female	2 747.5
Total	*5 048.5*
Age	
15–24 years	950.3
25–34 years	1 279.6
35–44 years	1 264.0
45–54 years	758.0
55–64 years	418.2
65 years and over	378.4
Birthplace	
Australian-born	3 687.3
Overseas-born	1 361.3

(a) Attendance in the 12 months prior to interview.

Source: Attendance at Selected Cultural Venues, April 1999 (4114.0).

Zoological parks and aquaria industry

An ABS survey of zoos, parks and gardens shows that there were almost eight million paid admissions to zoological parks and aquaria in the 12 months ending 30 June 1997 (table 12.9). Income from admissions accounted for 49% of total income.

12.9 ZOOLOGICAL PARKS AND AQUARIA, Key Aggregates—1996–97

Attendees	Unit	
Organisations at end June 1997		
Zoological gardens	no.	53
Aquaria	no.	12
Total organisations	*no.*	*65*
Locations at end June 1997	no.	69
Area of zoos, aquaria at end June 1997	ha	3 631
Employment at end June 1997		
Full-time	no.	1 268
Part-time	no.	677
Total employment	*no.*	*1 946*
Volunteers during June 1997	no.	1 591
Paid admissions	'000	7 978.8
Income		
Admissions income	$m	69.2
Other income	$m	73.2
Total income	*$m*	*142.4*
Expenses	$m	126.9
Operating surplus	$m	16.3
Industry gross product	$m	74.4

Source: Zoos, Parks and Gardens Industry, Australia, 1996–97 (8699.0).

Libraries and archives

Libraries

The main activities of libraries are the acquisition, collection, organisation, conservation and loan of library materials such as books, magazines, manuscripts, musical scores, maps and prints.

The National Library of Australia is Australia's largest library. It was established as a separate entity in 1960 by the National Library Act. The Library, formerly known as the Commonwealth National Library, grew out of the Commonwealth Parliamentary Library which was established in 1901.

The Library builds and maintains a national collection of Australian library materials and provides an effective gateway to national and international sources of information. The Library acquires Australian printed material (monographs, serials, maps and music) using the Legal Deposit provisions of the *Copyright Act 1968* and other formats and materials through purchase or voluntary deposit. The National Library identified as its goal for the years 2000–2002 that all Australians, at their place of choice, will have access to both Australia's

documentary heritage and the information resources of the world.

In recent years the Library's Internet site has become a primary means of information service delivery for both on-site and off-site users. The continued development of Kinetica, a modern Internet-based service for Australian libraries and their users, represents a significant advance in the Library's use of information technology. The core of Kinetica is the National Bibliographic Database (NBD) which records the location details of over 10 million items in more than 1,000 Australian libraries. Through Kinetica, libraries also have access to other databases, including the USA's Research Libraries Information Network (RLIN database) which has over 30 million bibliographic records.

With increasingly rapid technological change, significant changes introduced through the government reform agenda, and other issues in Australian society (including multicultural and Indigenous needs), a number of challenges have emerged to the traditional value systems on which library services have been based. Acknowledging that these challenges will continue, the focus for the National Library will be to ensure that it continues to serve the nation and provide access to the information resources of the world.

Public Lending Right

Public Lending Right (PLR) is a Commonwealth Government cultural program, administered by the Department of Communications, Information Technology and the Arts, which makes payments to eligible Australian book creators and publishers on the basis that income is lost from the availability of their books for loan in public lending libraries. It also supports the enrichment of Australian culture by encouraging the growth and development of Australian writing and publishing. Australia is one of 15 countries operating a PLR program.

The *Public Lending Right Act 1985* provides the legislative framework for the PLR Scheme. A Public Lending Right Committee is appointed by the Minister to administer the Scheme and the Act provides for the gazettal of a PLR Scheme by the Minister.

Payment is determined by the number of copies of eligible books that are held in public lending libraries. This information is obtained from an annual survey of the books held in a sample of public lending libraries. If 50 or more copies of an eligible book are estimated to be held in Australian public lending libraries, a payment may be made.

Books are surveyed annually for three consecutive financial years following their year of publication. If, in the third year, a book is still held in sufficient numbers in public lending libraries, it will be resurveyed once every three years. Books with less than 50 copies in the third or subsequent surveys are dropped from the survey cycle.

There were 8,253 book creators and their publishers who received PLR payments in 1999–2000, totalling almost $5.4m. The PLR rates of payment under the current PLR Scheme are $1.25 per copy of each eligible book for creators and $0.3125 per copy of each eligible book for publishers.

Library attendance

The 1999 Survey of Attendance at Selected Culture/Leisure Venues provides data on persons aged 15 years and over who attended a national, State or local library at least once over the 12 month survey period. Table 12.10 shows that almost 5.7 million persons (38.1% of the Australian population aged 15 and over) attended one of these libraries at least once during the 12 months ending April 1999.

12.10 ATTENDANCE(a) AT LIBRARIES(b)—1999

Attendees	'000
Sex	
Male	2 234.6
Female	3 449.6
Total	*5 684.1*
Age	
15–24 years	1 201.1
25–34 years	1 044.8
35–44 years	1 270.0
45–54 years	884.4
55–64 years	509.4
65 years and over	774.5
Birthplace	
Australian-born	4 170.4
Overseas-born	1 513.7

(a) Attendance in the 12 months prior to interview.
(b) National, State or local library only.

Source: Attendance at Selected Cultural Venues, April 1999 (4114.0).

Libraries industry

An ABS survey of libraries in respect of 1996–97 showed that there were 89.6 million visits to public libraries, which represented nearly five visits per person for the year. These visits resulted in public library loans of 153.9 million books and other materials. Additional data on the libraries industry are shown in *Chapter 21, Service industries.*

Reading habits and book buying

A household survey conducted in February 1995 by the ABS revealed that 87.9% of males and 82.4% of females aged 18 and over had read a newspaper in the week prior to the survey. The survey also found that 46.8% of males and 57.8% of females aged 18 and over had read a book in the week prior to the survey.

An ABS Survey of Aspects of Literacy in 1996 measured the ability of people aged 15 to 74 to use and understand everyday prose and documents (magazine articles, brochures, medicine labels, bus timetables etc.). The survey found that 63.8% of people read newspapers or magazines daily, 33.2% read books daily and 11.1% used a public library at least weekly (table 12.11).

In all, about 2.6 million people were assessed as having very poor prose skills (Level 1 rating) in 1996. Of these, 52.7% read newspapers or magazines daily, 21.4% read books daily and 6.3% used a public library at least once a week.

In contrast, 70.4% of the 2.3 million people with good/very good prose literacy (Level 4/5 rating) read newspapers or magazines daily, 47.0% read books daily, and 15.8% used a public library at least weekly.

Book publishing

Data were collected from 261 employer businesses predominantly engaged in book publishing in 1997–98. Table 12.12 shows that these organisations generated $1,242.0m in turnover, of which $1,035.6m was from the sales of books. Of the total book sales, $623.5m was attributed to Australian titles.

12.12 BOOK PUBLISHERS, Key Aggregates—1997–98

	Unit	
Organisations at end June 1998	no.	261
Sales of all books	$m	1 035.6
Sales of other products	$m	150.8
Total turnover	$m	1 242.0
Average turnover per business	$m	4.8
Wages and salaries paid	$m	205.2
Royalties and fees paid	$m	88.5
Total costs	$m	1 133.0
Average costs per business	$m	4.3
Sales of Australian titles	$m	623.5
Royalties and fees paid per Australian book sale	%	14.2
Operating profit before tax	$m	103.3
Profit margin	%	8.3

Source: Book Publishers, Australia, 1997–98 (1363.0).

12.11 SELECTED LITERACY-RELATED ACTIVITIES IN DAILY LIFE, By Prose Skill Level—1996

	Read newspapers or magazines daily		Read books daily		Wrote material more than one page in length at least weekly		Used a public library at least weekly		Total persons
Skill level(a)	'000	%	'000	%	'000	%	'000	%	'000
Level 1	1 373.1	52.7	557.6	21.4	366.9	14.1	164.4	6.3	2 607.4
Level 2	2 310.0	63.6	997.9	27.5	720.7	19.8	323.4	8.9	3 631.9
Level 3	3 124.6	66.9	1 748.6	37.5	1 299.8	27.8	612.4	13.1	4 668.9
Level 4/5	1 627.1	70.4	1 086.7	47.0	856.6	37.0	366.0	15.8	2 312.5
Total	**8 434.8**	**63.8**	**4 390.7**	**33.2**	**3 244.0**	**24.5**	**1 466.3**	**11.1**	**13 220.8**

(a) Level 1—very poor, Level 2—poor, Level 3—average, Level 4/5—good/very good.

Source: Aspects of Literacy: Assessed Skill Levels, Australia, 1996 (4228.0).

Archives

The primary function of archives is the permanent preservation of unique records, with these records selected because of their administrative, financial, legal or other information value. The records are generally no longer required for the conduct of current activities by government agencies, non-government organisations or private individuals. While much archival work is an adjunct to other activity, a growing number of archival bodies, funded by governments and private sources, employ specialist staff to serve the legal, administrative and research needs of individuals and organisations.

The National Archives of Australia is the Commonwealth organisation, established by the *Archives Act 1983*, responsible for the broad management of the range of Commonwealth records. It has offices and reading rooms in all the States and Territories. The national headquarters in Canberra also houses the Treasures Gallery and Exhibitions Gallery. It administers the legislative framework for Commonwealth records management (including arrangements for the disposal of records), maintains information systems, provides appropriate custody and preservation arrangements (including archival storage) and makes records available under the relevant legislation. Records covered by the Act occur in all formats including files, index cards, architectural models, photographs, films, video tapes and electronic media. The National Archives also curates touring exhibitions, produces publications based on its collections, and presents education and events programs. The Archives database 'Recordsearch' and many of its record keeping publications and reference guides are now on-line. The Archives also maintains the 'Documenting a Democracy' website (at *http://www.foundingdocs.gov.au*) presenting 99 founding documents of democratic governments in Australia.

Each State and Territory Government also maintains its own archives and provides for public access to records. In addition, archives have been established by some churches, business corporations, universities and city councils. The Australian War Memorial collects private material concerning Australians at war and it is also custodian of certain official Commonwealth records relating to war or warlike operations. ScreenSound Australia collects cultural material relevant to the film and sound media. Other corporate and private records continue to be collected by some State archives offices, libraries and universities.

Many of the bodies in the archives or records field are members of the Australian Council of Archives, which provides a means of promoting cooperation on issues of common concern.

The National Archives has established an Internet site 'Archives of Australia' (at *http://www.archivenet.gov.au*), which enables all other archives in Australia to place information about themselves and their holdings on the Internet.

Music

Music covers all areas of the industry: composition; live performances ranging from the latest pop styles to classical instrumental, vocal and orchestral forms; recording and publishing; studio and concert performances; and the marketing of sheet music.

Music businesses

The first comprehensive study of Australian music businesses by the ABS shows that in 1995–96 these businesses had an income of $1,064.0m (table 12.13), about the same size as Australia's book publishing industry. The 541 music businesses comprised record companies, distributors, manufacturers of recorded music, music publishers and sound recording studios.

Total employment was 3,886 persons (including working proprietors) with 60% employed by record companies and distributors, 21% by sound recording studios and the remainder by music publishers and manufacturers.

12.13 MUSIC BUSINESSES, Key Aggregates—1995–96

	Unit	Record companies and distributors	Manufacturers of recorded music	Music publishers	Sound recording studios	Total
Businesses at end June 1996	no.	153	23	73	292	541
Employment at end June 1996	no.	2 324	493	269	800	3 886
Income	$m	792.4	95.0	119.9	56.6	1 064.0
Expenses	$m	751.5	82.2	112.1	48.8	994.6
Net capital expenditure	$m	24.5	9.7	6.9	6.5	47.5
Operating profit before tax	$m	48.5	15.5	8.3	7.8	80.1
Profit margin	%	6.1	16.3	6.9	13.8	7.5
Business gross profit	$m	162.1	46.2	17.2	29.9	255.4

Source: Business of Music, Australia (4143.0).

Attendance at music performances

Attendance at music performances is a significant aspect of the cultural life of Australians. Table 12.14 shows the number of people attending popular and classical music concerts in the 12 months to April 1999. Almost 3.8 million people (25.4% of the Australian population aged 15 and over) attended at least one popular music concert, while 1.3 million (8.8% of the Australian population aged 15 and over) attended at least one classical music concert.

12.14 ATTENDANCE(a) AT MUSIC PERFORMANCES—1999

Attendees	Popular music concert '000	Classical music concert '000
Sex		
Male	1 844.8	521.2
Female	1 937.1	789.1
Total	*3 781.8*	*1 310.3*
Age		
15–24 years	1 086.8	159.0
25–34 years	936.1	209.1
35–44 years	751.4	252.6
45–54 years	571.1	291.8
55–64 years	269.9	191.5
65 years and over	166.6	206.2
Birthplace		
Australian-born	3 066.8	891.9
Overseas-born	715.0	418.4

(a) Attendance in the 12 months prior to interview.

Source: Attendance at Selected Cultural Venues, April 1999 (4114.0).

Musica Viva

Musica Viva is Australia's national chamber music entrepreneur. It began life as a performing ensemble—Sydney Musica Viva—on 8 December 1945, as an initiative of violist, conductor and inventor Richard Goldner. Sydney was still in the throes of wartime blackouts when the first concert was held, at the Sydney Conservatorium, with car headlights illuminating the entrance for patrons. A non-profit company with headquarters in Sydney, Musica Viva has a Board with members throughout Australia, a State committee structure and branch offices in capital cities.

Some 2,439 concerts were presented by Musica Viva in 1999 in Australia and overseas, with attendance exceeding 419,000 Australian patrons and in excess of 34,000 overseas patrons (table 12.15).

New market initiatives proved successful with the introduction of the *Ménage* series of concerts in Melbourne for people aged 35 years and younger, and the expansions of its outreach activities into retirement villages with the *Musica Viva comes to the Village* program.

In 1999, *Musica Viva in Schools* student audiences topped 340,000 across Australia and in Singapore.

12.15 MUSICA VIVA AUDIENCES(a)

	1996	1997	1998	1999
	no.	no.	no.	no.
New South Wales	288 993	276 889	291 292	274 495
Victoria	41 564	41 929	42 853	34 183
Queensland	6 735	11 118	15 303	22 144
South Australia	19 681	24 209	23 089	16 073
Western Australia	30 161	30 665	43 015	44 474
Tasmania	10 103	8 060	9 599	8 024
Northern Territory	. .	5 562	4 703	7 171
Australian Capital Territory	14 210	13 919	12 911	12 947
Australia	*411 447*	*412 351*	*442 765*	*419 511*
Overseas	21 000	20 600	50 000	34 350
Total	**432 447**	**432 951**	**492 765**	**453 861**

(a) Includes audiences at regional touring concerts, education concerts, subscription concerts and special events.

Source: Musica Viva.

Symphony Australia Network

The Symphony Australia Network comprises Australia's six major professional symphony orchestras—Adelaide Symphony Orchestra, Melbourne Symphony Orchestra, Queensland Symphony Orchestra, Sydney Symphony Orchestra, Tasmanian Symphony Orchestra and West Australian Symphony Orchestra—and the national service organisation, Symphony Australia. The network was established as a division of the Australian Broadcasting Corporation (ABC) over a number of years from 1932. The orchestras and the national service organisation now operate as subsidiary companies of the ABC. The orchestras present live concerts in Australia's major performing arts venues and in free open-air concerts. They also present broadcasts on ABC radio and television, make recordings for international record labels, accompany opera and ballet performances, undertake international tours, and give performances in regional and country areas throughout Australia. In 1998–99, the six orchestras presented more than 700 concerts to audiences totalling more than one million people (table 12.16) and reached much larger audiences through their recording and broadcast activities.

Performing arts

The performing arts encompass opera, musical comedy, theatre in its various forms and the various styles of dance. They also include artists working as acrobats, clowns, magicians, comedians, revue artists, poetry readers and other performing artists.

Attendance at the performing arts

The popularity of opera and musicals is reflected in attendance numbers at the performing arts. Table 12.17 shows that in the 12 months prior to April 1999 over 2.4 million people (16.3% of the Australian population aged 15 and over) attended at least one performance of musical theatre, while 1.3 million (9% of the Australian population aged 15 and over) attended at least one dance performance.

Performing arts industries

There were 1,399 employing businesses mainly engaged in the performing arts industries at the end of June 1997. Of these, 881 mainly provided live theatrical or musical presentations (i.e. music and theatre productions); 150 operated venues for performing arts such as concert halls and entertainment centres; and 369 provided services to the arts industry such as casting agency operation, costume design and set designing.

They employed 13,359 persons at the end of June 1997. During 1996–97 they accrued total income of $1,281.3m, of which $341.8m was from box office income and $294.3m from government funding. There were also 19 theatre ticket agency operators at the end of June 1997. Additional data on the performing arts industry are shown in *Chapter 21, Service industries*.

12.16 SYMPHONY ORCHESTRAS, Performances and Total Attendances

	1997–98		1998–99	
	Concerts	Total attendances	Concerts	Total attendances
Type of performance	no.	no.	no.	no.
Paid orchestral concerts	511	665 421	483	701 594
School concerts	184	95 070	242	99 424
Free concerts	24	297 520	29	290 447
Total	**719**	**1 058 011**	**754**	**1 091 465**

Source: Australian Broadcasting Corporation, Annual Report 1998–99.

12.17 ATTENDANCE(a) AT THE PERFORMING ARTS—1999

Attendees	Dance performance '000	Opera/Musical '000	Theatre '000	Other performing arts '000
Sex				
Male	496.0	876.6	993.0	1 170.6
Female	848.9	1 553.8	1 471.9	1 477.3
Total	*1 345.0*	*2 430.4*	*2 464.9*	*2 648.0*
Age				
15–24 years	242.5	394.2	477.0	468.5
25–34 years	267.6	486.6	500.2	631.0
35–44 years	311.5	449.4	486.7	678.3
45–54 years	270.1	505.6	492.9	404.2
55–64 years	134.8	297.8	269.8	225.1
65 years and over	118.5	296.9	238.4	240.9
Birthplace				
Australian-born	962.4	1 859.2	1 888.2	1 999.4
Overseas-born	382.6	571.2	576.7	648.5

(a) Attendance in the 12 months prior to interview.

Source: Attendance at Selected Cultural Venues, Australia, April 1999 (4114.0).

12.18 OPERA AUSTRALIA, Key Indicators(a)

	1996	1997	1998	1999
	no.	no.	no.	no.
Employees	1 295	1 212	1 175	1 118
Performances	249	243	237	237
Attendances	284 500	293 300	268 866	290 770

(a) Excludes operations of the Australian Opera and Ballet Orchestra. Excludes Victoria State Opera before 1997.

Source: Opera Australia.

Opera Australia

The result of a 1997 merger between The Australian Opera and the Victorian State Opera, the newly formed Opera Australia is more highly reliant on box office receipts than many of the world's arts companies. Unlike many other government and privately funded arts organisations, 65% of Opera Australia's revenue comes directly from ticket sales.

With an extensive repertoire spanning the history of opera, almost 250 performances are staged each year (table 12.18). This makes the company the third busiest in the world after the Vienna State Opera and the Metropolitan Opera, New York. To make this heavy schedule feasible, the company engages a full-time opera chorus and two resident orchestras—The Australian Opera and Ballet Orchestra, based in Sydney, and the State Orchestra of Victoria in Melbourne.

The Australian Ballet

The Australian Ballet gave its first performance in 1962, and since then it has been the defining face of ballet in Australia. The company has gained a reputation as one of the top ballet companies in the world. It has received international acclaim for its presentations of great ballet classics, as well as modern repertoire created by Australian and international choreographers.

In 1999 the company presented 20 performances overseas in Auckland, Singapore, Shanghai, New York and Washington (table 12.19).

12.19 THE AUSTRALIAN BALLET, Performances and Employment

	1994	1995	1996	1997	1998	1999
	PERFORMANCES					
Theatres in Australia						
New South Wales	82	81	81	81	94	80
Victoria	60	61	60	62	63	48
Queensland	11	11	10	10	7	6
South Australia	10	7	7	6	8	6
Western Australia	—	6	—	6	—	—
Australian Capital Territory	—	6	6	8	7	—
Other venues in Australia						
Regional (The Dancers Company)	27	18	28	10	18	23
Open-air	1	1	1	1	1	1
ABC-TV simulcasts	1	2	—	—	—	—
Overseas	14	—	14	—	—	20
Total performances	**206**	**193**	**207**	**184**	**198**	**184**
	EMPLOYMENT(a)					
Dancers	65	65	62	62	62	62
Staff						
Artistic	9	9	8	12	12	12
Music	5	5	5	6	5	5
Production and theatre	29	24	25	23	24	24
Marketing and publicity	19	23	23	22	21	21
Administration and finance	20	20	21	19	20	20
Total employment	**147**	**146**	**144**	**144**	**144**	**144**

(a) On average for the year.

Source: The Australian Ballet, Annual Reports.

Film and video

Film and video production

Australia has a well developed audiovisual production industry which is composed, for the most part, of small specialised companies. They produce programs ranging from feature films to sports coverage, documentaries and television commercials. A relatively small number of companies engage exclusively in film and television drama production. The majority specialise in the production of commissioned programs such as commercials and corporate communications.

The major market for Australian audiovisual producers is the domestic television broadcast industry. Export markets are important mainly for feature films and television dramas, some high-budget documentaries and some commercials.

The film and video production industry comprises businesses mainly engaged in the production of motion pictures on film or video tape for theatre or television projection. Services such as casting, film editing and titling are also included.

A survey of the film and video production industry was conducted by the ABS in respect of 1996–97. At the end of June 1997, there were 2,003 businesses in the film and video production industry, and these businesses employed a total of 9,438 persons. In 1996–97 these businesses generated $681.3m from the production of commissioned works, $222.6m from the provision of production and post-production services and $164.8m from the sale of rights for completed works. The industry had a total gross product of $440.4m.

During 1996–97, businesses in the television services industry, film and video production industry, and film and video distribution industry incurred total film and video production costs of $1,576.9m. Of these costs, $1,095.4m was spent on productions specifically for television, $233.7m on commercials and advertisements, and $247.7m on productions other than for television. These businesses completed, or were working on, 6,644 productions other than for television, of which 4,560 were corporate, marketing or training videos and 59 were feature films. Additional information on the industry is shown in *Chapter 21, Service industries*.

12.20 FILM AND VIDEO PRODUCTION INDUSTRY, Number and Value of Titles(a)

	1994–95		1995–96		1996–97		1997–98		1998–99	
Type of film	no.	$m	no.	$m	no.	$m	no.	$m	no.	$m
Features	20	113	30	221	36	198	41	246	45	291
Mini-series	11	54	15	117	10	97	10	52	9	85
Series and serials	18	113	22	103	23	179	27	213	21	244
Telemovies	22	53	18	38	15	36	12	40	15	58
Total	**71**	**333**	**85**	**479**	**84**	**510**	**90**	**551**	**90**	**678**

(a) Includes co-productions, foreign titles shot in Australia, and Australian titles shot overseas.

Source: Australian Film Commission.

The Commonwealth Government provides assistance and encouragement, through measures such as the investment program of the Australian Film Finance Corporation, the development program of the Australian Film Commission and the Australian content regulations of the Australian Broadcasting Authority, for the production of high cost feature films, television dramas and documentaries. Table 12.20 shows the number and value of both Australian titles produced in Australia and overseas and foreign titles shot in Australia from 1994–95 to 1998–99.

Film and video distribution

The film and video distribution industry comprises businesses mainly engaged in leasing or wholesaling motion pictures on film or video tape to organisations for exhibition or sale. Agents mainly engaged in leasing and wholesaling films and videos to organisations are also included.

At 30 June 1997, there were 66 businesses in the industry, employing 1,341 people. In 1996–97 these businesses generated $973.9m in total income and had an operating profit before tax of $3.1m. The main sources of income were $687.3m from the sales, rental or lease of prerecorded video tapes, disks, films and interactive software, and $156.0m from the provision of channels to pay television broadcasters. Additional information on the industry is shown in *Chapter 21, Service industries*.

Motion picture exhibition

The motion picture exhibition industry comprises businesses mainly engaged in screening motion pictures on film or video tape. It also includes businesses mainly engaged in drive-in theatre operation, cinema operation and film or video festival operation.

The ABS conducted a survey on the motion picture exhibition industry in respect of 1996–97.

At the end of June 1997, there were 188 businesses in the industry, employing 7,739 people. The motion picture exhibition industry had an operating profit before tax of $119.9m for 1996–97, which represented a profit margin of almost 15%.

At the end of June 1997, there were 325 cinema sites and 28 drive-in sites in Australia. For 1996–97, there were 73 million paid admissions to cinemas and drive-ins.

More findings of the survey are shown in *Chapter 21, Service industries*.

Cinema attendance

The April 1999 Survey of Attendance at Selected Culture/Leisure Venues found that almost 10 million persons (67.0% of the Australian population aged 15 and over) attended a hardtop cinema, drive-in or other public screening of a film at least once in the 12 months ending 30 April 1999 (table 12.21).

12.21 ATTENDANCE(a) AT CINEMAS—1999

Attendees	'000
Sex	
Male	4 715.6
Female	5 272.0
Total	9 987.6
Age	
15–24 years	2 374.2
25–34 years	2 244.2
35–44 years	2 105.2
45–54 years	1 604.8
55–64 years	836.1
65 years and over	823.1
Birthplace	
Australian-born	7 577.9
Overseas-born	2 409.7

(a) Attendance in the 12 months prior to interview.

Source: Attendance at Selected Cultural Venues, April 1999 (4114.0).

Multimedia

Multimedia is a significant creative medium. It is a presentation, by means of an electronic non-linear delivery system, of some combination of media forms such as voice, music, video, photographs, graphics, animation and text. An electronic non-linear delivery system is a combination of hardware and software which gives the user control over the order in which content is accessed.

Until a few years ago, most computer software was aimed primarily at business and education markets. However the household market has grown rapidly in recent years. By May 2000, 54% of households (3.8 million) had access to a computer at home and 33% (2.3 million) had home Internet access. Between May 1998 and May 2000, an additional 0.9 million households acquired a home computer while 1.3 million households acquired access to the Internet at home. By May 2000, three-quarters of the households with a home computer had one equipped with a CD-ROM drive.

In the 12 months to May 2000, 9.2 million persons aged 18 years or over, 67% of Australian adults, used a computer. Over this period 47% of adults used a computer at home, 43% did so at work and 38% did so at sites other than home or work. Half of the adults using a computer at home did so for work-related purposes. Other popular uses were for study or learning, for personal or family correspondence, to keep personal or family records and to play games. Each of these purposes was reported by more than a third of those adults who used a computer at home over the period.

In the same period, 6.4 million persons aged 18 years or over, 46% of the adult population, accessed the Internet. Over this period 28% of adults accessed the Internet at home, 21% did so at work and 23% did so at sites other than home or work. Two-thirds of adults accessing the Internet at home used email or visited chat sites. Over half were browsing or surfing, and one-third accessed the Internet for work related purposes over the period. About 800,000 adults used the Internet to purchase or order goods and services during the 12 months to May 2000. For more information see *Chapter 24, Communications and information technology*.

The Department of Communications, Information Technology and the Arts (DOCITA), through multimedia programs such as *Australia on CD* and *Australia's Cultural Network*, has undertaken to promote and provide access to Australia's cultural collections, while forming partnerships with the cultural institutions and multimedia producers involved. DOCITA has developed the Internet site *ArtsInfo* as a single point of access to the Australian cultural sector and has supported the development of the *Australian Museums On Line* site and the Archives of Australia site.

The *Australia on CD* program is designed to showcase a wide range of Australian cultural endeavour, artistic performance and heritage achievements, and to foster the development of the Australian multimedia industry.

Through the *Australia on CD* program, the Commonwealth Government has funded the production of ten interactive CD-ROMs covering areas such as Australia's prehistory, the environment, the performing and visual arts, the history of immigration of Australia, sport, science and rock'n'roll. Two copies of each title have been distributed to all Australian primary and secondary schools, public libraries, Austrade offices, overseas missions and members of Parliament.

Australia's Cultural Network is the on-line gateway to Australia's cultural organisations, resources, activities and events. The Network has two main objectives: to improve and develop on-line access to, and participation, in Australian cultural endeavour, activities and events; and to improve the prosperity of Australian cultural organisations and cultural workers. This gateway Internet site provides fast access to hundreds of cultural Internet sites nationwide. A national calendar of cultural events is a key feature of the site, with a range of resources to assist Australian cultural industries.

The *Performing Arts Multimedia Library*, a joint project between DOCITA and Cinemedia, involves the creation of a digital library of significant Australian performances, new and existing, across the range of live performance, for use in multiple electronic environments such as the Internet, Pay TV, video and multimedia. The project has been used as a testbed program for government and performing arts companies to identify and attempt to resolve the legal, contractual and technical issues associated with the recording and electronic distribution of recorded performances.

Australian Museums On Line (AMOL) is the electronic gateway to Australian museums, galleries and cultural institutions. AMOL is an

initiative of the Heritage Collections Council, which coordinates national approaches to caring for, and promoting access to, Australia's heritage collections. AMOL's Guide to Australian Museums lists over 1,000 national, regional and local museums across Australia, with information being accessible through a range of search options such as region, collection type and collection strength. The Open Collections section of AMOL offers a searchable collection database comprising almost half a million object level records, including over 50 full collections. It also features a growing number of knowledge-based stories about various collections and objects within collections. The Museum Craft section provides access to a range of resources for museums workers, including conservation resources and information, online discussion forums, an online Open Museum Journal, links to important Australian and overseas museums sites and information about contacts and associations, jobs and training, events, publications and grants. Since October 1998, the site has averaged well over 250,000 hits per month, representing more than 9,000 users in 2000.

The *ArtsInfo* Internet site brings together information on the wide array of cultural grants and support programs, as well as industry training and development programs, offered by all levels of government and by non-government organisations. ArtsInfo also provides access to a business showcase of Australia's cultural products and services and a resource section including industry bulletin boards, a directory of training, tutorials, a festival directory and fact sheets.

Radio and television broadcasting

Broadcasting services in Australia are regulated primarily through the *Broadcasting Services Act 1992*. The Act identifies and defines categories of broadcasting services, establishes regulatory arrangements for all but the national broadcasting services, and establishes the Australian Broadcasting Authority (ABA) as the independent regulator for radio and television in Australia.

The Act defines six categories of broadcasting services covering both radio and television:

- national broadcasting services—the Australian Broadcasting Corporation (ABC) and the Special Broadcasting Service (SBS) are regulated through separate legislation;
- community broadcasting services—non-profit free-to-air services provided for community purposes;
- commercial broadcasting services—free-to-air radio and television services operated for profit and funded predominantly by advertising revenue;
- subscription broadcasting services—services with general appeal to the public and funded predominantly by customer subscriptions;
- subscription narrowcasting services—services with limited appeal to the public (either because of content or availability) and funded predominantly by customer subscriptions; and
- open narrowcasting services—services providing programs targeted to special interests groups (e.g. foreign language), or of limited appeal because of content or availability, and not funded by subscriptions.

Broadcasting and transmission

In March 1999, the telecommunications company ntl won the bid to own and operate the National Transmission Network, previously managed by the National Transmission Agency. The transmission network comprises 560 strategic sites across metropolitan, regional and rural Australia, and ntl's core business is to transmit the analogue television and radio broadcasts by the ABC and SBS. Commercial and community broadcasters, emergency services and telecommunications operators have also leased space on the sites. The company will continue to invest in the network infrastructure to maintain and improve the range, reach and quality of transmission services across the country. Australia will enter the digital era of broadcasting by January 2001, and ntl will have a major role in migrating the broadcasting industry to the new digital platform.

Australian Broadcasting Corporation (ABC)

The ABC has been in existence since 1932 as Australia's only national, non-commercial broadcaster. At 30 June 1999 the ABC provided:

- six distinctly targeted radio networks across Australia on over 6,000 transmitters which include metropolitan radio stations in nine cities, 39 regional radio stations and 11 smaller studios, Radio National, ABC-FM and the Triple-J youth radio network;
- a national television service carried on about 600 transmitters;
- Radio Australia, an international radio service broadcast by shortwave to Papua New Guinea and the Pacific, and via satellite to the

Asia-Pacific regions in English and other languages;

- a 24-hour news and parliamentary broadcast radio service to all capital cities (except Darwin) and to Newcastle;
- an international network of press offices; and
- an on-line service which includes news and program related sites.

The ABC also operates a network of retailing outlets (24 shops and 119 ABC centres) known as ABC Enterprises. Operations include the production of books, classical and contemporary recordings, audio cassettes, videos, multimedia and licensed products, and music and magazine publishing.

The ABC has corporatised its symphony orchestras through a new subsidiary company, Symphony Australia (see table 12.16 and accompanying text).

Special Broadcasting Service (SBS)

SBS was established by the Commonwealth Government in 1978. Its principal function is to provide multilingual and multicultural radio and television services that inform, educate and entertain all Australians and, in doing so, reflect Australia's multicultural society.

Both SBS Radio and SBS Television broadcast nationally. The radio service has its origins in 1975 when ethnic radio stations 2EA in Sydney and 3EA in Melbourne began limited broadcasts. By 1996 SBS Radio had expanded to a five signal service broadcasting in 68 languages. It operates a national signal heard in all capital cities and key regional centres, and separate AM and FM signals in Sydney and Melbourne.

Each week, SBS Radio broadcasts more than 650 hours of programming, including news—local, national and international—and a mixture of current affairs, interviews, community information, sport and music. It broadcasts in more languages than any other radio network in the world.

SBS Television, which began in 1980, broadcasts nationally and is watched by more than six million people each week. More than half of the programs broadcast are in languages other than English, but they are made accessible to all Australians through subtitling. SBS Television gathers its programs from more than 600 national and international sources, and broadcasts in more than 60 languages. SBS shows more movies and documentaries than any other free-to-air television station in Australia. In 1999, documentaries accounted for about 13% of the television schedule and about 300 first-run movies are broadcast each year. SBS Television's coverage of international news and sports is a highlight. Each week, the WorldWatch program broadcasts 22 different news services from 18 countries.

Since 1994, SBS Independent (SBSI) has been at the forefront of local film and television productions by independent Australian film-makers. SBSI has commissioned almost 400 hours of drama, documentaries and animation. Among this output were more than 50 Indigenous documentaries and dramas.

In 1999, the Federal Government announced a five-year scheme to extend the SBS signal to 30 regional areas (each containing more than 10,000 people) under its $120m Television Fund. This will make SBS available to an additional 1.2 million potential viewers.

Radio and television operations

Australian Broadcasting Authority (ABA)

The ABA, established in October 1992 under the *Broadcasting Services Act 1992*, is the regulator for radio and television broadcasting, digital broadcasting and Internet content in Australia. As well as planning the availability of segments of the broadcasting services bands (VHF/UHF television, FM and AM radio), the Authority has the power to allocate, renew, suspend and cancel licences and collect any fees payable for those licences.

Following the assent of the *Television Broadcasting Services (Digital Conversion) Act 1998*, as Schedule 4 of the *Broadcasting Services Act 1992*, the ABA is empowered to regulate for the introduction of digital broadcasting services in Australia from 1 January 2001. The ABA is working with the broadcasting industry to deliver commercial and national television conversion schemes, digital channel plans and implementation plans.

In March 1998, the Minister for Communications, Information Technology and the Arts announced that commercial, community and national (ABC and SBS) radio broadcasters would be able to convert to digital using the Eureka standard, but would be required to transmit their programs in analog mode for a simulcasting period.

The commercial and national broadcasters will use the DVB-T standard in providing their digital television services. They will also be required to simulcast their signal using the analog service for the first eight years. Provision also has been made for datacasting services to use the broadcasting services bands from the same date.

The ABA continues to monitor international developments in Digital Radio Broadcasting. While the European Eureka 147 system remains the only proven terrestrial system, recent demonstrations in the United States indicate continuing progress in the development of the in-band on-channel (IBOC) technology. At the same time Digital Radio Mondiale (DRM), an international consortium, is continuing work towards a standard for digital broadcasting in the frequency bands below 30 MHz.

The ABA is empowered to:

- conduct research into community attitudes on programming matters;
- develop program standards relating to broadcasting in Australia;
- assist broadcasting service providers (licensees) develop codes of practice;
- monitor compliance with licence conditions; and
- investigate complaints about services.

The ABA monitors the suitability of licensees to ensure compliance with the ownership and control provisions of the Act. Licences for commercial television broadcasting services are subject to five year terms, compulsory standards on Australian content and children's television, and a condition that the licensee be a suitable person. Ownership and control limitations also apply. Under these conditions, no person may be in a position to control more than one commercial television licence in a market or control licences with a combined audience reach of more than 75% of the Australian population. Foreign control of commercial television licences is also restricted. Commercial licences may be transferred at will, subject only to notification requirements under the ownership and control rules. Commercial radio broadcasting licences are subject to less restrictive ownership provisions.

Community radio and television, subscription radio broadcasting services and all categories of narrowcasting services are not subject to ownership limits.

In 1999–2000, the ABA allocated six commercial radio licences—three by the price-based allocation system, two for services not using the broadcasting services bands, and one solus market licence to an existing commercial broadcaster. The ABA also allocated 35 permanent community broadcasting licences, 231 temporary community broadcasting licences and 13 subscription television licences. The ABA also issued 46 test licences for digital terrestrial television broadcasting, and planned 78 new transmitters for national television services. There were no commercial television licences issued.

Radio and television services—summary of operations

At 30 June 1997, there were 261 private broadcasters in radio services and 48 private broadcasters in television services. Private radio broadcasters employed 5,064 persons, while private television broadcasters employed 8,873 persons. Most of the income of private broadcasters in 1996–97 was derived from the sale of airtime. Private radio broadcasters had an operating profit before tax of $92.6m while private television broadcasters had an operating loss of $324.0m. Regarding the latter, while free-to-air broadcasters made a pre-tax profit of $734.3m, this was more than offset by the loss of $1,058.4m by pay television businesses.

In addition to private broadcasters, there are two public broadcasters of radio and television services. They employed a total of 5,248 persons at the end of June 1997. Their income totalled $775.6m in 1996–97, with expenses totalling $772.1m. The section *Radio and television services* of *Chapter 21, Service industries* provides more information including a summary of operations for 1996–97.

Training in the arts

Training in the arts in Australia covers a broad range of resources. Formal training is available through courses in Technical and Further Education institutions, universities and private institutions. A number of on-the-job training programs are also available in the arts, and many organisations offer in-house training programs for their staff. The last decade has seen the development in some States of multi-disciplinary tertiary institutions providing training in the arts.

A number of national specialised education institutions have been established to provide training in cultural fields. For example, the Australian Film, Television and Radio School is

the national training centre for the film and broadcasting industries. The National Institute of Dramatic Art is the national training school for people who wish to enter the profession of theatre, film or television as actors, directors, designers, stage managers, theatre crafts technicians, production managers or teachers of voice and movement. The Australian Ballet School provides full-time training to the highest standard for young Australian dancers seeking a career in the classical dance profession. The Australian National Academy of Music offers master classes and short-term programs which bring distinguished national and international performers and music educators into contact with students.

CREATE Australia is the national Industry Training Advisory Board (ITAB) for cultural industries. Its primary task is to help cultural industries develop and run high quality, relevant vocational education and training programs. CREATE Australia supports cultural industries by:

- developing quality training programs for industry—including competency standards, training packages, curriculum and assessment;
- encouraging innovation in training development and delivery, and giving advice to industry about training;
- encouraging partnerships between industry and training providers;
- giving advice to government on policy and training priorities based on industry consultation;
- coordinating training development and implementation in conjunction with State and Territory industry training advisory bodies;
- holding a biennial national conference to promote artistic achievements and the benefit of education and training in the industry (the next conference will be held in 2002); and
- holding product launches and workshops to promote education and training to the relevant cultural sector.

Products developed and produced by CREATE Australia include: the national entertainment industry training package; the national library and information services industry training package; the national museums industry training package; language, literacy and numeracy resources to support training in the entertainment industry; the first national careers guide for the Australian entertainment industry; the national multimedia education and training strategy; and the community cultural development training directory (available on-line).

In 2000 CREATE will launch the national music industry training package and the national film, television, radio and multimedia training package.

Festivals

Festivals have become a major part of Australian life, offering a unique and valuable contribution to our cultural life. Community festivals in regional Australia are increasing both in number and popularity. They range in size from small community celebrations to major cultural events, and feature a variety of themes as diverse as flower arranging, heritage, food and wine, multicultural events, music and the arts.

There are now some 1,300 festivals Australia-wide each year, ranging from major international events such as the Sydney, Melbourne and Adelaide International Festivals to the more regional and community based events. These festivals provide tangible benefits by giving their communities a creative focus, generating pride in the community and providing economic benefits by attracting tourists to the area.

Table 12.22 reflects the findings of a survey of festivals conducted in 1995 by the Australia Council, and shows that the total government grant, backing small and large arts festivals in Australia, amounted to $13.3m. Box office and subscription sales for larger arts festivals amounted to $16.6m, while sponsorships and donations amounted to $10.7m. Income totalled $46.9m for larger arts festivals and $7.6m for smaller arts festivals. The Australia Council defined large festivals as those with expenditure of $300,000 and over. Using this measure, 31 arts festivals were included in the 'larger' group.

Four quarterly surveys in 1995 and 1996, which asked about attendance at festivals over the previous 12 months, were conducted by the ABS. Over half of the attendances (2.4 million or 58.7%) were to main arts festivals, followed by popular music festivals (632,000 or 15.4%), art/museum exhibitions (287,000 or 7.0%) and film/video festivals (252,000 or 6.2%). Females were more likely to have attended a festival in the previous 12 months (23.0%) than males (20.8%) (table 12.23).

12.22 OPERATING INCOME AND EXPENDITURE OF ARTS FESTIVALS—1995

	Larger arts festivals	Smaller arts festivals
	$m	$m
Government funding	11.5	1.8
All other income	35.4	5.8
Total income	*46.9*	*7.6*
Salaries and fees	17.0	3.0
All other expenditure	28.9	4.6
Total expenditure	*45.9*	*7.6*

Source: Australia Council, Festival Survey 1995.

12.23 ATTENDANCES AT FESTIVALS(a)(b)—November 1995 to September 1996

	Attendances		
	Males	Females	Persons
	'000	'000	'000
Main arts festivals	1 101	1 303	2 404
Other festivals			
Art/museum exhibition	138	149	287
Popular music	335	297	632
Classical music	32	31	63
Film/video	115	136	252
Theatre	*17	50	67
Dance	53	35	88
Other performing arts	89	77	166
Craft	*17	24	42
Other	42	50	92
Total	*840*	*849*	*1 689*
Total attendances	1 941	2 152	4 094
Total number of people attending	1 335	1 518	2 853
	%	%	%
Participation rate(c)	20.8	23.0	21.9

(a) Attendances during the previous 12 months. (b) Includes all people who attended a festival, whether they went to paid or free events. (c) For each group the total number attending expressed as a percentage of the civilian population in that group.

Source: Attendance at Festivals, Australia, November 1995 to September 1996, Department of Communications and the Arts.

Employment and participation in cultural activities

This section contains a selection of ABS statistics ranging over the spectrum of cultural industries and activities. More comprehensive data can be found in the publications listed in the Bibliography.

Employment in cultural occupations

According to the 1996 Census of Population and Housing, there were 156,739 people working in a cultural occupation as their main job at the time of the Census. Females accounted for 50.1% of these people—this is higher than their proportion (44.1%) in the employed labour force. Table 12.24 shows that the most common cultural occupations were architects, graphic designers, librarians, library assistants and music teachers.

Involvement in culture and leisure activities

Over four quarters from November 1998 to August 1999 the ABS collected information through its Population Survey Monitor about the involvement of persons aged 18 years and over in selected culture and leisure activities during the previous 12 months. Results from these four quarterly surveys have been combined to produce annual estimates. Involvement in selected culture and leisure activities was defined to include both paid and unpaid work, but excluded involvement solely for the respondent's own use or that of their family.

As table 12.25 shows, in a 12 month period in 1998–99, 3.5 million people (25.6% of the Australian population aged 18 and over) were involved in selected culture and leisure activities. Of these persons, 36.6% received some payment.

Many persons were involved in more than one type of activity. There were almost 6.7 million involvements, the most common activities being writing, organising festivals, design, organising fetes, teaching cultural activities and photography. Almost half (46.6%) of these involvements were of a short-term and part-time nature, being 13 weeks or less duration and less than ten hours a week.

12.24 NUMBER OF PERSONS IN SELECTED CULTURAL OCCUPATIONS—1996

Occupation group	Males	Females	Total
Media producers	2 863	1 889	4 752
Environment, parks and landcare managers	1 889	447	2 336
Architects	8 290	1 671	9 961
Librarians	1 723	7 843	9 566
Music teachers	2 121	4 992	7 113
Dance teachers	380	2 381	2 761
Painters (visual arts)	1 126	1 288	2 414
Potters and ceramic artists	898	1 257	2 155
Photographers	4 405	1 854	6 259
Fashion designers	499	2 167	2 666
Graphic designers	7 066	6 020	13 086
Interior designers	1 032	1 954	2 986
Editors	1 152	1 094	2 246
Print journalists	3 238	2 585	5 823
Authors	1 216	1 128	2 344
Instrumental musicians	4 208	1 325	5 533
Radio presenters	1 717	415	2 132
Architectural associates	4 164	939	5 103
Library technicians	561	4 940	5 501
Sound technicians	2 550	332	2 882
Library assistants	1 236	7 379	8 615
Ticket collectors and ushers	1 550	1 275	2 825

Source: 1996 Census of Population and Housing.

12.25 PERSONS(a) INVOLVED IN CULTURE AND LEISURE ACTIVITIES—1998–99

	Paid involvement only	Unpaid involvement only	Paid and unpaid involvement	Total persons involved	Persons with no involvement	Total persons	Participation rate
	'000	'000	'000	'000	'000	'000	%
NSW	134.3	799.5	273.1	1 206.9	3 421.2	4 628.1	26.1
Vic.	124.0	532.5	212.7	869.2	2 584.3	3 453.5	25.2
Qld	77.8	393.9	159.8	631.5	1 809.6	2 441.1	25.9
SA	29.7	164.2	62.7	256.5	828.0	1 084.6	23.7
WA	55.0	211.1	72.5	338.5	968.6	1 307.2	25.9
Tas.	12.2	46.1	18.4	76.6	262.5	339.1	22.6
NT	3.9	18.2	7.1	29.2	71.6	100.8	29.0
ACT	10.4	39.7	20.2	70.3	144.1	214.4	32.8
Aust.	**447.1**	**2 205.1**	**826.5**	**3 478.8**	**10 090.0**	**13 568.7**	**25.6**

(a) Aged 18 years and over.

Source: Work In Selected Culture/Leisure Activities, Australia, 1998–99 (6281.0).

Time spent on culture and leisure activities

The 1997 Time Use Survey showed that Australians aged 15 years or more spent on average a little over 5 hours (316 minutes) or 22% of their time per day on free time activity as their main activity (table 12.26). Free time is the time left in the day after taking into consideration time spent on: sleeping, eating, personal care (necessary time); paid work and formal education (contracted time); and family and household responsibilities and unpaid voluntary work (committed time). People frequently undertake more than one activity at the same time (e.g. housework and listening to the radio). If simultaneous activities are included, Australians spent just over nine hours (552 minutes) on free time activities. Time spent using audio/visual media (e.g. watching television and listening to the radio) showed the largest increase when comparing all activities (including simultaneous activities) to main activities. As a main activity, an average of just over two hours (131 minutes) was spent on audio/visual media. However, when simultaneous activities were included, time spent on this activity nearly doubled to over four hours (257 minutes).

12.26 AVERAGE TIME SPENT ON FREE TIME ACTIVITIES—1997

Free time activities	Main Activity minutes per day	All activities minutes per day
Social and community interaction		
Socialising	11	12
Visiting entertainment and cultural venues	5	5
Attendance at sports events	2	2
Religious activities/ritual ceremonies	5	5
Other	22	22
Total	*45*	*47*
Recreation and leisure		
Sport and outdoor activity	27	28
Games/hobbies/arts/crafts	16	20
Reading	25	37
Audio/visual media	131	257
Attendance at recreational courses	1	1
Talking (including phone)	35	115
Other	34	47
Total	*271*	*505*
Total free time activities	**316**	**552**

Source: Time Use on Cultural/Leisure Activities, 1997 (4173.0).

Public attitudes to the arts

The November 1997 Population Survey Monitor showed that Australians hold different views about what range of activities is included in the arts: 81% included plays, ballet and opera; 80% music (concerts, orchestra and singing); 77% painting, drawing and sculpture; 62% literature, books and poetry; 54% craft, pottery and weaving; 54% photography; 35% architecture and design; and 9% sport.

Libraries were considered to be either very important or important in the community by 95% of the population. The corresponding figure for museums was 77%, for performing arts venues 76% and for art galleries 72%. These levels of support were irrespective of whether or not the reporting individuals were users of the facilities.

A quarter of the population indicated that they were not adequately informed about the arts, whereas only 7% indicated that they were not adequately informed about sport. The most commonly used sources of information about the arts were newspapers, magazines or books (69%) and television (63%).

Art and craft purchases

Results from surveys conducted during 1997 show that, in the three months prior to interview, 21.4% of Australian people purchased a total of 0.9 million art items and 3.9 million craft items. Of these, 0.7 million art items and 3.0 million craft items were made in Australia (table 12.27). The value of Australian made art items purchased in the three months prior to interview was $138m with a mean price of $195; the value of craft items was $318m with a mean price of $107. Extrapolated to expenditure for a full year, this would be in the order of $550m on art items and $1,250m on craft items.

12.27 AUSTRALIAN MADE ART AND CRAFT PURCHASES—Purchases over 3 months, 1997(a)

Attendees	Number(b) '000	Value(c) $m
Art items		
Paintings	334.3	84.2
Other	389.7	53.7
Total	*724.0*	*137.9*
Craft items		
Pottery/ceramics	885.5	44.4
Garments/clothing	435.3	26.5
Jewellery	383.9	58.6
Wood crafts	352.9	21.7
Other	982.2	166.4
Total	*3 039.8*	*317.5*
Total art and craft items	**3 763.8**	**455.4**

(a) Purchases of Australian made art and craft in a 3 month period. (b) Includes items where the price was not known. (c) Excludes items where the price was not known.

Source: Art and craft purchases, 1997, Department of Communications and the Arts.

Funding for culture

Government funding

Culture in Australia receives considerable financial support from the Commonwealth Government in the form of direct grants and through the provision of taxation benefits. This support is complemented by State, Territory and local governments.

Total outlays for cultural funding of the Commonwealth Government and State, Territory and local governments for 1998–99 were $3,750.7m. Table 12.28 shows the government outlays on culture for 1998–99.

12.28 CULTURAL FUNDING, By Level of Government—1998–99

	Level of government			
	Commonwealth	State/Territory	Local	Total
	$m	$m	$m	$m
Cultural facilities and services				
Zoological and botanic gardens	2.0	72.3	21.2	95.5
Libraries and archives	46.0	298.1	412.1	756.2
Literature and publishing	10.3	4.3	2.7	17.3
Museums	83.9	272.2	7.2	363.2
Art galleries	21.0	87.5	24.3	132.7
Visual arts/crafts and photography	15.8	9.6	4.4	29.8
Performing arts venues and arts centres	1.3	115.6	53.3	170.2
Music (excluding opera)	51.6	14.2	1.9	67.7
Other performing arts	36.1	59.8	4.9	100.8
Cultural heritage	72.4	50.3	17.6	140.3
Total	*340.2*	*984.0*	*549.4*	*1 873.6*
Broadcasting and film				
Radio and television broadcasting	684.4	0.4	0.6	685.4
Film and video	62.5	52.4	2.6	117.5
Multimedia	4.0	0.4	0.1	4.4
Total	*750.9*	*53.3*	*3.2*	*807.3*
Culture n.e.c.				
Administration of culture	41.9	27.6	12.7	82.2
Community cultural activities	44.0	11.1	10.9	65.9
Public halls and civic centres	0.0	0.0	158.0	158.0
National parks and wildlife services	66.3	635.4	7.5	709.1
Other culture n.e.c.	17.0	28.3	9.2	54.5
Total	*169.1*	*702.4*	*198.2*	*1 069.8*
Total	**1 260.2**	**1 739.6**	**750.9**	**3 750.7**

Source: Cultural Funding in Australia, 1998–99 (4183.0).

The largest funding category for the Commonwealth Government was radio and television broadcasting ($684.4m). The largest funding category for State and Territory Governments was national parks and wildlife services ($635.4m). For local governments, the largest cultural funding category was libraries and archives ($412.1m).

Business sponsorship

In 1996–97 some 2,900 employing businesses (0.5%) sponsored art and cultural activities to the value of $29m. The communication, Property and business services sector was the biggest provider with $8.8m of sponsorship. Almost half (48.6%) the businesses sponsoring arts and cultural activities sponsored creative arts.

Sport and recreation

Australia is recognised internationally as a nation involved in sport. Sport and recreation is an integral part of Australian culture and there are many benefits associated with participating in sport and physical activity, including enjoyment, social interaction, health, personal achievement, national pride and community involvement.

In many ways sport unites and personifies the nation. Interestingly, we competed internationally as 'Australia' in sport before we federated as a nation. Sport and recreation can be a whole-of-life activity, and is an important part of a well-balanced lifestyle.

Governments invest in sport because it returns both tangible and intangible benefits to the nation. Federal, State, Territory and local governments all play an important role in the development of Australian sport. The provision of quality facilities, whether they be state of the art stadiums or community cycling paths, encourage physical activity and, importantly, good health.

The Sport and Recreation Ministers' Council provides the major mechanism for liaison between the Commonwealth Government and State and Territory Governments on matters concerned with sport and recreation in Australia. The Council is a forum for consultation and cooperation between the respective governments, its membership comprising ministers with prime responsibility for sport and recreation.

The Australian Sports Commission (ASC) is responsible for the implementation of the Federal Government's sport policy, including the funding and development of sport, and it works closely with State and Territory Governments and national sporting federations.

Within the ASC, the Australian Institute of Sport (AIS) is responsible for the development of elite sport on a national basis. For the purposes of elite sport development, the ASC integrates sports science and medical services, sports management activities and funding, as well as athlete welfare and technical support services.

The Commission is also the lead agency in the Active Australia alliance. In a coordinated approach by a range of government and non-government groups at the national, State and local level, Active Australia focuses on two key areas—encouraging people to be more physically active and working to improve the places in which people can be active. These include sport, recreation and fitness clubs and organisations, schools and the local community.

The peak body for the sport and recreation industry in Australia is Sport Industry Australia. Established in 1976 as the Confederation of Australian Sport, it sees its role as maximising the contribution that sport and recreation makes to the health and wellbeing of individual Australians, their community and the Australian economy. The name change, which took place in April 2000, reflects the broader focus of the organisation, embracing recreation as well as competitive sport. Sport Industry Australia represents the sport and recreation industry to a wide range of government, industry, corporate, media and community organisations.

The Australian Sports Drug Agency (ASDA) is the custodian of Australia's athlete anti-doping program and plays a leading role, within Australian and international sports communities, in delivering drug testing and education services. ASDA also provides policy advice to sporting organisations and government regarding drugs in sport issues. ASDA is an independent statutory authority and was established in 1990.

A sporting life!

Professor John Daly

Professor John Daly lectured in the History and Sociology of Sport at the University of South Australia. He is the author of six books and numerous articles on Australian sport and is a keynote speaker at most national conferences on sport. He was one of the initial group that established the Australian Institute of Sport in Canberra in 1981 and has written the definitive history of the AIS (Quest for Excellence, 1991). He was the coach of the Australian athletic team from 1974 until 1992, a tenure that included five Olympic teams, and was personal coach of Glynis Nunn who won a gold medal in the heptathlon at the Los Angeles Games in 1984. A founding member of the Australian Coaching Council, a member of the Government Sports Council, he was awarded the Order of Australia for his significant contribution to national level sport.

Sport to many Australians is life and the rest a shadow.
—Donald Horne: *The Lucky Country*

When International Olympic Committee President, Juan Antonio Samaranch, announced (on 24 September 1993) that the year 2000 Olympic Games would be held in Sydney, he endorsed the IOC decision by acknowledging Australia's passion for and commitment to sport as "a way of life".

In his provocative book *Waltzing Materialism* (1978)—a cultural analysis of "attitudes that have shaped Australia"—Jonathon King admits that "to Australians, sport is not just something [we] play in our spare time, but is the medium by which [we] have to prove ourselves to the rest of the world". It was an element of social life that often drew comment from visitors. English writer D.H.Lawrence (1885–1930), when describing Australians in the 1920s, observed that we "play sports as if [our] lives depend on it", but prior to that the great novelist Anthony Trollope, visiting his son in the antipodes in the 1870s, had described sport in Australia as appearing to be "a national necessity".

Certainly we seem to believe that sporting success can help define our place in the world and illustrate who we are. Some years ago, in an article that attracted a lot of attention but little critical comment, I described 'Australia's national sport' as "winning". Few have disagreed with that assessment. Indeed many social commentators (e.g. Horne, McGregor, Stoddart, McKay et al.) have claimed the Australian "passion for sport", as Trollope described it, as obsessive, as a perceived defining characteristic of national identity, and as perhaps an explanation of "a sporting lifestyle". Brian Stoddart (1988) admits that, like it or not, "sport has been the central agency in the creation of an Australian sense of community and identity".

The national commitment to the Sydney Games and the athletes who will represent Australia is continuing proof that these observations and that of Donald Horne ("…sport to many Australians is life…") are true. Indeed, critic Keith Dunstan's 1973 claim that sport in Australia "is the ultimate super religion" still has an accepted credibility in the wider community.

Origins

This preoccupation with sport can be explained in historical terms. Given the European colonisation of Australia, it was natural that 'home' practices, including sport, would be transferred to the antipodes.

Anglo-Celtic settlement ensured that British games were dominant and preferred, although some ethnic groups (e.g. Germans) were able to retain some of their pastimes within their community. The Roman poet, Horace (65–8 BC), was right when he observed:

They change the sky, but not their ways,
Those who rush across the seas.

However, there was a conscious effort to develop "an entire British community…a new Britannia" in the colonies of Australia, and British sports and games helped to illustrate the success of this transposition. The editor of the *South Australian Gazette and Colonial Register*, George Stevensen, acknowledged the success of this in Adelaide, South Australia, when he confirmed in an 1845 editorial that: "English society, manners, language and habits have been successfully transferred" (*Register*, 9 August 1845). Sport was one of those 'habits'.

Francis Dutton, describing South Australia ten years after its foundation for a British audience, noted with satisfaction that "all the British sports are kept up with much spirit in the colony; hunting, racing and…cricket are in the proper seasons much patronised" (Dutton 1846).

Hunting and racing were the favoured leisure pursuits of the colonial gentry as they were of the upper class in Britain. The distinctive uniform, imported pack and horses defined a group of people who sought to be regarded as the leaders of "the new Britannia in the antipodes". Edwin Blackmore, an early master of the Adelaide Hunt, claimed that "South Australia was the first of the Australian colonies to possess a pack of hounds…" (*Register*, 5 September 1870), and while it is true that the hunt was "fully established" there by the early 1840s, there were hunt clubs in the older colonies that preceded the Adelaide Hunt. Thomas George Gregson, gentleman farmer of Jericho in Tasmania, possessed "a fine pack" of hounds in 1828 and "with his scarlet coat and good hunter…cuts no despicable figure…"(cited in Von Stieglitz 1960). In New South Wales John Piper was riding with the Bathurst Hunt in the 1830s, and Bonwick in his *Discovery and Settlement of Port Phillip* describes a "hunt with hounds…and 15 redcoats…" in 1839 (cited in Daly 1986).

Describing the sports and pastimes of the British in 1869, the Earl of Wilton wrote: "let but a few Englishmen assemble in any quarter of the globe and it may safely be predicted that a horse race would be organized…". Within a year of settlement, the first 'Adelaide Races' were held on the extensive plains west of the new town in South Australia. While horse racing claimed broad-based community support in the early settlement period, particularly as it provided opportunities for the 'lower orders' to gamble, the fact that race meetings were organised as mid week occasions indicated the intention of the colonial gentry to keep the sport exclusive. Indeed recent historical research indicates "there is very little evidence that an egalitarian sporting culture was forged during the foundation years of white settlement in Australia" (Adair and Vamplew 1997).

In New South Wales, officers of the 73rd Regiment, who had been involved in horse racing in India, organised a racing carnival in Sydney in 1810. A course was established in Hyde Park and most of the horses involved in the three day meet were owned (and ridden) by the officers.

Military and naval officers stationed in colonial Australia were instrumental in establishing other sports. The "First Australian Regatta" was organised in Sydney on 28 April 1827 by Captains Rous and Sterling of HMS Rainbow and HMS Success. The *Australian* of 25 July, deploring some of the more brutal English sports and pastimes, explained that it was military men "who...kept the sport [of cock fighting] alive…" (cited in Cashman 1995).

Anthony Trollope wrote in 1864 that cricket was the game by which Englishmen might be recognised in every corner of the earth. "Where a score or so of our sons are found, there is found cricket…". Cricket assumed a real importance in Australia during the nineteenth century. It was perceived to be the representative game of English mores. Success by colonial teams against 'home' counties and English representative teams also was proof that Australians had not degenerated in the antipodean sun or through "the convict stain", a fear often expressed in contemporary newspapers.

While cricket 'for all' was encouraged, there were other sports which were exclusive and definitive of the upper classes. 'Genteel' Australians imitated 'genteel' Britons in their leisure activities. Croquet was described as "a most infectious" amusement among the colonial gentry in the 1860s. Expensive sets of balls and mallets were imported from England and few of the 'great houses' of the upper classes did not possess a carefully manicured lawn for the sport—one of the few to encourage participation of women.

When tennis became the fashion in Britain in the late 1870s, colonial society adopted the English game and converted the croquet lawn to a court. The colonial 'gentry' played golf and lacrosse, went yachting and imported polo ponies from India. Women were included in the golf and 'boating', played hockey instead of lacrosse, and rode to the hunt. The homes of the upper classes boasted rooms for billiards and dancing. They formed exclusive clubs, imported expensive equipment and dressed for the occasion to display their status. In such a manner they strove to be English provincial gentry in the antipodes by engaging in symbolic elite activities.

Sport, though, was not the province of the upper class in early Australia. Richard Twopeny, who settled in South Australia and wrote of *Town Life in Australia* in 1883, observed that "no class was too poor to play" and added "…the more ample reward attaching to labour out here leaves the colonist more leisure…and this leisure he devotes to play".

The tavern provided the initial venue for sport for the 'common man' in colonial Australia as it had done in Britain. The hotels offered impromptu sporting entertainment for a male drinking and gambling clientele. The warm climate encouraged drinking, and the inns were real community centres offering recreation and fellowship, although only for a male clientele. Inn keepers acted as entrepreneurs for sporting events, played host to embryo sporting clubs and gave cover to early bookmakers.

Middle class settlers were critical of the sports and pastimes of the working class, associated as they were with drinking and gambling, and campaigned actively for "rational recreation". Organised team games, like cricket and football, flourished under their sponsorship, being justified for their communal values and ethical rules. Cricket, however, was considered "the game of games" and "must take pride of place", argued Twopeny "because all classes and ages are interested in it…Cricket is the colonial *carriere ouverte aux talents*" (Twopeny 1883). It was even advocated as an ideal game for the Indigenous peoples, a playful way of teaching white values to Australian Aboriginals.

Developments in the twentieth century

By the time Gordon Inglis published his *Sport and Pastime in Australia* (1912) many of these sports had been organised into structured, community competitions reflecting local identification and support. The more casual sports, like skittles, were "a thing of the past" as were the more brutal activities like cock fighting and bare knuckle boxing, but there was no doubting Trollope's comment about Australians' devotion to their sports, or D.H.Lawrence's observation that they played "as if their lives depended on it". By the turn of the century, a visitor to Australia could attest that "the principal amusements of the colonists [were] outdoor sports of one kind or another" (cited in Greenwood 1955).

Inglis admitted that sport occupied "a prominent place in Australian life" and that representative athletes were beginning to succeed in the international arenas. He explained this in terms of British origins, "a perfect climate", a favourable standard of life and increased leisure time, especially for the

working man. Professor Anderson Stuart, Dean of the Medical School at Sydney University, supported Inglis but added another explanation: that the immigrants to Australia had been "drawn from an adventurous lot" and that the qualities that contributed to their risk taking conduced to success in sport.

Australians certainly were successful in international sport. The country claimed its first Olympic victor when Edwin Flack won both the 800 and 1500 metres in Athens in 1896. Edward Trickett, though, was Australia's first world champion, having beaten sculler James Sadler in England in 1876. There were others—Freddy Lane, Frank Beaurepaire, Andrew Charlton and Fanny Durack in swimming, Norman Brookes in tennis. Numerous cricketers had international reputations, and the 'tests' against England confirmed their status and Australia's growing confidence in its overall sporting prowess in the games that 'mattered'.

Although linked with New Zealand as Australasia for the early Davis Cup tennis competitions, success against both the British and Americans (1907–1911) boosted antipodean confidence, especially in 1911 when the Americans were beaten 5–0. International sporting success continued as the century progressed: Bobby Pearce and Mervyn Wood in the single sculls at the Olympic Games (1928, 1932, 1948), Jack Crawford winning the Wimbledon tennis title in 1933. Clare Dennis won gold in swimming at the 1932 Olympic Games in Los Angeles, and Marjorie Jackson and Shirley Strickland were successful at the Games in Helsinki in 1952. Walter Lindrum was champion of the world in billiards from 1932 to 1950 and Don Bradman "the world's best cricketer".

In the two decades of the fifties and sixties Australia competed in nineteen Davis Cup finals and won fifteen of them. When the Olympic Games were held in Melbourne in 1956 Australia claimed thirteen golds, four in athletics and eight in swimming. This was the era of the 'golden girls' including Betty Cuthbert and Dawn Fraser. When, in 1962, *Sports Illustrated* judged the three leading nations in each of forty sports, Australia ranked sixth out of thirty-four nations. When scores were weighted on a per capita basis, Australia was placed first, and American sports writer Herbert Warren Wind concluded that it was "a land inundated with athletes". Australia basked in the limelight, enjoying the reputation of a sporting nation.

That ended in the sixties when other countries, particularly in the Eastern Bloc, recognised the value of sporting success, and developed structural systems to support athletic talent. After winning eight gold medals at the Munich Olympics in 1972, the Games of Montreal in 1976 produced none. Dubbed the "Lucky Country" by Donald Horne in the sixties, the country seemed to be running out of luck.

When Australians were not winning in the international sporting arenas (the seventies), the Government was forced by public pressure to match the efforts of other countries to maintain an expectation that by now had become part of the national ethos. The Australian Institute of Sport was established in Canberra in 1981 and was followed by State Institutes in the years following. Talent identification programs and elite athlete support at the so-called 'gold medal factories' have reversed the losing trend, and Australia has once more secured winners in the international arena. Government initiatives now seek actively to ensure that Australia's national sport is winning, and the population seems prepared to pay the cost of that success. However, there are some reservations about the current program and the aftermath of the Sydney 2000 Olympic Games.

Conclusion: A sporting life?

In his anthology of contemporary Australian writing (*Sporting Declaration*, 1996) Manfred Jurgensen asserts that "it is difficult to overestimate the importance of sport in the establishment of an Australian cultural identity", but the question has to be asked: is the lifestyle an active sporting one? Certainly 'sportuguese' seems to be the *lingua franca* of the people—we even use the word 'sport' as a slang term of endearment, interchangeable with 'mate'! One of our most significant public holidays celebrates a Melbourne horse race, and we seem preoccupied with the results of our national sporting representatives.

Our vicarious identification with successful elite Australian athletes has given them hero/heroine status, such that a christian name is enough to identify them (e.g. Dawn Fraser, Cathy Freeman, Kieran Perkins).

However, while there is a belief in the sport obsession and its centrality in defining the Australian character, active involvement is a myth. Sports participation nowadays is essentially reserved for the young and aspiring.

There is still a problem of women's involvement, some feminists declaring the domain to be a site of male hegemony and sexism (Bryson, 1987). This era of commodified global sport and TV entertainment encourages watching and discourages the dabbler, giving preference (and rewards) to the elite performer.

"Sports participation is less obviously an Australian trait." (Vamplew and Stoddart 1994). Player registrations have been decreasing for decades and the Federal Government has created programs to encourage active involvement in playful (as against competitive, elite determining) sport. The Active Australia program is a current example. Physical Education has been termed "in a crisis state" in Australian schools (Crowley Report) and few youngsters are being taught the basic maturation skills that can contribute to or encourage an active lifestyle. Physical activity surveys indicate that a sizeable proportion of Australians exercise neither long enough nor sufficiently vigorously to maintain a reasonable level of fitness.

One frequently asked question in Australia is: "After 2000, what?" The Olympics are over and have been successfully staged. Hopefully the emphasis in sport and recreation will be directed to assisting those, other than elite athletes, who could give veracity to the statement "an active, sporting lifestyle".

Funding for recreation and sport

Government funding

Total (consolidated) expenditure by the three levels of government (Commonwealth, State and Territory and local) on recreation in 1998–99 was $4,775m. Most expenditure was by general government ($3,447m compared with $1,915m by public non-financial corporations). Of general government expenditure (before consolidation between sectors), Commonwealth government expenditure was $236m, State and Territory $1,767m and local $1,515m. Of all public expenditure on recreation, current expenditure was far more significant than capital expenditure ($3,890m compared with $885m).

The Commonwealth Government, through the Australian Sports Commission, supports the development of sport in Australia. In 2000–01 the Commission, with a budget of some $111m, will provide assistance for elite athlete development programs, coaching, officiating, international competition, training camps, management improvement and community sport.

Business sponsorship

In 1996–97 about 22,700 employing businesses (3.7%) sponsored sport to the value of $282m.

Sport, recreation and gambling industries

There are over 11,000 businesses in the sports, recreation and gambling industries according to surveys conducted by the ABS.

There were 5,066 businesses in the sports industries at 30 June 1995. These businesses employed 58,414 persons and generated $2,517m in income during 1994–95 (table 12.29). There were 112,877 unpaid volunteers, representing 66% of persons working in sports industries.

Other recreation services, which include amusement parks or arcades, sideshows, circuses and agricultural shows, comprised 666 businesses, employing 10,138 persons and 3,518 volunteers.

The section *Sports industries* in *Chapter 21, Service industries* contains some further information on these industries.

There were 1,776 businesses in the gambling services industries at 30 June 1998. These businesses employed 37,035 persons and received $7,935m in income, the major source of income (91%) being the takings (net of payouts to players) and commissions from gambling (table 12.30). Total expenses for the gambling services industries were $7,518m, of which 35% were gambling taxes and levies.

There were 3,749 businesses in the hospitality clubs industry at 30 June 1998, employing 67,272 persons and receiving total income of $6,013m. Of these businesses, 2,408 had gambling facilities and received income from gambling of $3,207m.

12.29 SPORTS AND OTHER RECREATION SERVICES INDUSTRIES, Key Aggregates—1994–95

Industry	Number of businesses(a) no.	Total employment(a) no.	Total income $m
Horse and dog racing	898	14 118	789.1
Sports grounds and facilities n.e.c.	1 581	21 563	796.3
Sports and services to sports n.e.c.	2 588	22 732	931.6
Total sports industries	*5 066*	*58 414*	*2 517.0*
Other recreation services	666	10 138	610.1

(a) At 30 June 1995.

Source: Sports Industries, Australia, 1994–95 (8686.0); Recreation Services, Australia, 1994–95 (8688.0).

12.30 GAMBLING SERVICES AND HOSPITALITY CLUBS INDUSTRIES, Key Aggregates—1997–98

Industry	Number of businesses(a) no.	Total employment(a) no.	Income net of payouts to players $m
Lotteries	134	2 782	2 545.1
Casinos	13	20 531	2 709.7
Gambling services n.e.c.	1 629	13 722	2 680.5
Total gambling services	*1 776*	*37 035*	*7 935.3*
Clubs (hospitality)	3 749	67 272	6 012.5

(a) At 30 June 1998.

Source: Gambling Industries, Australia, 1997–98 (8684.0); Clubs, Pubs, Taverns and Bars, Australia, 1997–98 (8687.0).

Gambling services were also provided by 2,888 pubs, taverns and bars. The total net takings from gambling during 1997–98 from all businesses involved in gambling were $11,091m, of which 57.7% ($6,401m) were from poker/gaming machines, 12.9% from off-course TAB and 14.4% from lotteries, lotto style games, football pools, instant money and club keno. Net takings from poker/gaming machines were $3,595m for clubs; $2,106m for pubs, taverns and bars; and $700m for casinos.

The section *Gambling* in *Chapter 21, Service industries* contains some further details for these industries.

Involvement in sport

In the 12-month period to the end of March 1997, 4.7 million people (32% of all people aged 15 years and over) were involved in playing or organising a sport on at least one occasion (table 12.31). Over 4.1 million people (29%) had played a sport and 1.7 million (12%) (many of whom were also players) were involved as coaches, referees, administrators or in some other non-playing capacity.

Participation in sport and physical activities

Information on the sports and physical activities in which Australians participate has been collected using the ABS Population Survey Monitor (PSM). Results from the four quarterly surveys of the PSM are collated to produce annual estimates.

12.31 INVOLVEMENT IN SPORT—1993 and 1997

	1993		1997	
	Number	Participation	Number	Participation
Type of involvement	'000	%	'000	%
Players	3 963.6	29.1	4 115.2	28.5
Paid	57.0	0.4	142.6	1.0
Unpaid	3 906.5	28.7	3 972.6	27.5
Non-players(a)	1 419.7	10.4	1 655.9	11.5
Paid(b)	166.1	1.2	203.9	1.4
Unpaid	1 253.6	9.2	1 452.0	10.1
Players and non-players(c)	4 504.9	33.1	4 669.8	32.4
Paid	213.3	1.6	328.5	2.3
Unpaid	4 291.6	31.6	4 341.3	30.1

(a) Includes players with non-playing involvement. (b) Refers to those who received some payment for their non-playing involvement only. (c) Persons who are involved both as players and non-players are counted only once.

Source: Unpublished data, 1993 Involvement in Sport Survey; Involvement in Sport, Australia, 1997 (6285.0).

12.32 PARTICIPATION IN SPORT AND PHYSICAL ACTIVITIES(a), By Age Group—1998–99

	Males		Females		Persons	
Age group (years)	Number '000	Participation rate %	Number '000	Participation rate %	Number '000	Participation rate %
18–24	754.4	81.9	704.8	78.8	1 459.2	80.4
25–34	1 040.0	75.4	917.2	64.9	1 957.3	70.1
35–44	886.8	63.0	851.0	59.1	1 737.8	61.1
45–54	724.5	58.8	659.5	53.9	1 384.0	56.4
55–64	388.7	48.0	377.7	47.5	766.4	47.8
65 and over	389.1	41.9	368.5	32.6	757.6	36.8
Total persons	**4 183.5**	**62.6**	**3 878.8**	**56.3**	**8 062.3**	**59.4**

(a) Data for 1998–99 are not comparable with those for 1997–98, as non-organised running/jogging/walking activities were included for the first time in respect of 1998–99.

Source: Participation in Sport and Physical Activities, 1998–99 (4177.0).

The survey found that 59.4% of the population (8,062,300 people) aged 18 years and over participated as players in one or more sports and physical activities during the 12 months ending June 1999 (table 12.32).

Participation rates were highest for the 18–24 year age group (80.4%), and declined steadily with age. Only 36.8% of the population aged 65 years and over participated in a sport or recreational physical activity.

Males had a higher participation rate than females in every age group, the greatest difference occurring in the 25–34 year age group. Overall, males had a participation rate of 62.6% compared with 56.3% for females.

The most popular sport or physical activity undertaken during 1998–99 was walking, with participation by about 3,077,700 people, or 22.7% of the population aged 18 years and over.

Results from the surveys conducted in 1996–97 of participants aged 15 years and over show that over $2,762m was spent on organised sport and physical activities by participants. This represents an average expenditure of $693 per participant. Organisation of sports is through clubs, associations and schools.The main areas of expenditure were clothing and equipment ($814m), followed by weekly fees ($570m), membership ($538m) and transport ($527m).

The most expensive organised sport or physical activity was motor sports, which had an average expenditure of $1,787 in 1996–97. Other expensive sports for participants were horse riding ($1,405), waterskiing/powerboating ($1,277) and air sports ($1,259).

Popular sports and physical activities

In 1998–99 participation by adults in activities organised by clubs or associations was highest in aerobics/fitness, golf, tennis, netball and lawn bowls. However when non-organised participation is included, the activities which attracted the most participants were walking (3.1 million people), swimming (2.1 million),

aerobics/fitness (1.5 million), golf (1.3 million) and tennis (1.1 million) (table 12.33).

For men, the most popular activities were golf and walking; for women, walking and swimming had the most participants.

The most popular sports or physical activities varied with age. In the 18–24 year age group, swimming had the most participants (406,600), followed by aerobics/fitness (383,300) and walking (354,300). For people aged 45 years and over, walking (1,443,700) and swimming (579,000) had the most participants, followed closely by golf (558,400).

State and Territory differences

Differences in levels of participation in sport and physical activities in different parts of the country are in part affected by the age profiles of those populations, but other factors such as climate and life-style preferences of individuals may also be important. These differences can be observed between the States and Territories. In 1998–99 residents of the Australian Capital Territory (aged 18 and over) recorded the highest participation rate (73%). South Australia, on the other hand, recorded the lowest participation rate (57%). Furthermore, the biggest difference between the participation of men and women was in South Australia (61% and 53% respectively) (table 12.34).

Masters' sports

Older people who have enjoyed competitive sport at younger ages are often keen to maintain or renew their active involvement by competing with their peers. The Australian Masters' Games is a multi-sports festival for mature-aged people conducted biennially in various locations throughout Australia. Ownership of the Games is held in trust by Sport Industry Australia.

The most recent (7th) Australian Masters' Games were held in Adelaide from 25 September to 3 October 1999. There were 11,775 people registered in the Games from twenty eight countries, and they participated in 46 sports. The 8th Australian Masters' Games will be held in Newcastle and The Hunter in October 2001.

12.33 ADULT PARTICIPATION IN SELECTED SPORTS AND PHYSICAL ACTIVITIES(a)—1998–99

	Players	Participation rate
Sport/Activity	'000	%
MEN		
Golf	1 048.7	15.7
Walking	1 041.9	15.6
Swimming	937.6	14.0
Fishing	699.7	10.5
Tennis	553.1	8.3
Aerobic/fitness	518.9	7.8
Cycling	482.4	7.2
Running	438.1	6.6
Billiards/snooker/pool	284.1	4.3
Cricket (outdoor)	280.4	4.2
WOMEN		
Walking	2 035.9	29.5
Swimming	1 143.4	16.6
Aerobics/fitness	994.0	14.4
Tennis	498.3	7.2
Netball	372.0	5.4
Cycling	313.4	4.5
Golf	282.5	4.1
Running	215.8	3.1
Fishing	215.2	3.1
Horse riding	185.2	2.7

(a) Refers to persons aged 18 years and over.

Source: Participation in Sport and Physical Activities, Australia, 1998–99 (4177.0).

12.34 PARTICIPATION IN SPORT, By State/Territory(a)—1998–99

	Men	Women	Persons
State/Territory	%	%	%
New South Wales	62.7	54.2	58.4
Victoria	61.4	55.0	58.2
Queensland	63.4	58.4	60.9
South Australia	60.6	53.3	56.9
Western Australia	63.7	63.2	63.4
Tasmania	62.6	55.5	58.9
Northern Territory(b)	61.7	59.3	60.5
Australian Capital Territory	76.2	70.5	73.2

(a) Persons aged 18 years and over. (b) Figures for the Northern Territory refer to mainly urban areas only.

Source: Participation in Sport and Physical Activities, Australia, 1998–99 (4177.0).

Attendance at sporting events

Australians enjoy watching sporting events. According to a survey conducted by the ABS in November 1997, sporting programmes were the most commonly watched on television after news and current affairs programmes, and were viewed regularly by over half of all Australians aged over 18 (55%). As well as watching sporting events on television, attending sports events (such as club matches and international competitions) is also a popular pastime.

During the 12 months ended April 1999, 7.0 million people, or 47.1% of all people aged 15 years and over, attended a sporting event (excluding junior and school sport). Men (55%) were more likely to have attended than women (40%). For both men and women, attendance rates were highest for the 15 to 24 year age group (69% and 58% respectively) and steadily declined with age. Among men aged 65 years and over, the attendance rate was 28%, while for women in this age group it was 17%.

The most popular spectator sport was Australian Rules football, 2.5 million people having attended this sport on at least one occasion during the year (table 12.35). Horse racing (1.8 million), Motor sports (1.6 million) and Rugby League (1.5 million) were also among the most popular spectator sports.

12.35 ATTENDANCE(a) AT SELECTED SPORTING EVENTS—1999

Sporting event	Persons '000	Attendance rate(b) %
Australian Rules football	2 509.2	16.8
Horse racing	1 756.4	11.8
Motor sports	1 574.3	10.6
Rugby League	1 501.1	10.1
Cricket	942.5	6.3
Soccer	621.2	4.2
Harness racing	534.8	3.6
Basketball	526.0	3.5
Rugby Union	446.2	3.0
Tennis	444.0	3.0
Dog racing	276.4	1.9
Netball	248.7	1.7

(a) By persons aged 15 years and over. (b) Proportion of the civilian population aged 15 years and over.

Source: Sports Attendance, Australia, 1999 (4174.0).

Bibliography

ABS publications and data sources

Aspects of Literacy: Assessed Skill Levels, Australia, 1996 (4228.0).

Attendance at Selected Cultural Venues, Australia, April 1999 (4114.0).

Book Publishers, Australia, 1997–98 (1363.0).

Casinos, Australia, 1998–99 (8683.0).

Clubs, Pubs, Taverns and Bars, Australia, 1997–98 (8687.0).

Cultural Funding, Australia, 1998–99 (4183.0).

Employment in Selected Culture/Leisure Occupations, Australia, August 1996 (6273.0).

Film and Video Production and Distribution, Australia, 1996–97 (8679.0).

Gambling Industries, Australia, 1997–98 (8684.0).

Household Use of Information Technology, Australia, 1999 (8146.0).

Involvement in Sport, Australia, March 1997 (6285.0).

Libraries and Museums, Australia, 1996–97 (8649.0).

Motion Picture Exhibition, Australia, 1996–97 (8654.0).

Participation in Sport and Physical Activities, Australia, 1998–99 (4177.0).

Population Survey Monitor (4103.0).

Public Attitudes to the Arts, Australia, November 1997 (4157.0).

Radio and Television Services, Australia, 1996–97 (8680.0).

Recreation Services, Australia, 1994–95 (8688.0).

Sport and Recreation: A Statistical Overview, Australia, 1997 (4156.0).

Sports Attendance, Australia, April 1999 (4174.0).

Sports Industries, Australia, 1994–95 (8686.0).

Time Use on Culture/Leisure Activities, 1997 (4173.0).

Work in Selected Culture/Leisure Activities, Australia, 1998–99 (6281.0).

Zoos, Parks and Gardens Industry, Australia, 1996–97 (8699.0).

Other publications

7th Australian Masters' Games Final Report, 7th Australian Masters' Games Corporation Adelaide, 2000.

Australia Council:

—*Annual Report 1997–98*.

—*Arts Festivals 1993–94*, Research Paper No 13, January 1995.

—*Books: Who's Reading Them Now*, November 1995.

—*Festival Survey 1995*.

Australian Broadcasting Authority, *Annual Report 1998–99*.

Australian Broadcasting Corporation, *Annual Report 1998–99*.

Australian Film Commission:

—*Get The Picture*, 5th ed., 1998.

—*National Production Survey*, 1998–99.

Australian Heritage Commission, *Annual Report 1998–99*.

Commonwealth Department of Communications and the Arts:

—*Annual Report 1998–99*.

—*Art and craft purchases, 1997*.

—*Attendance at Festivals, Australia, November 1995 to September 1996*.

Musica Viva Australia, *Annual Report 1998*.

National Archives of Australia, *Annual Report 1999–2000*.

National Museum of Australia, *Annual Report 1998–99*.

Opera Australia, *Annual Report 1999*.

Public Lending Right Committee, *Annual Report 1998–99*.

The Australian Ballet, *Annual Reports*.

Wilson, Jan and Fagg, Murray 1988, *Directory of Australian Botanic Gardens Arboreta, 3rd Edition*, ANBG.

Internet sites

ARAZPA, *http://www.arazpa.org.au*

Archives of Australia, *http://www.archivenet.gov.au*

ArtsInfo, *http://www.artsinfo.net.au*

Australia on CD, *http://www.dca.gov.au/mmauscd.html*

Australian Film Commission, *http://www.afc.gov.au*

Australian Film Finance Corporation, *http://www.ffc.gov.au*

Australian Heritage Commission, *http://www.ahc.gov.au*

Australian Museums On Line, *http://amol.org.au*

Australian National Botanic Gardens, *http://www.anbg.gov.au*

Australian Sports Commission, *http://www.ausport.gov.au*

Australia's Cultural Network, *http://www.acn.net.au*

Commonwealth Department of Communications, Information Technology and the Arts (DOCITA), *http://www.dcita.gov.au*

CREATE Australia, *http://www.createaust.com.au*

Musica Viva Australia, *http://www.mva.org.au*

National Archives, *http://www.naa.gov.au*

National Library of Australia, *http://www.nla.gov.au*

National Office of Sport and Recreation Policy, *http://www.dist.gov.au/nosarp*

Official Sydney Olympics site, *http://www.olympics.com/eng/*

Opera Australia, *http://www.opera_australia.org.au*

Performing Arts Multimedia Library, *http://www.cinemedia.net/PAML/*

Public Lending Right, *http://www.dcita.gov.au/plr.html*

Screensound Australia, *http://www.screensound.gov.au*

Special Broadcasting Service (SBS), *http://www.sbs.com.au*

Sport Industry Australia, *http://www.sportforall.com.au*

The Australian Ballet, *http://www.austballet.telstra.com.au*

Accounting for audiences in Australian museums

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Ms Casey has wide-ranging experience in the management of indigenous and cultural heritage policy issues. As a member of the Department of Prime Minister and Cabinet, she was responsible for the establishment of the Council for Aboriginal Reconciliation.

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Introduction

Australia boasts over 1,700 museums, including museums housing collections of cultural and historical interest, art galleries, science centres, historic sites, house museums, outdoor museums and interpretation centres.[1] Each year, more than 16 million visitors journey through these institutions, encountering and engaging with Australia's cultural and natural heritage.[2] Who are these visitors and why do they go to museums? What do they expect to find in a museum? What does a visitor take away with them after a day at a museum? In the 1990s, Australian museums have become increasingly interested in such questions. Positions have been created for staff dedicated to investigating museum audiences, sophisticated research and evaluation tools have been developed, and a Special Interest Group of the museum profession's national association has been formed to work towards refining and improving means of knowing about museum audiences. In 1993–94, when the Council of Australian Museum Directors surveyed 23 participating institutions about their evaluation and visitor research activity, the museums indicated that they had completed 47 visitor research projects, 65 exhibition evaluations and another 15 associated program evaluations. Three years later, in 1996–97, the Council's survey showed that the 20 participating institutions had conducted 121 visitor research studies, 86 exhibition evaluations and 78 program evaluations. Budget expenditure on visitor research and evaluation over the three years had increased by 37%.[3]

These figures seem to indicate an explosion in the attention museums are paying to their visitors in the last decade. Questions about who museum visitors are and what they do when visiting have, however, interested Australia's museums since the first such institution was founded in the 1820s. Museums have always understood themselves to possess a dual mandate, to collect, research and preserve material evidence of people, cultures and

environments and to interpret those collections for the education and sometimes entertainment of particular audiences. These two tasks have provided an ongoing dynamic at the heart of Australia's museums, but the nature and relationship of each has changed significantly since the 1820s. How have museums in Australia imagined, constituted and sought to understand their audiences over this period, and what does this reveal of the changing ways museums have understood their role in and contributions to Australian society?

Colonial museums and 'respectable individuals'

Australia's first museums were established by the élite of colonial society, and they did not wait long after arriving in the new continent to get started. In the first century of European settlement in Australia, major museums, often associated with a library and an art gallery, were established in each of the metropolitan centres. The Australian Museum was founded in Sydney in 1827, and the Tasmanian Museum and Art Gallery in Hobart in 1848. In the 1850s, the colonies of Victoria, Queensland and South Australia all established museums, and Western Australia followed suit in the early 1890s. By Federation in 1901, Australia's cities already boasted significant museums, their edifices, sited prominently in the centre of town, declaring the rule of civilisation in the Antipodes.

These early museums were formed primarily through the efforts of clubs of amateur gentlemen scientists, such as the Philosophical Society of Australasia, the Philosophical Institute of Victoria and the Royal Society of Tasmania. Eager to institute in the colonies the organisations for enlightened discussion, scientific debate and serious research which had been their domain in Europe, these societies developed museum collections for their own edification and enjoyment, often housing them in part of the local university. Access to these early museums was restricted to members of the learned society, professors or students from associated universities, and other local or visiting members (usually male) of the educated class who might be granted permission through reputation or connection.

By the 1850s, the founders of Australia's museums were petitioning colonial governments to provide public monies to construct significant buildings to house their institutions. In part, perhaps, this reflects the growth in museum collections up to this time, but more importantly, it also signals a profound change in the conception of the museum itself. By the middle of the nineteenth century, the notion of the museum as a technology for universal public education had gained a strong hold in the Australian colonies, imported primarily from England where the idea of a 'public museum' open to all had been developing since the 1830s. The idea of the museum as a cultural resource for the educated classes had been joined by the concept of the museum as a means of reforming the uneducated. At the heart of this new conception of the museum was a widespread concern among social reformers that what they saw as the depredations of the working classes were leading to social decline and political unrest. Exposing the working classes to the refining influences of science and art through institutions such as the museum, the library and the school was believed to be one way in which the working classes could be diverted from such behaviours. Time spent at the museum would, at its most practical, be time not spent at the public house or in other 'common excitements'.

Working class men in particular were seen as the target of the museum's civilising influence. Social philosophies of the time held that such men, through absorbing the principles of rational thought embodied in science and the examples of virtue and courage expressed in art, might be set on a road of self-improvement through which they would become the "prudent, thrifty and responsible heads of households".[4] The museum was a means by which the dissolute might become useful contributors to society and economy. Australia's colonial governments were evidently persuaded relatively quickly of the social value of museums as, from the 1850s, they contributed funds to establish what are now the major State museums. Australia's museums were, from the first, created as public institutions.

The idea of the museum as a tool of public education and improvement entailed a new relationship between the museum and its visitors. The audience for any museum now ideally included all members of society, and

the success of a museum depended not only on its collections but also on the number of people it attracted. Visitor numbers could now provide some measure of how effectively the museum was fulfilling its mandate to enlighten and civilise all sectors of society. In 1859, for example, when the Royal Society of Tasmania petitioned the colonial Governor for funds to construct a building to house a 'national museum of natural history and the arts', together with the Society's library, it cited the fact that the number of visitors to its existing premises had doubled in two years. This was evidence, the Society argued, of the value of the museum in "stimulating and promoting mental culture and intellectual improvement".[5] It appears, however, that although many museums kept statistics on the number of visitors, the methodology of collection was never anything but impressionistic. A favourite technique for measuring visitors was to count numbers of visitors over bank holidays or weekends, the most popular visiting times for working class people, and to use these numbers to assess how effectively the museum was fulfilling its educational mandate. The well-to-do middle and upper classes, it seems, were safely assumed to be already dutifully visiting.

The museum's new understanding of its audience as the entire general public created new challenges for the institution. It now had to get new visitors in the door, drawing the working classes away from their everyday amusements such as the circus and the vaudeville and teaching them to enjoy the restrained satisfaction of acquiring new knowledge. Museum curators clearly wished to distance their institutions from these plebeian entertainments. Anxious to maintain the air of scientific endeavour and civilised authority which they took as their mission, they also recognised the problems of attracting visitors. Museums experimented with new display techniques such as dioramas and panoramas, designed to impress visitors with new viewpoints and interesting subjects. Australia's museums became some of the first to develop what later became known as 'outreach programs' designed to bring the museum to social groups who would not regularly visit. And by the 1880s, children became seen less as unsavoury nuisances and more as ideal visitors upon whom the civilising mission of the museum could be effected through targeted education programs.[6]

Australia's colonial museums also participated in the creation of displays for the international exhibitions and worlds fairs of the nineteenth and early twentieth centuries. These extravaganzas, often combining sideshow with scientific exhibition, drew a diverse crowd. The upper classes enjoyed the curiosities of the world as did the working classes, and the mercantile middle class perhaps saw new opportunities for trade and industry. In keeping with this diverse audience, displays representing the various Australian colonies at international exhibitions tended to combine specimens of the continent's unusual flora and fauna, Aboriginal artefacts, and examples of the colonies' natural resources and primary industries such as wool and gold. The colonial museums often participated in such events, sometimes by supplying artefacts for exhibition and advising on display and sometimes absorbing the contents of displays into their collections after the major exhibition closed. Through such work, museums showed themselves as places of potential interest to a wide variety of people. They became the repositories of the rare and curious, and sources of information about economic opportunities in the Australian colonies, while maintaining their association with scientific education.

Beyond their commitment to educating the general public, Australia's museums continued their commitment to a long established audience. Australia's first museums were primarily natural history museums, dedicated to developing large collections of the geological, floral and faunal resources of the continent. These museums encapsulated the Victorian enthusiasm for collecting, ordering and preserving the natural world within a unified system of classification. The process of cataloguing the new continent's natural history was a process of incorporating what appeared to European eyes 'new' forms of life into established European scientific taxonomies. In understanding their collecting work in this way, Australia's colonial museums implicitly recreated an international scientific community as their audience. This was a community, moreover, with its centre in Europe. This is abundantly evident in the considerable passage of specimens of indigenous species or geological formations from the Australian colonies to the collections of European museums, and the dissemination of European systems of thought through the practice of science.

Australia's colonial museums thus positioned themselves between two audiences. On the one hand, the 'public', often thought of as an undifferentiated mass requiring enlightenment and needing to be attracted, and on the other hand, a scholarly community of scientists and intellectuals who would provide the resources for enlightenment and education. At times, museums were evidently squeezed between the two as, throughout the nineteenth century, critics charged museums both with abandoning intellectual rigour in favour of the lowest common denominator and of alienating visitors through being high-brow and inaccessible. Despite these pressures, the colonial museum remained a place where the educated expert would provide information, and the uneducated everyday visitor would absorb it. There was no sense that all members of the audience should have access to the museum in terms of the museum representing and speaking to their own particular interests and concerns.

Evolving an audience

The focus of Australia's early museums on natural history gained strength throughout the nineteenth century. Practices of exhibition emphasised the display of collections of flora and fauna, and mineralogical and geological specimens, according to scientific systems of classification which demonstrated typological relationships. Frederick McCoy, for example, the first director of the National Museum of Victoria, stipulated that the specimens of the Museum's palaeontological collections would be

> "… first divided into geological groups or periods according to the distribution in time and analogous to the distribution in space indicated by the arrangement of the collections of specimens of the living species. The fossils of each formation are then arranged in zoological systematic order, and fully named with genus, species, locality and formation".[7]

Such exhibitions were seen to embody and communicate the principles of order, rationality and considered examination which lay at the heart of enlightened thinking and behaviour. These exhibitions were seen as one of the tools through which the masses might learn such attitudes and self-disciplines; and they consequently rested at the heart of the museum's 'civilising mission'.[8]

The new role for museums as educators of the public also emphasised the importance of art, sculpture, literature and other products of 'civilisation' in refining the morals and sentiments of working people. Art and culture would improve 'taste', while natural history taught 'reason'. This emphasis on the possibilities of high culture led almost every Australian colony to found, between the 1860s and 1900, public art galleries and museums of applied arts, science and technology. These new museums, and particularly the museums of applied arts, science and technology, also represented a continuation of an alternative museum tradition in the Australian colonies. From the 1830s to the 1860s, Mechanics Institutes flourished in Australia, offering labourers and the less well-to-do middle classes lessons and lectures in both technical and intellectual subjects. Attached to these Institutes were often small collections of objects, art and books, providing teaching and cultural resources. As the larger metropolitan museums (and libraries) were founded and developed a public education mandate, the collections of urban Institutes tended to be absorbed by them. Some Institutes, and particularly rural ones, persisted longer, often until governments created colony- or State-wide technical schooling organisations and libraries to take up and extend the work of the Institutes.[9]

After the 1860s, the collection and exhibition practices of all these museums came to be increasingly shaped by theories of natural and social selection, succession and progress deriving from evolutionary thinking. Exhibitions of art and culture were important in declaring the common heritage of Australian and European society through bringing the masterpieces, or at least copies of masterpieces, of European civilisation to Australia. Natural history and particularly ethnological collections and exhibitions, however, carried the primary burden of communicating concepts of social evolution.

Australia's colonial museums had collected Aboriginal and Torres Strait Islander artefacts, and sometimes human remains, since their foundation, understanding Australia's Indigenous inhabitants as part of the curious natural history of the continent. After the 1860s, as ideas about social evolution gained wider acceptance,

museums rapidly increased the size of these ethnological collections. Aboriginal people came to be seen as part of a 'nature' which would inevitably be destroyed by the advance of white civilisation, or as members of a 'primitive' race who would naturally be superseded by more 'highly developed' human races. These ideas were embodied in exhibitions expressing principles of hierarchical categorisation and succession and positioning men of white European extraction, or their artistic, cultural and technological products, at the hierarchical apex. Museum visitors were implicitly addressed as the inheritors of the progressive triumph of superior races.

Australia's colonial museums thus displayed and validated the perspectives and experiences of a very limited group of people—educated, white European men. Australian Aboriginal and Torres Strait Islander peoples, although not formally excluded, clearly only found their way into the museum as dead specimens of a 'primitive' people, or were represented through their artefacts displayed as 'simple technologies'. There was no sense in which Aboriginal and Torres Strait Islander people constituted a part of the audience imagined by the museum. Other groups, such as women and non-European ethnic minorities, were more complexly addressed. White women at least were evidently regarded as a part of the museum audience, but their specific interests and knowledges were rarely addressed. By the turn of the century, American feminists in particular began to argue that although museums purported to offer a universal representation of the world—its natural, social and cultural development—they failed to address women or accord sufficient attention to their art and culture. Museums, first-wave feminists proclaimed, were missing out on half the world.[10]

Discovering national history

When Australia celebrated its federation in 1901, the efforts of the colonial élites had ensured that the new nation boasted a good number of well-established museums. Dedicated to natural history, ethnology, art and technology, and informed by ideas about evolutionary progress and public education, these museums formed a network of collecting and exhibiting institutions that bound Australia firmly to the Empire. Australian museums were interested in representing Australia as a distinct place, developing displays for local and international exhibitions of the nineteenth and early twentieth centuries. These displays focused on what was rare, curious and exciting about Australia, as defined by metropolitan European eyes. Collections of Aboriginal artefacts, for example, were displayed as markers of Australia as a unique location, as well as in contrast to the fruits of Australian colonisation. Collections of unusual faunal species and displays of mineral wealth similarly presented Australia as the land of things one would never find in Europe.

Representations of Australia in museums and at world exhibitions demonstrated a nascent sense of national difference, but it was not a sense of identity based around either a narrative of Australian human history or the Australian nation. Unlike the exhibitions of contemporary European museums, Australian exhibitions did not reflect on the qualities and courses of the past hundred years of life in Australia, but rather on how far the nation had come since European colonisation.[11] It was the accomplishment of civilisation rather than the character of Australian society that mattered. Not one colonial museum held a significant collection of historical material, although some odd relics had found their way into the natural history museums,[12] and by 1908 the Commonwealth Government had accumulated a haphazard 'national collection' of historic artefacts. These small collections focused on those men seen as the founding fathers of Australia: explorers, politicians, and scientists. Of course, the large collections of Aboriginal artefacts held by Australia's museums were themselves historical objects, testaments not only to centuries of Indigenous experience in the continent but also to the more immediate history of colonisation. It was not until the decades after the 1960s, however, that museum professionals and the broader public would come to think of Aboriginal history in the same way as they understood human history more generally.

The buildup of national sentiment in Australia as the colonies approached federation generated a number of proposals for a national museum, although these contained little more than a glimmer of interest in exploring the human history of the continent rather than asserting the success of Australian society. In 1887, for

example, Henry Parkes proposed a Memorial State House for Sydney's Centennial Park that would celebrate the centenary of colonial settlement. The monument would include a great hall containing documents and relics illustrating the historical, material and industrial stages of the Colony's progress, and the "customs, languages and ethnological characteristics of the aboriginal races of Australia".[13] A second proposal at the time of Federation suggested a grand arch standing in Sydney which might contain a room for historical records and curios. In 1902, Arthur Woodward, Head of the Art Department at the Bendigo School of Mines, proposed a museum, to be located in the federal capital, covering archaeology, paintings, prints and drawings, Australian and natural history, and a portrait gallery; and Walter Burley Griffin's plan for Canberra included a monument storing archives and relics and located on Capital Hill. None of these projects ever got off the ground.

The 1920s saw two further proposals for national museums, although these retreated further from any interest in national history. By 1924 Professor Colin Mackenzie had secured government funds to build a National Museum of Australian Zoology displaying the comparative anatomy of Australian fauna. Opened in 1931 as the Australian Institute of Anatomy, the institution focused on natural history and ethnological collections. In 1927, A.R. Radcliffe-Brown, Professor of Anthropology at the University of Sydney, also proposed a national museum focusing on ethnology, primarily Australian but encompassing eventually "all peoples and ages of the world". The museum was designed to prevent the ongoing export of Australian ethnological collections to Europe and also to function as a resource for anthropological research. When Radcliffe-Brown's proposal was submitted to Cabinet, a Departmental submission suggested that the museum should encompass not only ethnological material but also "articles of historic interest and articles Australian in character", such as a Cobb & Co coach owned by the Government and Charles Sturt's surveying equipment.[14] An inquiry into the proposal, however, reduced the museum again to a focus on natural history, and eventually the project foundered in the face of the 1930s Depression.

This lack of sustained interest in Australia's history since 1788 derived perhaps from the fact that Australians felt little direct connection to the kinds of events which, at the time, were understood to constitute history. European museums housed objects of classical antiquity, royalty, imperial conquest, nation formation and war. Australians, however, brought little consciousness of their national identity to their experience of such events until the war of 1914–18. Moreover, the study of Australian history was born at a time when history was understood as a discipline of words, and a discipline dedicated to calculating the progress of civilisation and the formation of the state. Written or printed evidence, records, correspondence, documents, registers and census data were constituted as the key material remains of history in Australia.[15] It is perhaps consequently unsurprising that the first major museum which explicitly took the historical experience of Australians as its focus was the Australian War Memorial.

Developed since 1918 and eventually opened in its permanent home in Canberra in 1941, the Australian War Memorial was intended both to commemorate the sacrifice of Australians in war and to present the experience of Australian servicemen (and, to a lesser extent, women). This latter function was to be achieved through extensive exhibitions of objects, images and dioramas evoking the experience of battle. The War Memorial was to be a place to which returned veterans could bring their families to help explain to them what they had experienced, and a focus for grieving for widows and parents whose husbands, lovers and children had not returned home.[16] The Memorial emphasised the subject of patriotic sacrifice within the frame of the Australian nation, its displays centred around the figure of a serviceman who, while of European stock and still rather fond of England, was definitively Australian.[17] As such, the Memorial became the first major museum in Australia to explicitly imagine its audience as a national community, rather than an imperial or a racial one.

Audiences and their behaviours

Apart from the establishment of the Australian War Memorial, it appears from the available research that there was little substantive change in the way Australia's museums understood their purpose and character between the close of the nineteenth century and the middle of the

twentieth. In the 1950s, Australia's major museums were mostly still presenting exhibitions informed by the ideas of social and natural evolution and racial progress that had emerged in the previous century. Museums continued to assert that such representations encapsulated the natural and human worlds. Australian museums also continued to understand themselves as primarily institutions for public education, as arenas where the knowledgeable few might create technologies which would encourage the rest of society to rational enjoyment, greater knowledge and improved sentiment. From the 1920s, however, Australian museums began to envisage the process of education in which they were engaged, and particularly the audiences which they were educating, in new ways. The process of education was no longer assumed, or estimated from the fact of people visiting the museum, but itself became a subject of analysis.

At the beginning of the twentieth century, museum professionals, and especially those in the United States, began to look at what visitors actually did in the museum and particularly within exhibitions themselves, and what they derived from the experience of visiting. Inspired by new methods and ideas in psychology and education that emphasised experimental research and statistical analysis of behaviour, visitor research began with simply observing and recording what people did in museum exhibitions. Early research identified phenomena such as 'museum fatigue', generated by exhibitions requiring too much effort to apprehend and understand, and was concerned to identify how to make museums more enjoyable and comfortable experiences by altering exhibit design.[18]

Studies of the 1920s and into the 1930s employed hidden observers to record how visitors moved through exhibitions, identifying how long they paused in front of particular objects and whether exits distracted visitors from the exhibits. Experimentally minded researchers persuaded museums to design maze-like exhibitions in which observers could record visitors' reactions to various spatial and aesthetic qualities. These studies stimulated new approaches to exhibition design as they encouraged an understanding of the exhibition as an environment for processing visitors. Museums sought new techniques, such as the division of exhibition space into cells or chambers, and the use of clear organisational plans, to direct and hold visitors at the most important parts of the exhibition. The time visitors spent observing or dwelling in one area was equated with the visitors' absorption of knowledge from that area.[19]

These early studies constituted the first steps in the development of exhibition evaluation methodologies designed to establish what visitors were actually learning during their visits to museums. As evaluation emerged as a distinct practice in the late 1950s, the earlier focus on visitor observation was largely replaced by survey research designed to elicit visitor parameters and their attitudes to exhibitions, and to estimate the amount and nature of information visitors derived or retained from museums programs. During the 1960s, primarily through the work of the American researchers Harris Schettel and C.G. Screven, this practice was formalised as an evaluation process demanding the prior clarification of the cognitive or affective objectives of an exhibition, a statement of practical behavioural objectives for the exhibition, and the measurement of the achievement of those objectives.[20] This approach to evaluation, which dominated museums through the 1960s and is still a powerful influence, tended to see exhibitions as extensions of the school or book and focused almost exclusively on learning objectives. Visitors were understood as essentially the passive recipients of the museum's educational message, and the museum retained a vision of itself as a technology for the transmission of expert knowledge to a relatively uneducated visitor. Evaluation was simply providing information on how to better effect that transmission.

It is somewhat unclear how influential these early evaluative studies were in Australian museums, although the predominantly American methodologies were certainly being implemented by the 1970s. By the 1960s, Australian museums had also started to investigate their visitors in another way. Museums began trying to establish who their visitors were and why they visited, employing survey questionnaires, sometimes supported by interview, to develop complete sociographic profiles of visitors. The first major survey conducted by the Australian Museum in 1976, for example, sought to establish general patterns of visitation, frequency of visit, associated visiting habits, place of residence of the visitor, method of travel to the Museum, source of information

about the Museum, and preferences for certain exhibitions. Place of residence was used to deduce the socioeconomic status of visitors, and data on age and ethnic background was gathered through observation.[21] These early systematic surveys were devoted to gathering quantitative data from which generalisations about the typical museum visitor might be drawn.

The development of visitor studies was driven by the continuing need for museums to demonstrate that they were attracting a significant portion of the general public, and that people were actually learning something, given contemporary understandings of education, when they visited. Both of these criteria were central to their continued life as public institutions, and statistical data on visitors were often understood to be useful in disproving the public's supposed image of the museum as a boring and irrelevant place. The increasing profile, from the 1960s, of marketing as a profession and practice also had a significant impact on Australian museums' attitudes to visitors. From a marketing perspective, visitor research was important as a tool for devising policies and strategies that would enable museums to better tailor their programs to their audiences, both people who were already visitors, and eventually those who were not. Marketing, based on visitor research, became seen as one of the most important tools through which museums could attract the widest possible range and greatest possible number of visitors.

Disturbingly for Australian museums, the data provided by visitor research seemed to indicate that museums were far from fulfilling their public educational mandate. Studies confirmed what seemed to have been implicitly understood in the nineteenth century—-that visitors to museums tended to be restricted to people who were well-educated and came from higher than average socioeconomic backgrounds. One interpretation was that museums were in fact discriminating against people without the educational and cultural skills needed to apprehend and enjoy museum displays. In addition, evaluation studies seemed to suggest that visitors were not merely absorbing information from exhibitions, but were supplying as much as receiving meanings and understandings. This evidence made it very difficult to demonstrate behavioural changes occasioned by the museum visit. Until the 1970s, Australian museums tended to continue responding to these results by seeking to bend the population to their will, understanding that methods of marketing and display were inadequate to the educational task and needed to be improved, rather than considering that museums were failing because they did not address the contemporary interests of diverse social groups.

The museum transformed

Between the 1970s and the end of the twentieth century Australian museums began a profound transformation in their collecting and exhibitionary practices that derived from a new understanding of the relationship between museums and their publics. By the 1970s, museum practices which emphasised, often exclusively, the perspectives, experiences and interests of educated, white men were being challenged in a number of ways. Challenges from within museums tended to draw on a new body of museum scholarship that focused on the ways that museum exhibitions addressed and validated limited notions of who their visitors were and partial visions of history and society. Critics argued that these practices alienated potential visitors who felt, upon visiting the museum, excluded and derided rather than incorporated into an encompassing story of the world.[22]

Museums also faced often vehement criticisms from the variety of new social movements which gathered momentum during the 1970s. The women's movement led the way in many respects, following feminists of the late nineteenth century in arguing that if public museums were going to claim to represent the entire range of human knowledge, they needed to pay more attention to women's culture and experience. Similar arguments were made, with equal fervour, by working class movements, minority ethnic communities and Indigenous Australians. The challenges these groups sent out to museums entailed not only calls that they be accorded equal representation in the museum, but also that there be improved opportunities for women, working class communities, ethnic minorities and Indigenous people to participate in governing museum collections and in producing museum exhibitions and programs.[23]

Indigenous challenges to Australian museum practice have been perhaps the most telling and required the greatest changes. In most Australian museums of the 1960s, Aboriginal and Torres Strait Islander peoples tended still to figure only as representing 'stages' in hierarchies of cultural or racial evolution. Indigenous Australians were understood as essentially people outside of time, their cultures frozen beyond history and consequently an anachronism in the contemporary world. Aboriginal and Torres Strait Islander artefacts were displayed exclusively in terms of European-Australian cultural understandings. By the 1980s, Australian museums were beginning to understand the negative impact such representations and appropriations were having on the cultural and material conditions of Indigenous people. From this period, museums began to accede to demands and sometimes initiated programs to incorporate Indigenous protocols and understandings into museum practices. Repatriation programs started to return human remains to Aboriginal communities for burial. Secret/sacred objects were removed from public display and collection storage reconfigured to respect Indigenous classifications. Consultation processes with Indigenous communities and employment initiatives were established to include Indigenous people in museum decision making.

It was not until the 1990s, however, that Australian museum exhibition practices really began to reflect new understandings of Aboriginal and Torres Strait Islander peoples as historical actors and participants in living, continuing cultures. In 1993, the Australian Museum opened a new Indigenous Australians gallery focusing on contemporary issues of importance to Aboriginal people such as cultural heritage, land and social justice. In 1999, the Western Australian Museum opened its refurbished Aboriginal gallery looking at continuity and innovation in Aboriginal cultures. In 2000, the South Australian Museum opened a new Aboriginal gallery redeploying its extensive ethnographic collections, and Museum Victoria also opened Bunilaka, its Aboriginal Centre, exploring the historical experiences and contemporary cultures and issues of Victorian Indigenous people. All these exhibitions emphasise the ongoing adaptation of Aboriginal peoples, their distinct location and interests within Australian society, and their participation in the broader history shaping contemporary Australia.

As these new exhibitions indicate, Australian museums since the 1970s have responded to criticisms about access and representation in a new way. Rather than reverting, as they had done in previous decades, to attempts to convert excluded social groups to élite interests in culture and science, Australian museums began to see themselves as needing to cater equally to the cultural interests and preferences of all sectors of the population. In many ways, this change reflects museums adapting to the changing character of Australia as the country came to embrace ethnic and cultural diversity as a core element of its society. This change required in museums, however, a quite profound reconceptualisation of their mandate. Museums continued to understand themselves as essentially institutions of public education, but the public to which they spoke was no longer an undifferentiated mass. The public was composed of a range of different audiences, each with different interests and experiences. More radically, the public now not only represented an audience, but was also possessed of cultural rights of access to the museum. The museum's mandate was now to ensure that those rights were satisfied through according equal representation to all the diverse social groups. The education function of the museum became less to disseminate a single view of history and culture, but rather to offer up multiple visions and to promote tolerance and acceptance of those different visions.

This new appreciation of the diverse interests of the public explains, at least in part, the emergence in Australia since the 1970s of a variety of smaller museums, often catering to the interests of specific groups in the general population. Institutions such as local history museums, Melbourne's Chinese and Jewish museums, and museums dedicated to a specific industry or way of life, have flourished over the last few decades. Some Indigenous communities have established local keeping places, often built around collections repatriated from larger museums. Like the major museums, these smaller institutions seek to educate the wider public about the distinctive experiences of specific social groups while providing a focus for local culture.

The drive for Australia's museums to respond to the interests and experiences of diverse social groups also stimulated the emergence in museums, since the 1980s, of collections and exhibitions devoted to the social, cultural and technological history of nineteenth and twentieth century Australia. In part, this new field of practice represents museums attempting to speak more closely to subjects of interest and relevance to ordinary Australians; but it must also be seen as a response to the changing priorities of Australian public culture.[24] Since the 1970s, history has emerged as a key arena through which Australians negotiate senses of national identity. The focus for historiography in Australia has shifted from detailing Australia's connections to England to exploring the specific dynamics, challenges and problems of Australian societies. It is unsurprising that museums, as sites of collective memory, should engage with these new questions.

In addition, the development of national and international tourism has created new audiences for Australian museums. The numbers of international visitors to museums vary considerably depending on where the museum is located within Australia, but for high profile institutions, and especially those in cities such as Sydney, anecdotal evidence suggests that up to a quarter of total visitors are international tourists. Unlike local visitors who may engage with a museum in multiple ways over several visits, visitors on tour expect a concise experience through which they can glean a coherent understanding of the locality they are visiting. Since the 1970s, this experience has come increasingly to be framed in terms of the local or national culture or history, and Australian museums are consequently increasingly interested in creating exhibitions that can meet this expectation.

Australia's museums have consequently encountered the end of the twentieth century with a revised public education mandate. Rather than disseminating élite notions of science and culture and speaking exclusively to an assumed white male visitor, museums now attempt to represent and speak to a diversity of people, interests and viewpoints. This new commitment to representing diversity raises potential conflicts for Australian museums. As public institutions, they must now answer both to a diverse public and to the specific governments which fund them. It is the nature of democratic society that these two will not always agree, and contemporary museums often find themselves attempting to answer both masters. In addition, the complexities of exploring social, natural and historical diversity are often poorly served by museums seeking to create quick, coherent experiences for tourists.

The audience figures

The transformations occurring in Australian museums since the 1970s have been accompanied by an explosion of interest in understanding and examining museum visitors and the professionalisation of visitor research. In 1991, the first permanent position for an evaluation and visitor research coordinator was created at the Powerhouse Museum in Sydney. In 1994, the Australian Museum and Museum Victoria followed suit, and in 1996, the Australian War Memorial made a further appointment. These designated positions represent in many respects the tip of the iceberg, as evaluation and visitor research are also now habitually carried out by other staff and by consultant research companies. Evaluation of exhibitions, both establishing prior visitor expectations and interests and assessing visitor experience at the exhibition, is now quite widely carried out. Much of this research tends to remain, however, poorly disseminated within the museum profession generally, with the results of studies tending to lodge within institutions rather than contributing to the broader development of knowledge about museum visitors. The first national conference devoted to visitor research, for example, was held in Australia only in 1995. This lack of communication of results between museums derives, perhaps, from the fact that museums are reluctant to share information obtained through commercial consultancies, or from the atmosphere of competition between museums as leisure choices that is generated by scarcity of funding to museums generally.

The development of visitor research since the early 1990s has grown in part from the revision of the public museum's mandate described above. Museums worldwide now enshrine equity and access to collections for all social groups as part of their core mandate. Maximum participation from all members and sectors of the community is

desired, and is sometimes captured as a requirement in government policies applying to museums. The New South Wales Government's Charter of Principles of Cultural Diversity, for example, requires public institutions to ensure that their programs and services make possible maximum participation from all sectors of the community. Museums' new attention to equity and access recreates the 'public' as a potential audience who, as they have been since the nineteenth century, need to be attracted to the museum. A substantial body of research now attends not only to sectors of the audience who become visitors, but also to potential audiences who do not visit. During the 1990s, a number of large scale audience surveys have focused on people who do not visit museums, attempting to discover the social characteristics, cultural horizons, attitudes and interests of non-visitors. The impetus behind these 'barrier studies' has been explicitly to turn non-visitors into visitors.[25]

While these studies are motivated in part by principles of equity and access, visitor research is also driven by the more mundane need to demonstrate the utility of museums as public institutions in order to guarantee their continued funding. The 'public good' of a museum is no longer, if it ever was, unquestioned, and museums continue to need to respond to claims that they are the province of a small, privileged group of cultural élites. This requirement to maximise the number of visitors to the museum has gained considerable weight as the notion of a 'cultural industry' encompassing museums has developed. In the early 1980s, the federal Cultural Ministers' Council, dedicated to developing Australia's cultural industry, began to realise the lack of reliable statistical data on the activities of institutions such as museums. With their support, the Australian Bureau of Statistics established the National Centre for Culture and Recreation Statistics in 1991. One of its activities is to undertake surveys on attendance at cultural venues such as museums. The periodic availability of official statistics means that museums must now increasingly argue for their value in quantitative rather than qualitative terms.

In addition, in recent decades Australian museums have increasingly needed to develop audiences in order to increase revenue from non-governmental sources. In part, this derives from efforts to curtail government spending on public institutions, but it also reflects the great diversification and number of museums in Australia. Museums are coming to see themselves as competitors in a field of options through which people may spend their leisure dollars, and research into who visits and why, and especially who doesn't visit and why, is important to any one museum and all museums securing and increasing market share. The trend to view visitor research in this way has been strengthened by the increasing influence of marketing and corporate development programs within Australian museums over the last few decades.

Figures on visitors to Australian museums collected by the Australian Bureau of Statistics indicate that 20% of Australians aged 15 and over visited a museum and 21% visited an art museum (i.e. non-commercial art gallery) during the year ending April 1999 (see the section *Museum and art museum attendance* in *Chapter 12, Culture and recreation* in this edition of Year Book Australia). Total attendance figures of more than 16 million visitors per year indicate that some people visit a museum or art museum more than once per year. Attendance at art museums peaks between 45 and 54 years, while attendance at other types of museums peaks between 35 and 44 years of age. For the latter, these figures may correlate to parents taking their children to museums, as family visitation is very common. The ABS figures do not include visits by people under 15, but attendance figures for National Museum of Australia venues indicate that visits by school children, as part of organised school programs, account for a high percentage of total museum attendances. It appears that museum visitors from Australia continue to be drawn from higher than average educational backgrounds, with 46% of people with a Bachelor's degree visiting an art museum and 36% visiting other types of museums during the year ending April 1999. In contrast, people with trade qualifications, apprenticeships or no qualifications are the least likely to visit. (Note that there are no consolidated statistics on the socio-demographic profiles of international tourists.)[26]

The development of evaluation studies within museums has also grown significantly since the 1970s. While sometimes still informed by scientistic modes of assessing behavioural change and learning outcomes in visitors, exhibition evaluation also

sometimes incorporates a more open-ended vision of the role of the museum in learning and a less mechanistic vision of the visitor. Visitors are now often understood to take an active role in interpreting the material of exhibitions, bringing to the museum attitudes, ideas and expectations, and knowledge, through which they construct responses to museum programs.[27] The development of 'front-end evaluation' in which ideas and prototypes for exhibitions are introduced to potential audiences to gauge interest, expectations and existing knowledge, has facilitated the emergence of 'audience advocates' in museums. These staff work to ensure that a vision of the visitor is at the centre of any museum development. The museum's role in learning is more frequently, or at least ideally, understood not as a technology for the transmission of information, but as a facilitator for stimulating inquiry and discovery over the long term. These understandings of visitors and of learning tend often to sit at odds with the needs of museum administrators to demonstrate measurable behavioural outcomes from exhibition visits.

The growth in visitor research, and the factors driving it, have resulted in Australian museums becoming increasingly 'visitor focused'. A century ago, museums were concerned to distance themselves from the excitements and pleasures of 'entertainments'. At the close of the twentieth century, museums' interest in attracting increased numbers of visitors, and especially visitors uncomfortable with the sober display techniques of traditional museums, has led museums to reintroduce techniques more often associated with entertainment than education. The use of multimedia and computer technology, stronger reliance on narrative, and different aesthetics of colour and sound, indicate museums' attempts to move closer to the styles of popular culture. Australian museums now attempt to integrate their traditional pedagogic function with the concept of visitors having fun, being moved, and feeling excited.

Conclusion

In March 2001, the National Museum of Australia will open its new exhibition showcase in Canberra as part of Australia's celebrations of its centenary of Federation. Opening almost two hundred years after museums were founded in Australia, the National Museum will encapsulate in some ways much of that history. The Museum will focus on Aboriginal history and culture, Australian history since European settlement in Australia, and the continent's environmental history, integrating these three themes to tell the 'stories of Australia'. The National Museum claims some of the nineteenth century heritage of Australian museums, drawing on the ethnological collections of the Australian Institute of Anatomy which it acquired in the 1980s, but weaving these into contemporary stories about the continuity and experiences of Aboriginal and Torres Strait Islander cultures and peoples. Incorporating some of the earliest government collections of historical artefacts, the Museum will follow developments since the 1980s to explore the social history of Australia's people. And regarding Australia's environment in a new way, the National Museum will examine the continent's natural history in the context of how people from many different backgrounds have forged connections on and with the land, and how the land has shaped Australians' diverse experiences.

Consciousness of the 'visitor' sits at the heart of the National Museum. The institution seeks to reach out and speak to all Australians, bringing a sense of the diversity of Australian society and history to all its exhibitions. The Museum's programs are designed to be as accessible as possible, attempting to incorporate even audiences distant from the physical exhibitions through technologies such as broadcast and computer media. Information about visitors, their interests and attitudes, have informed exhibition development, influencing the Museum's character and aesthetic. The Museum, remains, however, acutely aware of its role as an institution for public education, seeking to disseminate information about the forces which shaped Australia historically and as it is today, and taking seriously its mandate to encourage visitors to reflect on their role within the Australian nation. Like all of Australia's contemporary museums, the National Museum of Australia will be required to both educate and entertain, to reach and be relevant to all sectors of Australian society while also maintaining an intellectual rigour in its programs and providing an accessible experience for international tourists. Ongoing investigation of its actual and potential audiences, assessments of their experiences in the

Museum, and exploration of how the Museum can become more relevant, exciting and interesting for them, will be an important aspect of the National Museum's ongoing development.

Endnotes

1 Cultural Ministers Council Statistics Working Group 1993, cited in Australian Bureau of Statistics and the Department of Communications and the Arts 1997, *Cultural Trends in Australia: A statistical overview*, Commonwealth of Australia, p. 51.

2 Museums Australia Inc. 1996, cited in Australian Bureau of Statistics and the Department of Communications and the Arts 1997, *Cultural Trends in Australia: A statistical overview*, Commonwealth of Australia, p. 53.

3 Carol Scott 1998, *The Long and Winding Road: Evaluation and visitor research in museums in Australia and New Zealand*, paper presented to the Visitor Centre Stage: Action for the Future conference.

4 Tony Bennett, "The Museum and the Citizen", in T. Bennett, R. Trotter & D. McAlear (eds), *Museums and Citizenship: A resource book*, Memoirs of the Queensland Museum 1996. South Brisbane: Queensland Museum, p. 6.

5 Ian McShane, "Building a National Museum of Australia: A history", *Public History Review*, 7, 1998, p. 77.

6 Tony Bennett, "The Museum and the Citizen", in T. Bennett, R. Trotter & D. McAlear (eds), *Museums and Citizenship: A resource book*, Memoirs of the Queensland Museum 1996. South Brisbane: Queensland Museum, p. 11.

7 McCoy, n.d. (c.1856), cited in David Goodman, "Fear of Circuses: Founding the National Museum of Victoria", in David Boswell & Jessica Evans (eds.) 1999, *Representing the Nation: A reader*. London: Routledge, p. 265.

8 David Goodman, "Fear of Circuses: Founding the National Museum of Victoria", in David Boswell & Jessica Evans (eds) 1999, *Representing the Nation: A reader*. London: Routledge, p. 265.

9 M. Talbot 1992, *A Chance to Read: A history of the Institutes movement in South Australia*, Adelaide: Libraries Board of South Australia; P. Candy & J. Laurent (eds) 1994, *Pioneering Culture: Mechanics Institutes and schools of art in Australia*, Adelaide: Auslib Press.

10 K. McCarthy 1991, *Women's Culture: American philanthropy and art, 1830–1930*, Chicago and London: University of Chicago Press; J. Weimann 1981, *The Fair Women: The story of The Woman's Building, World's Columbian Exhibition, Chicago, 1893*, Chicago: Academy Chicago.

11 Kimberley Webber, "Constructing Australia's Past: The development of historical collections, 1888–1938" in Patricia Summerfield (ed.) 1986, *Proceedings of the Council of Australian Museum Associations Conference*, Perth WA, pp. 155–173.

12 Chris Healy 1997, *From the Ruins of Colonialism: History as Social Memory*, Cambridge: Cambridge University Press, p. 86n.

13 Ian McShane, "Building a National Museum of Australia: A history", *Public History Review* 7, 1998, p. 78.

14 Ian McShane, "Building a National Museum of Australia: A history", *Public History Review* 7, 1998, p. 81.

15 Chris Healy 1997, *From the Ruins of Colonialism: History as Social Memory*, Cambridge: Cambridge University Press, p. 88.

16 Michael McKernan 1991, *Here is Their Spirit: A history of the Australian War Memorial, 1917–1990*, St Lucia: University of Queensland Press in association with the Australian War Memorial.

17 Ken Inglis, "A sacred place: the making of the Australian War Memorial", *War and Society* 3(2): 99–126.

18 Benjamin Gilman, "Museum fatigue", *The Scientific Monthly*, 1916, 12: 62–74.

19 See for example, Arthur Melton et al. 1935, *Experimental Studies of the Education of Children in a Museum of Science*, New Series, no. 15, Washington D.C.: American Association of Museums; Edward Robinson 1928, *The Behavior of the Museum Visitor*, New Series no. 5, Washington DC: American Association of Museums Monograph.

20 Bernard Schiele, "Creative interaction of visitor and exhibition", in Don Thompson et al. (eds.) 1992, *Visitor Studies: Theory, Research and Practice, volume 5*. Jacksonville, Alabama: The Visitor Studies Association, p. 32.

21 D.J.G. Griffin, *The Australian Museum Visitor 1976*, The Australian Museum Trust, Sydney, p. 4.

22 Peter Vergo (ed.) 1989, *The New Museology*, London: Reaktion Books; Ivan Karp & Steven Lavine (eds) 1991, *Exhibiting Cultures: The poetics and politics of museum display*, Washington DC: Smithsonian Institution.

23 Tony Bennett, Robin Trotter & Donna McAlear 1996, *Museums and Citizenship: A resource book*, Memoirs of the Queensland Museum 39(1), Queensland Museum; Margaret Anderson & Andrew Reeves, "Contested Identities: Museums and the nation in Australia", in Flora Kaplan (ed.) 1994, *Museums and the Making of "Ourselves": The role of objects in national identity*, London and New York: Leicester University Press, pp. 78–124.

24 Margaret Anderson, "Selling the past: History in museums in the 1990s", in J. Rickard & P. Spearritt (eds) 1991, *Packaging the Past? Public Histories*, Melbourne: Melbourne University Press, pp. 130–141.

25 Tony Bennett, Chilla Bulbeck & Mark Finnane 1991, *Accessing the Past*, Brisbane: Griffith University; Tony Bennett 1994, The *Reluctant Museum Visitor: A study of non-goers to history museums and art galleries*, Australia Council.

26 Australian Bureau of Statistics 1999, *Attendance at Selected Cultural Venues* (4114.0), Canberra.

27 Carol Scott, "Evaluation and Visitor Research in Australia: Developments and trends", *Visitor Behaviour*, 1997, 12(3–4): 22–23.

Public funding of the arts in Australia—1900 to 2000

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Introduction

During the twentieth century governments in most countries of the industrialised world became significant patrons of the arts. For some this was an extension of an already established role; for others it was something new. The timing and nature of these developments varied greatly from country to country, as did the formal structures for delivery of the support provided. In Australia, public-sector arts funding of the sort which is in place today is little more than thirty years old, although government involvement in some types of cultural support, such as provision of finance for public libraries and art galleries, dates back into the nineteenth century. In this article we trace the development of public funding of the arts in Australia from Federation to the present day, looking at the statistical picture, at the underlying motivations of governments and at the evolution of policies towards the arts over this period.

A prior question involves defining what comprises the arts for the purposes of this analysis. Although the traditional designations of artforms—literature, visual arts, music, theatre and so on—provide an initial working definition, there are still many uncertainties about where boundaries lie. If, for example, the arts are defined as those areas of concern to the Australia Council, the Federal Government's arts funding agency since 1975, the focus is turned principally on professional rather than amateur practice within artforms, and also largely excludes commercial activities such as rock and pop music. The picture is further complicated by the recent development of the concept of the 'cultural industries', a development that has been prompted both by an increasing interest in the economics of the arts and culture, and by the need for a systematic way of conceptualising cultural activity for purposes of data collection and analysis. The coverage of the cultural industries as they are now construed extends well beyond the arts to include a range of activities producing goods and services with some cultural content, including broadcasting, newspapers and magazines, architectural services and so on. Nevertheless, in these constructions the creative arts can still be seen as a core component, the principal source of creative ideas which emanate outwards from the primary artforms.[1]

For the purposes of this article, we shall define the arts as a set of artforms covering literature (including creative writing of nonfiction); the visual arts and crafts; the performing arts, comprising theatre, music, dance, opera and music theatre; film and video (including both drama and documentary); and multimedia arts. Our coverage also includes art galleries, as the

* With the usual caveat, I am grateful to Adriana Vanden Heuvel, Theo Neumann and Graeme Thomas at the National Centre for Culture and Recreation Statistics of the ABS in Adelaide, and to Hans Guldberg and Warren Woodward, for facilitating access to data.

principal means of conveying the visual arts to the public. However, we do not include libraries; even though they are an important means by which literature is made available for public consumption, libraries also have an equally or more significant role as information service providers and, in terms of public funding of the core arts, it would lead to overstatement of funding levels if support for libraries were included. Also, we exclude education and training in the arts even though some institutions such as the National Institute of Dramatic Art do produce some primary creative work; museums (other than art museums) even though some multi-purpose museums do display artworks; and broadcasting and publishing even though, for example, the television services do produce original drama.

It is apparent that in any definitional exercise involving the arts, there are going to be difficult decisions as to inclusion or exclusion, and that no boundary line around the arts is ever going to be watertight, especially when it comes to allocating activities to classifications for statistical purposes. Nevertheless the conventions adopted here do provide a reasonable coverage of the core arts activities in Australia which have been the focus of public funding over the period studied.

The paper is organised more or less chronologically, covering three broad periods. The first extends from Federation to the end of the 1960s, a period over which support for the arts was virtually nonexistent. The second stage covers the rapid expansion of arts funding during the 1970s and 1980s, during which time the economic importance of the arts became more widely advocated. Finally, the decade of the 1990s was one in which only moderate expansion occurred, despite some significant advances in the articulation of cultural policy. This last period also corresponds with the time when a framework for the classification of cultural statistics was gradually put in place, providing more detailed data about the arts than had ever been available before. The paper concludes with an overview and review of some of the motivations for arts support that have been expressed, and policy developments that have occurred, over the period studied.

The early years: 1900–1968[2]

It is sometimes supposed that public funding of the arts in Australia is an entirely modern phenomenon. In fact, the very first recorded example of government patronage of the arts in this country dates back to 1818–19 when the poet Michael Massey Robinson (1744–1826) was granted two cows from the government herd "for his services as Poet Laureate". Posterity has not been kind to Mr Robinson's verse, which is now largely forgotten, but he can claim a place in history as the first recipient of an arts grant in Australia.[3]

At the time of Federation, when the present story starts, governments in the various States had already entered the field of support for culture through their contributions to funding of public galleries, museums and libraries in the capital cities and in the rural areas. The major public art galleries in Sydney, Adelaide and Hobart, for example, had been founded in 1871, 1880 and 1887 respectively. By the end of the first decade after Federation, the six capital-city art galleries were all well established, and were drawing significant numbers of visitors. The National Art Gallery of New South Wales in Sydney reported about 250,000 attendances in 1908, the Art Gallery at Adelaide recorded about 130,000 visitors in that year, and the Queensland National Art Gallery about 40,000. Given the urban populations at the time, these were impressive figures, and were achieved with only modest amounts of public funds; for example, the annual government grant to the Sydney gallery at that time was about £4,000,[4] while that to the gallery in Perth, whose foundation stone had been laid in 1901 in a building shared with the Library and the Museum, was only £1,000.

Most of the galleries had also benefited from private patronage through the donation of funds and the bequest of collections of artworks. The Adelaide Gallery, for example, had financed its new building, opened in 1900, by means of a bequest of £25,000 from Sir Thomas Elder (equivalent to about $2.5m today). The National Gallery in Melbourne—incidentally, the only one of the State art galleries to retain its appellation of 'national' to the present day—received a substantial bequest in 1904 from Alfred Felton, which by 1915 was yielding the handsome sum of £8,000 per annum. Nevertheless, despite the generosity of many benefactors, the State budgets remained the primary source of funding for the public art

galleries throughout the period under review, and the amounts involved increased significantly as the galleries' collections grew in breadth and depth and the range of their activities expanded. By the late 1950s the expenditure of the Melbourne gallery had grown to almost £70,000 per year, the Art Gallery of New South Wales' annual expenditure was more than £46,000, and that of the Adelaide and Hobart galleries was around £22,000 each.[5]

Turning to the funding of individual artists during this first period of our coverage, we may note that the State galleries provided some indirect support for painters and sculptors via the acquisition of their works, and some visual artists benefited from the commissioning of portraits and the purchase of paintings by the Federal Government, acting on the advice of the Commonwealth Art Advisory Board established in 1912. But for the origins of direct grants to artists we must look elsewhere. The first formal program for funding individual artists in Australia was the Commonwealth Literary Fund (CLF), set up in 1908 by the Deakin Government to give financial assistance to writers. Originally it was a 'compassionate fund', providing literary pensions for aged or infirm authors, for the families of 'literary men' who died in poverty, and for writers unable for financial reasons to continue their activities. The Fund continued to operate through the early decades of the century, and in 1939 was greatly enlarged; while retaining its function as a source of literary pensions, it was extended to encourage the development of Australian literature and to foster appreciation of it, through the provision of fellowships for writers, assistance with publications, and the funding of public lectures. From then on it was administered by a small committee chaired by the Prime Minister of the day, assisted by an Advisory Board. At the time of its demise in 1973, when it was replaced by the Literature Board of the Australian Council for the Arts, the CLF's budget had grown to about $250,000 annually. Over its long lifetime, it had supported many notable Australian writers and their families, including Henry Lawson, Frank Dalby Davison, Mary Gilmore and Vance Palmer.[6]

It was not until the 1940s that consolidated and more wide-ranging programs of public support for the arts began to be contemplated in Australia. In the decade following the end of the Second World War, three important developments occurred. First, during the War, the British Government set up a Council for the Encouragement of Music and Arts (CEMA) in the UK, the forerunner of the Arts Council of Great Britain. It provided a model for a similar organisation to be established in Australia in 1943, which became the Arts Council of Australia (NSW Division), established with a grant of £600 in 1946 from the NSW Department of Education. The Council was a private body intended to "bring art in all its forms to the people"; it believed that "art, in the widest sense of the word, is not a luxury for the few, but a necessity for all".[7] Divisions were subsequently formed in other States and a Federal Council was established in 1964. It continued to be funded through the State Education Departments, and its focus was strongly on decentralisation of the arts, to country centres and schools.

The second development was the setting up of the Australian Elizabethan Theatre Trust (AETT), begun in 1954 to commemorate the visit to Australia in that year of Her Majesty Queen Elizabeth II and initially financed with a government grant of £30,000 together with private contributions of £90,000. The AETT presented drama, opera and ballet throughout the Commonwealth, and was funded via annual grants from Federal, State and local governments, and from subscriptions and donations. It played an important role in the 1950s and 1960s in encouraging Australian drama. It was also the forerunner of most of the country's major performing companies: the Elizabethan Trust Opera Company, begun in 1956, which became the Australian Opera in 1969; the Australian Ballet which presented its inaugural season in 1962; the Union Theatre Repertory Company (associated with the University of Melbourne) which became the Melbourne Theatre Company; and the Old Tote Theatre Company (University of New South Wales), which became the Sydney Theatre Company (these two theatre companies becoming the two principal State drama companies). By 1967, Commonwealth funding for the AETT had reached almost $1m.

The third significant advance in the immediate postwar years was the establishment of the State symphony orchestras within the Australian Broadcasting Commission. The first was the Sydney Symphony Orchestra, set up in 1946 with a

complement of 72 full-time players. By 1950, when the West Australian Symphony Orchestra was formed, all States had orchestras of their own, giving live concert series as well as broadcasts. The funding levels for these activities are difficult to identify, since the revenues and expenses associated with the orchestras simply formed part of the Commission's overall financial operations. Nevertheless, there is no doubt that the ABC's funding of the orchestras has been a major element in public support for the arts in modern Australia.[8]

Before concluding our coverage of the first period of arts funding, we should refer to film. The feature film industry in Australia flourished at various times over the period, beginning with *The Kelly Gang* in 1905–06, possibly the first full-length feature made anywhere in the world. Between 1900 and 1930—the silent era—about 160 commercial feature films were produced, and a further 115 were made between 1930 and 1960. Although a National Film Board was established by the Federal Government in 1945, it and its successors were concerned with film as a medium of information, and it was not until the late 1960s that initiatives aimed at setting up means for government support for film as an artform came into being, a matter to which we return below.

The great expansion: 1968–1990

The first half of the 1970s is sometimes seen as marking Australia's 'cultural renaissance', a period when the creative arts blossomed throughout the country as never before, thanks to enlightened public patronage. In fact, the impetus to rationalise and expand Commonwealth government support for the arts originated several years earlier. Towards the end of 1967 Prime Minister Harold Holt announced the establishment of the first Australian Council for the Arts, which was to distribute grants and to advise the government on cultural matters.[9] It was set up not as a statutory body, but as a committee acting under terms of reference with nine members and a chairman, Dr H.C. ('Nugget') Coombs, who had been instrumental in persuading the government to embark upon this new venture. The Council began operating in July 1968 with a budget for 1968–69 of $1.5m, a sum which, though small by the international standards of the day, was nevertheless a considerable increase on previous levels of support.[10]

Following the establishment of the Council by the Federal Government, the various States moved in turn to set up their own bodies to provide cultural support within their own jurisdictions. One of the first to act in this respect was Queensland which established a portfolio for Cultural Activities within its Ministry for Education and Cultural Activities in 1968. By the mid 1970s all States had either a department, a statutory authority, or an advisory committee to handle their expanding arts funding activities. Meanwhile, at the federal level, successive Coalition governments after 1967 continued to support the Council for the Arts, together with the Commonwealth Literary Fund and the Commonwealth Art Advisory Board mentioned above, the Committee for Assistance to Australian Composers, which had been established by Harold Holt in 1967, and the Interim Committee for the Film and Television School, which was inaugurated by John Gorton in 1969. Despite these efforts, in the election campaign of 1972 Gough Whitlam was able to point to Prime Minister William McMahon's apparent lack of interest in these areas, as evidenced by his assigning responsibility for the arts, along with Aborigines and the environment, to his most junior minister.

The Whitlam government elected in 1972 moved promptly to reconstitute the Australian Council for the Arts, rationalising the disparate collection of Commonwealth administrative arrangements noted above. The new Council comprised seven Boards covering Aboriginal arts, craft, film and television, literature, music, theatre (including opera and dance) and visual arts. Its financial allocation in the first Labor budget in 1973 was, at about $15m, roughly twice the Commonwealth's aggregate expenditure on the arts in the previous year.[11] The Council was also asked to recommend on a more permanent structure for government administration in the cultural field, and its report on this matter was adopted by Cabinet in November 1973. Legislation to establish the Australia Council, as it was now to be called, was introduced in 1974, and the Council assumed its new role as a statutory authority early in 1975.[12] Despite the ups and downs of political fortune over the ensuing quarter of a century, the Australia Council has survived as the Federal Government's arms-length arts funding body to the present day. It has been overseen by more than a dozen Ministers, a

tribute to the impermanence of the arts portfolio in the political firmament.

During the remainder of the 1970s and 1980s arts funding continued to grow at all levels of government. Table C10.1 shows the trends over this period in Commonwealth, State and local government funding for the arts, not including support for art galleries, performing arts venues, symphony orchestras, or film and video. The high initial levels of support were not maintained in real terms through the 1970s, but recovered during the following decade. The period is notable for the growth in local government cultural support. Table C10.2 indicates the distribution of arts support funds among the major artistic purposes. The decades of the 1970s and 1980s were marked by an increasing awareness of the need to support Aboriginal arts, and the dissemination of the arts in local communities also gained in prominence through the expansion of the community arts movement. It can also be seen from table C10.2 that the performing arts enjoyed the lion's share of public funding over this period, partly because of their higher cost levels than the other art forms, and partly because large performing organisations could assert a stronger bargaining position than could individual artists such as writers, visual artists and craftspeople in the scramble for funds.

In addition to the activities reflected in tables C10.1 and C10.2, the period of the 1970s and 1980s also saw continued support by the ABC for its State orchestras, and further expansion of the various State art galleries. The other development in the visual arts over this time was the establishment of the Australian National Gallery in Canberra, whose interim Council was appointed in 1974, and whose new building was opened in 1982. It rapidly built up its collection of Australian and international art, and its federal government allocation grew from around $10m at the beginning of the 1980s to around twice that by the end.

C10.1 GOVERNMENT FUNDING OF THE ARTS(a), By Level of Government, Australia—Selected Years 1968–69 to 1988–89

	1968–69		1973–74		1980–81		1982–83		1988–89	
	$m	%	$m	%	$m	%	$m	%	$m	%
Level of government										
Commonwealth	1.7	40	13.7	50	22.9	48	31.0	47	71.5	51
State and territory	2.6	60	12.9	47	20.4	43	29.4	45	50.6	36
Local	n.a.	n.a.	1.0	3	4.1	9	5.0	8	17.0	12
Total (current prices)	*(b)4.3*	*100*	*27.6*	*100*	*47.4*	*100*	*65.4*	*100*	*139.1*	*100*
Total (1998–99 prices)	(b)31.4	. .	145.5	. .	116.9	. .	130.8	. .	183.0	. .
$ per head (1998–99 prices)										
Real funding per head	(b)2.56	. .	10.60	. .	7.83	. .	8.50	. .	10.90	. .

(a) Not including government expenditure on art galleries, performing arts venues, symphony orchestras, or film and video.
(b) Not including local government.

Source: Derived from data in Australia Council, The Arts: Some Australian Data (Sydney: Australia Council, 1982); Hans Guldberg, Cultural Funding in Australia: Federal, State and Local Government (Sydney: Australia Council, 1991); and Hans Guldberg, Artburst! Growth in Arts Demand and Supply over Two Decades (Sydney: Australia Council, 1992).

C10.2 GOVERNMENT FUNDING OF THE ARTS(a), By Artistic Purpose, Australia—Selected Years 1968–69 to 1988–89

	1968–69(b)		1973–74		1980–81		1982–83		1988–89	
	$m	%	$m	%	$m	%	$m	%	$m	%
Artistic purpose										
Literature	0.1	2	2.1	8	2.0	4	4.0	6	7.8	6
Visual arts/craft	1.0	23	5.2	19	6.2	13	8.7	13	20.5	15
Music incl. opera	1.1	26	10.7	39	14.5	31	18.2	28	25.0	18
Theatre, dance	1.9	44	7.2	26	15.2	32	20.7	32	50.1	36
Aboriginal arts	—	—	0.8	3	2.5	5	3.6	6	12.5	9
Community arts	0.2	5	1.6	6	7.0	15	10.2	16	23.2	17
Total	**4.3**	**100**	**27.6**	**100**	**47.4**	**100**	**65.4**	**100**	**139.1**	**100**

(a) Including Commonwealth, State and Territory and local government funding. Not including government expenditure on art galleries, performing arts venues, symphony orchestras, or film and video. (b) Not including local government.

Source: Derived from data in Australia Council, The Arts: Some Australian Data (Sydney: Australia Council, 1982); Hans Guldberg, Cultural Funding in Australia: Federal, State and Local Government (Sydney: Australia Council, 1991); and Hans Guldberg, Artburst! Growth in Arts Demand and Supply over Two Decades (Sydney: Australia Council, 1992).

Turning to film, we may note that the impetus for a public presence in reviving the Australian film industry, which had begun in the late 1960s, came to fruition during the period under review, first with the establishment of the Australian Film Development Corporation (AFDC) in 1970, and then with the inclusion of a Film and Television Board in the original Australia Council. The AFDC was replaced in 1975 by the Australian Film Commission (AFC) whose central function remained that of encouraging the making, promotion, distribution and exhibition of Australian films. During the mid-1980s the appropriation to support the AFC reached around $20m, and it was earning back about half this amount in revenues from its various projects. By 1989–90 the government support was around $16m, and the AFC's earned revenue had fallen away to little more than $3m.

In addition to supporting the AFC, the Federal Government in 1978 introduced tax concessions to encourage investment in Australian films, first under Section 10B and then under the more widely known Section 10BA of the Tax Assessment Act. These measures were complemented in 1988 with the establishment of the Film Finance Corporation (FFC), set up as an avenue for providing a more direct means of government support for film investments. The 10BA arrangements in their initial form proved so attractive to investors that by 1984–85, for example, the total value of film budgets secured through this means exceeded $180m, at a cost to government revenue in the following year of around $125m (or $225m at 1998–99 prices). This level of indirect support for the film industry was well in excess of the total amount of direct support provided by the Federal Government at that time for all the other arts combined.[13]

Modern times: 1990–2000

In 1985 the Cultural Ministers' Council set up a Statistical Advisory Group with membership from the Commonwealth and all States. In 1987 the Group commissioned a study to develop a National Culture-Leisure Industry Statistical Framework. The framework was to be based on the 1986 UNESCO Framework for Cultural Statistics, and was intended to enable the ABS to rationalise and expand its collection of cultural statistics in a manner consistent with the statistical systems in use in other industry sectors.[14] The reports of these studies provided in due course a basis for compiling, for the first time, a comprehensive statistical picture of funding to the arts and culture in Australia.[15] Thus we are able, in this third stage of our coverage of public funding of the arts in Australia, to call upon a reliable data source to demonstrate developments over the period. Implementation of the statistical framework led to some modifications and improvements introduced over time, so in fact it is possible for present purposes to trace a strictly consistent series back only as far as 1994–95, although with some further assumptions we can extend this data set back to 1991–92.

Table C10.3 presents the broad aggregates for the eight-year period 1991–92 to 1998–99. The total levels of arts funding shown here are considerably higher than those for the

earlier period given in tables C10.1 and C10.2, because it is now possible to include expenditure on art galleries, performing arts venues, the orchestras, and film and video. Although funding at all levels of government increased at least in nominal terms over the decade of the 1990s, the relative share of Commonwealth arts funding declined as the significance of State and local government sources increased (see table C10.3). However, the distribution of funds between art forms as shown in table C10.4 remained fairly constant over this period, with literature receiving around 2–3% (recall that libraries are not included), the visual arts (including art galleries) just over 20%, and the performing arts accounting for almost half of available funds. After some significant investments in film, video and multimedia in the first half of the decade, these areas fell to just under 20% of total direct arts funding in 1998–99.

Year-by-year funding data are occasionally distorted by significant capital expenditures which occur from time to time; in a normal year, capital expenditures account for around 15% of arts and cultural funding. Illustrative data from 1998–99 shown in table C10.5 are consistent with this overall proportion, though the mean conceals some significant variations between artforms—not surprisingly, higher than average proportions of capital funding accrue to areas involving institutions engaged in capital works such as performing arts venues.

C10.3 GOVERNMENT FUNDING OF THE ARTS, By Level of Government, Australia—1991–92 to 1998–99

	1991–92	1992–93	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99
				$ MILLION				
Level of government								
Commonwealth	208.3	192.7	199.6	260.0	228.4	226.1	251.2	246.4
State and Territory	191.7	187.2	212.7	240.1	266.7	317.5	306.0	349.9
Local	52.2	61.2	77.5	94.6	98.2	125.1	115.3	105.0
Total (current prices)	*452.2*	*441.1*	*489.8*	*594.7*	*593.3*	*668.7*	*672.5*	*701.3*
Total (1998–99 prices)	513.3	495.6	540.4	635.9	608.7	677.0	680.9	701.3
				$ PER HEAD (1998–99 PRICES)				
Real funding per head	29.34	28.07	30.29	35.22	33.24	36.55	36.31	36.91
				PER CENT				
Level of government								
Commonwealth	46	44	41	44	38	34	37	35
State and Territory	42	42	43	40	45	47	46	50
Local	12	14	16	16	17	19	17	15
Total	100	100	100	100	100	100	100	100

Source: Derived from data contained in Cultural Ministers' Council, Cultural Funding in Australia (various years); Hans Hoegh Guldberg, The Arts Economy: 1968–98 (Sydney: Australia Council, 2000); and data supplied by National Centre for Culture and Recreation Statistics, ABS, Adelaide.

C10.4 GOVERNMENT FUNDING OF THE ARTS(a), By Artistic Purpose, Australia—1991–92 to 1998–99

	1991–92	1992–93	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99
	$m	$m	$m	$m	$m	$m	$m	$m
Artistic purpose								
Literature and publishing	15.1	14.3	13.7	13.6	15.5	14.5	16.8	17.3
Visual art, craft, photography	22.0	20.6	25.4	26.2	31.4	28.7	29.6	29.8
Art galleries	92.9	74.9	87.1	109.6	119.6	122.9	121.8	129.5
Music (excl. opera)	28.7	25.0	25.1	29.2	34.2	40.2	64.9	67.7
Theatre, opera, dance	65.1	72.2	73.8	76.8	89.4	89.9	92.3	100.8
Performing arts venues	83.7	92.5	120.9	137.5	134.9	188.3	160.8	168.4
Community arts	39.3	37.6	44.2	50.9	59.6	51.1	57.6	65.9
Film and video	105.3	104.0	99.6	102.4	106.9	127.1	121.2	117.5
Multimedia	—	—	—	48.5	1.8	6.0	7.5	4.4
Total	**452.2**	**441.1**	**489.8**	**594.7**	**593.3**	**668.7**	**672.5**	**701.3**

(a) Including Commonwealth, State/Territory and local government funding.

Source: Derived from data contained in Cultural Ministers' Council, Cultural Funding in Australia (various years); Hans Hoegh Guldberg, The Arts Economy: 1968–98 (Sydney: Australia Council, 2000); and data supplied by National Centre for Culture and Recreation Statistics, ABS, Adelaide.

C10.5 RECURRENT AND CAPITAL ARTS FUNDING(a), By Artistic Purpose, Australia—1998–99

	Recurrent		Capital		Total	
	$m	%	$m	%	$m	%
Artistic purpose						
Literature and publishing	15.8	91	1.6	9	17.3	100
Visual art, craft, photography	28.2	95	1.6	5	29.8	100
Art galleries	110.6	85	18.9	15	129.5	100
Music (excl. opera)	67.6	100	0.1	0	67.7	100
Theatre, opera, dance	100.2	99	0.6	1	100.8	100
Performing arts venues	100.8	60	67.5	40	168.4	100
Community arts	68.8	104	–2.9	–4	65.9	100
Film and video	101.8	87	15.7	13	117.5	100
Multimedia	4.4	100	0	0	4.4	100
Total	**598.2**	**85**	**103.1**	**15**	**701.3**	**100**

(a) Including Commonwealth, State/Territory and local government funding.

Source: Derived from data in National Centre for Culture and Recreation Statistics, Cultural Funding in Australia, 1998–99.

This article has focused on direct support for the arts by the public sector, but it is important to note that some significant private sector funding of artistic activities in Australia has also occurred over the years, as we observed earlier in regard to bequests of money and artworks to the nation's art galleries. In the current period, private support for the arts has come via business sponsorship, which yields a payoff to the sponsor through marketing, advertising, promotion of brand image etc., and via philanthropy, where individuals, corporations or foundations donate funds without seeking a tangible return. Several schemes have been introduced by successive Commonwealth governments which provide taxation incentives to donors in an effort to stimulate the flow of funds. The positive outcome of such programs is to leverage new money for the arts; the downside for any government has to do with loss of control over the direction of this funding, and hence some potential for dilution of the strength of public cultural policy. Estimates of the amounts of funds flowing to the arts from the private sector are difficult to make; one study in the early 1990s put the amount of direct support enjoyed by the arts as a result of bequests and donations (not including business sponsorship) in 1992–93 at about $90m, or about 15% of total support.[16] The cost to Treasury of such an amount, measured in terms of revenue forgone, is likely to have been around $30–40m, depending on the marginal tax rates assumed to apply.

Rationalising public funding of the arts: 1900–2000

Let us look back over the period covered by this article, and consider the development of the public sector's role in arts funding in Australia over the century. What have been the motivations and intentions of government involvement in the arts over this period?

In the early years after Federation it seems clear that the recognition of a government responsibility in matters relating to art was closely allied with the acknowledgement of its role in matters of public education. Indeed, in the first Year Book (for 1901–07, published in 1908) the expenditure on art from consolidated revenue is lumped in with that on education and science under the general heading 'State Expenditure on all Forms of Educational Effort' (p. 754). This view of the arts as being similar to education in their claim on the attention of the state persisted well into the century, and indeed is still relevant in some respects today. Nevertheless, the translation of a perceived obligation into any sort of broader government action did not emerge until after the Second World War, when notions of state support for the arts more widely began to crystallise. Although the focus of postwar reconstruction was on the re-establishment of a peace-time economy, social and cultural developments also figured in the public agenda at that time, in education, health, welfare, and so on. Even so, as we have seen, it was not until more than twenty years after the end of World War II that ideas for a more active participation by the government in support of culture began to take significant tangible form.

The rhetoric surrounding the establishment of formal mechanisms for arts funding in the late 1960s and early 1970s pointed to the importance of the arts as a cornerstone of a civilised society. Since governments were charged with a duty to foster such a society, it followed that encouragement of both the creation and the enjoyment of the arts could be seen as a public obligation, appropriately financed out of general government revenue. Statements by politicians of all persuasions then and now suggest that, notwithstanding perceptions about the political leanings of the 'arts community' which surface from time to time, there is overall bipartisan support for such a view.[17]

The decision to inaugurate a broad program of arts funding in the late 1960s required also a decision as to the best mechanism for delivery of such support. Based on the experience of other countries, it could be suggested that three alternatives were available. First, a program of tax concessions could be initiated to encourage private philanthropy towards the arts, along the lines of current practice in the United States. The cost to the public sector of such an approach would be the revenue forgone. Second, a Ministry of Culture could be established, as in some European countries, dispensing money directly to arts organisations and individual artists. Third, the arts council model could be adopted, as in the United Kingdom, where a public body independent of government could distribute grants free of direct political control.

In the event the British model was chosen, and the resulting Australia Council has remained an independent statutory authority to the present day. Its structure reflects the twin principles of 'arm's-length funding', where decisions are made without political interference, and 'peer review', where grants are determined on the basis of independent expert advice. Nevertheless, it has to be remembered that the importance of these two principles as a feature of arts funding in Australia has declined over the years as the proportion of total arts funding accounted for by the Australia Council has itself declined; these principles apply imperfectly, if at all, to funding through other Commonwealth avenues and via the States and local government.

The establishment of formal arts funding mechanisms at the Commonwealth level also required a decision as to criteria for the allocation of grants. The *Australia Council Act 1975*, which has remained more or less intact in the intervening years, directs the Council to pursue certain goals which can be summarised as having three principal elements: the pursuit of excellence, the widening of access, and the fostering of 'Australian-ness', i.e. the responsibility to reflect Australia's evolving national identity to its citizens and to the world. Translating these lofty ideals into operational decisions has always presented difficulties, such as when objectives of excellence and access, for example, appear to point in different directions. Nevertheless, they have remained a driving force in the Council's work, and have provided some contextualisation for

arts funding decisions made elsewhere in the public system.[18]

Despite the advent of a significant public presence in financing the arts in the early 1970s, it was not long before the government's role was put under critical scrutiny. Two important enquiries into arts funding were held in the 1970s and 1980s which focused attention on the rationalisation of arts expenditures and the means for their delivery. The first was the Industries Assistance Commission's (IAC) enquiry into the performing arts of 1975–76. This enquiry was the first big test for the newly-formed Australia Council, which was seen by the IAC commissioners during the course of the enquiry as being elitist and unable to justify its operations in objective (i.e. economic) terms. It is ironic, therefore, that it was the Council for the Arts itself which was responsible for bringing the enquiry about in the first place. For several years the Council had been refusing requests from commercial theatre organisations for financial assistance, but had come to feel that perhaps such requests could be supported in some circumstances, and sought guidance on whether this was so. The IAC was seen to be the appropriate body to analyse the commercial industry's requirements and the merits of its claims for assistance.[19] But when the Prime Minister Mr Whitlam referred the matter to the IAC on 6 October 1974, he did so in much more general terms. The Commission was asked whether assistance should be accorded the performing arts in general in Australia and, if so, what should be the nature and extent of such assistance. Whitlam believed that an economic case could be made for public assistance to the performing arts in much the same terms as the case for education and similar activities. He considered that public support, particularly in hitherto unassisted areas, needed to be publicly examined and explained. Thus, the enquiry's terms of reference gave the commissioners a virtual carte blanche to examine the whole performing arts industry and the government's role in it.

The enquiry's report[20] recommended that assistance to support the operating costs of performing companies should be phased out over the ensuing five years, and that instead funds should be directed to improving education, expanding dissemination and encouraging innovation in the performing arts. In the week after the release of the enquiry's draft report, the Prime Minister, Malcolm Fraser, took the unusual step of rejecting its recommendations. He told the Parliament: "The Government strongly affirms its support for the arts in virtually all its forms. The Government is committed to the support of the major performing companies in Australia—the opera, ballet and drama. That will be its continuing policy."[21]

The second investigation into arts funding was that conducted by a Sub-Committee of the House of Representatives Standing Committee on Expenditure, begun in 1982 and concluded with the publication of its report in 1986.[22] The Committee, chaired by Leo McLeay, reviewed the broad effectiveness and efficiency of the procedures for the delivery of Commonwealth assistance to the arts. Over the long course of its deliberations, the Committee considered ways of rationalising and coordinating the disparate means by which the Federal Government was providing both direct and indirect support for the arts in Australia. Its guiding principles were that the use of public funds demanded accountability and that expenditures should be commensurate with the benefits produced. Although, like the IAC ten years earlier, the Committee ruffled some feathers, its recommendations were by and large uncontroversial and a number of them were in fact implemented in one way or another over the ensuing years.[23]

These enquiries, and the climate of 'economic rationalism' which emerged in Australian public life during the 1980s, had the effect of forcing the arts sector to become more explicit about its economic base. At the macro level, statistics were presented by arts advocates comparing the arts with other industries, showing that the cultural sector was not a minor backwater in terms of value added, employment, exports, and contribution to GDP, but rather was a significant locus of economic dynamism in the post-industrial world.[24] At the micro level, economic impact studies began to appear which purported to show the significant contribution made by arts events and cultural institutions to local and regional economies.[25]

At the same time at an international level the emerging discipline of cultural economics was discussing ways in which government support of the arts could be rationalised

within contemporary economic systems relying essentially on private markets as the principal means of resource allocation. This long debate has had many strands, but the argument which emerged most convincingly was one proposing that the arts are a case of market failure, i.e. that the arts give rise to externalities or public-good benefits which are not reflected in market transactions and which therefore provide a *prima facie* justification for government intervention.[26] Discussion of these issues in Australia was assisted by the fact that one of the first studies anywhere in the world which attempted to give empirical substance to these theoretical hypotheses was undertaken in this country. In a research project funded by the Australia Council and carried out in 1982, Glenn Withers and I set out to identify the nature of the external benefits from the arts and to quantify the community's willingness to pay for arts support out of their taxes. Although limited in scope and specific to its time period, this study yielded strong support for the existence of a viable economic rationale for government assistance to the arts. Since the rationale was derived from the same basic economic paradigm which underlay the 'economic rationalist' ideology of the day, our results were helpful in aligning arts funding with the prevailing economic orthodoxy. Despite changing times, the essential conclusions of this research are still relevant today and their implications might be regarded as even more important, given the increased prominence of the same orthodoxy at the present time.[27]

In 1992 the Commonwealth Government set in train a process aimed at formulating a new cultural policy. The process culminated in 1994 with the release of a document entitled *Creative Nation*, which at the time represented one of the most comprehensive and forward-looking statements of government policy towards culture that had been seen anywhere in the world.[28] It was grounded firmly in the proposition that the creative industries could be seen as a significant force in generating employment and economic growth; indeed in the leadup to the finalisation of the document a major conference was organised by the then Department of Communications and the Arts, the title of which, 'Creating Culture: the New Growth Industries', reflected this prevailing mood.[29] *Creative Nation* adopted a broad view of the cultural sector in which the arts occupied a central position, not just in their own right but also as the foundation upon which the wider cultural industries, especially those dependent on new communications technologies, were built. Although criticised in some quarters as being longer on rhetoric than on concrete proposals, *Creative Nation* reflected an optimistic and expansionist mood about Australian culture and about the future potential of the creative arts in the new information age. Despite the fact that the document itself is still strongly identified with Paul Keating, the Prime Minister under whose aegis it was produced, the thrust of *Creative Nation* has remained broadly consistent with the approach to arts policy espoused by subsequent conservative governments.

In concluding our review of the policy context of arts funding over the twentieth century, let us consider some issues within the arts: What have been some of the factors affecting the distribution of funding between art forms? The first point to note is that historically funding of organisations has tended to dominate over support for individual artists. At the time the original Australian Council for the Arts was set up in 1968, the symphony orchestras and the opera and ballet companies were already well established, and the new Council saw a particular priority in consolidating and extending the network of State drama companies. The fact that the IAC enquiry of 1975–76 dealt with the performing arts continued this focus on organisational support. By the early 1980s, the artforms representing 'initial creative artists'—literature, the visual arts, the crafts—had come to feel that they were receiving an inequitable share of Australia Council funds compared with the performing arts. Their concerns led to the establishment of a Committee of Inquiry into the situation of the individual artist in Australia, which produced its report entitled *The Artist in Australia Today* in 1983. The report's recommendations led to the introduction of some new measures to improve the working conditions of practising professional artists, but the hoped-for shift in Australia Council funding towards initial creative artists did not materialise. Nevertheless, the Individual Artists Inquiry did at least spawn a series of surveys of the economic circumstances of artists, conducted at roughly five-yearly intervals, which have drawn periodic attention to declining real incomes and the lack of professional recognition suffered by writers, visual artists, composers, actors, musicians and other

practitioners in Australia; these studies have provided empirical support for arguments that arts policy in Australia needs to do more to address problems faced by individual artists.[30]

The matter of public funding of performing companies as distinct from individual artists, and indeed of large companies as distinct from small ones, has resurfaced with the publication of the most recent inquiry into an aspect of arts funding in Australia, namely the review of the major performing organisations carried out in 1998–99 by a committee chaired by Helen Nugent. Although composed entirely of business people, the committee did not adopt a solely business-oriented approach to its task. It recognised that the essential purpose of these opera, dance, theatre and music companies is to produce art, and its recommendations were aimed at securing the economic foundations on which those processes are built.[31] The result has been the injection of significant new funds (about $43m in Federal funding over four years) to support the major performing groups. Not surprisingly, there have been calls for similar attention to be paid now to the needs of smaller companies and of artforms outside the performing arts.

Conclusions

In tracing the development of public funding for the arts since Federation, we can see some patterns emerging which give a lead to likely directions in the new millennium. First, the consolidation of the public sector's role in arts funding which has occurred during the last quarter of the twentieth century now seems secure, and it is unlikely that that role will disappear. Second, however, the way in which it is discharged may well go through furthur transformations. In part these will be caused by technological change, as new means for production, dissemination and consumption of art affect the ways in which the public interest in this field can or should be asserted. In part also these transformations will arise through changing partnerships in the delivery of arts support between public and private sectors. Furthermore, shifts between levels of government are likely to occur, with the possibility of a further relative decline at the centre and increased involvement at the periphery; if so, this would be consistent with an apparent worldwide trend towards greater cultural diversity and more active expression of localised cultural values, especially in the face of what are seen as the homogenising influences of globalisation.

Finally, whatever the ebb and flow of political fortunes at the federal level in Australia, it is likely that a broad-ranging Commonwealth government cultural policy will evolve further in the years ahead, necessarily containing as one of its elements a specific stance towards public support for the arts. If so, there seems little doubt that such an arts policy will continue to be predicated on the threefold objectives noted earlier—a drive for the highest possible standards in artistic creativity, innovation and expression; an opening up of enjoyment of the arts to as wide an audience as possible free from economic and locational barriers; and a further enhancement of the arts' unique role in defining what it means to be Australian.

Endnotes

1 For further discussion of the cultural industries as a series of concentric circles centred on the arts, see Richard E. Caves, *Creative Industries: Contracts between Art and Commerce* (Cambridge: Harvard University Press, 2000), and David Throsby, *Economics and Culture,* (Cambridge: Cambridge University Press, 2001), ch. 7.

2 Unless otherwise stated, statistical information in this section is derived from the Commonwealth Year Books of various years, beginning with No. 1 for 1901–07. Throughout this paper, financial amounts are quoted at current prices, unless indicated otherwise. Constant price series are expressed in 1998–99 prices, with adjustments being made using the six capital cities CPI.

3 See further in Anon, ''Michael Massey Robinson'', in *The Australian Encyclopaedia* (Sydney: Australian Geographic, 1996, pp. 2599–2600).

4 Adjustment of historical monetary amounts to terms of today's prices is problematical. Nevertheless we can say that an amount of £4,000 in 1908 is the equivalent of roughly $350,000 today. In 1998–99 prices, government expenditure on the NSW Art Gallery in 1908 was about $0.22 per head of population in the State at that time, compared with an expenditure by the State Government on all art galleries in NSW of around $5 per head in 1998–99.

5 These amounts are equivalent to about $1.3m, $0.9m and $0.4m respectively in 1998–99 prices.

6 See further in *Helping Literature in Australia: The Work of the Commonwealth Literary Fund 1908–1966* (Canberra: Commonwealth Government Printer, 1967), and Thomas Shapcott, *The Literature Board: a Brief History* (St. Lucia: University of Queensland Press, 1988), pp. 13–18.

7 Sir Robert Garran, "Australian CEMA—its origin and purpose", in Arts Council of Australia (NSW Division), *A Five Years' Record 1943–1947*, (Sydney: the Council, 1947), p. 3.

8 For further on the origins of the State symphony orchestras, see K.S. Inglis, *This is the ABC: The Australian Broadcasting Commission 1932–1983* (Melbourne: Melbourne University Press, 1983), esp. pp. 157–161.

9 Holt's announcement was made in the Commonwealth Parliament on 1 November 1967; see CPD, vol. H. of R. 57 (1967), pp. 2515–7.

10 For some contemporary international comparisons see Geoffrey Dutton, "The work and prospects for the Australian Council for the Arts", in Derek Whitelock (ed.), *Government Aid to the Arts* (University of Adelaide, Department of Adult Education, 1968), pp. 8–20.

11 In 1998–99 prices this is equivalent to around $90m, or $6.70 per head of population; by contrast the Australia Council's 1998–99 allocation amounted to about $3.80 per head.

12 For further details of the establishment of the Council, see H.C. Coombs, *Trial Balance* (South Melbourne: Macmillan, 1981), ch. 8; Gough Whitlam, *The Whitlam Government 1972–1975*, (Ringwood: Viking, 1985), ch. 16; and Justin Macdonnell, *Arts, Minister? Government Policy and the Arts* (Sydney: Currency Press, 1992), chs. 1–3.

13 For further details of film financing arrangements over this period, see Australian Film Commission, *Get the Picture: Essential Data on Australian Film, Television and Video* (Sydney: AFC, 1992), and Simon Molloy and Barry Burgan, *The Economics of Film and Television in Australia* (Sydney: AFC, 1993).

14 In order to increase the comprehensiveness of the earlier framework, the ABS has developed an updated culture and leisure industry classification. This classification is one of three classifications (the other two covering products and occupations) that will be published, during 2001, in *Australian Culture and Leisure Classifications*.

15 The original report on the proposed statistical framework was prepared by a consulting group led by Peter Brokensha; see Corporate Concern, *The National Culture-Leisure Statistical Framework* (Report prepared for the Cultural Ministers Council Statistical Advisory Group, *mimeo*, Adelaide, March 1989). The first report on cultural funding based on this framework was for the year 1988–89, and was published as Hans Guldberg, *Cultural Funding in Australia: Federal, State and Local Government* (Sydney: Australia Council, 1991).

16 See David Throsby "Government support for the arts and culture: the Australian model" (Paper presented at Cultural Crossroads Conference, Sydney, 24 November 1997). These estimates were derived from data contained in: ABS, *Cultural Trends in Australia No. 3: Business Sponsorship of Cultural Activities* (June 1996), pp. 27–8; Australia Council, *Corporate Support for the Arts 1993* (Sydney: Australia Council, 1993), p. 30; Reark Research, *Giving Australia: a Quantitative Exploration of the Philanthropic Sector of the Australian Economy for the 1988–89 Financial Year* (Melbourne: Australian Association of Philanthropy, 1991), vol. 1, p. 76; and Daryl Dixon, Study of *Assistance to the Cultural Industry through Revenue Forgone* (Report for the Department of Arts, Sport, the Environment, Tourism and Territories, Canberra, June 1989). For further details of business sponsorship of cultural activities in Australia, see Australia Council, *Corporate Support for the Arts: a Discussion Paper* (Sydney: Australia Council, 1986); Yann Campbell Hoare Wheeler, *Corporate Support for the Arts 1996* (Sydney: Australia Council, 1996); and Department of Communications, Information Technology and the Arts, *Cultural Trends in Australia, No. 8: Business Sponsorship of the Arts and Cultural Activities, 1996–97* (Canberra: DOCITA, 1999).

17 For some examples of political statements supporting this contention, see further in David Throsby and Glenn Withers, *The Economics of the Performing Arts* (Melbourne: Edward Arnold, 1979), chs. 10–11.

18 For discussion of the objectives of arts policy in another time and place, see K. King and M. Blaug, "Does the Arts Council know what it is doing?" in Mark Blaug (ed.) *The Economics of the Arts* (London: Martin Robertson, 1976), pp. 101–125.

19 See further on this point in CPD, vol. H. of R. 19 (1976), p. 1822.

20 Industries Assistance Commission, *Assistance to the Performing Arts* (Canberra: AGPS, 1976).

21 See further in CPD, vol. H. of R. 19 (1976) p. 1802.

22 House of Representatives Standing Committee on Expenditure, *Patronage, Power and the Muse: Inquiry into Commonwealth Assistance to the Arts* (Canberra: Parliament of the Commonwealth of Australia, 1986).

23 For a review of the McLeay Report, which draws attention to the Committee's neglect of the individual artist, see contributions to Philip Parsons (ed.), *Shooting the Pianist: the Role of Government in the Arts* (Sydney: Currency Press, 1987). For further discussion of arts funding during this period see: Tim Rowse, *Arguing the Arts: the Funding of the Arts in Australia* (Ringwood: Penguin, 1985); John Gardiner-Garden, *Arts Policy in Australia: A History of Commonwealth Involvement in the Arts* (Canberra: Department of the Parliamentary Library, Background Paper No. 5, 1994); and Donald Horne, *Into the Open* (Sydney: Harper Collins, 2000), chs. 12 and 13.

24 See the useful series of statistical compilations published by the Australia Council under the generic title *The Arts: Some Australian Data*, of which the first appeared in 1982, with subsequent editions in 1984, 1989, 1991, 1996 and 2001; these reports map trends in key economic variables relating to the arts over time. For an assessment of the economic size of the arts industry, see Hans Guldberg, *The Arts Economy: 1968–98* (Sydney: Australia Council, 2000).

25 See a range of studies cited in National Centre for Culture and Recreation Statistics, *Measuring the Impact of Festivals* (Adelaide: ABS, 1997).

26 For some of the contributions to this debate, see papers collected in Ruth Towse (ed.), *Cultural Economics: The Arts, the Heritage and the Media Industries* (Cheltenham: Edward Elgar, 1997), vol. II, pp. 499–719.

27 The original study was published by the Australia Council under the title *What Price Culture?* (1984); for further detail see David Throsby and Glenn Withers, "Measuring the demand for the arts as a public good: theory and empirical results", in William S. Hendon and James L. Shanahan (eds.), *Economics of Cultural Decisions* (Cambridge: Abt Books, 1983), pp. 177–191. Our study was subsequently replicated in Canada, with broadly similar results; see William G. Morrison and Edwin G. West, "Subsidies for the performing arts: evidence on voter preference", *Journal of Behavioral Economics*, vol. 15, (1986), pp. 57–72.

28 See Department of Communications and the Arts, *Creative Nation: Commonwealth Cultural Policy* (Canberra: AGPS, 1994).

29 The theme of this conference, held in Parliament House, Canberra, on 11–12 August 1994, was built around the questions "What are the cultural industries? How can they make the most of links with other industries such as tourism, new technology, manufacturing? How can they break into the export market?"; see Department of Communications and the Arts, *Creating Culture: the New Growth Industries—Conference Papers* (Canberra; DOCA, 1994).

30 See the original survey reported in *The Artist in Australia Today*, and then the subsequent surveys reported in David Throsby and Devon Mills, *When Are You Going to Get a Real Job?* (Sydney: Australia Council, 1989), and David Throsby and Beverley Thompson, *But What Do You Do for a Living?* (Sydney: Australia Council, 1994).

31 See Major Performing Arts Inquiry, *Securing the Future: Final Report*, (Canberra: Department of Communications, Information Technology and the Arts, 1999).

13 Industry overview

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Introduction

This chapter starts with a short article sketching the evolution of Australian industry from the time of settlement. It then presents an overview of the current structure and performance of the main industrial components of the Australian economy, and their relative contributions to overall economic activity, particularly in terms of production and employment. Statistics are presented at a broad industry level, generally equating to the Division level of the *Australian and New Zealand Standard Industrial Classification (ANZSIC)*.

While the statistics presented in this chapter provide the basis for comparisons across industries, care should be taken when making comparisons with data in the industry-specific chapters. Differences in the frequency, scope, statistical units and methodologies of the various ABS collections used to compile the statistics will affect the degree to which comparisons can be made.

Table 13.1 shows each industry's contribution to production and employment in the economy. Tables 13.2 to 13.5 provide more detailed indicators of economic activity by industry over the short and longer term. Each of these tables includes data covering all businesses in the economy. Table 13.6 provides the latest in a selected series of performance indicators for each industry, but its scope excludes non-employing businesses and entities in the general government sector.

The chapter concludes with a brief introduction to the chapters on economic issues—on Australia's industries, on certain cross-cutting issues, and on the macroeconomic perspectives.

The evolution of Australian industry

Australia's economic development has been one of contrast and change. In the early years of settlement, between 1788 and 1820, there was little scope for industrial or commercial enterprises. The government, as both main producer and main consumer, established workshops to produce the basic necessities of life—flour, salt, bread, candles, leather and leather articles, blacksmith's products, tools and domestic items.

Between 1820 and 1850, the pastoral industry led Australia's economic development, and by 1850 it was supplying well over 50% of the British market for imported wool. The growth in the wool industry brought great advances in the rest of the economy, with local manufacturing industries being established in response to new market opportunities. Gold surpassed wool as Australia's major export earner throughout the 1850s and 1860s, resulting in a rapid expansion of banking and commerce. Increased public works activity during the 1870s played an important role in encouraging expansion in manufacturing.

From 1901 to 1930 manufacturing expanded further, with impetus from Federation and the elimination of customs barriers between States, and from the First World War. With the onset of the Second World War, the Australian manufacturing sector was sufficiently developed and diversified to respond to the demand for war materials and equipment. Key industries expanded and new ones developed rapidly to produce munitions, ships, aircraft, new kinds of equipment and machinery, chemicals, textiles and so on. After the war, all sectors of the economy experienced growth. The onset of the oil price rises in 1973–74 led the world into recession, and 'stagflation' (inflation coupled with slower growth in Gross Domestic Product (GDP)) affected all sectors of the economy. The modest employment growth between 1968 and 1979 was dominated by the service industries.

The 1980s and 1990s have seen a decline in the relative contribution to GDP from goods-producing industries and a rise in the contribution from service industries. The falling contribution from goods-producing industries is largely the result of a decline in Manufacturing's share of GDP. The Mining, Manufacturing and Electricity, gas and water supply industries have all experienced declining employment, along with outsourcing of some activities, particularly support services.

Measuring Australian industry early last century

At the beginning of the century there was no comparable information on Australian industry, with little if any uniformity in the data collected and published in each State. The following excerpt from the the *Official Year Book of the Commonwealth of Australia, 1901–1907* provides further background: "The want of uniformity in methods of compilation and presentation of Australian statistics renders it an extremely difficult task to make anything like a satisfactory valuation of the various elements of production. At present there is so little accurate statistical knowledge regarding such industries as forestry, fisheries, poultry and bee-farming, that any valuation of the production therefrom can only be regarded as the roughest approximation". However, despite these difficulties, there were official estimates that in 1906 Agricultural production constituted 61% of total production, Manufacturing 21% and Mining 18%.

Output and employment by industry

Two measures of the changing importance of an industry are its contributions to GDP at basic prices and to employment; these are illustrated in table 13.1.

The table shows that, in 1998–99, Manufacturing remained the most significant industry in terms of its contribution to GDP. Property and business services was the only other industry to contribute over 10% of GDP and over 10% of total employment. Manufacturing, with 12% of total employment, was the second largest employing industry behind Retail trade (15%).

13.1 INDUSTRY GROSS VALUE ADDED(a) AND EMPLOYMENT(b), By Industry—1998–99

	Industry gross value added		Employment(b)	
		Contribution to GDP(c)		Contribution to total employment
Industry	$m	(d)%	'000	%
Agriculture, forestry and fishing	18 191	3.1	433	5.0
Mining	23 001	3.9	76	0.9
Manufacturing	74 272	12.5	1 067	12.2
Electricity, gas and water supply	13 164	2.2	67	0.8
Construction	35 820	6.0	648	7.4
Wholesale trade	31 757	5.4	514	5.9
Retail trade	33 358	5.6	1 323	15.2
Accommodation, cafes and restaurants	12 814	2.2	419	4.8
Transport and storage	32 969	5.6	416	4.8
Communication services	17 247	2.9	156	1.8
Finance and insurance	39 277	6.6	302	3.5
Property and business services	61 031	10.3	954	10.9
Government administration and defence	24 056	4.1	(e)361	3.9
Education	26 719	4.5	624	7.2
Health and community services	34 292	5.8	811	9.3
Cultural and recreational services	10 888	1.8	217	2.5
Personal and other services	13 457	2.3	330	3.8
Ownership of dwellings	52 398	8.8	. .	. .
Taxes less subsidies on products	42 370	7.1	. .	. .
Statistical discrepancy	–3 770	. .	. .	. .
Total	**593 311**	**100.0**	**8 716**	**100.0**

(a) Industry gross value added at basic prices. (b) Estimates relate to May 1999 and are entirely sourced from the Labour Force Survey. (c) Gross value added at basic prices. (d) Percentage contributions do not sum to 100% due to rounding. (e) Defence forces are not included in the estimates of employment.

Source: Unpublished data, Australian System of National Accounts, 1998–99; Australian System of National Accounts (5204.0); Labour Force, Australia (6203.0).

Profits, wages and output

Table 13.2 presents broadly the profits of businesses (referred to as gross operating surplus and gross mixed income) and the wages income of employees (referred to as compensation of employees) for 1998–99, the change over 1997–98, and the average annual rate of growth over the years from 1990–91.

The table shows that profits rose in 1998–99 in all industries except Mining (down 8%), Communication services (down 2%) and Electricity, gas and water supply (down 1%). The average for all industries was an increase of 4% over 1997–98. Over the years from 1990–91 to 1998–99 profits grew by an average of 5% per year.

The strongest increases in profits in 1998–99 were recorded by Retail (19%), Finance and insurance (13%), Transport and storage (11%) and Wholesale trade (10%). In the period from 1990–91 to 1998–99, there was an average annual increase in profits for all industries. Over this period, Personal and other services showed an average annual increase in profits of 12% and profits for Communication services increased on average by 10%.

The table also shows the growth in wages. Movements in wages correlate with employment in the industry and average wages per person employed. The Property and business services industry showed the largest increase (16%) in wages in 1998–99, with an average annual increase of 8% in the years from 1990–91 to 1998–99. The largest annual increase over the period from 1990–91 to 1998–99 was recorded in the Cultural and recreational services industry (up by 10%).

Similarly, wages in Construction rose by 14% in 1998–99, with an average annual increase of 4% over the years from 1990–91 to 1998–99. There were also substantial increases in wages in the Finance and insurance industry (by 13% in 1998–99 and by 6% annually on average) and in the Wholesale trade industry (by 10% in 1998–99 and by 5% annually on average).

Wages in the Electricity, gas and water supply industry fell by 1% in 1998–99 and recorded an average annual fall of 4% over the years from 1990–91 to 1998–99.

13.2 PROFITS AND WAGES, By Industry

	Profits (GOS(a) and GMI(b))			Wages (compensation of employees(c))		
	1998–99	Change from 1997–98	Average annual rate of growth 1990–91 to 1998–99	1998–99	Change from 1997–98	Average annual rate of growth 1990–91 to 1998–99
Industry	$m	%	%	$m	%	%
Agriculture, forestry and fishing	13 202	2.6	5.4	4 320	2.7	4.5
Mining	16 224	–8.0	1.8	6 170	–4.0	3.0
Manufacturing	33 782	5.8	8.0	37 220	0.5	2.9
Electricity, gas and water supply	9 756	–1.2	3.1	3 242	–1.2	–4.2
Construction	18 637	5.8	8.1	16 233	14.2	4.3
Wholesale trade	7 965	10.0	–0.0	21 324	9.7	4.7
Retail trade	8 400	18.5	2.8	23 250	7.9	6.7
Accommodation, cafes and restaurants	3 982	6.1	4.5	8 442	3.8	7.7
Transport and storage	14 715	11.4	5.4	16 935	5.7	4.4
Communication services	9 670	–1.6	10.2	6 903	1.3	3.3
Finance and insurance	15 373	12.8	7.8	18 670	12.9	5.9
Property and business services	20 818	4.9	3.4	37 198	16.2	8.4
Government administration and defence	3 079	4.2	4.0	20 906	2.4	5.7
Education	2 805	5.4	6.0	23 508	3.0	5.2
Health and community services	5 511	6.2	6.0	28 195	4.9	5.5
Cultural and recreational services	4 754	6.9	7.7	5 779	7.8	9.9
Personal and other services	3 285	7.2	11.9	9 815	7.8	6.0
Ownership of dwellings	48 881	2.1	4.8	. .	. .	. .
All industries	**240 839**	**4.4**	**5.3**	**288 110**	**6.6**	**5.2**

(a) Gross operating surplus (GOS) in current prices. (b) Gross mixed income (GMI) in current prices. (c) This was formerly known as Wages, Salaries and Supplements.

Source: Australian System of National Accounts, 1998–99 (5204.0).

Table 13.3 shows the growth in each industry's gross value added in terms of chain volume measures, in 1998–99 and over the longer term as an annual average over the years from 1990–91 to 1998–99. While current price estimates reflect both price and volume changes, chain volume estimates reflect only volume changes, as the direct effect of price changes has been eliminated from the estimates. For more information on chain volume measures see the section *Chain volume or 'real' GDP* in *Chapter 29, National accounts*.

The three industries whose gross value added grew the most in 1998–99 were Communication services (10%), Accommodation, cafes and restaurants (9%) and Property and business services (9%).

The largest annual average increase (10%) in gross value added over the years from 1990–91 to 1998–99 was recorded in the Communication services industry.

Changes in hours worked by industry

Table 13.4 shows that, over the period 1990–91 to 1998–99, hours worked for all industries combined increased on average by 1.3% per year. The most substantial average annual increase was recorded in the Property and business services industry (6%); the most substantial average annual fall was in the Electricity, gas and water supply industry (4%).

In 1998–99, hours worked fell in Agriculture, forestry and fishing (6%), Manufacturing (2%), Personal and other services (1%) and the Mining industry (1%). The fall in hours worked for the Manufacturing industry was consistent with an average annual fall of 1% in hours worked over the period of 1990–91 to 1998–99.

The reductions in hours worked should be considered in the context of the corresponding increases in labour productivity achieved by some industries, most notably Electricity, gas and water supply. This issue is discussed in greater depth in the next section, *Changes in labour productivity*.

13.3 INDUSTRY GROSS VALUE ADDED(a), Chain Volume Measures(b), By Industry

Industry	1998–99 $m	Change from 1997–98 %	Average annual rate of growth 1990–91 to 1998–99 %
Agriculture, forestry and fishing	19 044	7.5	3.0
Mining	23 873	–3.2	3.9
Manufacturing	73 800	2.4	1.6
Electricity, gas and water supply	13 496	1.4	1.3
Construction	34 334	4.9	4.1
Wholesale trade	31 226	7.5	5.1
Retail trade	31 140	2.9	3.8
Accommodation, cafes and restaurants	13 314	8.6	3.9
Transport and storage	31 372	2.9	3.9
Communication services	18 945	9.6	9.8
Finance and insurance	37 696	7.2	4.3
Property and business services	59 547	8.8	5.3
Government administration and defence	22 906	–2.2	2.2
Education	26 541	2.5	2.6
Health and community services	33 092	1.4	2.7
Cultural and recreational services	10 544	3.9	2.8
Personal and other services	12 928	3.4	2.5
Ownership of dwellings	52 961	3.4	3.4
Taxes less subsidies on products	42 680	5.8	4.2
Statistical discrepancy (production-based)	2 107	. .	. .
All industries (GDP)	**591 546**	**4.5**	**3.8**

(a) At basic prices. (b) Reference year for chain volume measures is 1997–98.

Source: Australian System of National Accounts, 1998–99 (5204.0).

13.4 INDEXES OF HOURS WORKED(a), By Industry

Industry	1998–99 Index number	Change from 1997–98 %	Average annual rate of growth 1990–91 to 1998–99 %
Agriculture, forestry and fishing	94.1	–5.9	–0.7
Mining	99.2	–0.8	–1.1
Manufacturing	98.2	–1.8	–1.4
Electricity, gas and water supply	106.9	6.9	–4.4
Construction	105.5	5.5	1.8
Wholesale trade	101.8	1.8	0.1
Retail trade	103.1	3.1	1.4
Accommodation, cafes and restaurants	101.4	1.4	2.8
Transport and storage	103.0	3.0	1.1
Communication services	103.3	3.3	1.0
Finance and insurance	104.1	4.1	–0.9
Property and business services	104.5	4.5	5.9
Government administration and defence	101.6	1.6	–0.9
Education	104.5	4.5	1.9
Health and community services	102.7	2.7	2.2
Cultural and recreational services	102.6	2.6	3.9
Personal and other services	98.8	–1.2	2.9
All industries	**101.9**	**1.9**	**1.3**

(a) Reference year 1997–98 = 100.

Source: Australian System of National Accounts, 1998–99 (5204.0).

It is interesting to compare the growth in hours worked with the growth in wages over the same period. In the Manufacturing industry, hours worked fell over the period from 1990–91 to 1998–99. However, wages for this industry grew at an annual rate of 3%, compared with the average for all industries of 5%.

In evaluating changes in hours worked, it is important to recognise that industry restructuring, outsourcing of some functions and contract employment have impacted more substantially on some industries than others. More detail on employment changes over time is included in *Chapter 6, Labour*.

Changes in labour productivity

Changes in the number of hours worked provide another indicator of the level of economic activity of an industry. A developing or buoyant industry will generally show an increase in the number of hours worked over time. However, rapid growth in labour productivity within an industry may be associated with a decline in hours worked. A general indication of such effects is provided in table 13.5, which shows the changes in labour productivity (measured here as chain volume gross product per hour worked) experienced by each industry between 1997–98 and 1998–99, as well as the average rate of change over the period from 1990–91 to 1998–99.

For some industries, principally those dominated by the public sector, the growth in the volume of output is derived using indicators of labour input because of a lack of suitable output indicators. Therefore, for these industries there are no meaningful measures of labour productivity growth. The remaining industries are known collectively as the market sector, and indexes of their labour productivity are shown in the table.

The average increase in labour productivity across all industries in the market sector between 1997–98 and 1998–99 was 3%; over the period from 1990–91 to 1998–99 the average annual increase was 2%.

Gross product per hour worked increased most markedly in the Agriculture, forestry and fishing industry (14%); the industry achieved an average annual increase in labour productivity of 4% over the period from 1990–91 to 1998–99. In 1998–99 gross product per hour worked also increased in Accommodation, cafes and restaurants (7%) and the Communication services industry (6%).

Labour productivity in the Electricity, gas and water supply industry increased on average by 6% per year over the period from 1990–91 to 1998–99 (although falling by 5% in 1998–99); this

industry's average increase in gross value added over the same period was 1%, and hours worked fell by an annual average of 4% over the period. The Mining industry experienced growth on average of 5% per year over the period from 1990–91 to 1998–99 (although decreasing by 2% in 1998–99); this industry's average increase in gross value added over the same period was 4%, and hours worked fell by an annual average of 1% over the period.

As indicated in the table, Accommodation, cafes and restaurants experienced an average increase of 1% in labour productivity over the period from 1990–91 to 1998–99 with an increase of 7% in 1998–99. Labour productivity increased for this industry because the the average growth in the chain volume estimates of gross value added (4%) exceeded the average growth in hours worked (3%). Similarly, labour productivity in the Cultural and recreational services industry fell on average by 1% over the period from 1990–91 to 1998–99 because hours worked grew faster than gross value added.

These measures of labour productivity should be treated with care. Changes in the composition of labour, which are not captured in the hours worked measure, can affect output, which can also be affected by changes in inputs other than labour (e.g. capital). Finally, the extent to which the capacity of inputs is used can affect output per hour worked; for example, there will be an apparent increase in productivity when an input that was previously not fully used becomes fully used. The average increase in labour productivity across all industries between 1997–98 and 1998–99 was 3%; over the period from 1990–91 to 1998–99 the average annual increase was 2%.

Industry performance

The relative performance of industries, like the relative performance of businesses, can be analysed using a combination of quantitative estimates (of the kind shown in earlier tables) and performance ratios. Various ratios commonly used in financial analysis are included in table 13.6. These show, for example, that in 1998–99:

- industries which converted the highest proportion of their sales into profit (as represented by the profit margin) were Finance and insurance, Electricity, gas and water supply and Communication services;
- businesses in Construction, Communication services and Retail trade reported, on average, the highest return on assets;
- The industries with the highest returns on net worth were Construction, Communication services and Retail trade; and
- the greatest ability to service debt charges from profits (as represented by the interest coverage ratio) was recorded for the Cultural and recreational services, Construction and Private community services.

13.5 INDEXES OF GROSS PRODUCT(a) PER HOUR WORKED, By Industry(a)(b)

Industry	1998–99 Index number	Change from 1997–98 %	Average annual rate of growth 1990–91 to 1998–99 %
Agriculture, forestry and fishing	114.2	14.2	3.7
Mining	97.6	–2.4	5.1
Manufacturing	104.3	4.3	3.0
Electricity, gas and water supply	94.9	–5.1	6.0
Construction	99.4	–0.6	2.2
Wholesale trade	105.7	5.7	5.0
Retail trade	99.8	–0.2	2.4
Accommodation, cafes and restaurants	107.1	7.1	1.0
Transport and storage	99.9	–0.1	2.7
Communication services	106.2	6.2	8.6
Finance and insurance	103.0	3.0	5.2
Cultural and recreational services	101.3	1.3	–1.0
All industries	**102.6**	**2.6**	**2.4**

(a) Reference year for chain volume measures is 1997–98. (b) Estimates presented in this table relate only to industries in the market sector.

Source: Australian System of National Accounts, 1998–99 (5204.0).

The derivations of the performance ratios shown in table 13.6 are as follows:

- *Profit margin* is operating profit before tax as a percentage of sales of goods and services plus interest income plus other operating income;
- *Return on assets* is operating profit before tax as a percentage of total assets;
- *Return on net worth* is operating profit before tax as a percentage of net worth;
- *Interest coverage* is the number of times that businesses can meet their interest expenses from their earnings before interest and tax; and
- *Investment rate* is the proportion of industry gross product used for capital investment.

Number of businesses and employment by size of business

This section outlines the growth in the number of Australian businesses, and in their employment, by employment size group, in 1998–99 and over the period from 1983–84 to 1998–99. The analysis and tables cover businesses other than government enterprises and those classified to the Agriculture, forestry and fishing industries.

Table 13.7 shows details of the change in the number of businesses by employment size group, while table 13.8 shows the change in employment across the different employment size categories.

The tables show that in 1998–99 there were almost 990,000 non-agricultural private sector businesses operating in Australia, employing around 6.7 million people. Over the period from 1983–84 to 1998–99, the total number of businesses increased by an average of 3.6% per year, while the total number of persons working grew at 2.9% per year. By comparison, in 1998–99 the number of businesses grew by 1.6%, and the number of persons working increased by 4.4%.

Over the period 1986–87 to 1998–99 the average annual rate of growth in numbers of businesses was fairly similar across the different size categories, ranging from 2.7% for businesses with 200 or more employees to 4.8% per year for businesses with 0–4 employees. Changes from 1997–98 were more variable. The number of non-employing businesses fell by 2.3% whereas the numbers of other businesses grew.

13.6 INDUSTRY PERFORMANCE RATIOS(a)—1998–99

Industry	Profit margin %	Return on assets %	Return on net worth %	Interest coverage times	Investment rate %
Agriculture, forestry and fishing	14.9	3.2	3.9	3.9	39.5
Mining	16.6	7.6	20.1	4.4	42.9
Manufacturing	5.7	6.6	16.7	4.3	18.9
Electricity, gas and water supply	21.4	5.4	10.0	3.0	35.5
Construction	5.7	12.7	41.3	9.3	11.5
Wholesale trade	3.8	8.4	27.3	6.2	13.6
Retail trade	3.4	10.8	30.8	3.5	10.9
Accommodation, cafes and restaurants	6.0	5.7	12.7	3.4	16.5
Transport and storage	7.7	6.4	16.8	3.7	26.6
Communication services	20.0	14.1	34.5	8.1	38.8
Finance and insurance	25.3	2.4	11.8	1.8	. .
Property and business services	11.8	6.4	14.1	3.8	13.7
Private community services	10.4	9.7	18.5	9.0	13.9
Cultural and recreational services	13.6	9.7	18.6	9.5	37.0
Personal and other services	6.8	4.6	6.5	5.8	19.1
All industries(b)	**9.5**	**4.5**	**13.8**	**2.8**	**21.8**

(a) The underlying data include private employing and public trading businesses, but exclude non-employing businesses and entities in the general government sector. (b) Long-term debt to equity and Investment rate for All industries exclude Mining, Electricity, gas and water supply and Finance and insurance businesses. Interest coverage for All industries also excludes Mining and Electricity, gas and water supply.

Source: Business Operations and Industry Performance, Australia, Preliminary (8142.0).

Change in the number of persons employed across the employment size categories generally reflected the change in numbers of businesses, with the size group 1–4 employees recording the strongest average annual growth rate (4.3%) over the period from 1986–87 to 1998–99.

Over 1998–99 there was a decline in persons working in their own businesses, with the number of own account workers, and working proprietors and partners, decreasing by 2.2% and 2.0% respectively.

13.7 NUMBER OF BUSINESSES(a), By Employment Category of Business

Employment category	1998–99 '000	Change from 1997–98 %	Average annual rate of growth 1986–87 to 1997–98 %
Non-employing businesses	423.4	–2.3	3.0
1–4 employees	368.0	3.5	4.8
10–19 employees	159.8	7.0	3.2
20–99 employees	32.3	7.0	3.1
100–199 employees	3.8	11.8	4.1
200 or more employees	2.7	3.8	2.7
Total	**989.9**	**1.6**	**3.6**

(a) Excludes public trading and general government entities, and businesses in the Agriculture, fishing and forestry industries.

Source: Small Business in Australia, 1999 (1321.0).

13.8 PERSONS EMPLOYED(a), By Employment Category of Business

	1998–99 '000	Change from 1997–98 %	Average annual rate of growth 1986–87 to 1997–98 %
Persons working in their own businesses			
Own account workers	658.3	–2.2	2.8
Working proprietors and partners in employing businesses	299.5	–2.0	0.6
Employees			
Employees in businesses employing 1–4 persons	767.6	3.5	4.3
Employees in businesses employing 5–19 persons	1 394.2	7.1	3.4
Employees in businesses employing 20–99 persons	1 278.9	5.4	3.2
Employees in businesses employing 100–199 persons	517.1	10.2	3.2
Employees in businesses employing 200 or more persons	1 743.9	4.3	2.2
Total employees	*5 701.7*	*5.6*	*3.0*
Total persons working	**6 659.5**	**4.4**	**2.9**

(a) Excludes persons employed by public trading and general government entities, and by businesses in the Agriculture, fishing and forestry industries.

Source: Small Business in Australia, 1999 (1321.0).

The chapters on economic issues—a guide

Chapters 14 to 30 address economic issues—Australia's industries, some cross-cutting issues, and the macroeconomic perspectives.

Industries

Chapters 15 to 24, 26 and 27 provide a detailed discussion of individual industries, their structure, performance and activities.

Chapter 15, Agriculture presents a detailed picture of Australia's agriculture industry, including aspects such as land use, commodity production, livestock numbers and employment. Australian agriculture is a vital industry occupying a significant place in global rural trade, with wool, beef, wheat, cotton and sugar being particularly important. Australia is also an important source of dairy produce, fruit, rice and flowers. The chapter includes two short historical articles, *Agriculture, the early years*, and *Agricultural inventions*.

The main features of two important primary industries in Australia, forestry and commercial fishing, are presented in *Chapter 16, Forestry and fishing.* The chapter includes two contrasting short articles, *Thinking 'green' in 1901*, and *Timber then and now* on the volumes of timber sawn, imported and exported at the beginning of the century and now.

The mining industry is profiled in *Chapter 17, Mining*. Australia continues to rank as one of the world's leading mineral resource nations and minerals exports are the nation's largest export earner. The chapter includes a review article *A century of mining in Australia*.

Chapter 18, Energy presents information on the energy sector—its resources, the supply and use of energy products, conservation initiatives and environmental issues. The export of coal, petroleum, gas and uranium earned Australia $15,700m in 1997–98, representing 18% of the value of all exports in that year. In comparison, $4,362m was spent on energy imports, mainly crude oil and petroleum products.

The manufacturing industry is discussed in *Chapter 19, Manufacturing.* This chapter presents a range of data about manufacturing as a whole and its constituent industries. It is an important sector in the Australian economy, contributing about 13% of Australia's GDP and 12% of employment. However, the sector's share of Australian GDP has fallen over the past 20 years. The chapter includes a review article *Manufacturing in the twentieth century*.

Chapter 20, Construction provides an analysis of the construction industry and its activities. The Construction industry engages in three broad areas of activity: residential building (houses, flats, etc.), non-residential building (offices, shops, hotels, etc.), and engineering construction (roads, bridges, water and sewerage, etc.). A number of other parts of the Australian economy are also closely linked to the construction industry, including parts of the manufacturing, wholesale and retail trade and finance industries, in supplying components, fittings and furnishings, and in financing construction. The chapter includes an article *The Australian housing stock: 1911 and 1996*.

A profile of Australia's service industries is included in *Chapter 21, Service industries*. These industries are the most significant and fastest growing component of the Australian economy. This chapter presents them in overview, and provides a range of statistical information for a selection of the service industries, with a particular focus on those surveyed in the ABS's rotating program of service industries collections. The chapter includes an article *The changing face of the retail industry—1948 to 1992*.

Chapter 22, Tourism presents statistics on Australia's tourism activities, both domestic and international. In an economic context, the effects of tourism are to generate economic activity and to transfer such activity between different parts of the economy. Tourism-related activity is now recognised as a major contributor to total economic activity. In particular, international tourism has experienced substantial growth in the past decade or so.

The transport industry and transport activities are discussed in *Chapter 23, Transport*. Transport has great economic and social impact, generating substantial employment and contributing significantly to GDP, with numerous support industries ranging from automotive manufacturers to travel agencies. There are also social costs of transport—such as road accidents, traffic congestion, fuel emissions, aircraft noise pollution and shipping oil spills. The chapter includes two short articles: *A history of road fatalities in Australia*, and *Australia's motor vehicle fleet since the 1920s*.

Chapter 24, Communications and information technology covers the communication services industries, which encompass telecommunication services, and postal and courier services. Communication services overall has been one of the fastest growing industries in Australia. The chapter also canvasses the use of information technology by businesses, farms and households. It includes a review article *History of communications in Australia*.

Chapter 26, Financial system provides an analysis of Australia's financial system and its main institutions, markets and activities.The chapter concludes with an article *1901 in retrospect*, tracing the foundations and connections of the current financial system in the structures and activities of the financial system existing in 1901.

Chapter 27, Government finance presents statistics on the the financial operations and financial position of the Australian public sector, comprising general government entities, public financial and public non-financial corporations. The chapter includes two articles, *Accrual-based Government Finance Statistics* and *Taxation during the first 100 years of Federation*.

Cross-cutting issues

Two chapters discuss cross-cutting issues affecting the Australian economy.

Chapter 14, Environment discusses a range of contemporary environmental issues affecting Australia. These include environmental attitudes and behaviour in Australian households; waste generation and disposals; biodiversity; management of Australia's inland waters; management of Australia's marine and coastal environment; management of Australia's forest and land resources; and local government expenditure on protection of the environment. The chapter includes an article *Developing a reliable water resource in the early 1900s*.

Chapter 25, Science and innovation presents information on investment (in terms of human resources and expenditure) in research and development by broad sector, and on the incidence and impacts of innovation in Australian industry. The chapter concludes with a Centenary Article, *The pace of change in science and innovation*, by Dr Keith Boardman, former Chairman and Chief Executive of the Commonwealth Scientific and Industrial Research Organisation (CSIRO).

The macroeconomic perspectives

The remaining three chapters focus on various macroeconomic perspectives on the Australian economy.

Chapter 28, Prices discusses a range of price indexes providing summary measures of the movements in various categories of prices. Price indexes are used extensively to analyse and monitor price behaviour, and to adjust government payments such as pensions. The chapter provides an outline of the major consumer and producer price indexes, their history, and their underlying concepts and methodology. It also outlines recent work in output price indexes for services and producer price indexes in a Stage of Production framework. The chapter includes an article *Prices in Australia at the beginning and end of the 20th century*.

Chapter 29, National accounts provides a systematic summary of national economic activity, as embodied in Australia's system of national accounts. The system includes national income, expenditure and product accounts, financial accounts, the national balance sheet and input-output tables. At their summary level, the national income, expenditure and product accounts reflect key economic flows: production, the distribution of incomes, consumption, saving and investment. At their more detailed level, they are designed to present a statistical picture of the structure of the economy and the detailed processes that make up domestic production and its distribution. The chapter also includes some summary national balance sheet measures, and an article *A brief history of national accounts in Australia*.

Chapter 30, International accounts and trade presents statistics on Australia's exports and imports of goods, international trade in services, international investment transactions, and the levels of Australia's foreign financial assets and liabilities. These statistics are used by economic analysts and policy advisers to monitor, evaluate and forecast developments in Australia's external trade and external sector accounts, to analyse patterns of trade and to assess types of transactions and financial claims and liabilities between Australian residents and non-residents. The chapter includes three historical articles: *A century of Australia's balance of payments performance*; *An account of investment in and by the six colonies*; and *Trade since 1900.*

Bibliography

ABS publications

Australian and New Zealand Standard Industrial Classification (ANZSIC) (1292.0).

Small Business in Australia, 1999 (1321.0).

Australian System of National Accounts, 1998–99 (5204.0).

Labour Force, Australia, June 2000 (6203.0).

Business Operations and Industry Performance, Australia, Preliminary, 1998–99 (8142.0).

Business Operations and Industry Performance, Australia, 1997–98 (8140.0).

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Introduction

The passage of one hundred years since Federation has seen the development of significant environmental problems and challenges for the nation. Major environmental issues facing Australia today include: land degradation and clearing (mainly for agricultural purposes); declining water quality and health of the major river systems; increasing pollution and waste from urban and industrial centres; the invasion and spread of exotic plants and animals; greenhouse gas emissions and the related threat of climate change; and the ongoing loss of biodiversity. Other important environmental issues include the pressure on natural ecosystems from overfishing, and the extraction of timber from native forests and woodlands. These pressures have arisen from the use of the environment for economic and social benefit. The socioeconomic dimensions of ecological problems are important because these pressures drive the scale and nature of our impacts on the environment in Australia. A related but less obvious consideration is the attitudes and values of people in Australia. Although difficult to measure, values and attitudes affect environmental outcomes through expression at the ballot box, household behaviour, and patterns of consumption.

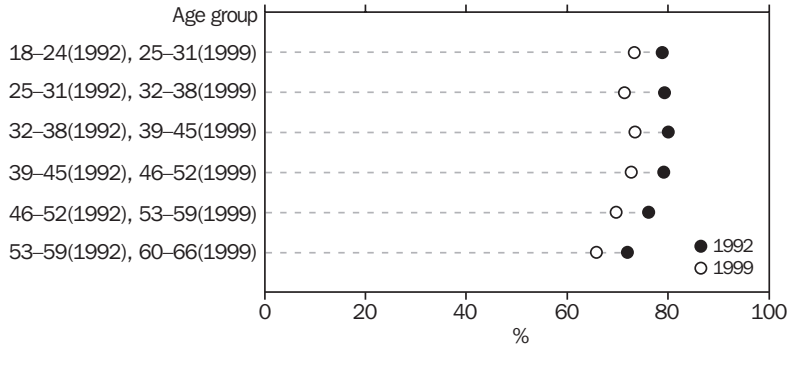
Australia's growing economy has brought prosperity to many Australians. However, environmental degradation arising from our economic activities has consequences for the social, economic and environmental options of present and future generations. It is not possible to cover comprehensively the complex interactions between socioeconomic forces and environmental outcomes here. What follows is a selection of information on: the environmental attitudes and behaviours of Australian households; waste generation and disposal; the importance of biodiversity; management of Australia's inland waters; management of the coastal and marine environment; management of forest and land resources; and local government spending on protecting the environment.

Environmental attitudes and behaviour in Australian households

Concern for environmental problems

The attitudes of people influence political decision-making on environmental issues; the ABS has conducted two household surveys to gather a range of information on the views and attitudes of adult Australians on environmental issues. In 1992 a sample of Australians aged 18 and over was asked if they were concerned about environmental problems; about 75% responded that they were. In 1999 the proportion of people answering 'yes' to the same question fell to 68%. The ABS also collected data on environmental concerns by age group in 1992 and 1999. By relating the two sets of data it is possible to compare the environmental views of adult Australians as they have aged; the 18 to 24 year olds of 1992, for example, are the same group (or cohort) being sampled as 25 to 31 year olds in 1999, seven years later.

14.1 PERSONS CONCERNED ABOUT ENVIRONMENTAL PROBLEMS, Comparison of Cohorts—1992 and 1999



Source: Environmental Issues: People's Views and Practices (4602.0).

Graph 14.1 shows that, for every age group, the passage of seven years saw a decline in the proportion of people concerned about environmental problems. This change in attitude is at odds with evidence which suggests that, during the 1990s, many of Australia's environmental problems worsened (SOE 1996); an example of ongoing environmental degradation was widespread and intensive clearing of native woody vegetation (Barson et al. 2000).

Reduced levels of concern for environmental problems may be partly explained by people's view on the quality of Australia's environment in the last ten years. In 1999 some 52% of adult Australians indicated a belief that the environment had improved or stayed much the same in the last ten years, compared with 49% in 1996.

Visiting World Heritage Areas, National Parks and State Parks

The numbers of adult Australians visiting World Heritage Areas, National Parks and State Parks were assessed in 1992 and 1998. The visitation rates in 1992 and 1998 are presented in graph 14.2.

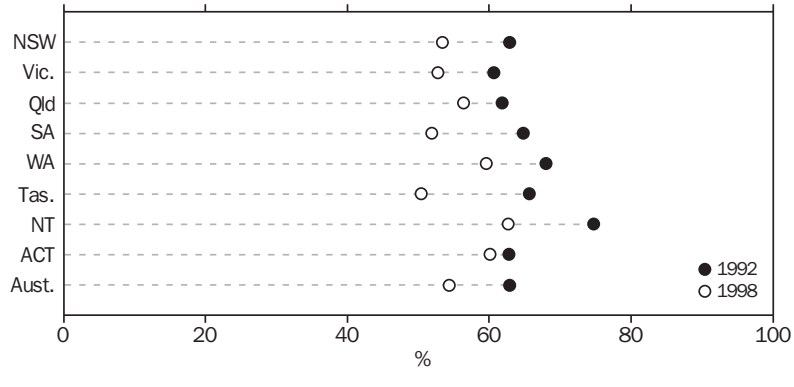
The proportion of Australians visiting World Heritage Areas and National and State Parks declined in 1998 compared to 1992. This fall occurred in every Australian State and Territory, Tasmania showing the largest fall and the Australian Capital Territory the smallest. Nationally, the proportion of people who had visited these places dropped from 62.9% in 1992 to 54.4 % in 1998. In 1992 and 1998 people were also asked to nominate the reason they had not visited a World Heritage Area, National or State Park in the last twelve months. In both years people nominated lack of time as an important constraint, although it was more of a constraint in 1998 (37% of respondents in 1998 compared to 25% in 1992). In addition, more people indicated that age and health, and lack of interest, were factors in 1998 than in 1992.

Household water—use, sources, quality and conservation

Household water consumption represented just over 8% of all water consumption in Australia in 1996–97. About half of all the water consumed in Australia is mains water (11,525.5 gigalitres (GL) in 1996–97), household use representing 15.6% (1,796.1 GL). This compared to household use of 1,676.7 GL (17.7%) of Australia's mains water in 1993–94. (A gigalitre, one billion litres, is roughly equivalent to one thousand Olympic swimming pools of water.)

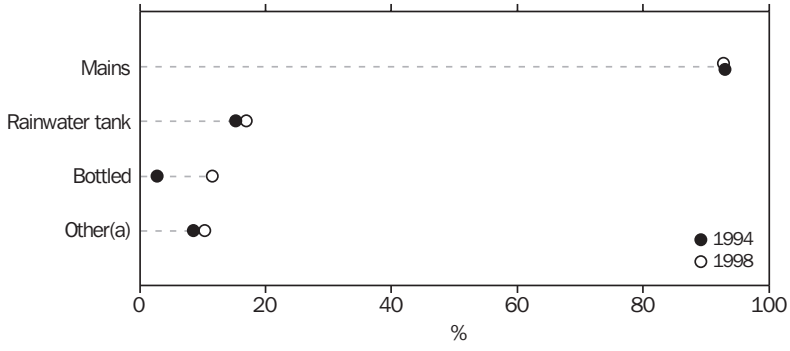
Graph 14.3, comparing the sources of household water in 1994 and 1998, shows that little has changed at the national level, with the exception of an increase in bottled water use.

14.2 VISITED A WORLD HERITAGE AREA OR PARK—1992 and 1998



Source: Environmental Issues: People's Views and Practices (4602.0).

14.3 HOUSEHOLD SOURCES OF WATER, Australia—1994 and 1998



(a) 'Other' includes water from springs, bores, wells, rivers, creeks and dams.

Source: Environmental Issues: People's Views and Practices (4602.0).

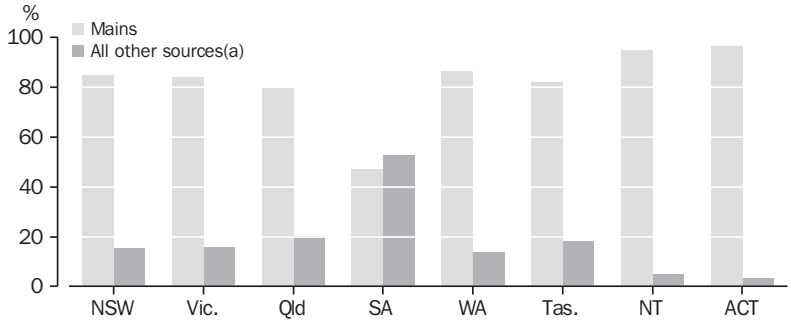
14.4 SATISFACTION WITH QUALITY OF MAINS (TAP) WATER FOR DRINKING—1994 and 1998

Source: Environmental Issues: People's Views and Practices (4602.0).

Nearly two-thirds (65%) of Australian households were satisfied with their mains tap water for drinking in 1998. There were differences in household satisfaction levels across States and Territories, however, with consumers in South Australia expressing the lowest levels of satisfaction (graph 14.4). The lower levels of satisfaction in South Australia with tap water quality are reflected in the lower proportion of households in that State actually drinking the mains water (graph 14.5). In 1998, 53% of households surveyed in South Australia primarily used alternative sources of water for drinking purposes, compared to the national figure of 19%. Factors contributing to water quality problems in South Australia include salinisation, nutrient enrichment, sediments, heavy metals, organic substances and water diversions, resulting from land-use practices within and outside the State's boundaries (SA SOE Report 1998).

Generally there have been only small changes between 1994 and 1998 in the proportions of households expressing satisfaction with their mains water for drinking purposes. Northern Territory households showed the largest fall (4.1%) in the percentage satisfied, followed by South Australian households (2.5%). New South Wales households registered the largest increase (4.2%) in satisfaction with water quality. However, the New South Wales data were collected by the ABS in March 1998, prior to the high profile contamination of Sydney's water supply by *Giardia* and *Cryptosporidium*, which occurred in July, August and September of 1998 (Sydney Water Corporation 1998).

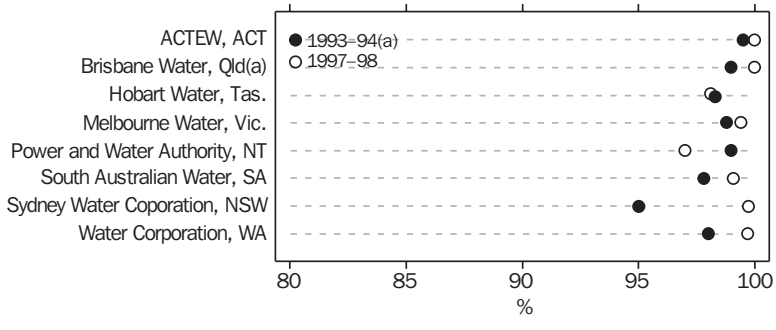
14.5 HOUSEHOLD DRINKING SOURCE, Primary Source—1998



(a) 'All other sources' includes rainwater from tanks, bottled water, and water from springs, bores, wells, creeks and dams.

Source: Environmental Issues: People's Views and Practices (4602.0).

14.6 COMPLIANCE WITH BACTERIOLOGICAL QUALITY STANDARDS, Selected Water Suppliers—1993–94 and 1997–98



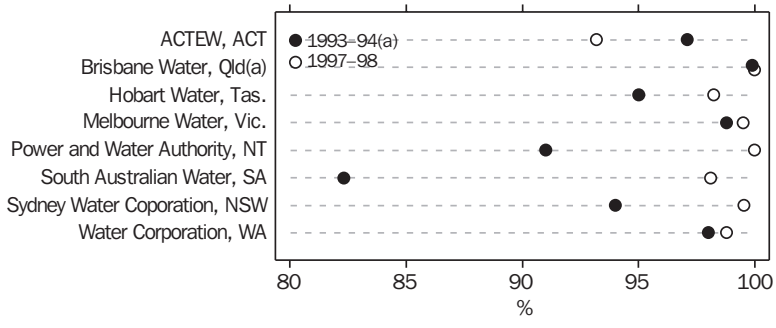
(a) Data for Brisbane Water are from 1994–95.

Source: Water Services Association of Australia 1998.

Another way of looking at the issue of mains water quality in Australia is to consider levels of compliance to bacterial and physico-chemical quality standards, as reported by water suppliers from different States and Territories (WSAA 1998 and 1996). Bacteriological standards are concerned with the concentration of potentially harmful bacteria (e.g. faecal coliforms) found in the water and provide an indication of the risk posed to human health. Physico-chemical properties of water are more concerned with its quality as measured by properties such as turbidity, colour and pH.

Water suppliers in Australia operate under different environmental conditions and regulatory frameworks, and these differences affect cross-business comparisons of performance. Given these differences, compliance with water standards for individual suppliers is best compared through time, rather than assessing suppliers against each other (WSAA 1998). Graphs 14.6 and 14.7 compare the percentage compliance with bacteriological and physico-chemical water quality standards by selected water suppliers in 1993–94 and 1997–98.

14.7 COMPLIANCE WITH PHYSICO-CHEMICAL QUALITY STANDARDS, Selected Water Suppliers—1993–94 and 1997–98



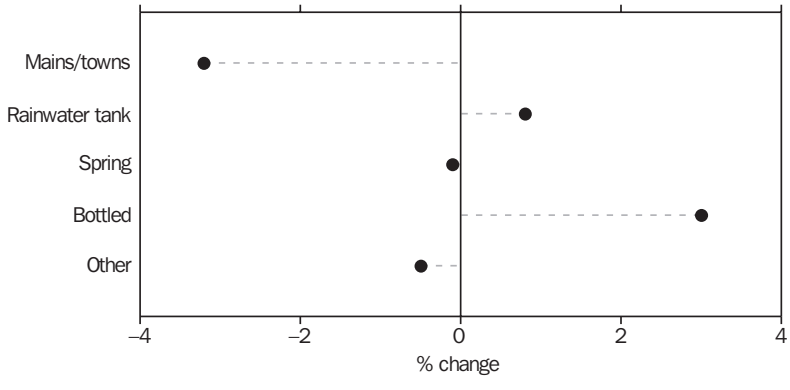
(a) Data for Brisbane Water are from 1994–95.

Source: Water Services Association of Australia 1998.

Graphs 14.6 and 14.7 indicate that the quality of water delivered to homes by these water suppliers has been maintained or improved, and is generally of a high standard. In the Australian Capital Territory a modest decline in compliance levels with physico-chemical standards was reported by ACTEW between 1993–94 and 1997–98 (graph 14.7). The Northern Territory showed a slight decrease (2%) in bacteriological compliance levels, between 1993–94 and 1997–98 (graph 14.6), while registering a 9% improvement in compliance levels with physico-chemical standards (graph 14.7). Compliance with physico-chemical water quality standards in South Australia has improved by about 15% (graph 14.7), with the relatively low compliance levels achieved in 1993–94 indicative of water quality problems discussed earlier. The water quality compliance levels presented here reflect only two dimensions of service performance by these suppliers in urban areas. A more complete picture of urban water services is presented in the annual publication *The Australian Urban Water Industry* (WSAA 1999).

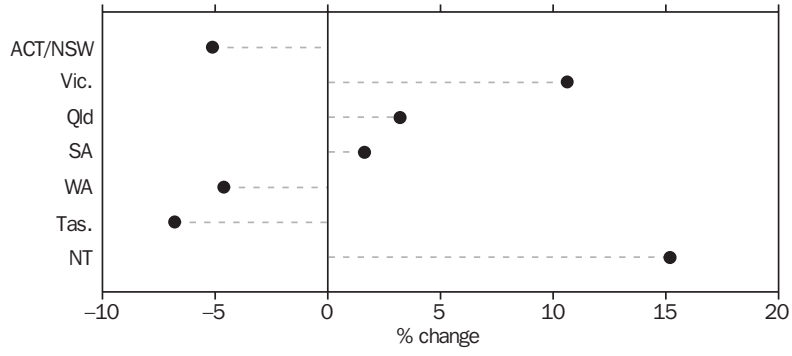
Despite the generally high standards for water quality delivered by the above water suppliers, fewer Australian households were drinking their mains water as their primary source of drinking water in 1998 compared to 1994 (graph 14.8). This change coincides with an increase in the number of Australian households consuming bottled water as their primary source of drinking water in 1998.

14.8 CHANGES IN SOURCES OF DRINKING WATER—1994 to 1998



Source: Environmental Issues: People's Views and Practices (4602.0).

14.9 CHANGE IN HOUSEHOLD WATER USE, Kilolitres per Year—1993–94 to 1996–97



Source: Water Account for Australia, 1993–94 to 1996–97 (4610.0).

Comparing data on household consumption of water by State and Territory for 1993–94 and 1996–97 shows that households in the Australian Capital Territory, New South Wales, Western Australia and Tasmania used less water per household in 1996–97 than in 1993–94 (graph 14.9). States and Territories increasing their water use in 1996–97 compared to 1993–94 were Victoria, Queensland, South Australia and the Northern Territory.

Nationally, household water use remained fairly stable in Australia between 1993–94 and 1996–97 (at 282 kL/year and 294 kL/year, respectively). However, based on survey data collected by the ABS in March 1998, there is still considerable scope for conserving use of water in the home; over half of households (52.7%) indicated that they did not take any steps to conserve water. Examples of methods available to reduce household consumption of water include reduced flow shower heads, shorter showers, dual flush toilets, ensuring full loads when washing, and reusing water.

Waste generation and disposals

The generation and disposal of waste is an environmental issue of increasing importance. Some wastes can impact directly on human health if not dealt with appropriately, while all waste needs to be managed carefully to minimise environmental and aesthetic impacts. Minimising wastes through more efficient production and increasing reuse and recycling of materials has been an objective at all levels of Australian government. There has been some success towards achieving this. This section outlines a selection of the issues and achievements in the area of waste management.

Solid waste disposal and recycling

In the mid 1990s Australia was the second largest producer of solid waste per capita among OECD countries. In 1992 the National Waste Minimisation Strategy was implemented, designed to combat the amount of waste going to landfill. This strategy highlighted the need for a national coordinated approach to waste management and set an overall quantitative objective of halving the amount of waste going to landfill by the year 2000, based on 1990 per capita figures.

Solid waste is generally classified by municipal, commercial, industrial, building, demolition and hazardous wastes. In Australia the majority of waste is disposed of at landfill sites. In 1996–97, 21.2 million tonnes of solid waste were received and disposed of at landfills (table 14.10). An audit in 1997 by the Beverage Industry Environment Council (BIEC) found that the average Australian household generated 15.7kg of waste for collection each week: 11.9kg of garbage, 3.1kg of recyclables, 0.2kg of contaminants (materials in the recycling stream not included as part of a council's recycling service) and 0.5kg of green waste. Around 44% of the waste stream consisted of organic material.

14.10 SOLID WASTE RECEIVED AND DISPOSED OF AT LANDFILL—1996–97

State/Territory	'000 tonnes
NSW	7 170.7
Vic.	5 020.1
Qld	4 428.8
SA	1 334.3
WA	2 429.1
Tas.	n.p.
NT	n.p.
ACT	236.0
Aust.	**21 220.5**

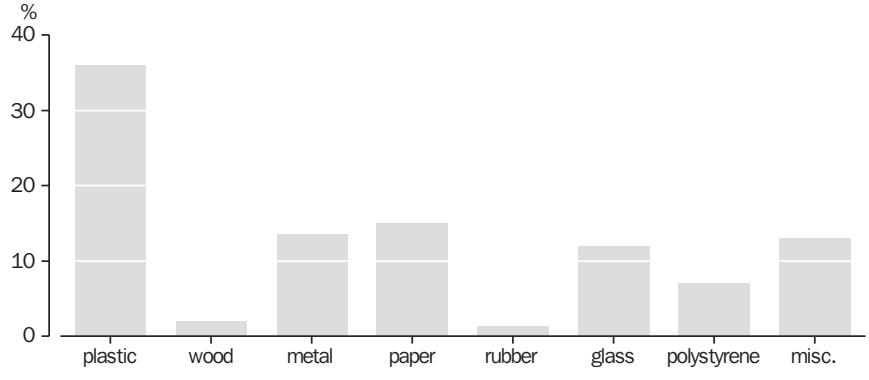
Source: Waste Management Industry, Australia, 1996–97 (8698.0).

To help combat the amount of waste ending up in Australia's waterways, parklands, roads and coastal environments, the National Clean Up Australia Day campaign was founded in 1989. The campaign is the largest community participation event in the country, attracting more than 500,000 volunteers a year and collecting around 5,000 tonnes of rubbish in 2000. Plastics continue to be one of the most common waste items collected, making up 36% of total rubbish collected in the program in 1999 (graph 14.11). The durability of plastics in the environment contributes to the blocking of our waterways and is a potential hazard for marine and terrestrial wildlife through ingestion and strangulation.

Recycling

In 1996–97, 1.5 million tonnes of recylables were owned and sold by waste management businesses and organisations. Paper and cardboard, concrete, glass and green waste were the greatest contributers to recyclable products (table 14.12). The Australian Capital Territory had the greatest diversion rate of recyclables (33.1%) from the municipal waste stream, compared to a national level of 19.8% (BIEC Audit 1997).

14.11 MAJOR SOURCES OF RUBBISH, Clean Up Australia Day 1999



Source: Clean Up Australia 1999 Annual Report.

14.12 RECYCLABLES, Total Recycling Tonnage(a) by Type—1996–97

Type of recyclable	Tonnes '000	Contribution to total %
Paper and cardboard	422.3	27.6
Glass	231.0	15.1
Mulch and compost	170.2	11.1
Oils	142.4	9.3
Concrete	352.9	23.1
Plastic	25.2	1.6
Aluminium	7.2	0.5
Ferrous metals	88.3	5.8
Other metals	23.4	1.5
Other recyclables	65.2	4.3
Total	**1 528.0**	**100.0**

(a) Recycling tonnage refers to the quantity of recyclables owned and sold by each particular business or organisation.

Source: Waste Management Industry, Australia, 1996–97 (8698.0).

The focus on reduction in waste is not restricted to minimisation of non-recyclable materials; it also aims at reducing the amount of packaging and material required to be recycled. Not all products that are recyclable are reaching recycling bins or stations. In 1997 the BIEC Audit found the diversion rate for recyclable materials from landfill to be around 20%, with another 23% available for recycling remaining in the waste stream. The audit concluded, however, that if this recyclable material were to be diverted to the recycling stream, current market infrastructure could not deal with the level of recovery, and new market sources would be required.

Attitudes to less packaging

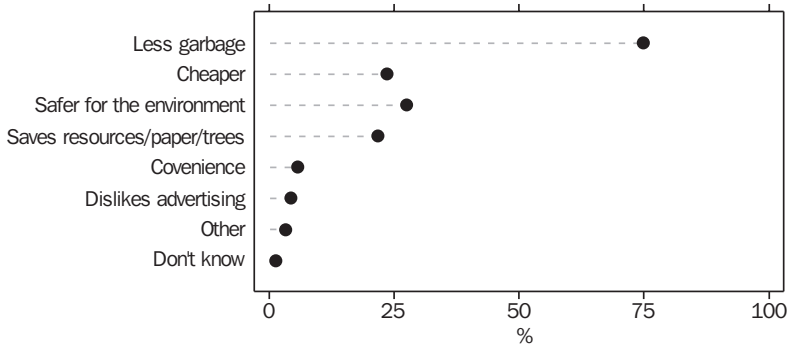
In 1992 Australians 18 years and over were surveyed about their attitudes to packaging, around 85% indicating that they were prepared to accept less packaging in the products they purchase. Six years later, this had risen slightly to 87%. These results show broad and consistent community acceptance of a reduction in the amount of packaging. In 1998 people were also asked to select a reason for their willingness to accept less packaging. The responses (graph 14.13) suggest that a large proportion of adult Australians appreciate and are concerned about the links between their purchasing habits and the accumulation of garbage.

One method of reducing waste disposal is through vermiculture (or worm farming, as it is commonly known). A commercially viable system, established in Australia in 1997, uses a method of processing human sewage (biosolids) and animal manure, mostly from pigs, into worm castings, using the end product as a soil conditioner. In 2000 three worm farms, located in Queensland and NSW, were processing around 650 tonnes of waste per week, or around 35,000 tonnes per year. Current uses of the end product include viticulture, horticulture and orchards, race courses, golfing greens and site rehabilitation. Further expansion of the system to include other organic wastes such as food and green waste are being trialed. This system actively contributes to Australia's National Waste Minimisation Strategy through reducing waste disposal and promoting reuse with a valuable end product.

Water waste

Not only solid waste disposal impacts on our environment; the discharge of liquid wastes affects our inland and coastal waterways and associated habitats. The *National Pollutant Inventory (NPI)* has been set up by the Environment Protection Council to report the amount of discharges occurring in our air, land and water systems. Limited industry participation has occurred for its inaugural year, with greater participation rates by industries expected for the 1999–2000 inventory. As an indication of the amount of nitrogen and phosphorus entering our waterways, 36 million tonnes of nitrogen and 10 million tonnes of phosphorus were discharged from some 163 plants during 1998–99. Nitrogen and phosphorus are two key elements increasing the potential for eutrophication of water systems, adding to algal bloom occurrance and disrupting the natural balance of Australia's wetland ecosystems.

14.13 PROPORTION OF PERSONS WILLING TO ACCEPT LESS PACKAGING, By Reason—1998



Source: Environmental Issues: People's Views and Practices (4602.0).

Effluent (waste water) reuse is one method of reducing the amount of waste water entering the environment. Table 14.14 shows the amount of effluent reuse in Australia. Effluent reuse is dominated by three sectors: Livestock, pasture, grains and other agriculture; Cultural, recreational and personal services (other); and Mining. Reuse in agriculture contributed around 32% of total effluent reuse, mainly on irrigated pastures. Around 24% of treated effluent was reused on parks, sports grounds and gardens. The mining sector increased reuse from 24% of total in 1993–94 to 31% in 1996–97, due either to better reporting of water reuse or to improvement in water efficiency measures. Values of effluent reuse in table 14.14 are estimates only, with numbers possibly higher than reported. Although total effluent reuse increased by 43% between 1993–94 and 1996–97, effluent reuse still only represents less than 1% of water use in Australia, the majority of water usage occurring from mains and self extracted water supplies.

Air pollution

Air pollution has been the environmental problem of greatest concern to Australians for nearly a decade. The ABS surveys into people's attitudes and practices regarding the environment found that in 1998 air pollution was more likely to be of concern to people living in metropolitan areas (34% of people concerned) than to people in other areas (20%) (table 14.15). People in metropolitan areas are more likely to be affected by pollution from industry and motor vehicles than people from other areas. There has been a decrease in concern about air pollution between 1992 and 1998, possibly due to improvements in air quality resulting from new emission control laws; or part of an overall downward trend in concern for environmental issues (graph 14.1).

The potential harm caused by different substances released into the air varies. Some substances are very harmful (toxic) and can cause problems even in small quantities. Standards have been developed in an effort to eliminate or reduce health problems caused by particular substances. These standards generally specify the upper concentration (in parts per million (ppm)) and the longest time period for which exposure to certain substances is safe. The Air Quality Standards for Australia are available in the document *Ambient Air Quality: Final Impact Statement for the Ambient Air Quality National Environment Protection Measure*, available from the Internet site of the National Environment Council (*http://www.nepc.gov.au*).

14.14 EFFLUENT REUSE, Australia—1993–94 to 1996–97(a)

	1993–94	1994–95	1995–96	1996–97
Sector	ML	ML	ML	ML
Agriculture	29 066	36 100	38 021	38 118
Forestry and fishing(b)	3 186	3 150	3 187	3 068
Mining	22 674	22 888	26 289	41 811
Manufacturing	4 864	5 382	5 239	4 769
Electricity and gas	4 242	5 108	6 766	6 912
Water supply(c)	2 158	1 891	1 929	4 339
Other	27 714	26 772	27 811	35 407
Total(d)	**93 904**	**101 291**	**109 242**	**134 424**

(a) Totals are based on estimates and assumptions described in the Water Account (see source below) and exact figures should be treated with caution. (b) Includes services to agriculture, hunting and trapping. (c) Includes sewerage and drainage services. (d) Where figures have been rounded, discrepancies may occur within totals.

Source: Water Account for Australia, 1993–94 to 1996–97 (4610.0).

14.15 ENVIRONMENTAL CONCERNS ABOUT THE ATMOSPHERE, By Area—1999

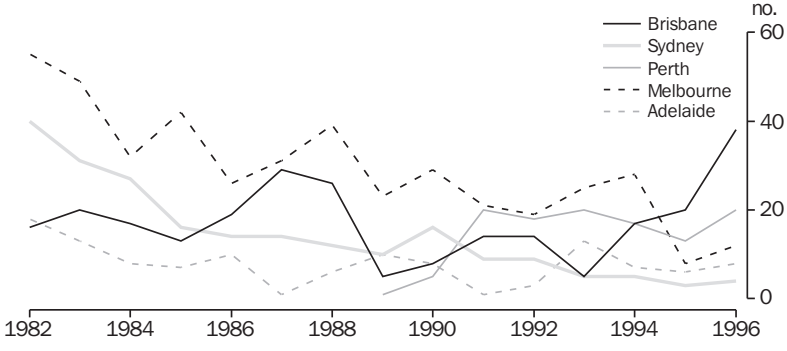
	Metropolitan areas	Non-metropolitan areas	Australia
Area of concern	%	%	%
Air pollution	33.9	20.0	29.1
Ozone layer	13.4	10.1	12.3
Greenhouse effect	9.6	7.2	8.7

Source: Environmental Issues: People's Views and Practices (4602.0).

Climate plays an important part in the amount of pollution experienced in Australia's cities (Katestone Scientific 1997). Particular weather patterns are more likely to produce high levels of air pollution than others. These days are known as pollution conducive days, and there are 20–40 such days per year in Australia's capital cities. While the exact nature of pollution conducive days varies from city to city, they typically occur in summer and spring in all of Australia's coastal capital cities, except for Brisbane which can expect them in late winter as well. Off-shore winds and high inland temperatures are a feature of most pollution conducive days.

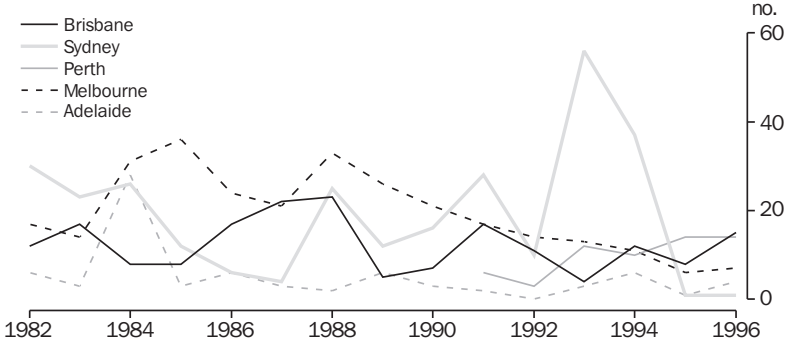
Where air quality in the capital cities has been measured, there has been no significant change for a decade or so (AATSE 1997). The trends in the amount of ozone and smog in the air in five cities are presented in graphs 14.16 and 14.17. Smog is one of the most serious air pollutants in terms of its impact on human health, while ozone is involved in the formation of smog in the atmosphere. While pollution levels have remained more or less constant, the number of cars and level of industrial activity have grown. This is an indication that emission control technologies and strategies have countered the rises which could be expected given the increases in pollution sources (AATSE 1997).

14.16 DAYS PER YEAR WITH MAXIMUM HOURLY OZONE GREATER THAN 6 PARTICLES PER HUNDRED MILLION, Selected Capital Cities



Source: Anthropogenic Influences in Australian Urban Air-sheds (Katestone Scientific 1997).

14.17 DAYS PER YEAR WITH MAXIMUM HOURLY SMOG GREATER THAN 10 PARTICLES PER HUNDRED MILLION, Selected Capital Cities



Source: Anthropogenic Influences in Australian Urban Air-sheds (Katestone Scientific 1997).

Estimating the amounts of different pollutants released into the environment has been a task of the *National Pollutant Inventory* referred to in the previous section. Data from the first reporting period, 1 July 1998 and 30 June 1999, are available on the Internet (at *http://www.environment.gov.au/npi*). Information is available on nearly 70 substances emitted by 7,385 operations across Australia. Air emissions in the 1998–99 reporting period totalled 11.5 million tonnes, which represented 95% of all emissions into the environment. While the NPI is not a complete picture of pollution in Australia, it provides an indication of the scale of emissions and a base for future assessments.

Biodiversity

Loss of biodiversity is seen by some as Australia's most serious environmental problem (State of the Environment Advisory Council 1996). Biodiversity (or biological diversity) is the variety of life forms on earth—the different plants, animals and microorganisms, the genes they contain, and the ecosystems of which they form a part. It is not static but constantly changing—increased by genetic change and evolution and reduced by processes such as habitat degradation and extinction. Biodiversity is usually considered at three levels:

- species diversity is the variety of species on earth (plants, animals, bacteria etc.);
- ecosystem diversity is the variety of habitats, biotic communities and ecological processes; and
- genetic diversity is the variety of genetic information within and between populations of species. It is the basis of continuing evolution, and of the adaptability and survival of species.

Australia is one of 12 'mega diverse' countries, with ecosystems of exceptional variety and uniqueness. It is estimated that Australia has more than one million species including microorganisms. A high proportion of these species are endemic, occurring only in Australia. For example, Australia has more endemic flowering plants than any other country, and over 80% of mammals occur nowhere else in the world. The Australian sea has one of the richest marine faunas in the world, due to areas such as the Great Barrier Reef. Freshwater fish species are relatively few, but include many endemic species. Less than 15% of Australia's species have been formally described (State of the Environment Advisory Council 1996). Groups such as anthropods, protozoans, bacteria and fungi are poorly known compared to flowering plants, birds and mammals. Table 14.18 summarises the number of endemic species in Australia.

14.18 NUMBER OF ENDEMIC SPECIES, Australia

Species	Total species no.	Species endemic to Australia no.	Species extinct(a) no.	Species threatened(b) no.
Animals				
Mammals (terrestrial)	268	225	19	43
Birds	777	350	20	50
Frogs	203	189	3	29
Reptiles	770	685	0	51
Freshwater fish	195	176	0	17
Marine fish	4 000	1 000	0	0
Invertebrates(c)	328 900	n.a.	3	(non-marine) 118
Plants				
Vascular plants	20 000	17 000	76	1 009
Algae	22 000	n.a.	at least 1	1
Microorganisms				
Microorganisms excluding fungi	105 000	n.a.	n.a.	n.a.
Fungi (excluding lichens)	250 000	n.a.	n.a.	n.a.
Lichens	2 500	950	2	168
Mosses	~900	n.a.	3	8
Liverworts	~500	n.a.	9	6
Total Species				
Total	~736 000	~20 600	136	1 500

(a) Species which have not been seen in the wild for 50 years. (b) Species classed as endangered or vulnerable. (c) Includes anthropods such as beetles, butterflies and spiders, molluscs such as snails, and sponges and nemotodes.

Source: State of the Environment Report (1996); NSW Biodiversity Strategy (1999).

Among OECD countries, Australia has a lower percentage of threatened bird species than all countries except Norway, and the lowest percentage of threatened fish. However, Australia has a higher percentage of threatened mammals than USA, Japan, Finland, Ireland and Norway (OECD 1999) and a high number of extinct and threatened plants (for further information refer to the IUCN Red List of Threatened Species at *http://www.wcmc.org.uk*).

Functioning of ecosystems is threatened by species extinction. Although it is difficult to specify when an ecosystem is extinct, many of Australia's ecosystems have changed significantly since 1788. For example, nearly 90% of temperate woodlands and mallee have been cleared. Within species, loss of genetic diversity through the reduction of numbers makes the species less adaptable and more vulnerable to factors such as climate change and disease.

Biodiversity provides the foundation for the continued existence of a healthy planet, including our own wellbeing. Ecosystems are critical for processes such as soil formation, nutrient storage and cycling, plant pollination, and pollution breakdown and absorption. They also contribute to climate stability at macro levels (e.g. undisturbed forests help to maintain local rainfall) and micro levels (vegetation may create specific micro-climates on which some organisms depend).

Biodiversity is essential to humans for food, clothing, medicine and raw materials for a wide range of products. The agricultural industry relies on biodiversity for healthy soils, clean water and mechanisms to combat weeds and pests. Genetic reservoirs maintained by biodiversity provide scope for improving food crops to be disease-resistant and tailored to new climatic conditions. As indicated in *Chapter 15, Agriculture*, 1998–99 gross value of Australian agricultural production was $29b, representing a contribution of 3% to GDP.

Biodiversity has social values, including aesthetic, scientific, recreational and cultural values. Aesthetic values of natural ecosystems and landscapes contribute to the wellbeing of Australia's highly urbanised population. Over 70% of international visitors to Australia have identified the main reasons for their visit as the unique flora and fauna and the open landscape. Australian society places great cultural value on the 'bush' and certain species, such as the kangaroo and emu, have become national icons. Aboriginal relationships to the land, sea, animals and plants are complex and have deep spiritual significance.

Many factors threaten biodiversity (table 14.19) and species are often affected by more than one threat. Our knowledge of ecosystems and their complex relationships is limited, and therefore the results of disturbance are to some extent unpredictable. However, we do know that the underlying causes of loss of biodiversity are the resource intensive nature of modern Australia and the steady increase in human population.

The governments of Australia use a number of approaches to conserve biodiversity. For example, in July 2000 the Commonwealth Government's *Environment Protection and Biodiversity Conservation Act 1999* came into effect, replacing five Acts, namely the *Endangered Species Protection Act 1992*; the *Environment Protection (Impact of Proposals) Act 1974*; the *National Parks and Wildlife Conservation Act 1975*; the *Whale Protection Act 1980*; and the *World Heritage Properties Conservation Act 1983*.

The Environment Protection and Biodiversity Conservation Act triggers Commonwealth involvement on issues of national environmental significance including World Heritage Areas, wetlands of international significance, endangered species and ecological communities, migratory species and Commonwealth marine areas. Actions that are likely to have a significant impact on matters of national environmental significance are subject to a rigorous assessment and approval process.

An important element protecting biodiversity is the National Reserves System, which currently represents between 6% and 7% of Australia's land area. There are many gaps in this system, including ecosystems in arid and semi-arid environments, native grassland, wetland and marine (Australian and New Zealand Environment and Conservation Council 1996). The Interim Biogeographic Regionalisation of Australia (IBRA) was developed in 1994 to identify gaps and to assist in allocating priorities for funding to projects for biodiversity conservation. It divides Australia into 80 biogeographic regions representing major environmental units, and is the only continent-wide regionalisation agreed to by all States and Territories. Of the 80 regions, 37 have less than 5% of their area in conservation reserves and four have no area in reserves. Much biodiversity occurs only outside formal conservation areas. The involvement of farmers, businesses, conservation groups, resource users, Indigenous peoples and the wider community is necessary for the conservation of biodiversity.

14.19 FACTORS THREATENING BIODIVERSITY IN AUSTRALIA

Threat	Description
Habitat loss and fragmentation	Cropping, forestry, mining, grazing, and human settlements have dramatically changed vegetation cover (State of the Environment Advisory Council 1996). 60% of birds and 80% of mammals listed as threatened have declined as a result of habitat loss.
Introduced pests and weeds	Introduced species in Australia include 25 mammals, 37 birds, 8 marine fish, 21 freshwater fish and 3,000 weeds. They threaten ecosystems by altering resource levels, community composition, disturbance regimes and the physical environment (Mackey et al. 1998). See the section *Marine pollution* for exotic marine species.
Altered fire regimes	Before European settlement, fire was used by Aborigines for many reasons including regeneration of food plants. Fires varied in location, season and frequency. Current fire regimes have contributed to the dramatic loss of small to medium sized mammal species from semi-arid/arid environments of Australia's arid interior.
Altered hydrological regimes	Large water storage facilities and small farm dams reduce annual streamflow, having a marked effect on aquatic ecosystems. Physical barriers such as weirs prevent fish from migrating, while alteration of natural river channels removes important aquatic habitats. See the section *Effects of water resource development on Australia's freshwater environments*.
Roads	Road construction increases sediment load in nearby waterways, affecting aquatic ecosystems and their flora and fauna. Roads provide conduits for the movement of feral predators and can pose barriers to movements of animals. An estimated 5.5 million frogs and reptiles are killed every year on sealed roads in Australia.
Accelerated global warming	Many scientists believe that global atmospheric temperatures are likely to rise between 1.5 and 4.5°C in the next century (Mackey et al. 1998). As this occurs, the preferred climatic conditions for a species will shift to higher altitudes and latitudes. Survival will depend on the ability of a species to relocate and availability of habitats.
Other threats	*Pollutants* such as chemicals, sewage, fertiliser and heavy metals particularly affect freshwater and marine ecosystems. See the section *Marine pollution*. *Salinity* is discussed in the section *Land degradation*. *Ground water* use by humans has altered flora and fauna in arid and semi-arid Australia. *Fishing, trawling and dredging* have significant impacts on marine biodiversity.

Source: Based on Mackey et al. 1998.

Management of Australia's inland waters

Developing a reliable water resource in the early 1900s

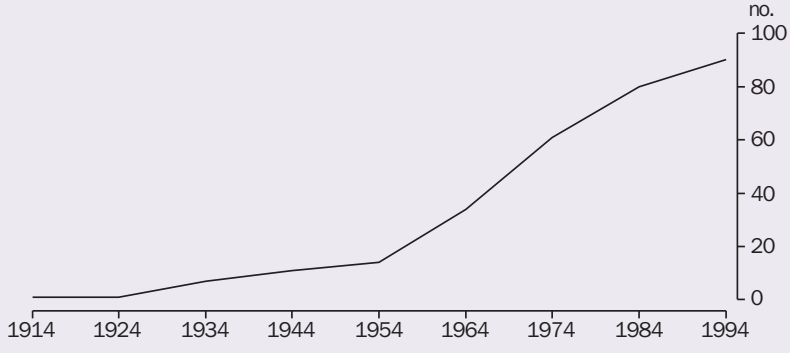
Fifty per cent of Australia receives an annual rainfall of less then 300 mm and is categorised as arid or semi-arid (see *Chapter 1, Geography and climate*). A dominant characteristic of semi-arid environments is variable rainfall patterns, within and between years. Low annual rainfall, coupled with high temperatures, produces high evaporation rates and low annual runoff by world standards (Davies et al. 1994). In the late 1800s dams were constructed to modify the highly variable flow regime of semi-arid river systems. The construction of dams and weirs ensured that Australians had a reliable water resource for both domestic and economic purposes.

The Murray River was the lifeblood of many early settlements and was one of the first major river systems to become regulated. Irrigation of agricultural land with Murray River waters in Victoria commenced in the 1870s. As the demand for water increased, disputes arose between States over the distribution of the variable resource, leading to the commencement of the Murray River water agreement in the early 1900s. This agreement saw the construction of dams on the Upper Murray and at Lake Victoria, as well as 26 weirs and locks from Echuca in Victoria to Blanchetown in South Australia. These developments on the Murray and the nine weirs built on the Darling and Murrumbidgee Rivers as part of the Murray River agreement ensured a reliable water resource in this region (MDBC 1990).

As Australia's population increased, not only in the Murray region but nationwide, so did the number of dams. Graph 14.20 shows the growth in the number of dams greater than 100 Gigalitres from 1910 to 1994. In 1939 there were 10 large dams of over 100 gigalitres, which increased substantially to 90 large dams by 1994 (ANCOLD 1990).

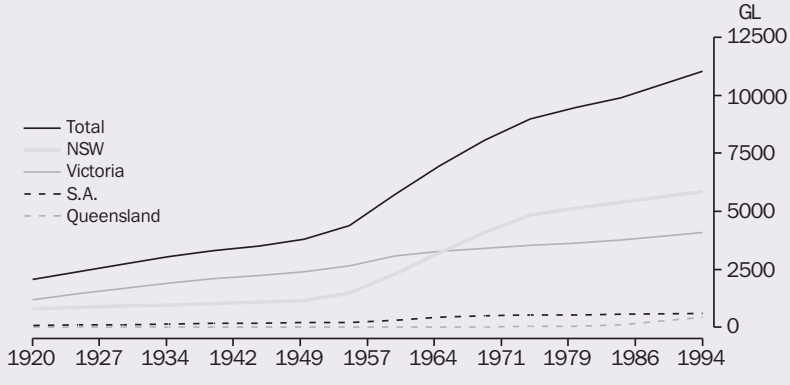
Together with increases in the number of large dams throughout Australia in the last century there were continual and substantial increases in water diversions (MDBC 1995). For example, in the Murray–Darling Basin annual diversions continually increased from 1920 to 1994 (graph 14.21). The basin has grown to support 42% of Australia's farm land, which includes 90% of Australia's irrigated crops (MDBC 2000).

14.20 NUMBER OF DAMS WITH CAPACITY GREATER THAN 100 GIGALITRES, Australia—1914–1994



Source: Australian National Committee on Large Dams 1990 and 1996.

14.21 GROWTH IN DIVERSIONS IN THE MURRAY–DARLING BASIN—1920 to 1994



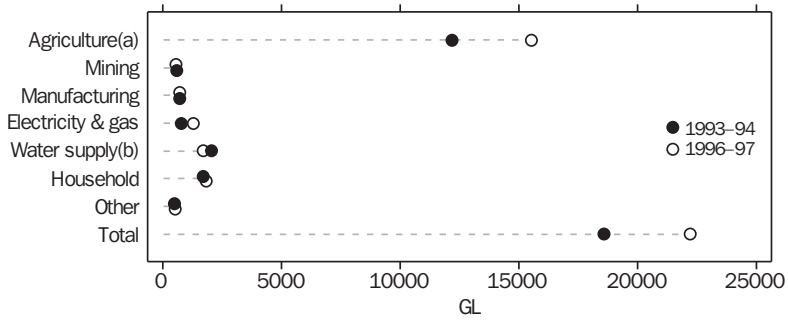
Source: MDBC 1995.

Water consumption in Australia

From the recent Water Account for Australia, there was an overall increase in net water consumption from 18,575 GL in 1993–94 to 22,186 GL in 1996–97 (graph 14.22). Most of the increase in net water consumption occurred in the Agriculture sector, which increased consumption by 3,434 GL to 15,502 GL, or 70% of the total net water consumption of 22,186 GL in 1996–97. Within the Agriculture sector, the largest increase in net water consumption occurred in the pasture industry, which includes livestock, pasture, grains (excluding rice) and other agriculture (graph 14.23). Other notable increases in net water consumption occurred in the rice and cotton industries.

In 1996–97 the agricultural sector was the largest consumer of both self-extracted and mains supplied water, at 7,160 GL and 8,362 GL respectively (graph 14.24). Electricity and gas supply, and water, sewerage and drainage service, used notable amounts of self-extracted water, 1,249 GL and 1,357 GL respectively. Net water consumption in the household sector was just 8% of the total net water consumption in 1996–97. The main source of household water was mains supplied, totalling 1,796 GL. Household water consumption patterns are discussed in the section *Household water—use, sources, quality and conservation*.

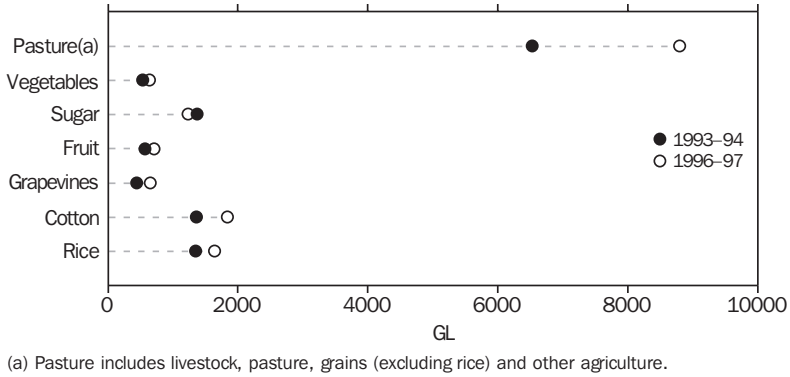
14.22 NET WATER CONSUMPTION, By Sector—1993–94 and 1996–97



(a) Agriculture includes services to agriculture, hunting and trapping; and forestry and fishing.
(b) Includes sewerage drainage services.

Source: Water Account for Australia, 1993–94 to 1996–97 (4610.0).

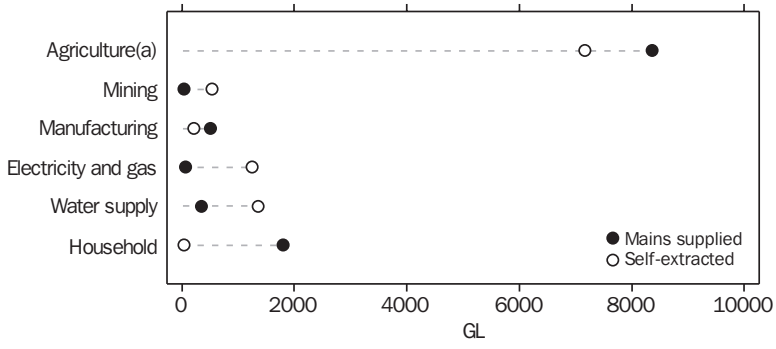
14.23 NET WATER CONSUMPTION, Agriculture Sector—1993–94 and 1996–97



(a) Pasture includes livestock, pasture, grains (excluding rice) and other agriculture.

Source: Water Account for Australia, 1993–94 to 1996–97 (4610.0).

14.24 SOURCE OF NET WATER CONSUMPTION, By Sector—1996–97



(a) Agriculture includes services to agriculture, hunting and trapping and forestry and fishing.

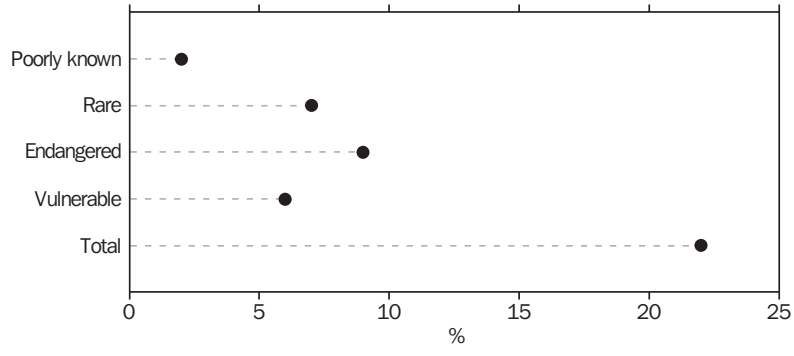
Source: Water Account for Australia, 1993–94 to 1996–97 (4610.0).

Effects of water resource development on Australia's freshwater environments

Water resource development, including both dam operations and water diversions, has influenced the hydrologic and ecological characteristics of a number of river systems across Australia. The once highly variable flow regimes of rivers found in semi-arid environments such as Australia have been substantially reduced and replaced by stable flooding regimes. In some cases, as well as a reduction in the annual flows there has been a distinct contrast in seasonal flooding characteristics. For example, peak flows for the Murray River at Albury under natural conditions (without dams and water diversions) occurred in September and October, with minimum flows occurring in February. In marked contrast to this flow regime it has been found that under current conditions (with dams and water diversions), peak flows now occur in January to March, with minimum flows occurring from June to September (MDBC 1995). Although water resource development has been an integral part of Australia's domestic and economic development, it has dramatically affected the health of many river systems.

There are many varied effects of changing flow regimes brought about by water resource development. Alteration of flow regimes, with both changes in flow patterns and a reduction in flow variability, has distinctly altered river channel, floodplain and wetland characteristics. Changes in inundation patterns of both floodplains and wetlands have altered biological and ecological processes, decreasing overall biodiversity and particularly breeding opportunities for wetland water birds (Kingsford 2000). Changes to in-channel flow have enhanced channel and bank erosion, consequently decreasing channel complexity and hence habitat availability for aquatic species. Clearing of riparian vegetation allows increased sediment into the rivers, which can add nutrients and pollutants that are harmful to aquatic species and to overall water quality and river health. Algal blooms have occurred as a result of increased nutrients (phosphorous and nitrogen) combined with reduced oxygen levels and stagnation, which both occur in reduced flows (MDBC 1995). Extended irrigation and tree clearing practices have also caused a rising water table and exacerbated the naturally saline ground water levels in much of the country. The spread of dryland salinity is mirrored by continually increasing salt loads in freshwater systems across Australia. For example, it is estimated that the salts loads in the Mallee zone of the Murray River (from the South Australian border to Morgan) will increase from 330,000 tonnes per year to 610,000 tonnes per year by 2050 (MDBC 1999). Further information on these issues is provided in *Australia's Environment: Issues and Trends, 2000* (4613.0).

14.25 CONSERVATION STATUS OF AUSTRALIAN FRESHWATER FISH, Proportion of Total Native Fish Species



Source: Native Fish Australia.

Impacts on Australia's freshwater fish

Many scientific studies carried out on native fish populations have highlighted the varied effects of water resource development and European settlement. A number of factors have been attributed to the decline of our native fish populations (Davis et al. 2000). Recreational and to a lesser extent commercial fishing are popular pastimes in Australia. However, these are not the major cause of our native fish decline. The major cause has been the destruction of fish habitats. Water resource development and European settlement have caused extensive damage to fish habitat through decreases of in-channel flows and water quality, reductions in riparian vegetation and in-stream habitats as well as increased sedimentation and overall decreases in in-stream water quality. The construction of dams on many of our inland rivers has brought about extensive barriers to fish movement in inland rivers throughout Australia. Although fishways were installed to help with the movement of native species, many of these were ineffective. Stable water levels, behind weirs and in-stream, disadvantage native fish which have adapted to and relied on the variability in flow found in Australian rivers as migration and spawning cues. While all of these factors have caused a decline in native fish populations, they have advantaged the establishment of populations of exotic fish species.

There are approximately 195 native freshwater fish species in Australian inland waters. A large majority of these species are unique to Australia, with very few found in other countries. Water resource development and the introduction of exotic species have depleted their numbers and endangered many populations. A total of 42 freshwater fish (22% of Australia's freshwater fish species) were listed with varying conservation status by Native Fish Australia. The list was compiled based on the Schedule 1 of the *Federal Endangered Species Act 1992* and the Deakin University Threatened Species List. Graph 14.25 shows the percentages of Australia's freshwater fish which are listed as rare, endangered or vulnerable, and those fish which are poorly or insufficiently known and are unable to be assessed.

Out of 195 species, 7% are classified as rare, 9% as endangered and 6% as vulnerable. Information on a further 2% is poor or insufficient and cannot be assessed. There are 47 listings in total as some species have more than one rating, which varies on a State to national scale. Further information on these issues is provided in *Australia's Environment: Issues and Trends, 2000* (4613.0).

Changes in the management of water resources

The management of water resources has undergone significant changes in recent times as a result of an increasing demand for water and declining ecosystem health. A cap on diversions in the Murray–Darling Basin has played an integral role in implementing the water reform framework established in the mid 1990s by the Council of Australian Governments. The cap on diversions in the Murray–Darling Basin is set at 1993–94 diversion levels and allows for seasonal adjustments. The main objective of the cap was to improve or maintain flow regimes in the basin and to curb environmental degradation while ensuring that commercial and social needs are met (MDBC 2000). The cap has limited increases in diversions in most catchments. However, there are still some catchments in the north of

the basin where diversions are continuing to increase, which could lead to environmental impacts further downstream. A review of the ecological sustainability of the cap suggested that it is an important factor in repairing environmental degradation. However, it will not completely rehabilitate the riverine environment as the level at which the cap is set has contributed to environmental degradation in the past. Researchers believe that to improve our river systems there needs to be further scientific research carried out on the effects of the current level of the cap, and public awareness that a balance has to be struck between economic and ecological sustainability of water resources and careful management of environmental flow allocations (Whittington et al. 2000).

Further information on the cap on diversions may be found on the Murray–Darling Basin Commission's Internet site at *(http://www.mdbc.gov.au)*. Further information on the water reform process may be found on the Internet site of the Commonwealth Department of Agriculture, Fisheries and Forestry–Australia *(http://www.affa.gov.au)*.

Management of Australia's marine and coastal environment

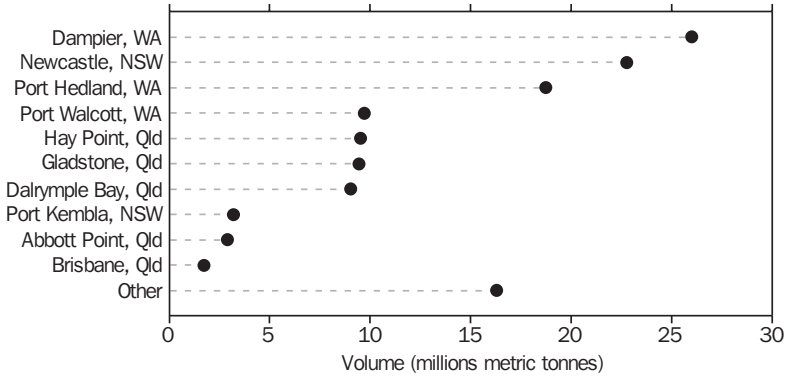
Australia has rights over and responsibilities for 16 million square kilometres of ocean, up to approximately 200 nautical miles from Australia's coastline. As discussed in *Australia's Oceans Policy* (Commonwealth Department of Environment and Heritage 1998), Australia is economically dependent on its estuaries and seas for a number of uses, including shipping and trade, offshore oil, fishing, tourism and the disposal or waste; all of these uses can exert pressures on our coastal and marine environment. With Australia's marine industries estimated to be worth around $29b in the mid 1990s (AMISC 1997), adequate management and protection is vital to the economic and environmental wellbeing of Australia's marine environment.

Shipping and the introduction of exotic marine species

Australia is heavily reliant on shipping as a mode of transport. About 97% of the volume of trade is carried by ships, with 95% carried by foreign flagged vessels (Commonwealth Department of Environment and Heritage 1998). Organisms present in sea water taken up as ballast by vessels in foreign waters have the opportunity to be introduced into Australian waters. From 1998 to 1999, around 129,304,000 metric tonnes of ballast water were discharged at ports around Australia. The ten ports receiving the greatest amount of ballast water are shown in graph 14.26. The Western Australian ports of Dampier and Port Hedland received 35% of all ballast water discharged in Australia. The majority of ballast water received in WA originates from the Asia Pacific region, with Japan the greatest single contributor (WA SoE 1998), reflecting trade links with this region. The transportation of exotic marine flora and fauna from foreign waters is a serious threat to Australia's native plants and to animals in our marine environment, and can greatly impact on our wild fisheries and aquaculture industries.

Over 100 species are known to have been introduced at Australian ports via ballast water discharges, dry ballast, on the hulls of ships or from mariculture transfers (aquaculture). Based on overseas experience, it is expected that the number of introduced species is much higher than this. Table 14.27 outlines some of the species that have been introduced into Australian waters and are currently targeted by the Australian Ballast Water Management Advisory Council (ABWMAC). These species are currently proving the greatest threat to our native marine ecosystem, and eradication is unlikely. The impact on Australia's diverse and unique marine life is apparent from the introduction of the Northern Pacific seastar, *Asterias amurensis*. This introduced organism from Japan is thought to be responsible for the demise of the spotted handfish *Brachionichthys hirsutus*, endemic to South-eastern Australian waters. The sea star is thought to eat the eggs of this critically endangered handfish.

14.26 BALLAST WATER DISCHARGES, Australia—1998–99



Source: Australian Quarantine Inspection Service 2000, unpublished.

14.27 SPECIES TARGET LIST, Australian Ballast Water Management Advisory Council

Species	Common name	Method of introduction	Known distribution
Sabella spallanzanii	Sabellid fan worm	Hull fouling, mariculture transfers, ballast water	WA, SA, Vic., NSW, Tas.(b)
Carcinus maenas	European shore crab, Green crab, N. Atlantic edible shoe crab	Dry Ballast, mariculture transfers, hull fouling	WA(b), SA, Vic., NSW, Tas.
Asterias amurensis	N. Pacific seastar, Japanese seastar	Hull fouling, ballast water	Vic., Tas.
Undaria pinnatifida	Wakame	Hull fouling	Vic., Tas.
Alexandrium catenella	Toxic cyst forming dinoflagellates	Ballast water	Vic., NSW, Tas.
Alexandrium minutum	Toxic cyst forming dinoflagellates	Ballast water	WA, SA, Tas.
Alexandrium tamarense	Toxic cyst forming dinoflagellates	Ballast water	WA, SA, Vic., Tas.
Gymnodinium catenatum	Toxic cyst forming dinoflagellates	Ballast water	WA, SA, Vic., Tas.
Musculista senhousia	Asian mussel, Bag or Senhouse's mussel	Hull fouling, ballast water	WA, SA, Vic., Tas.
Corbula gibba	Corbula	Hull fouling (sea chest), ballast water	Vic., NSW, Tas.
Crassostrea gigas	Pacific (King or rock) oyster	Mariculture transfers (intentional), hull fouling, ballast water	WA(b), Vic., NSW, Tas.
Potamocorbula amurensis(a)	Chinese clam	Ballast water	none
Mnemiopsis leidyi(a)	Comb jelly	Ballast water	none

(a) Not currently in Australian waters. (b) Populations not currently known.

Source: Unpublished data, Hewitt 2000.

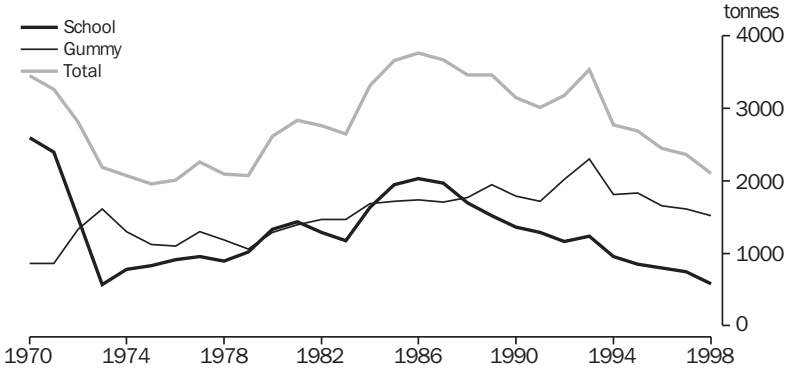
The full impact of introduced marine species cannot be determined due to a lack of information on existing native marine species in Australian waters. Currently, voluntary guidelines are in place, set by the United Nations International Maritime Organisation (IMO) to reduce the movement of organisms via ballast water. The CSIRO and AQIS, in collaboration with shipping companies, are attempting to reduce the introduction of new species by trialling different methods of ballast water treatment. AQIS and CSIRO are also determining the possible impacts of exotic species already present in Australian waters.

Fisheries management and aquaculture

Australia's fisheries, if well managed, are potentially a renewable resource. A number of Australian Commonwealth fisheries are considered fully fished (map 16.5 in *Chapter 16, Forestry and fishing* sets out the status of Australia's Commonwealth managed or jointly managed fisheries resources). In 1999 the Western Australia Rock Lobster Fishery received accreditation from the Marine Stewardship Council in recognition of sustainable management practices in this fishery (MSC 2000).

Other fisheries such as the Southern Bluefin Tuna, Eastern Gemfish (within the South East Fishery) and the School shark (Southern Shark Fishery), are classified as overfished. The Southern Shark Fishery is the latest fishery to have total allowable catch limits (TACs) implemented to aid in the rebuilding of school shark numbers within this fishery. Current production levels are similar to those prevailing in the 1970s, but are requiring two to three times the fishing effort (McLoughlin et al. 1998). The Southern Shark Fishery has had declining stocks since 1986 (graph 14.28), due to the decrease in catch of school shark. The decline is most likely to be related to the biology of the species, which does not reach sexual maturity until 8 to 10 years of age and has a lifespan of over 50 years. Although school sharks are also found elsewhere such as New Zealand, Western Europe, the east coast of South America, the west coast of North America and southern Africa, the sharks found in Australian waters are thought to be from a single genetic stock. Limits on catch from the Southern Shark Fishery are to be phased in over the next 5 years, beginning in 2000. It is estimated that school shark catches need to be reduced by 20% to 30% to stabilise breeding stock to a healthy level in the next 15 years.

14.28 SOUTHERN SHARK FISHERY, Production



Source: Bureau of Rural Sciences 2000.

Aquaculture is an emerging market for supplementation of wild fisheries in response to the global demand for seafood. The increase in aquaculture production and value has more than doubled in the past decade and was worth $602m in 1998–99 (*Chapter 16, Forestry and fishing*). Although the aquaculture industry is an emerging market, supplying around a third of the value of fisheries production in Australia, aquaculture is heavily reliant on fishmeal as a protein feed for farmed species. The high cost of protein feed to aquaculture farms presently accounts for around 60% of grow-out production costs. Presently only 20–30% of protein in aquaculture feed is retained by the fish; the rest is not eaten or is excreted. This adds to increased nutrient loads in coastal waterways. The development of alternative feed is being trialed in Australia to reduce reliance on fish meal and produce a better quality food source with less wastage. Aquaculture can have a positive influence on Australian fisheries by providing restocking potential for wild stocks and a reduction in fishing pressure. Negative environmental impacts, however, include the high demand for coastal foreshores, the increased nutrient loads from farm waste, depletion of wildstock fisheries for fishmeal products and the introduction of diseases and exotic species (Zann 1995). These impacts will need to be addressed to ensure beneficial environmental outcomes.

Marine pollution

Although Australia has a relatively clean image compared to other marine environments around the world, marine pollution is a serious threat to marine biodiversity in Australian waters. Around 80% of contamination in our marine and estuarine environments is thought to originate from land based sources (SoE 1996). These include point sources such as pipes and drains, and diffuse sources from river and urban catchments or from the atmosphere. Hydrocarbons are a key pollutant, originating from shipping, from accidents in offshore petroleum exploration and from stormwater run-off, stormwater being the most damaging and the least adequately monitored. Table 14.29 summarises the main pollutants and their sources.

Pollution impacts on Australia's marine environment in a variety of ways. Excess nutrients released into estuaries and the sea are a major threat to near-shore environments, with tropical coral reefs and seagrasses highly sensitive to nutrient inputs. Metals and pesticides released into the environment can accumulate in marine organisms or be magnified through the food chain. High concentrations of these contaminants in organisms can render them unfit for human consumption, reducing stocks for commercial and recreational fishing. Contaminants can also lead to loss of wetland habitats, which are important for fish nurseries, waterbirds and plants, many endemic to Australia. The loss of visual amenity can decrease economic returns from tourism and recreational pursuits.

Rising sea temperatures

Carbon dioxide, a key player in global warming from greenhouse gas emissions, is considered partly responsible for the increase in global ocean temperatures. Carbon dioxide absorbed into the oceans, coupled with heat reaching ocean water from the thinning of the atmosphere, has the effect of increasing ocean water temperatures. The Southern Ocean is considered an integral part of the carbon cycle, absorbing as much as 20% of carbon released into the atmosphere.

14.29 MARINE POLLUTANTS IN AUSTRALIA'S ENVIRONMENT AND THEIR SOURCES

Pollutants	Sources
Nutrients	Soil erosion, fertiliser run-off, industrial and urban sewage discharge, animal production
Suspended solids	Forest clearing, overgrazing, agriculture (soil erosion)
Organochlorines	Pesticides, herbicides, industrial chemicals
Organophosphates	Pesticides
Metals	
Cu, Pb, Cd, Zn, Hg	Discharge leachates, tailings, smelters, mining operations
Tributyltin (TBT)	Antifouling paints from ships
Pathogens	Stormwater, ballast water
Litter	Storm water, shipping, recreational and commercial fishing boats, 'beach-goers'

Source: Derived from State of the Environment, Environment Australia 1996.

One of the noticable impacts of increasing sea temperatures is the bleaching of the world's coral reefs. Known for their natural beauty, biological diversity and high productivity, these represent a crucial source of income for fisheries, tourism and the emerging market of biotechnology. The bleaching of the world's corals will severely impact on these sources of income. Bleaching occurs when the symbiotic algae are expelled from the coral due to stress induced by rising sea temperatures. Sea temperatures in the tropics have increased by almost one degree celcius in the last 100 years. The last major bleaching episode occurred in 1998, when 87% of inshore reefs of the Great Barrier Reef were affected by bleaching to some extent (Berkelmans and Oliver 1999). With corals currently living at the upper limit of their thermal tolerance, an increase by one to two degrees celcius over the next century will see an increase in bleaching episodes and more deaths of the world's corals.

Whaling

Many of the great whales are now listed as threatened species and are either endangered, vulnerable or conservation dependent. The decimation of whale numbers was initially due to unregulated whaling during the early part of the 20th century. Attempts to regulate the whaling industry started in 1925 and were ineffective until the mid 1960s when a number of whale species were listed as protected. By this stage, species such as the Northern Right whale and the Blue whale were hunted close to extinction. Currently, the serious threats to whales include marine pollution, habitat degradation, bycatch from fisheries and illegal fishing, noise pollution, global climate change, accidents and disturbances from shipping, boating and tour operators.

The inability of certain whale species to recover from declining population numbers is related to their biology. Whales are long lived, with some species living up to 90 years. Large whales may only reproduce every three to four years. Limited data are available on numbers of whales within each species prior to exploitation by commercial whaling. Table 14.30 provides some estimates on whale populations in the Southern hemisphere and current status under the *Environment Protection Conservation and Biodiversity Act 1999*. Most whale species are protected due to the limited numbers that remain.

Australia's Antarctic oceans are home to many migratory whale species that spend the summer months in the Antarctic waters and move further north during the winter to give birth or for mating. Whale sanctuaries have been set up to protect whale populations from further decline. These sanctuaries also assist in non-lethal methods of research into whale species. The Southern Ocean Whale Sanctuary, endorsed by the International Whaling Commission (IWC) in 1994, covers an area of around 50 million square kilometres. Combined with the Indian Ocean Sanctuary (endorsed in 1992), these protected areas cover around one-third of the world's oceans. Australia has proposed another whale sanctuary for the South Pacific Ocean, which would protect whales' migratory patterns along the east coast of Australia. This current proposal has faced opposition from Japan, which still participates in whaling for scientific research.

14.30 GREAT WHALES IN THE SOUTHERN HEMISPHERE

Species	Status(a)	Pre-exploitation population no.	Current population no.
Southern right whale	endangered	not known	1,500 to 4,000
Blue whale	endangered	250,000	200 to 1,000
Pygmy blue whale	data deficient	not known	~ few thousand
Fin whale	vulnerable	300,000 to 1,650,000	~24,000
Sei whale	vulnerable	not known	~40,000 (uncertain)
Humpback whale	vulnerable	not known	12,000
Minke whale	near threatened	around post whaling numbers	500,000 to 1,100,000

(a) Status from Environment Protection Conservation and Biodiversity Act 1999 with the exception of pygmy blue and minke whales (World Wildlife Fund International).

Source: Derived from WMF (International) website, Environment Protection Conservation and Biodiversity Act 1999.

Management of Australia's forest and land resources

National parks and other protected areas

Australia's national parks are primarily the responsibility of State and Territory Governments. Australia has 498 national parks, encompassing a total area of 25.8 million hectares. National parks are only one part of Australia's protected area network. Other types of protected areas include aboriginal sites, flora and fauna reserves, scientific areas, historic sites, State parks and wildlife sanctuaries. Protected areas are defined internationally by The World Conservation Union (formerly the International Union for the Communication of Nature (IUCN)) as "Areas of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means". The IUCN defines six categories of reserve, and the area covered by all types of conservation reserves (including national parks) in Australia in 1999 was 57.3 million hectares, representing 6.4% of the total land area. The conservation reserve system does not represent all ecosystems equally, with arid and semi-arid environments, native grassland and wetlands poorly represented when compared to other types of ecosystems. See also the section *Use of national parks* in *Chapter 12, Culture and recreation*.

Forest conservation and management

Forests in Australia cover about 157 million hectares, which account for around 20% of land use. Just over one million hectares of these are plantations. Some 457 forest types are recognised in Australia, reflecting their distribution over a wide range of climatic and geographic environments. These forest types fall into one of eight groups: acacia, callitris, casuarina, eucalypt, mangrove, melaleuca, rainforest and 'other' (table 14.31). Eucalypt forests cover the greatest area and callitris the least.

14.31 AUSTRALIA'S EIGHT FOREST TYPES, Area and Amount within Conservation Reserves

Forest type	Total area '000 ha.	Conserved area '000 ha.	Conserved %
Acacia	12 298	276	2.24
Melaleuca	4 093	424	10.35
Rainforest	3 583	812	22.66
Casuarina	1 052	39	3.71
Mangrove	1 045	231	22.11
Callitris	867	69	7.96
Other	8 435	770	9.13
Eucalypt	124 463	14 961	12.02
Total	**155 835**	**17 580**	**11.28**

Source: Adapted from National Forest Inventory 1997.

Forests are managed for a variety of purposes. Conservation and wood production are two objectives. Wood production is addressed in the section *Wood and paper products* of *Chapter 16, Forestry and fishing*. The area of forests in conservation reserves is just over 17.5 million hectares, or 11.3% of the total forest estate. The proportions of different forest types in conservation reserves vary greatly, with acacia forests the most poorly represented and rainforest the best (table 14.31). The amount of forests in conservation reserves also varies between States/Territories (table 14.32). The geographic imbalance in the spread of conservation reserves is also highlighted by the fact that of Australia's 80 biogeographic regions, 37 have less than 5% of their area in conservation reserves, 12 have less than 1% and four have no area in reserves (after CEDA 1997).

14.32 TENURE OF AUSTRALIA'S NATIVE FORESTS(a)

Tenure	ACT ha.	NSW ha.	NT ha.	Qld ha.	SA ha.	Tas. ha.	Vic. ha.	WA ha.	Australia ha.
Conservation reserves	93	3 060	2 709	2 870	1 252	523	2 710	4 364	17 580
Multiple-use forests	5	3 095	0	3 983	27	1 285	3 346	1 612	13 351
Leasehold land	13	5 966	20 236	23 996	1 866	0	0	14 025	66 103
Other Crown land	2	605	258	1 051	12	296	165	13 206	15 597
Private forests	7	8 046	11 187	17 111	2 327	801	1 038	1 502	42 018
Total native forests	**120**	**20 787**	**35 385**	**49 056**	**5 499**	**2 904**	**7 285**	**34 800**	**155 835**

(a) Column or row totals may not equal sum of components, due to rounding.

Source: Australia's State of the Forest Report, 1998.

The Australian landscape has undergone significant change since European settlement. For example, in 1788 forests covered around 252 million hectares, but by 1997 this had diminished to around 156 million hectares, a 38% reduction in 209 years. The growth of agriculture, which has been a feature of the growth and prosperity of the Australian nation, has been a key reason for tree clearing. By 1980 Victoria, New South Wales and South Australia had cleared half of their native forests (table 14.33). Clearing has occurred in all State and Territories since 1980, with Queensland clearing the greatest area between 1980 and 1997 (Glanzig 1995; Barson 1999). However, the percentage of forests cleared in Queensland (39%) is lower than in all other States and Territories except the Northern Territory (effectively zero) and Western Australia (25%). The clearing of native vegetation, whether for agriculture or forestry, has been a significant environmental issue for more than a decade, because the loss of trees can lead to declines in the abundance of wildlife and increased levels of land degradation.

14.33 ESTIMATED CHANGE IN FOREST COVER(a)—1788 to 1980

State/ Territory	1788	1980	1997	Difference 1788–1997
	mill. ha.	mill. ha.	mill. ha.	%
ACT	236	124	120	–0.49
NSW	54 710	22 910	20 787	–0.62
NT	27 565	27 474	35 385	+0.28
Qld	80 609	55 963	49 056	–0.39
SA	18 417	9 058	5 499	–0.70
Tas.	5 604	3 871	2 904	0.48
Vic.	18 513	7 538	7 285	–0.61
WA	46 346	32 934	34 800	–0.25
Aust.	252 000	159 872	155 835	–0.38

(a) The total area of native forest differs from other estimates given in Year Book Australia 2001 due to differences in the definition of forest and improved data sources.

Source: Australia's State of the Forest Report, 1998.

Land degradation

Salinity

Land degradation is a significant concern of Australian farmers, governments and the general public. In 1999 around 20% of farms experienced some form of land degradation, 16% reported productivity declines and 10% removed land from agricultural production (Kemp and Alexander 2000). Estimates of the cost of land degradation vary. One estimate put the cost at 6% of the value of agricultural production or $1.5b per annum (Gretton and Salma 1996). Another study estimated the cost of three types of land degradation—salinity, acidity and sodicity—to be $2.4b per annum (CRCSLM 1999). The variation in the estimates reflects the difficulties and different approaches used in valuing the damage, which includes the cost of lost production as well as the damage to public and private infrastructure. For example, saline (salty) water can cause damage to water pipes, hot water systems, rainwater tanks, roads, municipal water treatment plants, dams, and sewers (Wilson 2000). Estimates of the cost of salinity to Australia are in the range $250–330m per annum (MDMC 1999; CRCSLM 1999).

Salinity is related to the loss of trees as well as the increasing use of irrigation for crops and pastures. This gives rise to two types of salinity: irrigation salinity and dryland salinity. Both types occur when water tables rise, bringing salts normally stored well below ground to near the soil surface. In the case of irrigation salinity, water is applied in greater amounts than is used by crops. The excess water feeds into the water table and may cause it to rise. Dryland salinity occurs outside of irrigated areas. It can occur naturally, but is also caused when trees and other deep rooted native vegetation are removed and replaced with annual shallow rooted agricultural crops. The shallow rooted crops do not use as much rainwater as native vegetation and hence more water reaches the water table, causing it to creep nearer to the soil surface.

Around 2.5 million hectares of land are currently affected by salinity, which could in time rise to over 15 million hectares (PMSEIC 1999). At present around three-quarters of the salt affected land is in Western Australia, but the State with the greatest potential problem is New South Wales with 7.5 million hectares at risk (table 14.34). The National Land and Water Resources Audit has produced a map of ground water flows which can be used to assess the risk of areas becoming saline (see *http://www.nlwr.gov.au*).

Salinity can be prevented and reversed in many cases. Appropriate measures depend on local circumstances, but could include reducing the amount of water used in irrigation, growing alternative, more deeply rooted crops, planting salt tolerant trees (Bell 1999), pumping water and building drains or other engineered works.

14.34 CURRENT AND POSSIBLE FUTURE EXTENT OF SALINITY

State	Current area (km^2)	Potential area (km^2)
WA	1 804 000	6 109 000
NSW	120 000	7 500 000
Vic.	120 000	1 200 000
SA	402 000	600 000
Qld	10 000	74 000
Other	minor	unknown
Total	**2 476 000**	**15 483 000**

Source: Prime Minister's Science Engineering and Innovation Council, 1999.

Weeds

There are over 3,000 weed species in Australia today (National Weeds Strategy Fact Sheet), and a 1997 survey of land management practices identified that weeds were the most common problem faced by farmers (Mues et al. 1998). Weeds can be native or foreign to Australia and can be broadly defined as plants that have established themselves outside of their natural range and are reproducing. Many weeds were imported for use in agriculture or as ornamental plants. One study found that 31% of weeds were 'garden escapees' and 15% were originally for use in agriculture (Panetta 1993).

A National Weeds Strategy was released in 1997 and revised in 1999 (NWS 1999). The strategy aims to reduce the threat weeds pose to natural and agricultural environments. Losses to agricultural industries are estimated to be $3.3b per annum. Weeds can also threaten the survival of native vegetation. For example, in Victoria 16 plant species (many of them orchids) and six animals are threatened or potentially threatened by weeds (Adair and Groves 1998). The National Weeds Strategy recognises that effective coordination between Commonwealth, State/Territory and local governments, and farmers and other land owners, will be essential to the management of weed problems.

As part of the national strategy, a list of 'Weeds of National Significance' was compiled (Thorp and Lynch 2000). The list (table 14.35) is the first attempt to prioritise weed problems at a national level. Some weeds cover very large areas. For example, Blackberry currently infests 9% of Australia, and has the potential to nearly double this area. Other weeds have the potential to affect regions of national and international conservation importance. For example *Mimosa* threatens the Kakadu World Heritage Area. *Mimosa* is prickly, can grow to a height of six metres, and produces so many seeds that it is capable of doubling in area every year, turning species-rich tropical wetlands of northern Australia into a *Mimosa* monoculture (Lonsdale 1999).

14.35 WEEDS OF NATIONAL SIGNIFICANCE, Current and Political Distribution

		Current Distribution	Potential Distribution
Common name	Origin of weed	'000 km^2	'000 km^2
Alligator weed	Argentina	30	500
Athel pine	North Africa, Arabia, Iran and India	80	3 646
Bitou bush/Boneseed	South Africa	231	1 258
Blackberry	Europe	691	1 425
Bridal creeper	South Africa	385	1 244
Cabomba	USA	35	181
Chilean needle grass	South America	14	242
Gorse	Europe	233	870
Hymenachne	Central America	73	415
Lantana	Central America	389	1 052
Mesquite	Central America	410	5 110
Mimosa	Tropical America	73	434
Parkinsonia	Central America	950	5 302
Parthenium	Caribbean	427	2 007
Pond apple	North, Central and South America and West Africa	27	181
Prickly acacia	Africa	173	2 249
Rubber vine	Madagascar	592	2 850
Salvinia	Brazil	383	1 376
Serrated tussock	South America	171	538
Willows	Europe, America and Asia	63	135

Source: Unpublished data, National Weeds Strategy Executive Committee 2000.

Local government expenditure on protection of the environment

The ABS publication *Environment Expenditure, Local Government, Australia* (4611.0) presents information for local governments across Australia on their expenditure on services and activities to protect the environment. The underlying survey also collects data on what is spent on managing natural resources, and measures councils' revenues in relation to provision of environment protection and natural resource management services. This information is important because the collective activities of local governments have a significant influence on environmental outcomes in Australia.

Table 14.36 presents, for all local governments combined, revenue and expenditure figures for environment protection activities (data for natural resource management are not presented), classified into the following environmental categories: waste water management; solid waste management; protection of soil and ground water; protection of biodiversity and landscape; protection of ambient air and climate; protection of cultural heritage and other environmental protection. Revenue as a percentage of expenditure explores this relationship by environmental category; this highlights which environmental categories are largely funded by revenue received for those categories.

Total national expenditure by local governments on environment protection in 1998–99 was $2.1b, while natural resource management by local governments accounted for $1.3b. Other findings from the 1998–99 survey were: local government revenue from environment related activities accounted for 18% ($2.8b) of all council revenue; expenditure on solid waste (rubbish) collection amounted to approximately 41% of total expenditure by local governments on environment protection, while waste water management accounted for 45% ($881m and $965m respectively); protecting ambient air and climate was the least significant (in terms of expenditure) environmental activity reported by councils (expenditure of about $3.7m).

14.36 LOCAL GOVERNMENT ENVIRONMENTAL EXPENDITURE AND REVENUE, By Category

Environmental category	Expenditure $m	Revenue $m	Revenue as proportion of expenditure %
Waste water	965.2	825.6	85.5
Solid waste	881.2	840.4	95.4
Biodiversity and landscape	106.4	43.6	41.0
Soil and ground water	48.3	5.2	10.8
Air and climate	3.7	0.1	2.7
Cultural heritage	19.7	18.4	93.4
Other	101.7	79.9	78.6
Total	2 126.1	1 813.2	85.3

Source: Environment Expenditure, Local Government, Australia, 1998–99 (4611.0).

Bibliography

ABS publications

Agriculture, Australia (7113.0).

Australians and the Environment (4610.0).

Australia's Environment: Issues and Trends (4613.0).

Environment Expenditure, Local Government, Australia (4611.0).

Environmental Issues: People's Views and Practices (4602.0). Issues released in 1993, 1994, 1996, 1998 and 1999.

Waste Management Industry, Australia, 1996–97 (8698.0).

Water Account for Australia, 1993–94 to 1996–97 (4610.0).

Year Book Australia 2000 (1301.0).

Other publications

Adair, R.J. and Groves, R.H. 1998, *Impact of environmental weeds on biodiversity: a review and development of a methodology*, National Weeds Program, Environment Australia, Canberra.

Agricultural and Resource Management Council of Australia and New Zealand, Australia and New Zealand Environment and Conservation Council and Forestry Ministers 1999, *The National Weeds Strategy: A Strategic Approach to Weed Problems of National Significance (1999)* (Revised edition). (Available at *http://www.weeds.gov.au*)

Australian Academy of Technological Sciences and Engineering (AATSE) 1997, *Urban Air Pollution* in Australia (available at *http://www.environment.gov.au/epg/pubs/urban_air.html*)

Australian and New Zealand Environment and Conservation Council 1996, *National Strategy for the Conservation of Australia's Biological Diversity*.

Australian Marine Industries and Science Council 1997, *Marine Industry Development Strategy*, Department of Industry, Science and Tourism, Canberra.

Australian National Committee on Large Dams (ANCOLD) 1990, *National Register of large dams*.

Barson, M, Randell, L. and Bordas, V. 2000, *Land cover changes in Australia*, Bureau of Rural Sciences, Canberra.

Bell, D. T. 1999, "Australian trees for the rehabilitation of waterlogged and salinity-damaged landscapes", *Australian Journal of Botany*, 47, pp. 697–716.

Beverage Industry Environment Council (BIEC) 1997, *National recycling and garbage bin audit analysis.*

Berkelmans, R. and Oliver, J.K. 1999, "Large Scale Bleaching of corals on the Great Barrier Reef", *Coral Reefs*, 18, pp. 55–60.

Bureau of Rural Sciences (BRS) 1998, *State of the Forests Report*, BRS, Canberra. (Available at *http://www.brs.gov.au/forest/sofr.html*)

Caton, A. and McLoughlin, K. (eds) 2000, *Fishery status reports 1999: Resources assessments of Australian Commonwealth fisheries*, Bureau of Rural Sciences, Canberra.

Clean up Australia 1999, *Clean up Australia 1999 Annual Report incorporating the rubbish report.* Produced with the assistance of the Commonwealth Government with Grants to Voluntary Conservation Organisations (GVCO).

Commonwealth Department of Environment, Sports and Territories 1993, *Biodiversity and its value*. Biodiversity Series, Paper No.1.

Commonwealth Department of Environment and Heritage 1998, A*ustralia's Ocean's Policy, caring, understanding, using wisely*, Canberra.

Cooperative Research Centre for Soil & Land Management (CRCSLM) 1999, *The costs of soil acidity, sodicity and salinity for Australia: Preliminary estimate*, Cooperative Research Centre for Soil & land Management Report CRCSLM/CTT2/6/99 (ISBN: 1 876 162 02 3).

Davies, B.R., Thoms, M.C., Walker, K.F., O'Keefe, J.H. and Gore, J.A. 1994, "Dryland Rivers: Their Ecology, Conservation and Management", in P. Calow and G.E. Petts (eds) *The Rivers Handbook II*, Oxford Blackwell Scientific Publications, pp. 484–511.

Davis, K.M., Kearney, R.E. and Beggs, K.E. 2000, "Research priorities for Australia's Freshwater Fisheries", in *Australian Journal of Environmental Management*, Vol 7, pp. 28–37.

Environment Australia 2000, *Environment Protection and Biodiversity Conservation Act 1999* (available at *http://www.ea.gov.au/epbc/index.html*)

Glanzig, A. 1995, *Native vegetation clearance, habitat loss and biodiversity decline. An overview of recent native vegetation clearance in Australia and its implications for biodiversity*. Biodiversity Series, Paper No. 6. Biodiversity Unit, Department of Environment, Sport and Territories, Canberra.

Gretton, P. and Salma, U. 1996, *Land degradation and the Australian Agricultural Industry*. Industry Commission Staff Information Paper. AGPS, Canberra.

Hewitt, C. 2000, Species Target List (unpublished), Centre for Research of Introduced Marine Pests (CRIMP).

Katestone Scientific 1997, *Anthropogenic influences and trends in Air Quality for Australian Urban Air-sheds*. Final Report to the Australia Academy of Technological Sciences and Engineering Inquiry into Urban Air Pollution, Katestone Scientific, Brisbane. (Available at *http://www.environment.gov.au/epg/airquality/urban-air/urban_air_docs.html*)

Kemp, A. and Alexander, F. 2000, "Land care and degradation: a survey of natural resource management", *Australian Farm Surveys Report 2000*, ABARE, Canberra, pp. 37–39.

Kingsford, R.T. 2000, "Ecological impacts of dams, water diversion and river management on floodplain wetlands in Australia", *Austral Ecology*, vol. 25, pp. 109–127.

Lonsdale, M. 1999, "Weeding out the enemy", *Ecos*, July–September 1999, pp. 32–37.

Mackey, B., Lesslie, R., Lindenmayer, H., Nix, H. and Incoll, R. 1998, *The Role of Wilderness in Nature Conservation: A Report to The Australian and World Heritage Group Environment Australia*.

McLoughlin, K., Walker, T. and Punt, A. 1998, "Southern Shark Fishery", in A. Caton, K. McLoughlin, and D. Staples (eds), F*ishery status reports 1998: Resources assessments of Australian Commonwealth fisheries*, Bureau of Rural Sciences, Canberra, pp. 85–91.

Murray–Darling Basin Commission (MDBC):

—1990, *The River Murray System: the regulation and distribution of River Murray waters*, Murray–Darling Basin Commission. Canberra.

—1995, *An audit of water use in the Murray–Darling Basin*, Murray–Darling Basin Commission.

—1999, *The Salinity Audit of the Murray–Darling Basin. A 100-year perspective, 1999*, Murray–Darling Basin Commission. Canberra.

—2000, *Review of the operation of the Cap: Economic and Social Impacts*, Murray–Darling Basin Commission, Canberra.

Mues, C., Chapman, L. and Van Hilst, R. 1998, *Landcare: Promoting improved land management practices on Australian farms*, ABARE Research Report 98.4, Canberra.

National Environment Protection Council (NEPC) 1998, *Ambient Air Quality: final impact statement for the Ambient Air Quality national Environment Protection Measure*, National Environment Protection Council.

NSW National Parks and Wildlife Service 1999, *NSW Biodiversity Strategy*.

Organisation for Economic Co-operation and Development (OECD):

—1998, *Environmental Performance Reviews—Australia*, Organisation for Economic Co-operation and Development, Paris.

—1999, *OECD Environmental Data: Compendium 1999*.

Panetta, F. D. 1993, "A system for assessing proposed plant introductions for weed potential", *Plant Protection Quarterly*, 8: 10–14.

Prime Minister's Science, Engineering and Innovation Council (PMSEIC) 1999, *Dryland Salinity and its Impact on Rural Industries and the Landscape*, Occasional Paper No. 1, Department of Industry, Science and Resources, Canberra.

South Australian Department for Environment, Heritage and Aboriginal Affairs 1998, *State of Environment Report for South Australia 1998* (SA SOE Report).

Saunders D., Margules, C. and Hill, B. 1998, *Environmental Indicators for National State of the Environment Reporting—Biodiversity*, in *Australia: State of the Environment (Environmental Indicators Reports)*, Department of the Environment, Canberra.

State of the Environment Advisory Council 1996, *Australia—State of the Environment Report 1996*, CSIRO Publishing, Melbourne.

State of the Environment Reference Group 1998, *Environment Western Australia 1998: State of the Environment Report*, Department of Environmental Protection, Perth.

Sydney Water Corporation 1998, *Sydney Water Annual Environment Report 1998.*

Thorp, J. and Lynch, R. 2000, *The Determination of Weeds of National Significance*, Natural Heritage Trust/National Weeds Strategy Executive Committee, Launceston.

Water Services Association of Australia (WSAA):

—1996, *The Australian Urban Water Industry, WSAA Facts '96.*

—1998, *The Australian Urban Water Industry, WSAA Facts '98.*

Whittington, J., Cottingham, P., Gawne, B., Hillman, T., Thoms, M. and Walker, K. 2000, *Review of the operation of the cap. Ecological sustainability of rivers of the Murray–Darling Basin*, Cooperative Research Centre for Freshwater Ecology, *Technical Report*, February 2000.

Wilson, S. 2000, *Dryland Salinity. What are the impacts and how do you value them? Part 3 Instructions for identifying and valuing the impacts of dryland salinity*, Murray–Darling Basin Commission and National Dryland Salinity Program, Canberra. (Available at *http://www.ndsp.gov.au/15_publications/45_guidelines_and_manuals/guidelines_and_manuals.html*)

Zann, L. 1995, *Our sea, our future: major findings of the state of the marine environment report for Australia*, Great Barrier Reef Marine Park Authority for the Department of the Environment, Sport and Territories, Ocean Rescue Program 2000, Townsville.

Internet sites

Australia Fishery Management Authority, *http://www.afma.gov.au*

Australian Surveying and Land Information Group (AUSLIG), *http://www.auslig.gov.au*

Bureau of Rural Sciences, *http://www.affa.gov.au/outputs/ruralscience.html*

Commonwealth Department of Agriculture, Fisheries and Forestry–Australia, *http://www.affa.gov.au*

Commonwealth Scientific and Industrial Research Organisation, *http://www.csiro.au*

Environment Australia, *http://www.environment.gov.au*

Great Barrier Reef Marine Park Authority, *http://www.gbrmpa.gov.au*

Marine Stewardship Council, *http://www.msc.org.au*

Murray–Darling Basin Commission, *http://www.mdbc.gov.au*

National Environment Protection Council, *http://www.nepc.gov.au*

National Land and Water Resources Audit, *http://www.nlwra.gov.au*

National Pollutant Inventory, *http://www.npi.gov.au*

Native Fish Australia, *http://www.nativefish.asn.au*

OECD, *http://www.oecd.org*

Sydney Water Corporation, *http://www.sydneywater.com.au*

Vermitech, *http://www.vermitech.com*

Weeds Australia, *http://www.weeds.org.au*

World Conservation Monitoring Centre (1997 IUCN Red List of Threatened Plants), *http://www.wcmc.org.uk*

World Wide Fund for Nature International, *http://www.panda.org*

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Introduction

Interacting factors such as the opening up of new land, the development of transport facilities and profitable markets, and technical and scientific achievements, have shaped the evolution of Australian agriculture.

Until the late 1950s, agricultural products accounted for more than 80% of the value of Australia's exports. Since then, that proportion has declined markedly as the Australian economy has become increasingly diverse. The quantity and value of production have expanded in the mining, manufacturing and, in recent years, the service industries. This decline in importance has not been due to a decline in agricultural activity, as agricultural output has increased over this period. The direct contribution of agriculture to Gross Domestic Product (GDP) has remained steady at around 3% throughout the last decade. Australian agriculture is a vital sector occupying a significant place in global rural trade, with wool, beef, wheat, cotton and sugar being particularly important. Australia is also an important source of dairy produce, fruit, rice and flowers.

The major source of statistics on land use, commodity production and livestock numbers in this chapter is the ABS Agricultural Census, conducted each year until 1996–97. Since 1997–98 these data have been collected in the Agricultural Commodity Survey, a large sample survey conducted Australia wide. The Agricultural Commodity Survey is expected to replace the census in four years out of five, with the next census being conducted in 2001 to coincide with the Census of Population and Housing.

Agriculture, the early years

Since the European settlement of Australia in 1787, agriculture has played an important role in the development of the nation. Associated with this has been the need to compile statistics about agricultural activities. The ABS has in its libraries an extensive collection of statistical reports from those early years. The following excerpts from early Year Books provide an insight into the state of the nation at that time, the problems it faced, and the challenges encountered by early statistics collectors.

For example, in Hobart in 1804, "the rations issued to all the people were as follows: Beef, 7 lbs., or pork, 4 lbs.; flour 7 lbs.; sugar, 6 ozs.–per week". Soldiers "were each allowed half a pint of rum daily".

In 1842 in South Australia "An important feature in these returns is the great increase in the cultivation of the vine, and the manufacture of wine. Although the latter will not, for some years, bear due proportion to the area of our vineyards and the number of vines planted, owing to the circumstance that only the old-established vineyards produce anything like a fair yield per acre, sufficient is shown to prove that the wine of this Province will become, at no distant date, one of our greatest staples".

In 1896 in Queensland "The collection of schedules relating to agriculture and the manufacturing industries devolves upon the police, and, with but few exceptions, is carried out in a most painstaking and intelligent manner; but the absence of expert collectors, who would be qualified by experience to estimate the areas to be devoted to each kind of crop, and to form conclusions as to the probable results in anticipation of harvest, makes it hardly possible, with much prospect of success, to do more than obtain records of facts respecting the crops after they have been garnered".

In the Northern Territory in 1909 "Tobacco-growing is peculiarly suitable for men of small means, as the grower obtains a return for his labour within a few months of commencement; and for good quality leaf he has the world for a market at highly remunerative prices".

The following selection, reproduced from the *Official Year Book of the Commonwealth of Australia, 1901–1907*, provides a statistical snapshot of agriculture at the time. It complements the article *A hundred years of Agriculture* in *Year Book Australia 2000*.

§ Land Tenure and Settlement.

First Grants of Land made In New South Wales, 1787—In the early days of Australian colonisation, land was alienated by grants and orders from the Crown, the power of making such being vested solely in the Governor, under instructions issued by the Secretary of State. The first instructions, issued on the 25th April, 1787, authorised the Governor to make grants only to liberated prisoners. The grant was to be free from all taxes, rents, fees, and other acknowledgments for the space of ten years, and for each unmarried male was not to exceed thirty acres; in case of a married man twenty acres more was allowed, and a further quantity of ten acres for each child living with his or her parents at the time of making such grant. By further instructions issued by the Secretary of State in 1789, the privilege of obtaining grants was extended to free migrants and to such of the men belonging to the detachment of marines serving in New South Wales—which then included the whole of the eastern part of Australia—as were desirous of settling in the colony; the maximum grant was not to exceed 100 acres, and was subject to a quit-rent of one shilling per annum for every fifty acres, to be paid within five years of the date of issue. In many cases these grants were made conditional upon a certain proportion of the land being cultivated, or upon certain services being regularly performed, but these conditions do not seem to have been enforced.

§ Initiation and Growth of Pastoral Industry.

Early Statistics—The live stock which Captain Phillip brought with him when establishing the first settlement in Australia in 1788 is stated to have comprised seven horses, six cattle, twenty-nine sheep, twelve pigs, and a few goats. Later in the same year, in a letter from Captain Phillip to Lord Sydney, then Secretary of State for the Colonies, an enclosure signed by "Andrew Miller, Commissary'' sets forth in detail the numbers of each kind of live stock in the colony on 1st May, 1788. A summary of the particulars supplied is as follows :—Horses, 7; cattle, 7; sheep, 29; pigs, 74; rabbits, 5; turkeys, 18; geese, 29; ducks, 35; fowls, 209. In view of the depredation since caused by rabbits their inclusion in this return as part of the live stock of the Commonwealth is of interest.

Increase in Numbers—Particulars concerning the numbers of each kind of live stock in the Commonwealth from 1860 to 1900 at quinquennial intervals, and thence onwards in single years, are given in the following table.

During the forty-six years covered by the table, the live stock of the Commonwealth increased considerably, horses by 309 per cent., cattle 136 per cent., sheep 316 per cent., and pigs 132 per cent. The annual increases which these aggregates represent are as follows:—Horses, 3.11 per cent. per annum; cattle, 1.89 per cent.; sheep, 3.15 per cent.; and pigs, 1.84 per cent.

COMMONWEALTH LIVE STOCK, 1860 to 1906(a)

	Horses	Cattle	Sheep	Pigs
1860	431,525	3,957,915	20,135,286	351,096
1865	566,574	3,724,813	29,539,928	345,704
1870	716,772	4,276,326	41,593,612	543,388
1875	835,393	6,389,610	53,124,209	549,808
1880	1,068,402	7,527,142	62,186,702	815,776
1885	1,143,064	7,397,947	67,491,976	748,908
1890	1,521,588	10,299,913	97,881,221	891,138
1895	1,680,419	11,767,488	90,689,727	822,750
1900	1,609,654	8,640,225	70,602,995	950,349
1901	1,620,420	8,493,678	72,040,211	931,309
1902	1,524,601	7,067,242	53,668,347	777,289
1903	1,546,054	7,254,258	56,932,705	837,368
1904	1,595,256	7,849,520	65,823,918	1,062,703
1905	1,673,805	8,525,025	74,403,704	1,014,853
1906	1,765,186	9,349,409	83,687,655	813,569

(a) In early publications, and in this table, the year shown is the year prior to the one in which the number of livestock was actually measured (probably because, while measurement was done early in the year in most States, the time of measurement varied from State to State). From about 1940, publications reported the reference year as the year in which the measurement was taken, and historical series were amended to reflect this practice. Therefore the years shown in this table are one year earlier than the equivalent years shown in table 15.35 later in this chapter, which were drawn from Primary Industries Part I—Rural Industries 1961–62, Bulletin No. 56 (CBCS). The latter table also shows minor revisions to some of the numbers in this table.

§ Poultry Farming.

Development of the Industry—Until recently, poultry farming as a well organised industry could scarcely be said to exist, although in metropolitan and suburban districts poultry has of course long been kept for the table and egg supplies. The aggregate output, though considerable, represented relatively little value beyond the cost of production, owing to imperfect management. Many farmers also, both wheat-growers and dairymen, have maintained a large poultry stock, erecting poultry yards constructed on modern principles, and feeding from the stubble fields and waste grain with a minimum expenditure in tending. This brought about a considerable addition to the net agricultural or dairying return. The poultry industry during recent years has assumed an independent position among rural industries, notwithstanding that large numbers of poultry runs on wheat and dairy farms are still maintained; poultry farming is also carried on in conjunction with pig farming. In special poultry farms, breeding on scientific principles and a proper arrangement of the runs is secured, and feeding and reproduction are technically attended to, and proper shelter is provided either by means of trees or sheds. Poultry experts are engaged by the State Governments to instruct in matters that will amplify the returns. Poultry for consumption are extensively reared and the egg-producing qualities of the birds have also been greatly improved by careful breeding.

§ Early Attempts at Agriculture.

The instructions issued to Captain Phillip on the 25th April, 1787, directed him, amongst other things, to proceed as soon as possible to the cultivation of the soil "under such regulations as may appear to be necessary and best calculated for securing supplies of grain and provisions''. When the settlers landed at Botany Bay, however, it was found that the glowing accounts published in England by members of Captain Cook's expedition of the fertility of the soil in the vicinity of the existing settlement were considerably overdrawn. Even when Phillip and his company moved round to Port Jackson on the 26th January, 1788, matters were for a time in no better case. The ground in the immediate neighbourhood of the settlement was not suitable for the cultivation of cereal crops, and when the time came to cultivate the soil it was found that there were very few who possessed the slightest acquaintance with the art of husbandry.

Progress of Cultivation since 1860—The following table shows the area under cultivation in each of the Commonwealth States at various periods since 1860 and during each year of the period 1901–7. The area under artificially-sown grasses is excluded in all the States, except for the years 1860–79 in the case of New South Wales, where the acreage cannot be separated. During those years, however, the area laid down under permanent grasses could not have been very large.

AREA UNDER CROP IN AUSTRALIA, 1860–1 to 1906–7

	New South Wales	Victoria	Queensland	South Australia	Western Australia	Tasmania	Commonwealth
	Acres	Acres	Acres	Acres	Acres	Acres	Acres
1860–1	260,798	387,282	3,353	359,284	24,705	152,860	1,188,282
1965–6	378,255	448,194	14,414	547,124	38,180	159,547	1,585,714
1870–1	426,976	692,840	52,210	801,571	54,527	157,410	2,185,534
1875–6	451,139	736,520	77,347	1,111,882	47,571	142,547	2,567,006
1880–1	629,180	1,548,809	113,978	2,087,237	57,707	140,788	4,577,699
1885–6	737,701	1,867,496	198,334	2,298,412	60,058	144,761	5,306,762
1890–1	852,704	2,031,955	224,993	2,093,515	69,678	157,376	5,430,221
1895–6	1,348,600	2,413,235	285,319	2,092,942	97,821	212,703	6,450,620
1900–1	2,445,564	3,114,132	457,397	2,369,680	201,338	224,352	8,812,463
1901–2	2,278,370	2,965,681	483,460	2,236,552	217,441	232,550	8,414,054
1902–3	2,249,092	3,246,568	275,383	2,224,593	229,992	246,923	8,472,551
1903–4	2,545,940	3,389,069	566,589	2,256,824	283,752	259,611	9,301,785
1904–5	2,674,896	3,321,785	539,216	2,275,506	327,391	226,228	9,365,022
1905–6	2,840,235	3,219,962	522,748	2,255,569	364,704	230,237	9,433,455
1906–7	2,826,657	3,303,586	559,753	2,150,291	460,825	244,744	9,545,856

§ Relative Importance of Crops.

Various Crops—The following table has been compiled in order to show the relative importance of the various crops in each State and in the Commonwealth as a whole. The figures refer to the season 1906–7.

§ Vineyards.

Nature and Extent—The introduction of the grape vine into Australia is said to have taken place in 1828, some forty years after the first settlement. The locality claiming to be the cradle of the vine-growing industry of Australia is the Hunter River district of New South Wales, where, in the year mentioned, cuttings from celebrated vineyards of France, Spain, and Germany were planted. From New South Wales the vine spread to Victoria and South Australia, and these States have now far outstripped the mother State in the area which they have devoted to its cultivation. In Queensland and Western Australia also, vine-growing has been carried on for many years, but in neither State, has the industry progressed with the rapidity attained in Victoria and South Australia. In Tasmania the climate is not favourable to the growth of grapes. The purposes for which grapes are grown in Australia are three in number, viz.:—(i.) for wine-making, (ii.) for table use, (iii.) for drying. The total area under vines in the several States from 1860 onwards is given in the following table.

Wine Production—The production of wine in Australia has not increased as rapidly as the suitability of soil and general favourableness of conditions would appear to warrant. The cause of this is probably twofold, being in the first place due to the fact that the Australians are not a wine-drinking people and consequently do not provide a local market for this product, and in the second to the fact that the new and comparatively unknown wines of Australia find it difficult to establish a footing in the markets of the old world, owing to the competition of well-known brands. Active steps are being taken in various ways to bring the Australian wines under notice, and it may be confidently asserted that when their qualities are duly recognised the wine production of Australia will exhibit much more rapid development than has taken place within recent years.

DISTRIBUTION OF CROPS IN AUSTRALIA, 1906–7

	New South Wales	Victoria	Queensland	South Australia	Western Australia	Tasmania	Commonwealth
	Acres	Acres	Acres	Acres	Acres	Acres	Acres
Wheat	1,866,253	2,031,893	114,575	1,681,982	250,283	32,808	5,977,794
Oats	56,431	380,493	1,236	57,000	28,363	58,320	581,843
Barley	7,979	52,816	8,601	28,122	3,590	5,328	106,436
Maize	174,115	11,559	139,806	—	101	—	325,581
Beans and Peas	124	12,012	—	7,109	937	10,642	30,824
Rye	6,735	1,571	122	—	643	667	9,738
Other Cereals	—	—	24	—	—	134	158
Potatoes	36,815	55,372	8,031	9,894	2,264	34,305	146,681
Onions	422	4,705	88	—	54	109	5,378
Other Root Crops	327	2,073	3,632	—	120	5,994	12,146
Hay	458,072	621,139	64,498	295,895	149,830	64,965	1,654,399
Green Forage	122,893	36,502	50,513	17,985	3,265	5,326	236,484
Grass Seed	—	1,859	1,131	—	—	3,720	6,710
Sugar Cane	20,601	—	133,284	—	—	—	153,885
Vines	8,521	25,855	2,070	22,575	3,525	—	62,546
Tobacco	601	133	666	—	—	—	1,400
Hops	—	323	—	—	—	921	1,244
Orchards and Other Fruit Gardens	46,177	54,021	13,310	18,199	12,517	18,050	162,274
Market Gardens	9,550	7,906	1,953	8,379	3,789	2,210	33,787
All Other Crops	11,041	3,354	16,213	3,151	1 544	1,245	36,548
Total Crops	2,826,657	3,303,586	559,753	2,150,291	460,825	244,744	9,545,856

COMMONWEALTH VINEYARDS, 1860–1 TO 1906–7

	New South Wales	Victoria	Queensland	South Australia	Western Australia	Tasmania(a)	Commonwealth
	Acres	Acres	Acres	Acres	Acres	Acres	Acres
1860–1	1,584	1,138	—	3,180	335	—	6,237
1865–6	2,126	4,078	110	6,629	634	—	13,577
1870–1	4,504	5,466	416	6,131	710	—	17,227
1875–6	4,459	5,081	376	4,972	675	—	15,563
1880–1	4,800	4,980	739	4,337	659	—	15,515
1885–6	5,247	9,775	1,483	5,142	624	—	22,271
1890–1	8,044	20,686	1,981	9,535	1,024	—	41,270
1895–6	7,519	30,275	2,021	17,604	2,217	—	59,636
1900–1	8,441	30,634	2,019	20,158	3,325	—	64,577
1901–2	8,606	28,592	1,990	20,860	3,629	—	63,677
1902–3	8,790	28,374	1,559	21,692	3,528	—	63,943
1903–4	8,940	28,513	2,069	22,617	3,324	—	65,463
1904–5	8,840	28,016	2,194	23,210	3,413	—	65,673
1905–6	8,754	26,402	2,044	23,603	3,541	—	64,344
1906–7	8,521	25,855	2,070	22,575	3,525	—	62,546

(a) There are no vineyards in Tasmania.

§ Minor Crops.

Nature and Extent—In addition to the leading crops, there are many others which, owing either to their nature or to the fact that their cultivation has advanced but little beyond the experimental stage, do not occupy so prominent a position. Some of the more important of these are those which may be classed under the heads of Market Gardens, Nurseries, Grass Seed, Tobacco, Hops, and Millet, while the possibilities of cotton growing in the tropical portions of the Commonwealth have in recent years received considerable attention, although the industry cannot yet be said to have assumed definite shape. The total area in the Commonwealth during the season 1906–7 devoted to crops of this nature was 79,689 acres, of which market gardens accounted for 38,787 acres.

Cotton—Cotton-growing on a small scale has been tried in Queensland, but so far without marked success. The area under cotton during the season 1905–6, viz., 171 acres, had fallen by 1906–7 to 138 acres. Hopes are entertained that with the invention of a mechanical device for the picking of the cotton the industry will become firmly established, since the soil and conditions appear eminently suitable for the growth of this crop. Small areas in the Northern Territory have also been planted with cotton, while the tropical portions of Western Australia have long been regarded as suitable for its cultivation.

Coffee—Queensland is the only State of the Commonwealth in which coffee-growing has been at all extensively tried, and here the results have up to the present time been far from satisfactory. The total area devoted to this crop reached its highest point in the season 1901–2, when 547 acres were recorded. Since then the area has continuously declined, and for 1906–7 amounted to only 256 acres.

Millet—Millet appears in the statistical records of three of the Commonwealth States, viz., New South Wales, Victoria, and Queensland. The total area devoted thereto in 1905–6 was 4,323 acres, by far the greater portion, viz., 3,765 acres, being in New South Wales. The particulars here given relate to millet grown for grain and fibre. That grown for green forage is dealt with in the section relating thereto.

§ Fertilisers.

General—In the early days of settlement and cultivation in the Commonwealth scientific cultivation was in a much less developed state than to-day. The early farmers were neither under the necessity, nor were they as a rule aware of the need, of supplying the constituents to the soil demanded by each class of crop. The widely-divergent character of the soils in the Commonwealth, their degeneration by repeated cropping, the limitations of climatic conditions, the difficulties of following any desired order of rotation of crops, all rendered it necessary to give attention to artificial manuring. The introduction of the modern seed-drill, acting

also as a fertiliser distributor, has greatly facilitated the use of artificial manures, and much land formerly regarded as useless for cultivation has now been made available. There is reason to believe that this feature will be even more strikingly characteristic of the future.

The words "fertiliser" or "manure'' mean any substance containing nitrogen, phosphoric acid, or potash, manufactured, produced, or prepared in any manner for the purpose of fertilising the soil or supplying nutriment to plants, but do not include farm-yard or stable manure or similar articles in their natural or unmanufactured state. The Acts provide that every vendor of fertilisers shall, within a stated period, forward to the Secretary of Agriculture, or corresponding officer, samples of the fertilisers on sale by him, together with the distinctive name or brands by which they are known, and the price at which he intends to sell during the year. On every bag, package, or bundle of fertiliser sold, or exposed for sale, he must attach a printed label showing thereon:—

(i) The number of net pounds of fertiliser in such bag or parcel;

(ii) The figure or trade mark attached to the fertiliser and intended to identify it;

(iii) The proportion per centum of nitrogen, phosphoric acid, and potash contained therein.

In addition to the above the vendor must furnish every purchaser with an invoice certificate, signed by himself or his agent, stating his full name and place of business and the quality of the fertiliser sold.

Any officer or analyst appointed under the Acts may enter any factory, warehouse, store, vessel, wharf, railway station, conveyance, or other place where fertiliser is manufactured, stored, exposed for sale, or in course of delivery or transit, and demand and take samples of such fertilisers. Every sample so taken must be divided by such officer into three parts, and each marked, sealed and fastened by him in the presence of the person in charge, and disposed of as follows:—

(i) One part to be taken by person in charge.

(ii) One part to be used for analysis.

(iii) One part to be retained by the officer for future comparison.

Every buyer of fertiliser is entitled to submit a sample of such to the analyst appointed under the Act, and receive a certificate of the analysis of such. If the analysis prove it to be under what it is represented to be, the vendor must pay the cost of analysis.

The agricultural environment

Australia is a relatively flat continent, with mean elevation just exceeding 200 metres. The dominant feature of the continent is the Great Dividing Range which spans the length of the Eastern Seaboard. There are very few naturally good soils for agriculture. Most are infertile and shallow, with deficiencies in phosphorus or nitrogen. To offset these deficiencies, superphosphate and nitrogenous fertilisers are widely used, particularly on pasture and cereal crops. Fragile soil structure and a susceptibility to waterlogging are other common features of Australian soils, while large areas are naturally affected by salt or acidity. These soil characteristics restrict particular agricultural activities or rule out agricultural activity altogether.

With the exception of Antarctica, Australia is the world's driest continent. The wet northern summer is suited to beef cattle grazing inland and the growing of sugar and tropical fruits in coastal areas. The drier summer conditions of southern Australia favour wheat and other dryland cereal farming, sheep grazing and dairy cattle (in the higher rainfall areas) as well as beef cattle. Within regions there is also a high degree of rainfall variability from year to year, which is most pronounced in the arid and semi-arid regions. Rainfall variability often results in lengthy periods without rain. The seasonality and variability of rainfall in Australia require that water be stored, and 70% of stored water use (including ground water) is accounted for by the agricultural sector. Storage ensures that there are adequate supplies all year round for those agricultural activities requiring a continuous supply. Irrigation has opened up areas of Australia to agricultural activities which otherwise would not have been suitable.

Evaporation is another important element of Australia's environment affecting agricultural production. Hot summers are accompanied by an abundance of sunlight. This combination of

climatic variables leads to high rates of evaporation. Areas that have been cleared for crop and pasture production tend to coincide with five to nine months effective rainfall (where rainfall exceeds evaporation) per year. In areas of effective rainfall of more than nine months, generally only higher value crops or tropical crops and fruits are grown, while in areas with effective rainfall of less than five months, cropping is usually restricted to areas that are irrigated.

Since European settlement the vegetation of Australia has altered significantly. In particular, large areas of Australia's forest and woodland vegetation systems have been cleared, predominantly for agricultural activity. The areas that have been altered most are those which have been opened up to cultivation or intensive grazing. Other areas, particularly in the semi-arid regions where extensive grazing of native grasses occurs, now show signs of returning to timber and scrub.

For more detail see *Chapter 1, Geography and climate*.

Land used for agriculture

In spite of Australia's harsh environment, agriculture is the most extensive form of land use. At 31 March 1999, the estimated total area of agricultural establishments in Australia was 453.7 million hectares, representing about 59% of the total land area (tables 15.1 and 15.2). The rest of the Australian land area consists of unoccupied land (mainly desert in western and central Australia), Aboriginal land reserves (mainly located in the Northern Territory), forests, mining leases, national parks and urban areas.

Livestock grazing accounts for the largest area of land use in Australian agriculture. This activity has led to the replacement of large areas of native vegetation by introduced pastures and grasses in the higher rainfall and irrigated areas.

At 31 March 1999, 5% of Australia's agricultural land was under crops, with a further 5% under sown pastures and grasses. This maintains the trend which has seen about 10% of Australia's agricultural land under cultivation each year since the 1980s. Until this time, the area of land cropped or sown to pastures and grasses had been expanding rapidly. This expansion was facilitated by factors including increased use of fertilisers, improved water supply and reduction in the rabbit population due to myxomatosis.

15.1 AGRICULTURAL LAND USE IN AUSTRALIA

	Area of			Total	
	Crops(a)	Sown pastures and grasses	Balance(b)	Area of establishments with agricultural activity	Proportion of Australian land area(c)
31 March	mill. ha.	mill. ha.	mill. ha.	mill. ha.	%
1994	18.0	29.5	421.6	469.1	61.0
1995	17.0	(d)	410.2	463.3	60.2
1996	19.4	17.1	428.7	465.2	60.5
1997	21.1	19.0	422.0	462.2	60.1
1998	21.5	22.8	419.5	463.8	60.3
1999	23.3	22.5	407.9	453.7	59.0

(a) Pastures and grasses harvested for hay and seed are included in 'Sown pastures and grasses'. (b) Includes areas of arid or rugged land held under grazing licences but not always used for grazing, and also variable amounts of fallow land. (c) About 769,203,000 ha. (d) Collected in the Northern Territory only.

Source: AgStats (7117.0); Agriculture, Australia, 1998–99 (7113.0).

15.2 AREA OF ESTABLISHMENTS WITH AGRICULTURAL ACTIVITY

31 March	NSW mill. ha.	Vic. mill. ha.	Qld mill. ha.	SA mill. ha.	WA mill. ha.	Tas. mill. ha.	NT mill. ha.	**Aust.(a) mill. ha.**
1994	61.2	13.0	152.6	57.3	114.4	2.0	68.6	**469.1**
1995	60.3	12.7	149.7	56.1	114.0	1.9	68.6	**463.3**
1996	61.0	12.8	149.7	56.9	114.5	1.9	68.3	**465.2**
1997	60.9	12.7	149.6	56.2	112.5	1.9	68.3	**462.2**
1998	60.3	12.7	148.2	57.5	115.8	1.9	67.3	**463.8**
1999	59.3	12.8	140.3	59.4	113.1	1.9	66.9	**453.7**

(a) Including ACT.

Source: AgStats (7117.0); Agriculture, Australia, 1998–99 (7113.0).

Irrigation

Most crops require a minimum amount of annual rainfall to grow successfully without irrigation. The variability in river flow and annual rainfall which are features of the Australian environment means that successful irrigation of crops and pastures is dependent on storage. Ground water supplies are used in areas where the quantity is adequate and the quality is suitable.

The area of land irrigated, about 2.3 million hectares in 1999 (table 15.3), represents less than 1% of the total land used for agriculture. Vegetables, fruit (including grapes) and sugar cane are the most intensively irrigated crops, with 74%, 75% and 39% respectively of their total growing areas sown being irrigated.

Most irrigated land is located within the confines of the Murray–Darling Basin, which covers parts of New South Wales, Victoria, Queensland and South Australia.

Characteristics of Australian farms

In 1998–99 there were 145,226 establishments undertaking agricultural activity with an Estimated Value of Agricultural Operations (EVAO) greater than $5,000. For the majority of these establishments (143,407) their primary activity was agriculture. While the remainder were undertaking some form of agricultural activity, their main activity was not in agriculture. Farms engaged in beef farming (33,163), mixed grain/sheep/beef farming (18,954), grain growing (16,579), sheep farming (15,410) and dairy cattle farming (13,963) accounted for the majority of agricultural establishments.

Table 15.4 provides information on the numbers and types of establishments undertaking agricultural activity at 31 March 1999.

15.3 AREA OF CROPS AND PASTURES IRRIGATED—1999

	NSW '000 ha.	Vic. '000 ha.	Qld '000 ha.	SA '000 ha.	WA '000 ha.	Tas. '000 ha.	NT '000 ha.	ACT '000 ha.	Aust. '000 ha.
Pastures (native or sown)									
Annual	199.2	267.0	27.5	18.0	12.0	10.2	—	—	534.0
Perennial	114.5	251.3	21.0	40.9	5.3	18.8	—	—	451.9
Total pastures	*313.7*	*518.4*	*48.5*	*58.9*	*17.3*	*29.0*	—	—	*985.9*
Cereals									
Rice	147.6	—	—	—	—	—	—	—	147.7
Other cereals	163.3	17.2	29.7	4.5	1.4	2.2	—	—	218.7
Total cereals	*311.0*	*17.2*	*29.7*	*4.5*	*1.4*	*2.2*	—	—	*366.3*
Cotton	256.1	—	117.4	—	1.0	—	—	—	374.5
Sugar cane cut for crushing	—	—	153.1	—	3.0	—	—	—	156.2
Vegetables for human consumption	16.4	21.4	25.8	10.5	7.9	14.7	—	—	96.8
Fruit (including nuts)	23.1	21.6	22.8	15.3	6.2	2.8	1.8	—	93.6
Grapevines	25.2	31.8	1.4	44.7	4.5	—	—	—	107.9
All other crops	29.4	9.2	19.9	7.0	2.1	9.3	—	—	77.0
Total	**974.0**	**619.3**	**417.4**	**137.5**	**42.4**	**58.1**	**2.5**	**—**	**2 251.3**

Source: Agriculture, Australia, 1998–99 (7113.0).

15.4 ESTABLISHMENTS UNDERTAKING AGRICULTURAL ACTIVITY—At 31 March 1999

	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Aust.
Establishments mainly engaged in agriculture, forestry and fishing industries									
Agriculture									
Plant nurseries	1 069	379	765	119	200	55	17	6	2 611
Cut flower and flower seed growing	251	268	207	122	146	46	7	—	1 047
Vegetable growing	826	1 045	1 466	584	563	617	8	—	5 109
Grape growing	1 090	2 086	75	2 079	360	74	4	2	5 770
Apple and pear growing	235	445	102	123	244	170	—	2	1 320
Stone fruit growing	424	250	79	277	139	*26	—	—	1 195
Kiwi fruit growing	*34	**6	**4	—	**6	—	—	—	*50
Fruit growing n.e.c.	1 874	324	2 169	602	316	39	89	—	5 412
Grain growing	4 735	2 763	2 262	4 145	2 632	40	3	—	16 579
Grain-sheep/beef cattle farming	7 105	3 472	1 896	2 633	3 762	85	—	—	18 954
Sheep-beef cattle farming	3 772	2 357	918	742	472	391	—	22	8 674
Sheep farming	5 474	5 136	651	1 678	1 703	739	—	30	15 410
Beef cattle farming	10 172	7 890	10 853	1 053	1 947	1 014	211	23	33 163
Dairy cattle farming	2 044	8 066	1 849	785	445	772	1	1	13 963
Poultry farming (meat)	333	163	122	76	64	14	1	—	773
Poultry farming (eggs)	176	143	99	46	96	13	5	2	579
Pig farming	324	172	346	146	95	45	1	—	1 129
Horse farming	791	499	608	100	119	52	2	6	2 177
Deer farming	*28	*38	*54	**19	*16	12	—	—	166
Livestock farming n.e.c.	460	349	291	142	81	44	3	2	1 373
Sugar cane growing	501	—	4 706	—	*3	—	—	—	5 210
Cotton growing	625	—	607	—	—	—	—	—	1 232
Crop and plant growing n.e.c.	283	473	495	62	85	107	7	1	1 513
Total agriculture	*42 626*	*36 322*	*30 622*	*15 532*	*13 495*	*4 354*	*359*	*97*	*143 407*
Establishments mainly engaged in other industries, but also with some agricultural activity	676	379	130	206	327	92	4	4	1 818
Total establishments undertaking agricultural activity	**43 302**	**36 701**	**30 753**	**15 738**	**13 822**	**4 446**	**363**	**101**	**145 226**

Source: Agricultural Commodities, Australia, 1998–99 (7121.0).

Employment in agriculture

The number of people employed in agriculture increased by 4% in 1999 to 408,000 persons. The majority of persons employed in agriculture were male (68%). Slightly less than 79% of women employed in agriculture were married, compared with 67% of men.

Table 15.5 shows the average employment in agriculture and services to agriculture for each of the years 1994 to 1999.

15.5 EMPLOYED PERSONS(a) IN AGRICULTURE AND RELATED SERVICES TO AGRICULTURE, Annual Averages

	Married males	All males	Married females	All females	**Persons**
	'000	'000	'000	'000	**'000**
1994	181.2	258.4	97.5	118.9	**377.3**
1995	180.3	257.9	101.2	123.3	**381.2**
1996	184.2	269.5	98.7	120.9	**390.5**
1997	191.1	278.2	102.8	126.2	**404.4**
1998	181.7	268.0	97.0	124.5	**392.5**
1999	186.1	278.7	101.6	129.1	**407.7**

(a) The estimates of employed persons include persons who worked without pay for at least one hour per week in a family business or on a farm (i.e. unpaid family helpers). Persons who worked in another industry and in agriculture are classified to the industry of predominant activity.

Source: Unpublished data, Labour Force Survey.

15.6 AGRICULTURAL COMMODITIES PRODUCED, Gross Value and Chain Volume Index(a)

Commodity	1993–94 $m	1994–95 $m	1995–96 $m	1996–97 $m	1997–98 $m	1998–99 $m
GROSS VALUE OF COMMODITIES PRODUCED (CURRENT PRICES)						
Crops						
Barley for grain	844.9	622.2	1 276.4	1 308.0	1 057.2	885.1
Oats for grain	147.9	165.8	289.4	226.6	223.3	156.7
Wheat for grain	2 866.8	2 127.2	4 304.7	4 877.9	3 801.5	3 860.0
Other cereal grains	537.5	580.2	733.0	764.9	702.1	785.1
Sugar cane cut for crushing	944.6	1 207.7	1 168.7	1 186.4	1 247.7	1 044.0
Fruit and nuts	1 316.7	1 426.3	1 498.8	1 667.8	1 582.4	1 778.6
Grapes	450.1	511.1	714.4	751.4	998.2	1 115.6
Vegetables	1 443.7	1 491.6	1 616.1	1 662.3	1 812.7	2 009.6
All other crops(b)	2 963.8	2 999.6	3 716.1	3 689.9	3 904.3	4 536.3
Total crops	*11 515.9*	*11 131.7*	*14 603.1*	*15 685.2*	*15 329.4*	*16 171.0*
Livestock slaughterings and other disposals(c)						
Cattle and calves(d)	4 433.5	4 213.5	3 575.9	3 390.1	4 138.2	4 476.6
Sheep and lambs	793.6	833.7	1 035.7	1 038.9	1 066.2	1 045.5
Pigs(e)	660.5	630.6	597.8	692.9	709.8	689.7
Poultry(e)	929.3	902.0	948.1	1 053.3	1 122.2	1 174.3
Total livestock slaughterings and other disposals(f)	*6 852.9*	*6 615.7*	*6 192.7*	*6 211.9*	*7 060.2*	*7 401.4*
Livestock products						
Wool	2 449.1	3 317.9	2 475.3	2 636.1	2 753.9	2 139.1
Milk	2 448.0	2 419.1	2 848.3	2 810.6	2 817.0	2 897.3
Eggs	233.9	230.6	256.9	278.2	347.5	347.5
Total livestock products(g)	*5 166.7*	*5 993.7*	*5 707.3*	*5 758.7*	*5 957.8*	*5 417.9*
Total value of agricultural commodities produced(h)	**23 547.2**	**23 750.3**	**27 451.9**	**28 089.7**	**28 347.4**	**28 990.2**
CHAIN VOLUME INDEX OF GROSS VALUE OF COMMODITIES PRODUCED						
Crops						
Barley for grain	103.7	45.3	90.5	104.1	100.0	93.1
Oats for grain	101.0	56.7	115.0	101.4	100.0	110.3
Wheat for grain	86.7	47.2	86.9	120.7	100.0	113.0
Other cereal grains	77.0	77.4	99.7	114.0	100.0	124.9
Legumes for grain	105.2	64.0	110.2	110.4	100.0	113.1
Oilseeds	57.5	43.3	70.8	90.6	100.0	207.4
Sugar cane cut for crushing	74.1	86.3	87.5	94.6	100.0	94.0
Cotton	49.6	51.1	59.0	92.6	100.0	100.0
Nursery production	127.3	123.0	133.9	113.3	100.0	110.2
Fruit and nuts	103.0	95.9	96.3	103.6	100.0	98.9
Grapes	101.4	82.8	117.1	101.3	100.0	119.0
Vegetables	92.1	87.7	97.2	96.8	100.0	105.5
All other crops(b)	96.0	79.7	118.2	88.9	100.0	113.1
Total crops	*84.0*	*67.0*	*91.6*	*105.5*	*100.0*	*109.6*
Livestock slaughterings and other disposals(c)						
Cattle and calves(d)	89.2	88.2	89.2	95.9	100.0	102.8
Sheep and lambs	103.1	97.6	96.1	96.6	100.0	101.4
Pigs(e)	99.9	101.7	102.7	100.8	100.0	105.4
Poultry(e)	84.5	83.6	87.4	90.3	100.0	104.2
Total livestock slaughterings and other disposals(f)	*91.5*	*90.3*	*91.5*	*95.6*	*100.0*	*103.1*
Livestock products						
Wool	119.4	106.3	100.2	106.2	100.0	99.6
Milk	85.5	87.0	92.4	95.6	100.0	107.8
Eggs	101.1	98.3	96.7	98.4	100.0	104.4
Total livestock products(g)	*101.3*	*96.5*	*96.0*	*100.4*	*100.0*	*103.6*
Total agricultural commodities produced(h)	**88.7**	**78.7**	**92.4**	**102.1**	**100.0**	**106.8**

(a) Chain volume indexes are compiled by linking together (compounding) movements in volumes, calculated using the average prices of the previous financial year, and applying the compounded movements to the current price estimates of the reference year, which for these estimates is 1997–98. (b) Includes pastures and grasses. Excludes crops for green feed or silage. (c) Includes net exports of livestock. (d) Includes buffalo slaughtered in the Northern Territory. (e) Excludes pigs and poultry in Tasmania and the Northern Territory, prior to 1997–98. (f) Excludes pigs and poultry in the Northern Territory, prior to 1997–98. (g) Includes honey and beeswax. (h) Includes pigs and poultry slaughterings in Tasmania and the Northern Territory.

Source: Value of Agricultural Commodities Produced, Australia, 1997–98 (7503.0); Agriculture, Australia, 1998–99 (7113.0); Principal Agricultural Commodities Produced, Australia, Preliminary, 1998–99 (7501.0).

Gross value of agricultural commodities produced

The contribution of agriculture to the Australian economy can be measured in a number of ways. The most direct measurement available is the gross value of agricultural production for the year ending 31 March. In 1998–99, the gross value of agricultural production in current prices was $29.0b.

Table 15.6 shows the gross value of agricultural commodities produced for the years 1993–94 to 1998–99 i.e. the years ending 31 March 1994 to 31 March 1999. The values shown are the values of recorded production at the wholesale prices realised in the principal market place. Also shown are chain volume indexes of the value of production, which provide an indication of the change in value after the direct effects of price change are eliminated. Chain volume measures are discussed in the section *Chain volume or 'real' GDP* in *Chapter 29, National accounts*.

Agricultural inventions

The untamed landscape of Australia, quite different from the results of centuries of cultivation in the United Kingdom, presented challenges to Australian farmers which they overcame with great ingenuity and innovation.

In the late 1800s and early 1900s the invention of machines such as the stump jump plough and the header harvester paved the way for efficient large scale farming in the comparatively harsh Australian environment. The stump jump plough allowed farmers to till soil still holding tree roots after tree clearing had taken place. The header harvester gave farmers the opportunity to harvest crops on broader acreages than could be harvested by traditional labour-based methods on smaller allotments. James Farrer applied scientific methods to wheat breeding and developed new strains of drought and disease resistant wheat, enabling the expansion of wheat growing into the drier inland regions of Australia.

Inventions throughout the 20th century allowed Australia's farmers to become and remain among the most productive and efficient primary producers in the world. Large scale mechanisation, with machines replacing animal and human labour, has enabled Australian farmers to remain price-competitive and to supply markets around the world. The development of equipment such as wheeled and tracked tractors, the milking machine, the sugar cane harvester, travelling irrigators and even the humble 'ute' has given farmers the tools to produce bigger crops more efficiently.

Technological and scientific developments have included biological control agents such as the myxoma virus, and more recently the calici virus, to control rabbit numbers; the use of satellite positioning systems to assist in land management by, for example, applying chemicals only to the areas of paddocks needing them; the improved uses of gene technologies (noting Farrer's ground-breaking work begun over 100 years ago) to breed more productive and healthier plants and animals; and the implementation of holistic systems such as integrated pest management and cell grazing. Current and future technologies include the further computerisation of farm activities and genetic engineering.

In the pioneering days of Australia's history, technology and innovation were used to overcome the obstacles faced by farmers trying to make a living off impoverished soil and very dry land. In leaving the 20th century, we see farmers making use of technology and innovation to remain viable players in a keenly competitive international market, while ensuring the sustainability of their social, economic and biophysical environments. While we do not know what technologies will be available to Australian farming in the future, the uptake of technology over the last century has helped to place Australian agriculture in its present strong position.

Financial statistics of farm businesses

Estimates of selected financial aggregates of farm businesses are shown in tables and graphs 15.7 to 15.13. The estimates have been derived from the Agricultural Finance Survey, conducted annually since 1986–87.

Turnover

Turnover (all gross proceeds received by the business during the year from the sale of crops, livestock, livestock products and other miscellaneous revenue) is a good guide to the level of farm business activity. The average turnover per farm business increased by 3% to $269,000 during 1998–99 as a result of a slight increase in total turnover and a fall in the estimated number of farm businesses (table 15.9).

In 1998–99, 24,000 or 24% of Australian farm businesses had a turnover of $300,000 or more, and contributed 67% of the total turnover of all Australian farms. Their average turnover was $759,000 and the average cash operating surplus (a measure of profitability) was $160,000.

At the other end of the scale, 20,000 farms (19%) had a turnover of less than $50,000. These farm businesses contributed only 2% of the total turnover, at an average of $30,000. These farms had an average cash operating loss of $1,000 per farm.

In 1998–99, the farm business profit margin (the ratio of cash operating surplus to turnover) was 20%, down from 22% in 1997–98 (graph 15.10).

15.7 FARM BUSINESSES, Selected Financial Aggregates

	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99
	$m	$m	$m	$m	$m	$m
Sales from crops	9 369.5	9 804.2	13 159.6	13 581.2	13 493.1	13 564.3
Sales from livestock	6 232.5	6 279.1	6 339.7	5 964.7	5 922.0	6 373.4
Sales from livestock products	4 637.3	5 596.3	4 975.1	5 403.3	5 556.5	4 986.5
Turnover	21 694.3	23 516.3	26 724.9	27 122.3	27 300.1	27 606.6
Purchases and selected expenses	12 541.1	13 517.0	14 948.6	15 692.3	15 472.4	15 908.7
Value added(a)	10 598.4	9 768.1	11 185.3	10 797.4	12 034.4	12 181.4
Adjusted value added(b)	9 178.5	8 234.3	9 552.5	9 103.2	10 145.0	10 191.0
Gross operating surplus(a)	7 081.2	6 006.0	7 176.6	6 588.3	7 608.1	7 359.1
Interest paid	1 302.0	1 508.9	1 666.7	1 719.9	1 595.1	1 645.3
Cash operating surplus(c)	4 433.3	4 835.7	6 429.3	5 906.3	6 091.7	5 529.1
Net capital expenditure	1 945.0	2 090.8	2 307.9	2 480.7	2 624.7	2 573.1
Gross indebtedness	15 921.7	18 267.7	19 592.7	20 464.2	21 630.8	24 295.4

(a) Includes an estimate for the increase (or decrease) in the value of livestock. (b) The estimate of value added less the estimates of rates and taxes, insurance payments and other expenses. (c) Excludes an estimate for the increase (or decrease) in the value of livestock.

Source: Agricultural Industries, Financial Statistics, Australia (7507.0); Agriculture, Australia (7113.0).

15.8 FARM BUSINESSES, Selected Financial Aggregates by State—1998–99

	NSW	Vic.	Qld	SA	WA	Tas.	**Aust.(a)**
	$m	$m	$m	$m	$m	$m	**$m**
Sales from crops	3 819.1	1 978.5	3 190.8	1 840.2	2 471.2	236.1	**13 564.3**
Sales from livestock	1 869.2	962.8	2 144.9	482.8	659.8	154.8	**6 373.4**
Sales from livestock products	1 208.8	2 006.8	577.2	385.7	616.9	189.6	**4 986.5**
Turnover	7 538.8	5 463.2	6 634.7	2 938.9	4 182.7	676.4	**27 606.6**
Purchases and selected expenses	4 477.9	3 099.8	3 723.8	1 531.3	2 603.5	378.2	**15 908.7**
Value added(b)	3 342.8	2 492.5	2 898.4	1 488.4	1 557.9	321.6	**12 181.4**
Adjusted value added(c)	2 714.5	2 114.8	2 492.2	1 278.2	1 251.1	276.9	**10 191.0**
Gross operating surplus(b)	1 949.6	1 455.0	1 773.2	996.7	955.7	192.4	**7 359.1**
Interest paid	463.9	297.5	403.5	173.9	256.5	41.9	**1 645.3**
Cash operating surplus(d)	1 276.9	1 088.4	1 453.0	779.3	769.2	135.1	**5 529.1**
Net capital expenditure	700.0	481.9	610.8	324.1	425.1	38.9	**2 573.1**
Gross indebtedness	6 758.3	3 966.2	6 658.7	2 332.1	3 870.0	569.0	**24 295.4**

(a) Includes the Northern Territory and the Australian Capital Territory. (b) Includes an estimate for the increase (or decrease) in the value of livestock. (c) The estimate of value added less the estimates of rates and taxes, insurance payments and other expenses. (d) Excludes an estimate for the increase (or decrease) in the value of livestock.

Source: Agriculture, Australia, 1998–99 (7113.0).

15.9 FARM BUSINESSES, By Size of Turnover

	Number of farm businesses				Total turnover			
	1995–96	1996–97	1997–98	1998–99p	1995–96	1996–97	1997–98	1998–99
Size of turnover	'000	'000	'000	'000	$m	$m	$m	$m
Less than $50 000	22.7	20.4	22.5	20.0	613.6	618.6	620.9	607.2
$50 000 to $99 999	20.0	21.4	20.2	18.7	1 560.1	1 609.0	1 562.6	1 440.5
$100 000 to $149 999	15.9	13.8	13.3	15.0	1 991.0	1 787.3	1 666.2	1 887.2
$150 000 to $199 999	11.1	12.0	11.6	11.2	1 957.3	2 170.9	2 064.9	1 993.9
$200 000 to $249 999	9.2	9.7	6.7	8.0	2 053.5	2 184.8	1 514.8	1 830.6
$250 000 to $299 999	6.1	6.0	5.0	5.3	1 629.2	1 699.8	1 398.2	1 470.9
$300 000 and over	23.6	22.9	25.0	24.2	16 920.2	17 051.9	18 472.5	18 376.4
Total	**108.4**	**106.1**	**104.3**	**102.5**	**26 724.9**	**27 122.3**	**27 300.1**	**27 606.6**

Source: Agricultural Industries, Financial Statistics, Australia (7507.0); Agriculture, Australia (7113.0).

15.10 AUSTRALIAN FARM BUSINESSES, Profit Margins(a)

(a) Profit margin is derived before allowing for any drawings taken by directors of unincorporated businesses.

Source: Agricultural Industries, Financial Statistics, Australia (7507.0); Agriculture, Australia (7113.0).

Gross indebtedness

Australian farm businesses owed a total of $24.3b at 30 June 1999 (table 15.11), a 12% increase on 1997–98. The aggregate debt has risen steadily from $11.5b in 1986–87 when the current series of surveys began. The average gross indebtedness at 30 June 1999 was $237,000 per farm business. About 30% of farm businesses owed more than $200,000. On the other hand, 24% of farm businesses were debt free at 30 June 1999. The total interest bill for Australian farm businesses, at $1.6b, was 3% higher than in 1997–98.

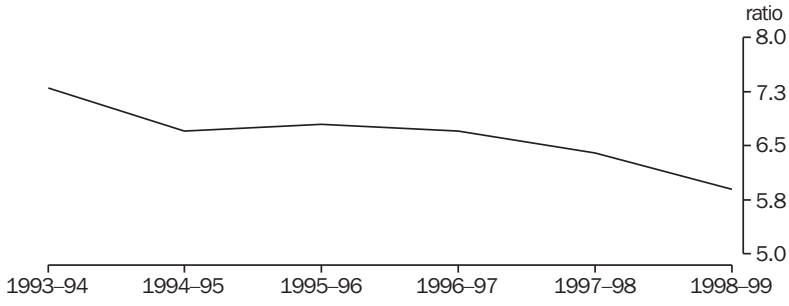
Graph 15.12 shows that the average debt to asset ratio for agricultural businesses has been trending down slowly. Graph 15.13 shows a decrease in the average interest coverage of agricultural businesses, from 4.8 times in 1997–98 to 4.4 times in 1998–99, reflecting the impact of a 9% decrease in cash operating surplus and a 3% rise in interest paid.

15.11 AUSTRALIAN FARM BUSINESSES, Aggregate and Average Gross Indebtedness

	Gross indebtedness	
	Aggregate	Average per farm business
30 June	$m	$
1994	15 921.7	148 057
1995	18 267.7	170 266
1996	19 592.7	180 723
1997	20 464.2	192 815
1998	21 630.8	207 456
1999	24 295.4	237 012

Source: Agricultural Industries, Financial Statistics, Australia (7507.0); Agriculture, Australia (7113.0).

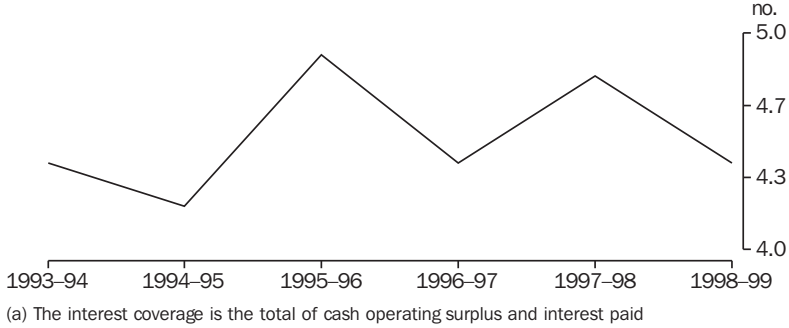
15.12 AUSTRALIAN FARM BUSINESSES, Average Debt to Asset Ratio(a)



(a) The debt to asset ratio is the total value of assets at 30 June divided by gross indebtedness at 30 June.

Source: Agricultural industries, Financial Statistics, Australia (7507.0); Agriculture, Australia (7113.0).

15.13 AUSTRALIAN FARM BUSINESSES, Average Interest Coverage(a)



(a) The interest coverage is the total of cash operating surplus and interest paid divided by interest paid at 30 June.

Source: Agricultural Industries, Financial Statistics, Australia (7507.0); Agriculture, Australia (7113.0).

Crops

Table 15.14 shows the area of crops in the States and Territories of Australia since 1870–71, and table 15.15 is a summary of the area, production and gross value of the principal crops in Australia over recent years.

Cereal grains

In Australia, cereals are divided into autumn-winter-spring growing (winter cereals) and spring-summer-autumn growing (summer cereals). Winter cereals such as wheat, oats, barley and rye are usually grown in rotation with some form of pasture such as subterranean clover, medics or lucerne. In recent years, alternative winter crops such as canola, field peas and lupins have been introduced to crop rotation in areas where they had not previously been grown. Rice, maize and sorghum are summer cereals, with the latter being grown in association with winter cereals in some areas. In northern Australia there are two rice growing seasons.

Wheat

Wheat is Australia's largest crop. It is produced in all States but primarily on the mainland in a narrow crescent known as the wheat belt. Inland of the Great Dividing Range, the wheat belt stretches in a curve from central Queensland through New South Wales, Victoria and southern South Australia. In Western Australia, the wheat belt continues around the south-west of the State and some way north, along the western side of the continent (see map 15.17).

Final estimates for the 1998–99 season show that wheat production increased by 12% to 21.5 million tonnes over the 1997–98 season (table 15.16). Record State productions were recorded in Western Australia (8.2 million tonnes) and South Australia (3.3 million tonnes). Queensland also recorded a significant increase, up 39% to 1.9 million tonnes. The largest Australian wheat crop ever recorded (22.9 million tonnes) occurred in 1996–97.

15.14 AREA OF CROPS

Year	NSW '000 ha	Vic. '000 ha	Qld '000 ha	SA '000 ha	WA '000 ha	Tas. '000 ha	NT '000 ha	ACT '000 ha	**Aust. '000 ha**
1870–71	156	280	21	235	22	64	—	—	**868**
1880–81	245	627	46	846	26	57	—	—	**1 846**
1890–91	345	822	91	847	28	64	—	—	**2 197**
1900–01	990	1 260	185	959	81	91	—	—	**3 567**
1910–11	1 370	1 599	270	1 112	346	116	—	—	**4 813**
1920–21	1 807	1 817	316	1 308	730	120	—	1	**6 099**
1930–31	2 756	2 718	463	2 196	1 939	108	1	2	**10 184**
1940–41	2 580	1 808	702	1 722	1 630	103	—	2	**8 546**
1949–50	2 295	1 881	832	1 518	1 780	114	—	4	**8 424**
1959–60	2 888	1 949	1 184	1 780	2 628	130	1	3	**10 564**
1969–70	4 999	2 212	2 208	2 290	3 912	98	6	2	**15 728**
1979–80	5 243	2 243	2 334	2 771	5 281	79	2	1	**17 954**
1990–91	4 073	2 063	2 872	2 933	5 359	75	6	—	**17 382**
1991–92	3 846	2 039	2 302	2 920	5 216	76	5	—	**16 404**
1992–93	3 906	2 258	2 316	3 073	5 668	73	4	1	**17 297**
1993–94	4 209	2 317	2 394	2 940	6 100	78	5	—	**18 043**
1994–95	3 432	2 296	2 056	2 991	6 182	77	4	—	**17 040**
1995–96	4 757	2 439	2 495	3 219	6 419	75	4	—	**19 409**
1996–97	5 589	2 552	2 685	3 279	6 950	73	5	—	**21 133**
1997–98	5 648	2 565	2 682	3 290	7 328	78	4	—	**21 595**
1998–99	6 173	2 749	3 014	3 648	7 597	76	7	—	**23 264**

Source: AgStats (7117.0); Agriculture, Australia, 1998–99 (7113.0).

15.15 SELECTED CROPS, Area, Production and Gross Value

	Area(a)			Production			Gross value		
	1996–97	1997–98	1998–99	1996–97	1997–98	1998–99	1996–97	1997–98	1998–99
Crop	'000 ha.	'000 ha.	'000 ha.	'000 t	'000 t	'000 t	$m	$m	$m
Cereals for grain									
Barley	3 367	3 521	3 167	6 696	6 482	5 987	1 308	1 057	885
Grain sorghum	544	507	587	1 425	1 081	1 891	257	183	285
Maize	67	57	64	398	272	338	80	55	60
Oats	1 052	937	909	1 653	1 634	1 798	227	223	157
Rice	152	147	148	1 255	1 324	1 362	310	341	332
Wheat	10 936	10 441	11 543	22 925	19 227	21 465	4 878	3 802	3 860
Lupins for grain	1 260	1 425	1 406	1 522	1 561	1 696	314	306	244
Crops cut for hay									
Cereal crops for hay	326	401	425	1 220	1 567	1 827	142	194	196
Non-cereal crops for hay	36	59	45	109	170	126	13	20	14
Sugar cane cut for crushing	390	415	402	38 633	39 531	38 534	1 186	1 248	1 044
Tobacco	3	3	3	9	8	8	54	46	40
Cotton lint(b)	378	381	446	560	564	634	1 342	1 228	1 353
Peanuts (in shell)	24	19	21	47	32	47	35	22	31
Soybean	39	32	55	74	54	107	31	22	39
Canola	408	698	1 247	623	855	1 690	239	330	638
Sunflower	139	90	195	143	84	220	47	34	74
Orchard fruit									
Oranges	n.a.	n.a.	n.a.	523	500	446	256	254	307
Apples	n.a.	n.a.	n.a.	353	309	334	378	273	325
Pears (excluding Nashi)	n.a.	n.a.	n.a.	168	153	157	106	108	114
Peaches	n.a.	n.a.	n.a.	72	65	66	60	53	65
Other fruit									
Bananas	10	10	11	200	223	225	217	230	264
Pineapples	3	3	5	123	123	131	39	37	39
Grapes	72	78	95	943	1 112	1 266	722	998	1 116
Vegetables									
Carrots	7	7	7	257	267	257	142	151	162
Potatoes	41	43	41	1 286	1 372	1 327	449	493	486
Tomatoes	9	8	9	393	380	394	177	167	222
Total all crops (excluding pastures and grasses)	**21 133**	**21 595**	**23 264**	**. .**	**. .**	**. .**	**16 182**	**15 329**	**16 171**

(a) Area is productive area. (b) Value of cotton includes value of cotton seed.

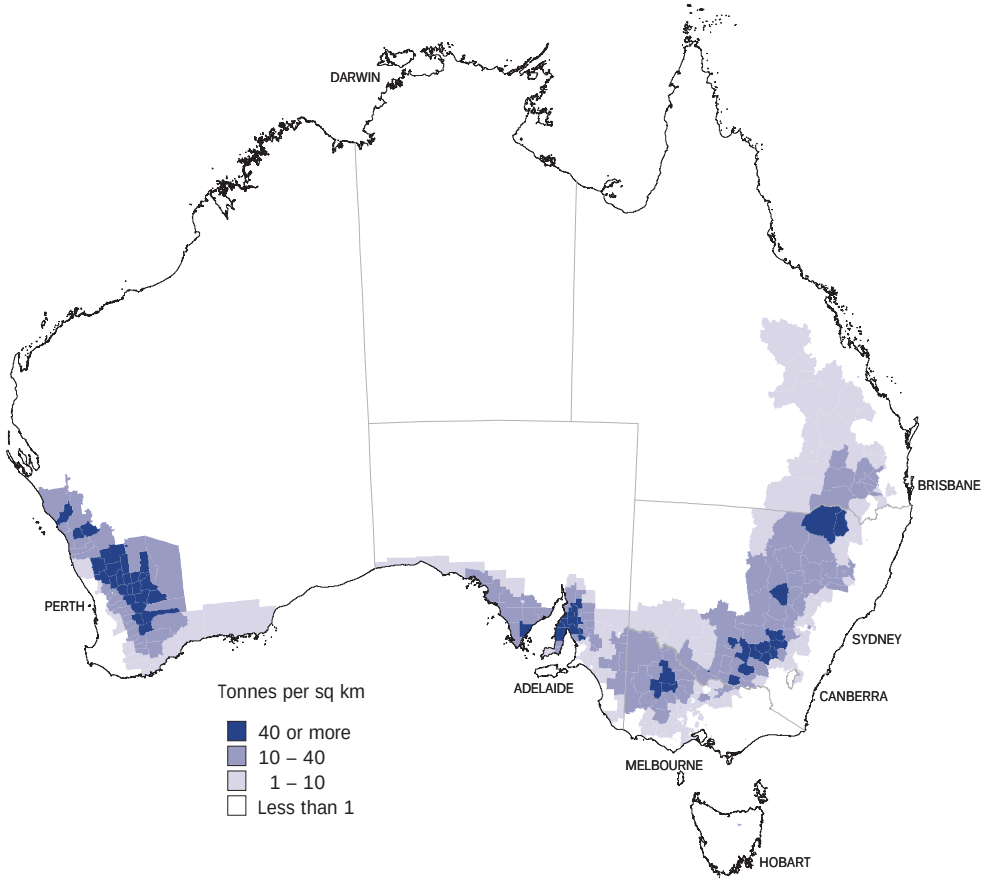
Source: AgStats (7117.0); Value of Agricultural Commodities Produced, Australia (7503.0); Agriculture, Australia, 1998–99 (7113.0).

15.16 WHEAT FOR GRAIN, Area and Production

Year	NSW	Vic.	Qld	SA	WA	Tas.	**Aust.**
			AREA ('000 HA.)				
1993–94	1 978	780	556	1 216	3 852	2	**8 383**
1994–95	1 424	822	401	1 395	3 848	1	**7 891**
1995–96	2 328	853	627	1 519	3 892	1	**9 221**
1996–97	3 192	963	980	1 535	4 264	2	**10 936**
1997–98	2 936	857	1 001	1 438	4 205	3	**10 441**
1998–99	3 174	949	1 139	1 762	4 515	4	**11 543**
			PRODUCTION ('000 t)				
1993–94	5 086	222	555	2 121	6 689	5	**16 479**
1994–95	875	934	225	1 487	5 438	3	**8 961**
1995–96	4 508	1 921	519	2 724	6 827	4	**16 504**
1996–97	8 363	2 262	1 980	2 795	7 516	8	**22 925**
1997–98	5 906	1 503	1 392	2 689	7 725	12	**19 227**
1998–99	6 563	1 462	1 941	3 310	8 170	18	**21 465**

Source: AgStats (7117.0); Agricultural Commodities, Australia, 1998–99 (7121.0).

15.17 WHEAT FOR GRAIN, Production—1996–97(a)



(a) This map has been generated using small area Agricultural Census data for 1996–97.

Source: Agstats (7117.0)

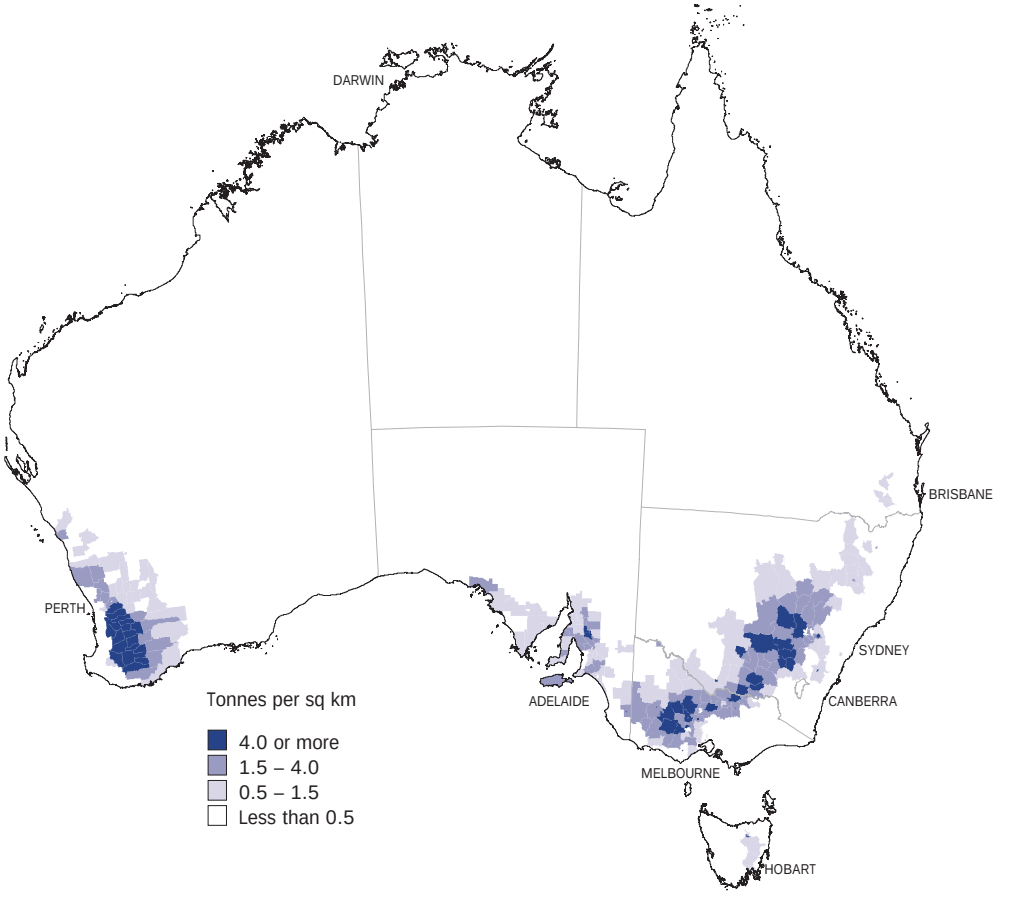
Oats

Oats are traditionally grown in moist, temperate regions. However, improved varieties and management practices have enabled oats to be grown over a wider range of soil and climatic conditions. They have a high feed value and produce a greater bulk of growth than other winter cereals; they need less cultivation and respond well to superphosphate and nitrogen. Oats have two main uses: as a grain crop, and as a fodder crop (following sowing, fallow or rough sowing into stubble or clover pastures). Fodder crops can either be grazed and then harvested for grain after removal of livestock, or else mown and baled or cut for chaff.

Map 15.18 shows the production of oats for grain in Australia in 1996–97.

The 1998–99 production of oats for grain was 10% higher than the 1997–98 harvest (table 15.19). Production increased in New South Wales, by 37% to 669,000 tonnes, and in Victoria, by 24% to 458,000 tonnes, but decreased in Western Australia, by 22% to 463,000 tonnes.

15.18 OATS FOR GRAIN, Production—1996–97(a)



(a) This map has been generated using small area Agricultural Census data for 1996–97.

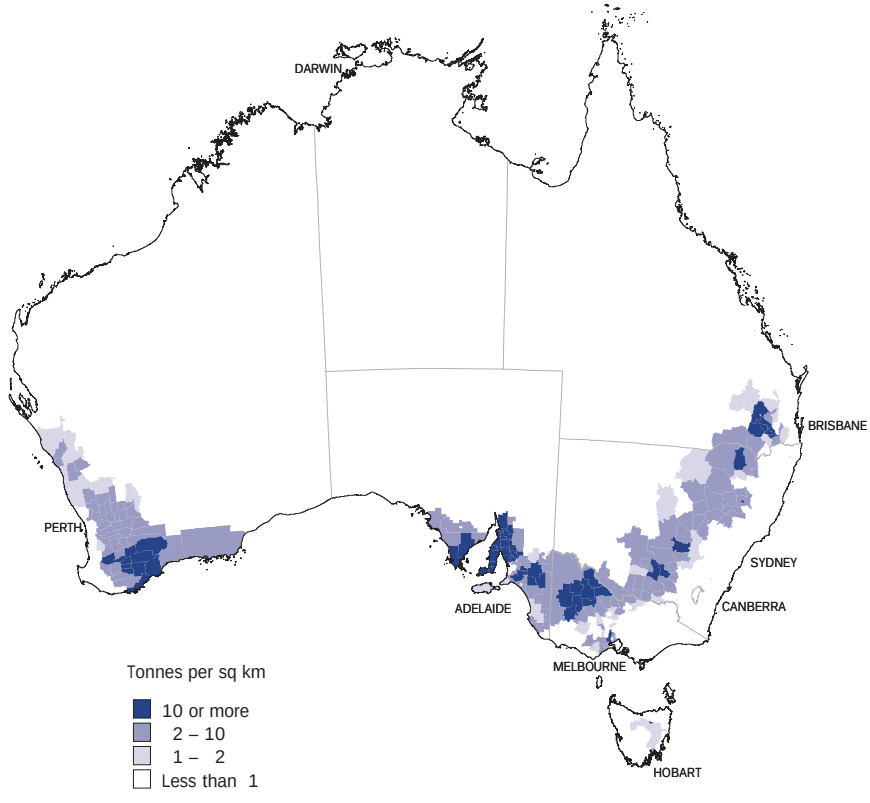
Source: AgStats (7117.0).

15.19 OATS FOR GRAIN, Area and Production

Year	NSW	Vic.	Qld	SA	WA	Tas.	**Aust.**
			AREA ('000 HA.)				
1993–94	369	186	16	101	268	7	**947**
1994–95	375	148	14	95	256	8	**897**
1995–96	505	187	14	120	300	10	**1 136**
1996–97	393	175	39	121	316	8	**1 052**
1997–98	325	172	16	111	305	8	**937**
1998–99	354	188	18	112	228	8	**909**
			PRODUCTION ('000 t)				
1993–94	618	362	8	135	511	13	**1 647**
1994–95	197	201	3	87	425	11	**924**
1995–96	711	392	7	162	585	18	**1 875**
1996–97	607	304	26	156	546	14	**1 653**
1997–98	488	369	13	153	596	15	**1 634**
1998–99	669	458	15	178	463	14	**1 798**

Source: AgStats (7117.0); Agricultural Commodities, Australia, 1998–99 (7121.0).

15.20 BARLEY FOR GRAIN, Production—1996–97(a)



(a) This map has been generated using small area Agricultural Census data for 1996–97.

Source: AgStats (7117.0).

Barley

This cereal contains two main groups of varieties, 2-row and 6-row. The former is generally, but not exclusively, preferred for malting purposes. Barley is grown principally as a grain crop, although in some areas it is used as a fodder crop for grazing, with grain being subsequently harvested if conditions are suitable. It is often grown as a rotation crop with wheat, oats and pasture. When sown for fodder, sowing may take place either early or late in the season, as barley has a short growing period. It may therefore provide grazing or fodder supplies when other sources are not available. Barley grain may be crushed to meal for stock or sold for malting. Map 15.20 shows the production of barley for grain in Australia in 1996–97.

Barley planting for 1998–99 fell by 10% to 3.2 million tonnes. Barley production declined in 1998–99 by 8% to 6.0 million tonnes (table 15.21). Western Australia contributed most to the fall, down 24% to 1.5 million tonnes.

Grain sorghum

The sorghums are summer growing crops which are used in a number of ways: grain sorghum for grain; sweet or fodder sorghum, Sudan grass and, more recently, Columbus grass for silage, green feed and grazing; and broom millet for brooms and brushware. However, the grain is used primarily as stockfeed and is an important source for supplementing other coarse grains for this purpose.

Grain sorghum has been grown extensively only in the last two decades, with Queensland producing around 56% of the harvest (table 15.22). Increases in production have enabled a substantial increase in exports over this period.

Maize

Maize is a summer cereal demanding specific soil and climatic conditions. Maize for grain is almost entirely confined to the south-east regions and the Atherton Tablelands of Queensland, and the north coast, northern slopes and tablelands and the Murrumbidgee Irrigation Area in New South Wales. Small amounts are grown for green feed and silage in all States except South Australia, generally in association with the dairy industry.

In 1998–99, maize for grain production increased by 24% to 338,000 tonnes (table 15.23).

15.21 BARLEY FOR GRAIN, Area and Production

Year	NSW	Vic.	Qld	SA	WA	Tas.	**Aust.**
			AREA ('000 ha)				
1993–94	623	639	232	1 115	799	15	**3 424**
1994–95	410	492	93	882	579	14	**2 470**
1995–96	593	628	168	964	745	14	**3 111**
1996–97	668	585	180	1 009	909	15	**3 366**
1997–98	701	618	135	1 017	1 036	13	**3 521**
1998–99	638	568	163	975	811	11	**3 167**
			PRODUCTION ('000 t)				
1993–94	1 357	1 386	261	2 242	1 381	41	**6 668**
1994–95	291	448	73	1 159	915	27	**2 913**
1995–96	1 074	1 342	195	1 851	1 323	38	**5 823**
1996–97	1 483	1 189	429	1 923	1 635	35	**6 696**
1997–98	1 365	928	205	2 027	1 926	31	**6 482**
1998–99	1 247	870	320	2 051	1 469	30	**5 987**

Source: AgStats (7117.0); Agricultural Commodities, Australia, 1998–99 (7121.0).

15.22 GRAIN SORGHUM, Area and Production

Year	NSW	Vic.	Qld	SA	WA	Tas.	**Aust.(a)**
			AREA ('000 ha.)				
1993–94	99	—	399	(b)	—	—	**499**
1994–95	161	6	519	(b)	—	(b)	**687**
1995–96	171	2	597	(b)	—	(b)	**770**
1996–97	117	1	424	—	1	(b)	**544**
1997–98	123	3	379	—	1	(b)	**507**
1998–99	216	**1	367	—	*2	(b)	**587**
			PRODUCTION ('000 t)				
1993–94	228	—	852	(b)	—	(b)	**1 084**
1994–95	347	8	916	(b)	2	(b)	**1 273**
1995–96	472	4	1 116	(b)	0	(b)	**1 592**
1996–97	417	3	1 003	—	2	(b)	**1 425**
1997–98	382	6	691	—	2	(b)	**1 081**
1998–99	822	**2	1 059	—	*6	(b)	**1 891**

(a) Includes the Northern Territory. (b) Not collected.

Source: AgStats (7117.0); Agricultural Commodities, Australia, 1998–99 (7121.0).

15.23 MAIZE FOR GRAIN, Area and Production

Year	NSW	Vic.	Qld	SA	WA	Tas.	**Aust.(a)**
			AREA ('000 ha.)				
1993–94	14	—	28	(b)	2	(b)	**44**
1994–95	21	1	27	(b)	2	(b)	**50**
1995–96	24	1	31	(b)	—	(b)	**56**
1996–97	31	1	34	—	1	—	**67**
1997–98	22	1	34	—	—	—	**57**
1998–99	27	1	37	**	*	—	**64**
			PRODUCTION ('000 t)				
1993–94	100	2	87	(b)	15	(b)	**204**
1994–95	145	5	80	(b)	11	(b)	**242**
1995–96	190	7	114	(b)	1	(b)	**311**
1996–97	256	7	130	—	5	—	**398**
1997–98	161	10	97	—	3	—	**272**
1998–99	186	3	145	**	*4	—	**338**

(a) Includes the Northern Territory. (b) Not collected.

Source: AgStats (7117.0); Agricultural Commodities, Australia, 1998–99 (7121.0).

Rice

Nearly all of Australia's rice is grown in New South Wales. Rice was first grown commercially in 1924–25 in the Murrumbidgee Irrigation Area, one of three irrigation areas in southern New South Wales.

The rice harvest in 1998–99 showed a slight increase in production over 1997–98 (table 15.24).

Vegetables

The area sown to vegetables reached a peak of over 200,000 hectares in 1945. It remained static at around 109,000 hectares from the mid-1970s to the mid-1980s, then increased toward the end of the decade, peaking in 1995–96 (table 15.25). Yields from most vegetable crops have continued to increase due to development of improved varieties, greater use of irrigation and better control of disease and insect pests.

In 1998–99, potatoes were by far the largest vegetable crop in terms of both area and production (tables 15.25 and 15.26).

15.24 RICE FOR GRAIN, Area and Production

Year	NSW	Vic.	Qld	SA	WA	Tas.	**Aust.(a)**
			AREA ('000 ha.)				
1993–94	125	(b)	(b)	(b)	(b)	(b)	**125**
1994–95	119	(b)	(b)	(b)	(b)	(b)	**119**
1995–96	136	(b)	(b)	(b)	(b)	(b)	**137**
1996–97	151	1	(b)	(b)	(b)	(b)	**152**
1997–98	146	1	(b)	(b)	(b)	(b)	**147**
1998–99	148	1	(b)	(b)	(b)	(b)	**148**
			PRODUCTION ('000 t)				
1993–94	1 042	(b)	(b)	(b)	(b)	(b)	**1 042**
1994–95	1 016	(b)	(b)	(b)	(b)	(b)	**1 016**
1995–96	965	(b)	(b)	(b)	(b)	(b)	**966**
1996–97	1 248	6	(b)	(b)	(b)	(b)	**1 255**
1997–98	1 320	4	(b)	(b)	(b)	(b)	**1 324**
1998–99	1 357	5	(b)	(b)	(b)	(b)	**1 362**

(a) Includes the Northern Territory. (b) Not collected.

Source: AgStats (7117.0); Agricultural Commodities, Australia, 1998–99 (7121.0).

15.25 SELECTED VEGETABLES FOR HUMAN CONSUMPTION, Area

Year	French and runner beans '000 ha.	Cabbages '000 ha.	Carrots '000 ha.	Cauliflowers '000 ha.	Onions '000 ha.	Green peas '000 ha.	Potatoes(a) '000 ha.	Tomatoes '000 ha.	Other '000 ha.	**Total vegetables '000 ha.**
1993–94	6.5	2.0	5.4	3.7	5.2	10.5	40.3	8.9	42.8	**125.3**
1994–95	6.1	2.1	6.9	3.7	5.2	9.8	37.6	8.7	49.0	**129.1**
1995–96	7.1	2.2	7.6	4.0	5.5	8.2	41.8	8.6	46.9	**131.4**
1996–97	7.9	1.9	7.0	4.0	4.8	9.3	41.1	8.8	44.9	**129.7**
1997–98	6.6	1.8	7.1	4.0	5.6	7.0	42.6	8.0	47.9	**130.6**
1998–99	5.9	1.7	6.5	4.2	5.4	6.2	41.3	8.5	50.5	**130.2**

(a) Excludes potatoes for seed.

Source: AgStats (7117.0); Agricultural Commodities, Australia, 1998–99 (7121.0).

15.26 SELECTED VEGETABLES FOR HUMAN CONSUMPTION, Production

Year	French and runner beans '000 t	Cabbages '000 t	Carrots '000 t	Cauliflowers '000 t	Onions '000 t	Green peas (pod weight) '000 t	Potatoes(a) '000 t	Tomatoes '000 t
1993–94	31.0	64.5	194.8	75.2	213.2	97.2	1 184.7	327.2
1994–95	29.4	70.8	238.5	66.1	200.4	97.9	1 122.4	340.0
1995–96	32.0	69.4	249.9	71.1	244.5	80.8	1 308.1	370.9
1996–97	37.6	60.4	257.4	64.4	196.5	94.2	1 286.1	393.1
1997–98	35.6	58.1	266.5	64.8	218.9	76.0	1 371.6	380.1
1998–99	30.4	53.2	256.6	73.4	224.0	65.7	1 326.8	394.4

(a) Excludes potatoes for seed.

Source: AgStats (7117.0); Agricultural Commodities, Australia, 1998–99 (7121.0).

Fruit (excluding grapes)

A wide variety of fruit is grown in Australia, ranging from pineapples, mangoes and pawpaws in the tropics to pome, stone and berry fruits in temperate regions. Table 15.27 shows the number of trees for the main types of orchard fruit, and the area under cultivation for bananas and pineapples.

The principal fruit crops in Australia are apples, oranges and bananas. However, some other fruit types have experienced considerable growth in recent years, for example mandarins and strawberries. The most significant crops in terms of gross value of production are apples, oranges and bananas. In 1998–99 the value of the apple crop increased by 19%, while the value of the orange crop increased by 21%, and that of the banana crop increased by 15% (table 15.28).

Grapes

Grapes, which are a temperate crop, require warm to hot summer conditions for ripening and predominantly winter rainfall. Freedom from late spring frosts is essential. Grapes are grown for winemaking, drying and, to a lesser extent, for table use. Some of the better known wine producing areas are the Barossa, Clare, Riverland, Southern Districts and Coonawarra (South Australia); north-eastern Victoria and Great Western (Victoria); Hunter and Riverina (New South Wales); Sunraysia (New South Wales and Victoria); and Swan Valley and Margaret River (Western Australia).

The gross value of grape production for 1998–99 increased by 12% to $1.1b (table 15.29). Table 15.30 shows the area of vines and the grapes produced by grape variety.

15.27 SELECTED FRUIT, Number of Trees(a), Area

	Orchard fruit				Area of selected tropical fruits(b)		
Year	Apples '000 trees	Oranges '000 trees	Pears(c) '000 trees	Peaches '000 trees	Bananas ha	Pineapples ha	**Total area of fruit (excluding grapes) ha**
1993–94	5 033	6 587	1 376	1 082	8 756	3 668	**132 419**
1994–95	5 101	6 297	1 317	1 245	8 281	3 209	**128 258**
1995–96	5 302	6 477	1 384	1 296	8 893	2 824	**133 461**
1996–97	5 656	6 736	1 416	1 475	9 589	2 668	**137 086**
1997–98	5 845	6 667	1 381	1 498	10 478	2 762	**144 082**
1998–99	5 969	6 400	1 401	1 509	11 405	2 821	**145 265**

(a) Number of trees six years and over. (b) Bearing area. (c) Excludes Nashi.

Source: AgStats (7117.0); Agricultural Commodities, Australia, 1998–99 (7121.0).

15.28 SELECTED FRUIT, Quantity and Value of Production

Year	Apples	Apricots	Bananas	Cherries	Oranges	Peaches	Pears(a)	Pineapples	Plums and prunes
				QUANTITY OF PRODUCTION ('000 t)					
1993–94	306.9	21.2	219.2	6.4	582.1	59.4	155.2	157.4	26.1
1994–95	316.6	29.8	208.1	5.8	517.2	58.7	151.7	138.5	21.3
1995–96	280.0	21.6	220.0	4.8	442.1	60.4	156.0	127.9	21.4
1996–97	353.1	25.9	199.6	6.7	522.6	72.1	167.6	123.0	25.2
1997–98	308.9	19.9	223.0	7.0	499.8	64.8	152.9	123.0	26.4
1998–99	334.4	21.5	225.2	6.0	455.8	66.0	156.7	131.4	22.7
				GROSS VALUE OF PRODUCTION ($m)					
1993–94	237.6	27.1	203.3	27.0	230.0	53.2	89.0	45.2	37.2
1994–95	269.8	28.8	254.7	27.2	214.8	50.0	73.4	43.3	31.9
1995–96	305.3	30.7	224.9	22.7	219.5	50.3	90.7	36.4	33.4
1996–97	393.4	39.0	216.6	29.1	256.3	60.1	106.2	39.3	38.6
1997–98	272.7	31.0	230.3	28.4	253.5	53.4	107.8	37.3	44.1
1998–99	324.9	27.7	264.3	35.3	306.8	65.1	114.2	39.4	43.2

(a) Excludes Nashi.

Source: Value of Agricultural Commodities Produced, Australia (7503.0); Agriculture, Australia, 1998–99 (7113.0).

15.29 VITICULTURE, Area, Production and Value

	Area(a)		Production of grapes(b) used for		Total production(c)	
Year	Bearing '000 ha.	Total '000 ha.	Winemaking '000 t fresh weight	Drying '000 t fresh weight	Quantity '000 t fresh weight	Gross value $m
1993–94	61	67	662	213	920	450.1
1994–95	63	73	578	147	769	511.1
1995–96	65	81	782	248	1 087	714.3
1996–97	72	90	743	136	943	721.5
1997–98	78	99	871	177	1 112	998.2
1998–99	95	123	1 076	119	1 266	1 115.6

(a) At harvest. (b) Excludes the Northern Territory and the Australian Capital Territory. (c) Includes grapes used for table and other purposes.

Source: Value of Agricultural Commodities Produced, Australia (7503.0); Agricultural Commodities, Australia, 1998–99 (7121.0).

15.30 VITICULTURE, Area and Production—1998–99(a)

	Area of vines at harvest			Production of grapes used for(b)			
Variety	Bearing ha.	Not yet bearing ha.	All vines ha.	Winemaking tonnes fresh weight	Drying tonnes fresh weight	Other tonnes fresh weight	**Total tonnes fresh weight**
Red grapes							
Cabernet Sauvignon	13 629	7 541	21 169	127 494	—	193	**127 687**
Currant (including Carina)	889	49	938	5 515	7 189	10	**12 714**
Grenache	2 025	231	2 255	24 196	53	33	**24 281**
Mataro	683	183	866	9 217	—	69	**9 286**
Pinot Noir	2 226	770	2 996	19 668	26	267	**19 960**
Shiraz	16 944	8 651	25 596	192 330	36	477	**192 843**
Other red grapes	8 967	5 138	14 105	71 389	721	20 880	**92 992**
Total red grapes	45 363	22 563	67 925	449 809	8 025	21 929	**479 762**
White grapes							
Chardonnay	15 298	1 558	16 855	210 770	—	299	**211 069**
Doradillo	306	8	314	6 597	—	1	**6 598**
Muscat Gordo Blanco	2 924	81	3 005	58 017	2 575	112	**60 703**
Palomino and Pedro Ximenes	307	2	309	4 562	—	—	**4 562**
Riesling	3 190	157	3 347	30 144	—	—	**30 144**
Semillon	5 307	737	6 044	80 191	—	—	**80 191**
Sultana	12 943	696	13 639	117 783	105 982	26 339	**250 103**
Waltham Cross	407	22	429	2 366	2 277	1 200	**5 842**
Other white grapes	9 256	1 791	11 048	115 968	580	20 011	**136 560**
Total white grapes	49 938	5 052	54 990	626 398	111 414	47 962	**785 774**
Total grapes	95 301	27 614	122 915	1 076 207	119 438	69 891	**1 265 536**

(a) Year ended 31 March. (b) Excludes the Northern Territory and the Australian Capital Territory, where varietal data are not collected.

Source: Australian Wine and Grape Industry, 1999 (1329.0).

Selected other crops

Oilseeds

The oilseeds industry is a relatively young industry by Australian agricultural standards. The specialist oilseed crops grown in Australia are sunflower, soybeans, canola, safflower and linseed. Sunflower and soybeans are summer grown while the others are winter crops. In Australia, oilseeds are crushed for their oil, which is used for edible and industrial purposes, and as protein meals for livestock feeds.

While oilseed crops are grown in all States, the largest producing regions are the grain growing areas of the eastern States. Australian production of oilseeds reached 2.0 million tonnes in 1998–99, doubling the production of the previous year (table 15.31). Canola is the main oilseed crop and its production has rapidly increased over the last 12 years. In 1998–99 total canola production was 1.7 million tonnes, an increase of 98% over the previous year (table 15.15).

Cotton

Cotton is grown in New South Wales and Queensland, primarily for its fibre (lint). When the cotton is mature, seed cotton is taken to a gin where it is separated (ginned) into cotton lint and cotton seed. Lint is used for yarn while cotton seed is further processed at an oil mill. There, the short fibres (linters) remaining on the cotton seed after ginning are removed. These fibres are too short to make into cloth but are used for wadding, upholstery and paper. The seeds are then separated into kernels and hulls. Hulls are used for stock feed and as fertiliser, while kernels are crushed to extract oil. The oilcake residue (crushed kernels) is ground into meal, which is a protein roughage also used as stock feed.

The quantity and value of seed cotton production have risen significantly over the past three years (table 15.32), making it Australia's second most valuable crop in gross value terms after wheat. The yield has increased from 2.7 tonnes per hectare in 1993–94 to 3.5 tonnes per hectare in 1998–99.

Sugar

Sugar cane is grown commercially in Australia along the east coast over a distance of some 2,100 kilometres in a number of non-contiguous areas from Maclean in northern New South Wales to Mossman in Queensland. More recently, it has also been grown in Western Australia. This geographical spread contributes to the overall reliability of the sugar cane crop and to Australia's record as a reliable sugar supplier.

15.31 OILSEEDS, Area and Production

Year	NSW	Vic.	Qld	SA	WA	Tas.	**Aust.**
			AREA ('000 ha)				
1993–94	177	66	88	24	37	—	**392**
1994–95(a)	217	95	92	33	104	—	**540**
1995–96(a)	227	105	57	35	99	—	**522**
1996–97(b)	247	115	112	42	107	—	**622**
1997–98(b)	310	125	89	67	248	—	**839**
1998–99(b)	496	222	145	136	537	1	**1 538**
			PRODUCTION ('000 t)				
1993–94	301	83	82	32	48	—	**545**
1994–95(a)	147	69	64	30	108	—	**417**
1995–96(a)	339	143	46	51	117	—	**697**
1996–97(b)	432	147	120	57	108	—	**864**
1997–98(b)	419	142	82	92	270	—	**1 005**
1998–99(b)	793	268	166	196	615	1	**2 039**

(a) Excludes linseed. (b) Excludes peanuts and cotton seed.

Source: AgStats (7117.0); Agricultural Commodities, Australia, 1998–99 (7121.0).

15.32 COTTON, Area and Production

		Seed cotton(a)		
	Area	Quantity	Gross value	Cotton Lint
Year	'000 ha.	'000 t	$m	'000 t
1993–94	293	788	652	286
1994–95	245	796	851	317
1995–96	315	923	1 003	381
1996–97	378	1 485	1 342	560
1997–98	381	1 519	1 228	564
1998–99	446	1 547	1 353	634

(a) Before ginning.

Source: Value of Agricultural Commodities Produced, Australia (7503.0); AgStats (7117.0); Agricultural Commodities, Australia, 1998–99 (7121.0); Agriculture, Australia, 1998–99 (7113.0).

15.33 SUGAR CANE, Area, Production and Yield

	New South Wales			Queensland			Western Australia		
Year	Area harvested '000 ha.	Production '000 t	Yield t/ha.	Area harvested '000 ha.	Production '000 t	Yield t/ha.	Area harvested '000 ha.	Production '000 t	Yield t/ha.
1993–94	15	1 674	112.7	323	29 638	91.8	(a)	(a)	(a)
1994–95	16	1 825	111.2	347	31 146	89.8	(a)	(a)	(a)
1995–96	18	1 923	107.8	359	33 898	94.6	1	69	69.0
1996–97	18	2 231	124.0	371	36 232	97.6	1	170	164.7
1997–98	19	2 416	127.0	394	36 790	93.4	3	326	126.7
1998–99	20	2 555	126.0	379	35 587	93.9	3	392	135.5

(a) Data not collected.

Source: AgStats (7117.0); Agricultural Commodities, Australia, 1998–99 (7121.0).

15.34 FODDER CROPS, Area and Production

	Hay(a)				
	Production			Green feed or silage(b)	
Year	Area '000 ha.	Quantity '000 t	Gross value $m	Area '000 ha.	Silage made '000 t
1993–94	321	1 227	136.3	707	1 142
1994–95	484	1 074	158.1	n.a.	n.a.
1995–96	531	1 965	237.1	1 000	n.a.
1996–97	362	1 329	154.9	n.a.	1 686
1997–98	460	1 737	213.5	n.a.	2 129
1998–99	470	1 954	209.7	n.a.	2 770

(a) Principally oaten and wheaten hay. (b) Principally from oats, barley, wheat and forage sorghum.

Source: AgStats (7117.0); Agricultural Commodities, Australia, 1998–99 (7121.0).

About 95% of production occurs in Queensland (table 15.33), with 75% of the crop grown north of the Tropic of Capricorn in areas where rainfall is reliable and the warm, moist and sunny conditions are ideal for growing sugar cane.

Fodder crops

Considerable areas of Australia are devoted to fodder crops, which are either used for grazing (as green feed) or harvested and conserved as hay and silage (table 15.34).

To counter Australia's seasonal conditions and unreliable rainfall, farmers use fodder conservation to supplement pasture and natural sources of stockfeed.

Livestock

The numbers of each of the principal categories of livestock in Australia are shown in table 15.35 at 10-yearly intervals from 1861 to 1991, and then yearly.

15.35 LIVESTOCK NUMBERS—At 31 March(a)

31 March	Cattle '000	Sheep and lambs '000	Pigs '000
1861	3 958	20 135	351
1871	4 276	41 594	543
1881	7 527	62 184	816
1891	10 300	97 881	891
1901	8 640	70 603	950
1911	11 745	98 066	1 026
1921	13 500	81 796	674
1931	11 721	110 568	1 072
1941	13 256	122 694	1 797
1951	15 229	115 596	1 134
1961	17 332	152 579	1 615
1971	24 373	177 792	2 590
1981	25 168	134 407	2 430
1991	(a)(b)23 662	163 238	2 531
1992	(a)(b)23 880	148 203	2 570
1993	(a)(b)24 062	138 099	2 646
1994	(a)(b)25 758	132 569	2 775
1995	(a)(b)25 731	120 862	2 653
1996	(b)26 377	121 116	2 526
1997	(b)26 695	120 228	2 555
1998	(b)26 851	117 491	2 768
1999	(b)26 578	115 456	2 626

(a) Prior to 1943, livestock numbers were recorded at different times of the year in different States. (b) Excludes house cows.

Source: AgStats (7117.0); Agricultural Commodities, Australia, 1998–99 (7121.0); Primary Industries Part I—Rural Industries 1961–62, Bulletin No. 56 (CBCS).

15.36 CATTLE, By Age, Sex and Purpose—At 31 March

	1994	1995	1996	1997	1998	1999
	'000	'000	'000	'000	'000	'000
Milk cattle						
Cows (in milk and dry)	1 786	1 821	1 884	1 977	2 060	2 155
Other milk cattle	892	919	923	982	1 015	1 065
Total	*2 678*	*2 740*	*2 808*	*2 958*	*3 076*	*3 220*
Meat cattle						
Bulls used or intended for service	557	555	553	551	547	528
Cows and heifers (1 year and over)	12 076	11 213	11 667	11 879	11 783	11 621
Calves under 1 year	5 388	5 806	5 768	6 029	6 026	5 740
Other cattle (1 year and over)	5 058	5 418	5 581	5 278	5 420	5 469
Total	*23 080*	*22 991*	*23 569*	*23 736*	*23 776*	*23 358*
Total all cattle(a)	**25 758**	**25 731**	**26 377**	**26 695**	**26 851**	**26 578**

(a) Excludes house cows.

Source: AgStats (7117.0); Agricultural Commodities, Australia, 1998–99 (7121.0).

15.37 CATTLE, By State/Territory(a)

	NSW	Vic.	Qld	SA	WA	Tas.	NT	**Aust.(b)**
31 March	'000	'000	'000	'000	'000	'000	'000	**'000**
1994	6 515	4 189	9 942	1 202	1 806	679	1 435	**25 758**
1995	6 236	4 280	9 974	1 216	1 899	693	1 421	**25 731**
1996	6 390	4 396	10 214	1 219	1 924	718	1 503	**26 377**
1997	6 511	4 411	10 415	1 181	1 909	725	1 530	**26 695**
1998	6 351	4 142	10 867	1 214	1 973	728	1 567	**26 851**
1999	6 291	4 125	10 748	1 183	1 931	724	1 567	**26 578**

(a) Excludes house cows. (b) Includes the Australian Capital Territory.

Source: AgStats (7117.0); Agricultural Commodities, Australia, 1998–99 (7121.0).

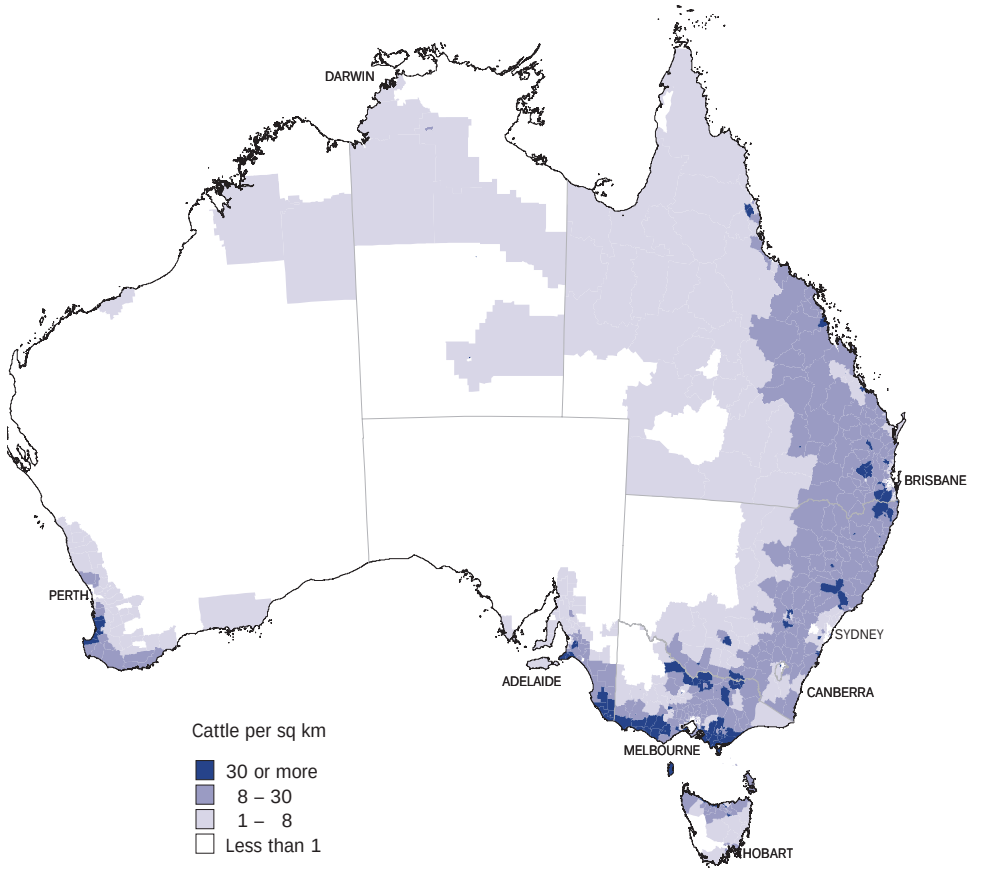
Cattle

Cattle farming is carried out in all States and Territories. While dairy cattle are restricted mainly to southern and coastal districts, beef cattle are concentrated in Queensland and New South Wales. Table 15.36 shows the number of cattle by age, sex and purpose.

Cattle numbers in Australia increased slowly during the 1960s and 1970s, despite seasonal changes and heavy slaughtering, to a peak of 33.4 million in 1976. Beef cattle production is often combined with cropping, dairying and sheep. In the northern half of Australia, cattle properties and herd sizes are very large, pastures are generally unimproved, fodder crops are rare and beef is usually the only product. The industry is more intensive in the south because of the more favourable environment, including improved pasture (see map 15.38).

Drought conditions in the early 1980s led to a decline in the beef herd until 1984. For the next five years, the size of the herd remained relatively stable. Since 1989, cattle numbers have gradually increased despite unfavourable weather conditions continuing in many parts of Australia. Table 15.37 shows the number of cattle by State and Territory.

15.38 CATTLE FOR ALL PURPOSES, Excluding House Cows—31 March 1997



(a) This map has been generated using small area data from the 1996–97 Agricultural Census.

Source: AgStats (7117.0).

Dairying

Dairying is a major Australian agricultural industry. The preliminary estimate of the gross value of dairy production at farm gate prices in 1998–99 was $2.9b (table 15.39), 10% of the gross value of agricultural production, ranking third behind the value of beef and wheat. Table 15.36 shows that the number of milk cattle in 1999, at 3.2 million, was 5% greater than in 1998.

The entry of the United Kingdom, Australia's then largest market, into the European Union in 1973 forced the Australian dairy industry to become more internationally competitive and to develop new export trade links. Around 50% of Australian milk production is now exported in manufactured forms, with just under 80% of these sales destined for markets in Asia and the Middle East.

Dairy production

There are areas in Australia where climate and natural resources are favourable to dairying and allow production to be based on year-round pasture grazing. This encourages efficient, low cost milk production. With the exception of several inland river schemes, pasture growth generally depends on natural rainfall. Most dairy production in non-irrigated regions is located in coastal fringe areas. Feedlot-based dairying is

expanding although it remains uncommon in Australia. The use of supplementary feed, such as grains, has become more common throughout the industry in recent years.

While seasonal conditions continue to have some influence on yearly output, Australian milk production has risen steadily over recent years and in 1998–99 was 10.2 billion litres (table 15.39), an increase of 8% over the previous year.

Domestic dairy market

Average annual per capita milk consumption by Australians has stabilised at around 100 litres since the mid-1980s. However, there have been substantial changes in the types of fresh milk consumed, with fat-reduced and modified milks taking an increasing share of overall market milk sales.

In 1998–99, Australians consumed 10.7 kg of cheese per person, the same as in 1997–98. Per capita milk consumption showed a slight decrease, down from 103.0 litres in 1997–98, to 102.4 litres in 1998–99 (see table 15.52).

Sheep

Sheep numbers reached a peak of 180 million in Australia in 1970. In general, numbers have fallen since this time. Poor market prospects for wool since 1990 have had a marked impact on the flock size. It fell rapidly until 1995, New South Wales showing the largest fall in that year (table 15.40), after which the decrease has been slower (tables 15.40 and 15.41).

Map 15.42 shows the distribution of sheep and lambs in Australia at 31 March 1997.

15.39 WHOLE MILK, Production, Use and Gross Value

			Whole milk intake by factories	
Year	Market milk sales by factories mill. litres	Milk used in the manufacture of dairy products mill. litres	Total intake mill. litres	Gross value $m
1993–94	1 845	6 232	8 077	2 448
1994–95	1 893	6 313	8 206	2 419
1995–96	1 905	6 810	8 715	2 848
1996–97	1 920	7 116	9 036	2 809
1997–98	1 918	7 521	9 439	2 817
1998–99	1 930	8 248	10 178	2 897

Source: Australian Dairy Corporation; Value of Principal Agricultural Commodities Produced, Australia, Preliminary, 1998–99 (7501.0); Agriculture, Australia, 1998–99 (7113.0).

15.40 SHEEP AND LAMBS, By State

31 March	NSW mill.	Vic. mill.	Qld mill.	SA mill.	WA mill.	Tas. mill.	**Aust.(a)** **mill.**
1994	46.5	23.4	11.5	14.7	32.0	4.3	**132.6**
1995	40.5	21.4	11.6	13.2	30.2	3.9	**120.9**
1996	41.1	22.0	10.7	13.6	29.8	3.9	**121.1**
1997	42.4	22.3	10.5	13.1	27.8	4.0	**120.2**
1998	40.8	21.1	11.0	13.1	27.5	3.9	**117.5**
1999	40.6	21.0	10.6	13.1	26.4	3.8	**115.5**

Source: AgStats (7117.0); Agricultural Commodities, Australia, 1998–99 (7121.0).

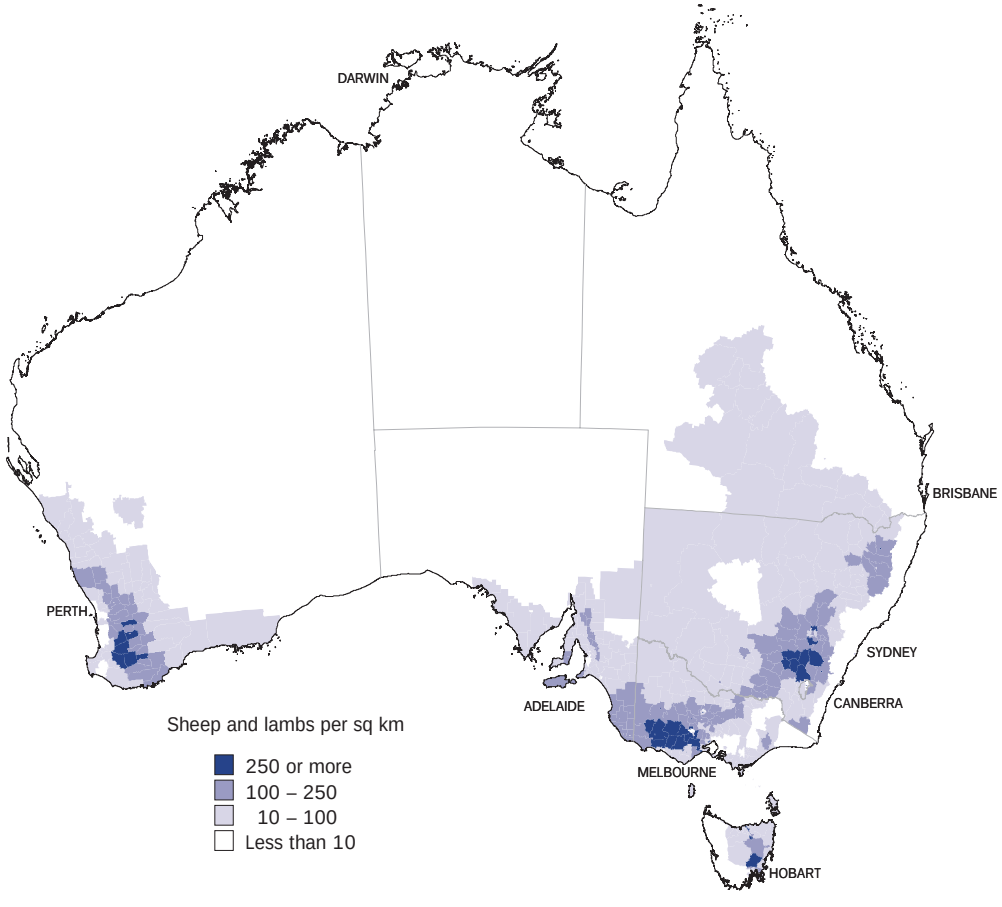
15.41 SHEEP AND LAMBS—1994 to 1999

At 31 March	1994 mill.	1995 mill.	1996 mill.	1997 mill.	1998 mill.	1999 mill.
Sheep (1 year and over)						
Breeding ewes	60.8	(a)	57.2	57.4	55.7	55.6
Other sheep (b)	42.1	94.0	34.5	32.4	31.8	30.4
Lambs (under 1 year)	29.7	26.8	29.4	30.5	30.0	29.5
Total sheep and lambs	**132.6**	**120.9**	**121.1**	**120.2**	**117.5**	**115.5**

(a) Not separately collected. (b) Includes rams, wethers and non-breeding ewes.

Source: AgStats (7117.0); Agricultural Commodities, Australia, 1998–99 (7121.0).

15.42 SHEEP AND LAMBS, Total Number—31 March 1997



(a) This map has been generated using small area data from the 1996–97 Agricultural Census.

Source: AgStats (7117.0).

Pigs

Pig farming is a highly intensive industry, with the majority of pigs grown in specially designed sheds which provide a controlled environment. The pig farming industry is a large user of feed grain and tends to expand when grain prices are low. The numbers of pigs decreased by 5% to 2.6 million in 1998–99, while the number of establishments classified to pig farming fell by 10% to 3,500. Recent adjustments in the Australian pig industry have seen many smaller producers leave the industry and existing producers increase their size of operations in an attempt to remain viable.

As table 15.43 shows, New South Wales is the largest producer of pigs, followed by Queensland.

Poultry

Poultry farming is a highly intensive industry, with the majority of poultry raised in large sheds which provide the birds with a stable environment protected from the elements. The poultry farming industry consists of two streams, meat production and egg production, both being major users of feed grains. The industry has grown over recent years, with production expanding to meet increased demand (tables 15.44 and 15.52).

Meat production and slaughtering

Tables 15.45 and 15.46 show details of slaughtering and meat production from abattoirs, and from commercial poultry and other slaughtering establishments. They include estimates of animals slaughtered on farms and by country butchers. The data relate only to slaughtering for human consumption and do not include animals condemned or those killed for boiling down.

Production of beef for 1998–99 increased by 3% over the previous 12 months, to a record 2.0 million tonnes. Production of beef has reached record levels in recent years, partly as a result of the drop in live cattle exports and partly because poor seasonal conditions and low market prices have provided little incentive for producers to build up herd numbers.

Changing patterns of both consumer demand and sheep and lamb supply have seen production of lamb meat exceed that of mutton for the first time. In 1998–99 lamb production increased by 10% to 312,000 tonnes, while mutton production fell by 9% to 302,000 tonnes.

15.43 PIGS

	NSW	Vic.	Qld	SA	WA	Tas.	**Aust.(a)**
31 March	'000	'000	'000	'000	'000	'000	**'000**
1994	834	460	682	440	312	46	**2 775**
1995	791	439	644	423	316	38	**2 653**
1996	710	458	603	412	314	26	**2 526**
1997	729	485	600	417	297	24	**2 555**
1998	849	518	648	424	303	24	**2 768**
1999	778	521	621	406	277	22	**2 626**

(a) Includes the Northern Territory and the Australian Capital Territory.

Source: AgStats (7117.0); Agricultural Commodities, Australia, 1998–99 (7121.0).

15.44 POULTRY

	Chickens(a)			Other poultry(c)			
	Hens and pullets for egg production	Meat strain chickens (broilers)(b)	Total chickens	Ducks	Turkeys	Other poultry	**Total all poultry**
31 March	'000	'000	'000	'000	'000	'000	**'000**
1994	13 163	55 513	68 676	447	839	374	**70 336**
1995(d)	11 148	54 445	65 593	(e)	(e)	2 088	**67 682**
1996	13 413	62 331	75 744	411	1 222	1 040	**78 417**
1997	14 059	67 373	81 432	390	1 211	909	**83 942**
1998	14 036	75 504	89 540	456	1 268	673	**91 937**
1999	13 609	77 863	91 472	370	1 288	448	**93 578**

(a) Includes breeding stock. (b) Excludes meat strain chickens in Tasmania. (c) Excludes turkeys in South Australia. (d) Excludes other poultry in South Australia. (e) Not collected.

Source: Livestock Products, Australia (7215.0); Agricultural Commodities, Australia, 1998–99 (7121.0).

Significant changes have taken place in the pig meat producing industry in recent years. Capital investment and corporate takeovers have seen the emergence of a few large companies producing a significant proportion of all pig meat sold in Australia. These moves, on top of the trend to more intensive and efficient production techniques, have seen pig meat production rise steadily since 1982 to reach a peak of 365,000 tonnes in 1994–95. After a decline in production during 1995–96 and 1996–97, production of pig meat increased again, reaching a record level of 370,000 tonnes in 1998–99.

Table 15.47 shows the gross value of livestock slaughtering over recent years. The value of slaughtering and other disposals dropped sharply in 1995–96, primarily due to a drop in the value of cattle and calves slaughtered. The value has increased in each of the last three years, with 1998–99 showing a 5% increase over 1997–98.

The biggest customers for Australian beef in recent years have been Japan, the United States and the Republic of Korea. In 1998–99 Japan continued to be the main customer for Australian beef with 333,000 tonnes purchased, slightly down on the previous year's shipment. The United States was Australia's second biggest customer with 305,000 tonnes purchased, up 21% from the previous year. The Republic of Korea was the third largest importer of Australian beef, purchasing 79,000 tonnes.

Table 15.48 shows the volume of exports of fresh, chilled or frozen meat. Beef is the major meat export. Bone-out beef was the major commodity exported, increasing by 5% to 837,000 tonnes in 1998–99. Pork exports rose by 34% to 16,500 tonnes, but are still one of the smaller export items.

Table 15.49 shows the number, gross weight, gross value and unit value of live sheep and cattle exports. While the number of live sheep exports fell marginally in 1998–99, average unit value fell by 6% to $36.64. As a result gross value also fell 6% to $181.7m. The number of live cattle exported in 1998–99 increased by 3% to 713,000; gross weight and gross value increased by similar proportions.

15.45 PRODUCTION OF MEAT(a)

	Carcass weight						Dressed weight(b)(c)	
Year	Beef '000 t	Veal '000 t	Mutton '000 t	Lamb '000 t	Pig meat '000 t	Total meat '000 t	Total all chickens '000 t	Total poultry(d) '000 t
1993–94	1 786	39	381	267	357	2 830	469	500
1994–95	1 766	38	354	268	365	2 791	467	499
1995–96	1 711	34	310	265	347	2 667	481	516
1996–97	1 772	38	296	270	336	2 712	488	524
1997–98	1 911	44	333	284	358	2 930	550	587
1998–99	1 973	38	302	312	370	2 994	564	607

(a) Excludes offal. (b) Excludes Tasmania, the Northern Territory and the Australian Capital Territory. (c) Dressed weight of whole birds, pieces and giblets. (d) Includes other fowls, turkeys, ducks and drakes.

Source: Unpublished data, Livestock Products Collection.

15.46 LIVESTOCK AND POULTRY SLAUGHTERED FOR HUMAN CONSUMPTION

Year	Cattle mill. head	Calves mill. head	Sheep mill. head	Lambs mill. head	Pigs mill. head	Chickens(a)(b) mill. head	Other fowls(c) and turkeys(b) mill. head	Ducks and drakes(b) mill. head
1993–94	7.3	1.0	17.8	15.0	5.2	329.5	8.0	2.5
1994–95	7.2	1.0	17.5	15.3	5.1	330.5	8.7	2.3
1995–96	6.9	1.0	14.6	14.2	4.8	336.4	9.6	2.6
1996–97	7.3	1.1	14.4	14.6	4.8	340.9	10.0	3.1
1997–98	8.1	1.3	16.3	15.0	5.1	364.2	10.7	2.9
1998–99	7.9	1.2	14.4	16.1	5.2	375.0	10.2	3.5

(a) Comprises broilers, fryers and roasters. (b) Excludes Tasmania, the Northern Territory and the Australian Capital Territory. (c) Comprises hens, roosters, etc.

Source: Livestock Products, Australia (7215.0).

15.47 GROSS VALUE OF LIVESTOCK SLAUGHTERINGS AND OTHER DISPOSALS(a)

Year	Cattle and calves $m	Sheep and lambs $m	Pigs $m	Poultry $m	**Total(b) $m**
1993–94	4 433.5	793.6	660.5	929.3	**6 852.9**
1994–95	4 213.5	836.8	630.6	902.0	**6 618.8**
1995–96	3 575.9	1 035.7	597.8	948.1	**6 192.7**
1996–97	3 597.0	1 127.5	777.4	1 067.5	**6 583.1**
1997–98	4 138.2	1 066.2	709.8	1 122.2	**7 060.1**
1998–99	4 476.6	1 045.5	689.7	1 174.3	**7 401.4**

(a) Includes adjustment for net exports of live animals. (b) Includes goats and buffalo.

Source: Value of Agricultural Commodities Produced, Australia (7503.0); Agriculture, Australia, 1998–99 (7113.0).

15.48 EXPORTS OF FRESH, CHILLED OR FROZEN MEAT(a)

	Beef(b)(c)		Veal(b)		Mutton(b)		Lamb(b)		Pork
	Bone-in	Bone-out	Bone-in	Bone-out	Bone-in	Bone-out	Bone-in	Bone-out	Meat
Year	'000 t	'000 t	'000 t	'000 t	'000 t	'000 t	'000 t	'000 t	'000 t
1993–94	62.7	742.4	1.3	5.8	97.9	71.0	52.7	5.2	5.9
1994–95	59.8	717.4	2.0	6.9	103.4	65.4	48.6	4.6	5.5
1995–96	50.7	702.6	1.7	5.3	81.0	64.3	46.3	7.8	5.7
1996–97	48.6	692.1	1.2	3.8	92.7	50.8	53.5	8.4	6.7
1997–98	46.9	795.9	1.8	5.5	107.8	59.1	62.2	8.8	12.3
1998–99	61.0	836.6	1.6	6.1	114.8	51.4	71.6	9.3	16.5

(a) Excludes offal. (b) Factors can be applied to beef, veal, mutton and lamb bone-out figures to derive bone-in carcass weight estimates which, when added to bone-in figures, show total exports in carcass weight. The factor for beef and veal is 1.5 and that for mutton and lamb is 2.0 (source: Australian Meat and Livestock Corporation). (c) Includes buffalo meat.

Source: Unpublished data, Merchandise Exports.

15.49 LIVE SHEEP AND CATTLE EXPORTS(a)

	Live sheep exports				Live cattle exports			
	No.	Gross weight	Gross value	Unit value(b)	No.	Gross weight	Gross value	Unit value(b)
Year	'000	'000 t	$'000	$	'000	'000 t	$'000	$
1993–94	5 429.8	287.4	148 907	27.42	234.7	79.9	115 020	489.97
1994–95	5 697.0	290.2	184 291	32.35	385.7	136.5	201 948	523.52
1995–96	5 879.9	296.9	226 913	38.59	615.9	219.0	343 699	558.07
1996–97	5 237.2	269.8	189 944	36.27	863.8	313.9	427 721	495.19
1997–98	4 961.1	256.0	193 266	38.96	694.0	255.4	334 058	481.10
1998–99	4 958.7	254.9	181 671	36.64	713.0	264.7	342 667	480.57

(a) Excludes live sheep and cattle for breeding. (b) Obtained by dividing the gross value by the number of sheep, or cattle.

Source: Unpublished data, Merchandise Exports.

Wool

The wool industry

Australia is the world's largest wool producing country, accounting for about 30% of world production. Wool production has been declining in Australia and the world for the last 10 years, and is expected to continue to do so in the medium term. Since 1990, Australian wool production has fallen by about 35%, to around 640,000 tonnes in 1998–99. Almost all of Australia's wool is exported, the major markets being China and Hong Kong, followed by Italy, some other western European countries and Japan.

Over the last decade, wool producers have had to face significant changes, including a decline in the underlying demand for wool, changes to wool marketing arrangements, disruption of traditional international markets, and strong competition from other fibres, all of which have had a major impact on the profitability of all sectors of the wool industry.

The recent decline in the underlying demand for wool reflects changes in lifestyle (such as the trend to more informal, easy-care clothing), and the increasing competition from other fibres, particularly high quality synthetic fibres. On top of this, economic upheaval in many countries traditionally considered to be large purchasers of wool (particularly the Asian economies) has resulted in limited demand for wool. These factors, together with a very large supply of wool left over from the high production of the late 1980s and early 1990s, have resulted in a dramatic fall in the price of wool in recent years. However, this fall appears to have reached the bottom, with wool prices generally improving in the first half of 2000. Reasons for this include a reduction in the quality of stored wool and an increase in demand.

Demand for wool has traditionally been a cyclical phenomenon, determined largely by economic cycles and world wide trends in clothing fashion. Attempts to minimise the damaging effect of these short term cycles on the income of woolgrowers have been in place for many years. In 1970 a reserve price scheme was introduced, the original intention of which was to protect wool growers from severe short term price reductions caused by fluctuations in the demand for wool. A minimum reserve price was introduced in 1974 to provide growers with a guaranteed minimum price for their wool. The scheme was funded by a proportion of the tax paid by growers on the value of shorn wool, and was administered by the Australian Wool Corporation (AWC), which purchased all wool not meeting the minimum reserve price at auction. This wool was later sold during periods of higher prices.

The reserve price scheme worked well for about 20 years. However a combination of a sharp fall in demand and a high reserve price (set during a period of high demand in the late 1980s), resulted in the scheme being suspended in February 1991, when the size of the AWC stockpile had reached 4.7 million bales. The Government, with the agreement of the industry, decided that the scheme could no longer be maintained.

The Australian Wool Realisation Commission (AWRC) was initially responsible for the disposal of the wool stockpile. In December 1993 the disposal of the stockpile became the responsibility of Wool International (WI), a statutory corporation of the Commonwealth Government. WI was required to sell the stockpile in accordance with a statutory imposed disposal schedule, the last bale of stockpile wool to be disposed of by 31 December 2000. At 30 June 1998, under the management of WI, the stockpile had been reduced to 1.2 million bales. By October 1998, equity in the wool stockpile had reached a level significantly higher than the wool debt, and therefore ongoing government involvement in stockpile management was no longer justified. On 15 October 1998 the Commonwealth Government announced a freeze on sales of wool from the stockpile, and an intention to privatise WI by 1 July 1999. On this date WI became WoolStock Australia Limited, a public company limited by shares allocated to previous holders of units of equity in WI.

WoolStock Australia took over the assets and liabilities from WI and is fully accountable to its shareholders for the efficient management and sale of the stockpile. The principal activities of WoolStock are selling the stockpile, and making distributions to unit/share holders. There is no fixed schedule of stockpile disposal as such decisions can now be taken on a purely commercial basis and in the interests of WoolStock's shareholders. As of 31 January 2000, the wool stockpile consisted of 927,000 bales of unsold wool.

A second reform process is currently underway to replace the Australian Wool Research and Promotion Organisation (AWRAP) with private sector arrangements with a target date of 1 January 2001. Following the continuing low demand and prices for wool and a successful 'no confidence' motion in the Board of AWRAP (in November 1998), the wool industry Future Directions Taskforce was established to undertake a major inquiry into the future of the Australian wool industry. The Taskforce presented its findings in June 1999. While most of the recommendations of the Taskforce report were focused on individual farm businesses and what they can do to improve their profitability, there were recommendations for government to consider, including the future of AWRAP and wool tax arrangements. On 23 September 1999, the Minister for Agriculture, Fisheries and Forestry announced an Eight Point Plan for progressing those recommendations of the Taskforce report that related to industry services and levy arrangements. A key element of the Plan was to conduct a grower ballot (WoolPoll 2000) to give woolgrowers the opportunity to vote on their preferences for future industry services and associated wool tax arrangements. The final result of WoolPoll 2000, released on 6 April 2000, showed 61% of votes, based on an optional preferential voting system, supporting the 2% service model.

15.50 SHEARING, WOOL PRODUCTION AND VALUE

			Wool production			
			Total wool			
Year	Sheep and lambs shorn	Average fleece weight	Shorn wool	Other wool(a)	Quantity	Gross value(b)
	mill.	kg	'000 t	'000 t	'000 t	$m
1993–94	148.7	5.27	784.2	52.6	836.8	2 449.1
1994–95	155.3	4.37	679.4	50.1	729.5	3 319.3
1995–96	146.7	4.40	646.1	43.6	689.7	2 559.7
1996–97	156.4	4.37	685.0	46.1	731.1	2 621.2
1997–98	155.5	4.12	640.7	48.9	689.6	2 753.9
1998–99	123.7	5.17	639.9	47.7	687.6	2 139.1

(a) Comprises dead and fellmongered wool, and wool exported on skins. (b) Gross value for shorn wool is based on the average price realised for greasy wool sold at auction; for skin wools the gross value is based on prices recorded by fellmongers and skin exporters.

Source: Value of Agricultural Commodities Produced, Australia (7503.0); Livestock Products, Australia (7215.0); Agriculture, Australia, 1998–99 (7113.0).

On 1 May 2000, the Minister announced the next stage in the wool reform process, the reduction of the wool tax rate from 4% to 3% from 1 July 2000 and a further reduction to 2% as soon as practicable after the establishment of the new arrangements. The 1 May announcement included the establishment of a Woolgrower Advisory Group (WAG) and an Interim Advisory Board (IAB), to drive the next stages in the reform process. The IAB and WAG are working in conjunction with the Government's Office of Asset Sales and Information Technology Outsourcing (OASITO) and the Department of Agriculture, Fisheries and Forestry–Australia (AFFA) throughout the process. The creation of the new entity will encourage the industry to become more self-reliant. While the growers still desire a compulsory levy, as indicated in WoolPoll 2000, the objective is to minimise government involvement in commercial wool industry matters.

Wool production

Shorn wool (greasy wool) contains an appreciable amount of grease, dirt, vegetable matter and other material. The exact quantities of these impurities in the fleece vary with climatic and pastoral conditions, seasonal fluctuations and the breed and condition of the sheep. It is, however, the clean wool fibre that is ultimately consumed by the textile industry, and the term 'clean yield' is used to express the net wool fibre content present in greasy wool.

The gross value of wool produced in 1998–99 ($2.1b) decreased by 22% from that produced in 1997–98 (table 15.50), but is still less than half the value recorded in 1988–89 ($5.9b), the peak year in the wool boom of the 1980s.

Wool receivals

The total amounts of taxable wool received by brokers and purchased by dealers in recent years are shown in table 15.51. They exclude wool received by brokers on which tax had already been paid by other dealers (private buyers) or brokers.

15.51 TAXABLE WOOL RECEIVALS

	Receivals			
Year	Brokers	Dealers	Brokers and dealers	Dealers as % of total receivals
	'000 t	'000 t	'000 t	%
1993–94	635.6	148.6	784.2	18.9
1994–95	567.0	112.5	679.4	16.6
1995–96	552.9	93.1	646.1	14.4
1996–97	565.2	119.9	685.0	17.5
1997–98	524.0	116.7	640.7	18.2
1998–99	526.9	113.0	639.9	17.7

Source: Livestock Products, Australia (7215.0).

Apparent consumption of foodstuffs

Estimates of the consumption of foodstuffs in Australia are compiled by taking the production of a commodity, adding to it any imports, deducting from it any exports, and taking account of changes in the levels of stocks. Because consumption of foodstuffs is measured, in general, at producer level, no allowance is made for consumer wastage, which results in overstating consumption to some extent.

The estimates of consumption per capita have been obtained by using the mean resident population for the period.

Table 15.52 shows the changes in trends in the consumption of various foodstuffs since 1938–39.

15.52 APPARENT PER CAPITA CONSUMPTION OF FOODSTUFFS

		Average three years ended								
Commodity	Units	1938–39	1948–49	1958–59	1968–69	1978–79	1988–89	1996–97	1997–98	1998–99
Meat (carcass equivalent weight)										
Beef	kg	n.a.	n.a.	n.a.	n.a.	n.a.	38.3	37.8	36.2	34.9
Veal	kg	n.a.	n.a.	n.a.	n.a.	n.a.	1.7	1.8	1.9	1.5
Beef and veal	kg	63.6	49.5	56.2	40.0	64.8	40.0	39.6	38.1	36.4
Lamb	kg	6.8	11.4	13.3	20.5	14.4	14.9	11.1	11.0	11.8
Mutton	kg	27.2	20.5	23.1	18.8	3.6	7.3	6.0	5.7	4.5
Pigmeat	kg	3.9	3.2	4.6	6.7	13.3	17.5	17.6	18.5	19.0
Total meat	kg	101.5	84.6	97.2	85.9	96.1	79.8	74.2	73.3	71.6
Offal and meat n.e.i.	kg	3.8	4.0	5.2	5.1	5.9	3.1	0.9	n.a.	n.a.
Total meat and meat products (carcass equivalent weight)	*kg*	*118.5*	*103.0*	*112.4*	*98.8*	*102.0*	*82.8*	*75.1*	*n.a.*	*n.a.*
Canned meat (canned weight)	kg	1.0	1.2	1.9	2.2	1.6	n.a.	n.a	n.a.	n.a.
Bacon and ham (cured carcass weight)	kg	4.6	5.3	3.2	3.6	6.0	6.9	8.5	8.7	8.7
Poultry (dressed weight)(a)	kg	n.a.	n.a.	n.a.	8.3	17.1	24.1	27.8	29.6	30.8
Milk and milk products										
Market milk (fluid whole litres)	L	106.4	138.7	128.7	128.2	100.5	101.7	104.2	103.0	102.4
Cheese (natural equivalent weight)	kg	2.0	2.5	2.6	3.5	5.3	8.8	10.6	10.7	10.7
Oils and fats										
Butter	kg	14.9	11.2	12.3	9.8	5.1	3.2	2.8	2.8	2.9
Margarine	kg	2.2	2.8	n.a.	4.9	8.5	9.0	6.6	6.7	6.4
Table margarine	kg	0.4	0.4	n.a.	1.5	5.4	6.8	4.7	4.4	4.5
Other margarine	kg	1.8	2.4	2.2	3.4	3.1	2.2	1.9	2.3	1.9
Beverages										
Tea	kg	3.1	2.9	2.7	2.3	1.7	1.2	0.8	0.8	0.9
Coffee	kg	0.3	0.5	0.6	1.2	1.6	2.0	2.0	2.3	2.4
Aerated and carbonated waters	L	n.a.	n.a.	n.a.	47.3	67.4	87.4	114.4	109.0	113.0
Beer	L	53.2	76.8	99.7	113.5	133.2	113.1	95.5	94.5	93.2
Wine	L	2.7	5.9	5.0	8.2	14.7	20.2	19.0	19.7	19.8
Spirits (litres alcohol)	L	0.5	0.8	0.7	0.9	1.2	1.2	1.2	1.3	1.2

(a) Excludes Tasmania, the Northern Territory and the Australian Capital Territory.

Source: Apparent Consumption of Foodstuffs, Australia (4306.0); the Australian Dairy Corporation.

Bibliography

ABS publications

Agriculture, Australia (7113.0).

Agricultural Industries, Financial Statistics, Australia (7507.0).

AgStats (7117.0).

Apparent Consumption of Foodstuffs, Australia (4306.0).

Apparent Consumption of Selected Foodstuffs, Australia, Preliminary (4315.0).

Australian Agriculture and the Environment (4606.0).

Australian Wine and Grape Industry (1329.0).

Integrated Regional Database (IRDB), Australia (1353.0).

International Merchandise Trade, Australia (5422.0).

Labour Force, Australia (6203.0).

Livestock and Livestock Products, Australia (7215.0).

Principal Agricultural Commodities, Australia, Preliminary (7111.0).

Value of Agricultural Commodities Produced, Australia (7503.0).

Value of Principal Agricultural Commodities Produced, Australia, Preliminary (7501.0).

Other publications and data sources

Australian Bureau of Agricultural and Resource Economics (ABARE):

—*Australian Commodities Forecasts and Issues*, various years.

—*Australian Commodity Statistics*.

Australian Dairy Corporation, *Dairy Compendium*.

International Wheat Council, *Grain Marketing Report, December 1992*.

Lewis, Holt and English 1992, *Composition of Foods, Australia*, AGPS, Canberra.

WoolStock Australia Ltd (the Internet site below has a 'Key Documents' page covering a brief history of WoolStock, the financial reports and the Constitution of the company).

Internet sites

ABARE, *http://www.abare.gov.au*

Australian Wool Exchange, *http://dev.inter-serv.com.au/awex_corp*

Australian Dairy Corporation, *http://www.dairycorp.com.au/adc*

Bureau of Rural Sciences, *http://www.affa.gov.au/outputs/ruralscience.html*

Commonwealth Department of Agriculture, Forestry and Fisheries–Australia, *http://www.affa.gov.au*

Woolstock Australia Ltd, *http://www.woolint.com.au*

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Introduction

This chapter outlines the main features of two important primary industries in Australia, forestry and commercial fishing.

The forests and wood products industries, based on native and plantation forests, account for about 1% of Gross Domestic Product (GDP) and employment of over 60,000 people. While the value of exports and imports of forest products is substantial (about $1.3b and $3.3b respectively in 1998–99), Australia is a net importer of forest products.

Australia's fisheries resources are diverse. Over 3,000 species of marine and freshwater fish, and at least an equal number of crustacean and mollusc species, occur in and around Australia. Less than 600 of these are commercially exploited. However, almost all the major known fish, crustacean and mollusc resources are fully exploited. Aquaculture, or 'fish farming', is an alternative to harvesting the naturally occurring fish stocks and has considerable potential as a way to ensure the sustainability of harvesting yields.

The gross value of Australian fisheries production was about $2.0b in 1998–99, of which aquaculture accounted for 30%, up from 27% in 1997–98. Exports and imports of fisheries products were valued at $1.5b and $0.8b respectively in 1998–99, making Australia a net exporter of these products.

Forestry

Forests are an important sustainable natural resource providing a wide range of indispensable products and benefits to the community.

Forest vegetation cover protects the soil from water and wind erosion, reduces flooding and siltation of water bodies and maintains water quality. Forests provide habitats for a wide variety of native animals and plants. They also act as a sink to absorb greenhouse gases.

The forests and wood products industries, based on native and plantation forests, contribute substantially to Australia's economy, especially to employment in regional areas. In addition to being a source for timber, forests are also valuable ecosystems providing a gene pool of great diversity for scientific investigation; a source of honey, oils, gums, resins and medicines; and a resource base for education, tourism, recreation and other purposes. Forests cannot necessarily provide for all uses at the same time, but careful management will ensure that forests provide multiple benefits in the long term for the Australian community.

Farm forestry is becoming increasingly important as a potential commercial source of wood. A broad range of programs has been implemented by governments and private organisations to promote tree planting on Australian farms.

Forest estate

Native forest

Native forest is defined by the National Forest Inventory (NFI) as "an area, incorporating all living and non-living components, dominated by trees having usually a single stem and a mature or potentially mature stand height exceeding two metres and with an existing or potential crown cover of overstorey strata about equal to or greater than 20%". This definition includes Australia's diverse native forests, regardless of age. It is also sufficiently broad to encompass areas of trees that are sometimes described as woodlands.

Based on this definition, the total area of native forest at 30 June 1997 was estimated at 155.8 million hectares (ha.)(table 16.1), which is about 20% of Australia's land area. Of this area, 112.6 million ha. (72%) were publicly-owned and 42 million ha. (27%) were on private land. Of the publicly owned forests, 17.6 million ha. (16%) were in Nature Conservation Reserves, 13.4 million ha. (12%) were managed by State forest authorities for various uses, including wood production, 15.6 million ha. (14%) were on other Crown land, and 66.1 million ha. (59%) were on leasehold tenure. Taking forested leasehold land together with private freehold forest, some 69%, or 108 million ha., of Australia's forests were under private management.

16.1 NATIVE FOREST AREAS, By Dominant Canopy and Tenure—30 June 1997

	NSW '000 ha.	Vic. '000 ha.	Qld '000 ha.	SA '000 ha.	WA '000 ha.	Tas. '000 ha.	NT '000 ha.	ACT '000 ha.	Aust. '000 ha.
CLASSIFIED BY DOMINANT CANOPY SPECIES									
Eucalypt									
Tall	2 097	2 825	1 126	2	171	250	—	72	6 543
Medium	12 842	2 986	28 511	497	20 815	1 901	23 849	48	91 450
Low	1 163	76	2 340	316	3 431	86	7 288	—	14 700
Mallee	1 827	958	—	4 005	4 973	—	—	—	11 764
Unknown	—	—	6	—	—	—	—	—	6
Total eucalypt	*17 929*	*6 845*	*31 984*	*4 820*	*29 390*	*2 237*	*31 138*	*120*	*124 463*
Acacia	944	17	4 603	307	3 986	3	2 439	—	12 298
Melaleuca	202	18	2 643	2	155	—	1 072	—	4 093
Rainforest	209	3	2 567	—	7	545	252	—	3 583
Casuarina	802	—	62	147	40	—	—	—	1 052
Mangrove	7	5	398	20	173	—	442	—	1 045
Callitris	382	37	309	139	—	—	—	—	867
Other	312	360	6 490	63	1 048	118	43	—	8 435
Total	**20 787**	**7 285**	**49 056**	**5 499**	**34 800**	**2 904**	**35 385**	**120**	**155 835**
CLASSIFIED BY TENURE									
Multiple Use Forest(a)	3 095	3 346	3 983	27	1 612	1 285	—	5	13 351
Nature Conservation Reserve(b)	3 060	2 710	2 870	1 252	4 364	523	2 709	93	17 580
Other Crown Land(c)	605	165	1 051	12	13 206	296	258	2	15 597
Leasehold(d)	5 966	—	23 996	1 866	14 025	—	20 236	13	66 103
Total public	*12 726*	*6 221*	*31 900*	*3 157*	*33 207*	*2 104*	*23 203*	*113*	*112 631*
Private	8 046	1 038	17 111	2 327	1 502	801	11 187	7	42 018
Unresolved tenure	15	26	44	15	90	—	995	—	1 186
Total	**20 787**	**7 285**	**49 056**	**5 499**	**34 800**	**2 904**	**35 385**	**120**	**155 835**

(a) Publicly owned land managed for multiple use including wood production. (b) Public land on which wood production is excluded (National Parks, etc.). (c) Reserved areas of educational, scientific and other public institutional land, including easements, defence land, and other minor tenure classifications. (d) Crown land where the right to harvest or clear land must be approved by State/Territory Governments. Often known as pastoral leases.

Source: National Forest Inventory 1997.

16.2 PLANTATION AREAS, Classified by Species Type—30 September 1999

	NSW '000 ha.	Vic. '000 ha.	Qld '000 ha.	SA '000 ha.	WA '000 ha.	Tas. '000 ha.	NT '000 ha.	ACT '000 ha.	Aust. '000 ha.
Softwood	247	219	186	106	95	75	5	15	948
Hardwood	44	65	11	12	153	102	1	—	389
Total	**291**	**285**	**197**	**118**	**247**	**177**	**6**	**15**	**1 337**

Source: Bureau of Rural Sciences, National Plantation Inventory Tabular Report, March 2000.

Plantations

The NFI's first report of the National Plantation Inventory (NPI) of Australia (1997) brought together comprehensive information on Australia's standing large-scale plantation forest resources at regional and national levels. The NPI project was established to allow up-to-date quantitative reporting of Australia's plantation resource (both hardwood and softwood) based on growers' information. This includes location, area, species and age of plantations. A tabular report is released in March of each year and a comprehensive spatial report is produced five yearly, with the next one due at the end of 2000.

The NPI Tabular Report for 2000 reveals there are now 1.3 million ha. of plantation in Australia (planted to the end of September 1999), of which 71% is softwood (0.95 million ha.) and 29% is hardwood (0.39 million ha.) (table 16.2). Australia's new plantation establishment (first rotation only, and excluding expansion on existing plantations) increased by 44% over the area of new plantations in 1998, to 94,812 ha. in 1999.

This growth resulted in an increase of almost 8% over the 1998 total plantation. Of the increase in new plantations in 1999, 89% was hardwood and 11% softwood.

Tree ownership in the 1999 plantation estate in Australia was equally distributed between public and private. A further 8% is held in joint private and public ownership. Of the new areas planted in 1999, 83% were planted by private tree owners, 10% by joint owners and 7% by public tree owners. Of the 1999 plantation estate, 58% is on public land and 42% on private land. The majority of new areas planted in 1999 were on private land, with only 10% on public land.

The 3-year National Farm Forest Inventory (NFFI) program, established by the NFI and the Commonwealth Farm Forestry Program in 1998, will report on farm-forest plantation resources. Together, the NFFI (farm forest plantations) and the NPI (large-scale plantations) will provide a comprehensive picture of the plantation resource in Australia.

Under the National Forest Policy Statement (NFPS) agreed to by the Commonwealth Government and the State and Territory Governments in 1992, Australia is committed to expanding its plantation estate to provide additional resources for the forestry sector. The Commonwealth Government has supported the expansion of Australia's plantation resource base for many years. For instance, the National Afforestation Program (NAP) was established in 1987–88 as a three year grants program to stimulate an expansion in the commercial hardwood timber resource and to assist in land rehabilitation through broadacre commercial plantations (including farm forestry).

The Commonwealth Government has continued to support and stimulate commercial plantation development on cleared agricultural land through the Farm Forestry Program (FFP) and the Community Rainforest Reafforestation Program (CRRP). The Government announced the implementation of a range of measures to encourage plantation and farm forestry development in the Wood and Paper Industry Strategy, issued in December 1995.

Thinking 'green' in 1901

At the start of the 20th century, each State of the Commonwealth (except Tasmania) had established forestry departments. The following extract from the *Official Year Book of the Commonwealth of Australia, 1901–1907* outlines their objective as follows: "Economic Forestry, aiming at the conservation of forestal wealth by safeguarding forests against inconsiderate destruction, and by the suitable re-afforestation of denuded areas, is essential to the preservation of industries dependent upon an adequate supply of timber, and to the perpetuation of a necessary form of national wealth".

While the concept of conservation was well known a hundred years ago, modern day critics of forestry policy would suggest that the principles of conservation have not been well practised, given the deforestation programs of the last century. However, criticism of the outcomes of past policies is not new; the 1901–1907 Year Book laments: "Though in Australia large areas of virgin forests still remain, the inroads made by timber-getters, by agriculturalists, and by pastoralists—who have destroyed large areas by 'ring-barking'—are considerable; and it is not unlikely that climatological changes are caused hereby".

This reference to climate changes has a strong 1990s 'feel' in its sentiment, if not its language. With supporting evidence, the argument is developed: "For it would appear that variations in climate, and alternating periods of drought and flood, desiccation and erosion of soil, with loss or diminution of fertility, have resulted from forest denudation in countries bordering the Mediterranean. In many of the States of America, diminished rainfall is said to have followed the destruction of large forest areas".

In conclusion, the Year Book of 1901–1907 observes that "...beneficial consequences appear also to have followed on the planting of trees on denuded lands, or along encroaching coasts, and it is obvious that a forest covering tends to beneficially regulate the effects of rainfall".

In October 1997 the joint government/industry initiative 'Plantations for Australia: the 2020 Vision' was released. The national initiative, which aims to treble Australia's forest plantations estate by the year 2020, will enhance growth in Australia's forest industry and the contribution made by plantations to the Australian economy, rural communities and regional development.

Wood and paper products

Australia's wood and paper products industries are important components of Australia's primary and secondary industries. They are particularly important in providing economic development and employment in many regions of rural Australia. The industries include hardwood and softwood sawmilling, plywood and panels manufacturing, woodchip production and export, and the pulp and paper industries. Just over 60,000 people were directly employed at the end of June 1999 in growing and harvesting of wood and the manufacture and processing of wood and paper products (table 16.3). The wood and paper products industries contribute about 1% to GDP. In 1998–99 the value of turnover in the wood and paper products industries was $12.1b, of which wood processing establishments (log sawmilling, timber dressing and other wood product manufacturing) contributed turnover of $6.5b.

Preliminary estimates for 1998–99 show that total roundwood removed from forests fell by 4% from the 1997–98 level, to 20.2 million cubic metres. The removal of broadleaved wood (primarily from native forests) fell by 8.1% in 1998–99 to 9.5 million cubic metres, while 1% less coniferous wood (mainly from plantations) was removed.

In 1998–99 the value of exports of forest products totalled $1,293m, of which 45% were woodchips and 27% paper and paperboard products. In that year the value of imports of forest products was $3,262m, of which 54% were paper and paperboard products and 13% sawnwood. This indicates a trade deficit in forest products of $1,969m in 1998–99. Australia produces 83% of its sawn timber needs, of which native forests provide about 31%, with the balance coming from softwood plantations. Imported sawn timber is mostly Douglas Fir from North America, and Radiata Pine from New Zealand.

The hardwood and softwood sawmilling industries comprise mills of various sizes which process wood into sawn timber and other products such as veneers, mouldings and floorings. The hardwood mills are generally small scale and scattered. The softwood mills are generally larger and more highly integrated with other wood processing facilities. Australia's production of sawn timber fell by 1% in 1998–99 to 3,603,000 cubic metres (table 16.4), of which 67% was softwood.

Other value added timber products include plywood, wood-based panels and reconstituted wood products. Australian wood-based panels include particleboard, medium density fibreboard, and hardboard made from softwood or hardwood pulp logs, sawmill residues or thinnings.

Pulp and paper mills use roundwood thinnings, low quality logs, harvesting residues and sawmill waste, recycled paper and paperboard to produce a broad range of pulp and paper products. Around a third of domestically consumed paper is imported. The majority of paper products produced domestically are packaging and industrial papers, newsprint, printing and writing papers, and tissue paper. Each requires different inputs and technologies. Recycled paper now contributes about half the fibre used in the production of paper and paperboard.

Woodchips are mainly used in the production of paper and paper products, and the woodchip export industry uses sawmill residues and timber which is unsuitable for sawmilling and not required by the Australian pulp, paper and reconstituted wood products industries. Before the advent of the woodchip export industry, much of this material was left in the forest after logging. Considerable quantities of sawmill waste material, which would otherwise be burnt, are also chipped for local pulpwood-using industries and for export. Up until 1990–91, at least 95% of woodchips exported from Australia had been eucalypt, but since then increasing quantities of softwood woodchips have become available from pine plantations. In 1998–99, 27% of the total value of woodchips exported was from softwood woodchips. See also the section *Management of Australia's forest and land resources* in *Chapter 14, Environment*.

16.3 WOOD AND PAPER PRODUCT MANUFACTURING INDUSTRIES, Summary of Operations—1997–98

Industry	Employment at 30 June(a) '000	Wages and salaries(b) $m	Turnover $m
Log sawmilling and timber dressing			
Log sawmilling	5.4	151.0	711.0
Wood chipping	0.7	37.2	448.0
Timber resawing and dressing	6.2	222.3	1 177.3
Total	*12.3*	*410.5*	*2 336.3*
Other wood product manufacturing			
Plywood and veneer manufacturing	1.5	52.8	253.0
Fabricated wood manufacturing	3.5	143.3	890.0
Wooden structural component manufacturing	20.2	533.7	2 521.7
Wood product manufacturing n.e.c.	5.5	129.2	532.0
Total	*30.7*	*859.1*	*4 196.8*
Paper and paper product manufacturing			
Pulp, paper and paperboard manufacturing	4.4	265.2	2 114.2
Solid paperboard container manufacturing	2.5	106.5	555.6
Corrugated paperboard container manufacturing	5.5	n.p.	n.p.
Paper bag and sack manufacturing	1.3	n.p.	n.p.
Paper product manufacturing n.e.c.	3.7	141.6	1 085.0
Total	*17.3*	*864.0*	*5 601.5*
Total wood and paper product manufacturing	**60.4**	**2 133.5**	**12 134.6**

(a) Includes working proprietors. (b) Excludes the drawings of working proprietors.

Source: Manufacturing Industry, Australia (8221.0).

16.4 PRODUCTION OF WOOD AND SELECTED WOOD PRODUCTS

Commodity	Quantity	1995–96	1996–97	1997–98	1998–99
Sawn Australian grown timber					
Coniferous	'000 m^3	2 053	2 063	2 327	2 331
Broadleaved	'000 m^3	1 391	1 418	1 322	1 271
Total	*'000 m^3*	*3 445*	*3 481*	*3 649*	*3 603*
Hardwood woodchips(a)	'000 t	4 827	4 779	5 665	4 856
Railway sleepers	'000 m^3	86	72	r 62	67
Plywood	'000 m^3	131	151	170	169
Unlaminated particle board(a)	'000 m^3	826	790	882	902
Medium density fibreboard	'000 m^3	377	434	501	495
Wood pulp(a)	'000 t	986	949	958	871
Paper and paperboard					
Newsprint(a)	'000 t	445	421	444	404
Printing and writing	'000 t	351	364	424	497
Household and sanitary	'000 t	180	181	191	208
Packaging and industrial	'000 t	1 344	1 452	1 483	1 431

(a) Excludes production of small single establishment management units with fewer than four persons employed, and establishments engaged in non-manufacturing activities but which may carry on, in a minor way, some manufacturing.

Source: Unpublished data, Australian Bureau of Statistics and Australian Bureau of Agricultural and Resource Economics.

Timber then and now

In 1901 Australian forests gave up 1.1 million cubic metres of sawn or hewn timber. Nearly a century later, our forests produced about three and a half times this amount of sawn wood (3.6 million cubic metres in 1998–99); over the same period Australia's population grew five-fold. More use of timber substitutes such as steel, concrete and plastic can probably explain the disparity.

At the beginning of the 20th century, Queensland (31%), Western Australia (27%) and New South Wales (21%) produced the most timber, but by 1998–99 Victoria was cutting 25% and New South Wales 24%; Queensland dropped its share to 21%.

One hundred years ago, Australia was a net importer of timber and timber products. In 1901, Australia imported timber and timber products to the value of about $130m in today's terms, while exports then would be valued at about $60m now. In 1998–99, Australia was still a net importer, in broadly similar proportions; the value of exports of timber and timber products ($1.3b) was about 40% that of imports ($3.3b).

Management of forests

Land and forests management is primarily the responsibility of State and Territory Governments. Each State has a forest authority responsible for the management and control of publicly-owned forests, in accordance with the relevant Forestry Acts and Regulations.

The Department of Agriculture, Fisheries and Forestry–Australia (AFFA) and the Department of the Environment and Heritage (E&H) are the two key agencies which have responsibilities relating to forests at the national level. Close liaison is maintained between them on relevant issues. AFFA's main responsibilities are the development of a national approach to forest management; providing advice to the Commonwealth Minister responsible for forest matters; administration of export licensing responsibilities in relation to unprocessed timber; liaison with State, national and international organisations concerned with forestry; provision of a Secretariat for the Ministerial Council on Forestry, Fisheries and Aquaculture (MCFFA); and management of policy and program initiatives.

E&H has responsibilities for environmental matters relating to forests, and provides policy advice to its Minister and the Government on conservation and environmental matters pertaining to Australia's forests, including biological diversity and climate change. The Australian Heritage Commission and Environment Australia within the Environment and Heritage Portfolio have assessment, management and monitoring roles in respect of the national estate, endangered species and environmental impacts in Australia's forests.

AFFA and E&H, in close cooperation with the States, Territories and Ministerial Councils, were extensively involved in the development of the National Forest Policy Statement and the National Forest Inventory, which resides in the Bureau of Rural Sciences in AFFA.

The MCFFA consists of Commonwealth, State, Territory and New Zealand Ministers responsible for forestry. The Council is chaired jointly by the Commonwealth Minister for Agriculture, Fisheries and Forestry and the Commonwealth Minister for Industry, Science and Resources. MCFFA, the successor of the Australian Forestry Council formed in 1964, works to provide leadership and facilitate cooperation at the national level.

Initiatives fostered by the MCFFA are aimed at promoting the enhanced management of the nation's forest resources in the general interest of the community. Most recently, it has been involved in the development and implementation of initiatives under the National Forest Policy Statement in cooperation with the Australian and New Zealand Environment and Conservation Council.

Commonwealth Government initiatives

National Forest Policy Statement (NFPS)

The NFPS was signed by the Commonwealth and all mainland State and Territory Governments at the Council of Australian Governments meeting in Perth in December 1992. Tasmania became a signatory in 1995. The Statement provides a policy framework for the future management of

Australia's public and private forests and outlines a vision for the ecologically sustainable management of Australia's forests, comprising 11 broad national goals in the following areas: conservation; wood production and industry development; integrated and coordinated decision-making and management; private native forests; plantations; water supply and catchment management; tourism and other economic and social opportunities; employment, labour force education and training; public awareness, education and involvement; research and development; and international responsibilities.

Plantation initiatives under the NFPS

In 1993, under the NFPS, the Commonwealth established two plantations initiatives: the Farm Forestry Program and the Community Rainforest Reafforestation Program (CRRP). The CRRP is a joint initiative sponsored by the Commonwealth Government and State/Territory and local governments. Commonwealth funding of the CRRP and FFP has continued since 1992 under the Wood and Paper Industry Strategy. From 1997–98, further funding for the FFP has been provided under the Natural Heritage Trust.

Farm Forestry Program (FFP)

The FFP aims to promote commercial wood production on cleared agricultural land so as to provide an additional reliable, high-quality wood resource for sustainable regional industries, as well as to diversify farm incomes. The FFP also promotes tree-planting for the production of non-wood products with an emphasis on developing commercial uses of native species, while addressing problems of land degradation. A total of $36.5m is available from the Natural Heritage Trust for farm forestry, of which $3.1m was available in 1997–98. The National Farm Forest Inventory will identify the extent of farm forest plantings in 2001.

Regional Forest Agreements (RFA)

Australia's National Forest Policy sets out broad conservation and industry goals for the management of Australia's forests agreed between the Commonwealth Government and the State and Territory Governments. They have agreed to a framework and process for carrying out comprehensive assessments of the economic, social, environmental and heritage values of forest regions. In 1996, the Commonwealth Government allocated an additional $48m over three years to accelerate the completion of the Comprehensive Regional Assessments (CRA) process. Once completed, CRAs will provide Governments with the information required to make decisions about forest use and sustainable management over the long term.

RFAs will provide a blueprint for the future management of our forests, and the basis for an internationally competitive and ecologically sustainable forest products industry. The first RFA was signed between the Commonwealth Government and the Victorian Government for the East Gippsland region in February 1997. The RFA for Tasmania was signed in November 1997, while the RFA for Central Highlands (NSW) was signed in March 1998 and the RFA for North East (Victoria) in late 1999. RFAs for Eden (NSW), Upper North East (NSW), and the Lower Northern East (NSW) were signed in the first half of 2000.

Wood and Paper Industry Strategy (WAPIS)

The Commonwealth outlined new initiatives to underpin development of the wood and paper industry in the WAPIS released in December 1995. The strategy is intended to build upon the RFA process, and aims to facilitate a positive environment for investment in downstream processing based on resources from sustainably managed native forests and plantations. In the 1996–97 Federal Budget, $32m was allocated to the Wood and Paper Industry Strategy over the four years 1996–97 to 1999–2000. The WAPIS is complemented by the Forest Industry Structural Adjustment program.

Forestry Industry Structural Adjustment Program (FISAP)

The 1996–97 Federal Budget allocated $98.6m to the FISAP to assist businesses and workers involved in native forest industries to adjust to changes as a result of the Interim/Deferred Forest Agreements and Regional Forest Agreements. Under matching funding arrangements with the States, $60m has been committed to NSW, $18.8m to Victoria, $5m to Queensland and $15m to Western Australia. As at 30 June 2000, about $18.2m had been spent in NSW, $1.5m in Victoria and small amounts in Queensland and Western Australia. A further $0.3m has been spent in Tasmania, without a matching State commitment, to assist private landowners adversely affected by the Deferred Forest Agreement.

National Forest Inventory (NFI)

In late 1988 the Commonwealth Government initiated a National Forest Inventory (NFI). A State of the Forests Report (SOFR) produced by

the NFI was released in December 1998. This comprehensive publication includes a description of the public, private, native and plantation forest resource, forest use and management, and examination of the social forces framing public opinion on these issues. Information from the NFI is used to meet Australia's national and international forest-related reporting requirements.

National Plantation Inventory (NPI)

The NPI describes in detail Australia's plantation resource in terms of location, species and planting date, and forecasts regional and national wood flows. In 1999 the NPI established a process for the annual collection and reporting of Australia's plantation estate involving key regional committees, State agencies and growers. Annual figures will be updated and released each March. A comprehensive report, including woodflows along the lines of the 1997 report, will be published five yearly, with the next report due in 2000.

National Farm Forest Inventory (NFFI)

A National Farm Forest Inventory has been established, as a component of the NPI, to facilitate the collection and capture of data on the farm forest plantation resource. In 2000 the NFFI is undertaking a comprehensive review of Australia's farm forest resource to provide a comprehensive picture of Australia's plantation resources.

Tropical timber

In June 1992 the Commonwealth Government announced its International Tropical Forest Conservation and Sustainable Land Use Policy. A key aspect of the policy is a commitment to the year 2000 target set by the International Tropical Timber Organisation (ITTO), by which date all tropical timber products entering international trade should be derived from sustainably managed forests. Other aspects of the policy include support for the conservation of biodiversity, reafforestation through agroforestry and plantations, and the provision of technical and scientific assistance to other countries, largely in the Asia-Pacific region, to promote better forest management practices.

Pulp mill guidelines

In December 1989, the Commonwealth established environmental guidelines for the development of new bleached eucalypt kraft pulp mills. To ensure that the guidelines remain current with international developments in pulping and bleaching technologies, the Government also announced in December 1989 the establishment of a National Pulp Mills Research Program (NPMRP). The NPMRP is a cooperative venture involving the Commonwealth Government and State Governments, community interest groups, industry and the Commonwealth Scientific and Industrial Research Organisation (CSIRO). The Commonwealth has released a set of guidelines based on recent international research under the Pulp and Paper Research Program and recent international developments in the wood pulping industry.

Forest and Wood Products Research and Development Corporation

The Forest and Wood Products Research and Development Corporation was established in 1994 as a key initiative under the National Forest Policy Statement, to assist the forest industries to improve their international competitiveness and to realise their growth potential. The Corporation is jointly funded by industry and the Commonwealth.

First Approximation Report of the 'Montreal Process' Working Group

In June 1997, Australia released its *First Approximation Report* on Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests (the 'Montreal Process'). This was the first time Australia had attempted to report against the seven criteria and 67 indicators of sustainable forest management agreed by the Montreal Process Working Group in 1995. Data for the report were drawn from the National Forest Inventory as well as Commonwealth, State and Territory agencies.

Framework of regional criteria and indicators

The Commonwealth Government and the State Governments, with input from other stakeholders, have developed a framework of regional criteria and indicators for assessing sustainable forest management in the RFA process. The framework is based on the internationally agreed Montreal Process criteria and indicators. The development and use of indicators will be an evolving process that will be reviewed and adjusted as appropriate to reflect new research findings, advances in technology, changes in community values, and developments in sustainable forest management practices.

Commonwealth Scientific and Industrial Research Organisation (CSIRO)

CSIRO research for the Forestry, Wood and Paper Industries Sector is concerned with sustainable commercial production and processing of wood from native eucalypt forests, and plantations of eucalypts and softwoods.

Much of the organisation's work for the sector takes place at CSIRO Forestry and Forest Products, which has five locations across the country, enabling attention to be given to important regional as well as national issues. Part of the Cooperative Research Centre (CRC) for Sustainable Forest Management is co-located with the Division on the campus of the University of Tasmania. The Division is also part of the CRC for Greenhouse Accounting. Other Divisions of CSIRO which contribute to the sector include the Divisions of Entomology, Plant Industry, Wildlife and Ecology, and Mathematical and Information Sciences.

CSIRO Divisions of Wildlife and Ecology and Plant Industry undertake studies of rainforest ecology from the Tropical Forest Research Centre at Atherton, Queensland. The CSIRO is also addressing a range of important industry and community issues including Greenhouse gas emissions and trading, forest productivity, landscape management, waste/residue management and new product options.

A recent independent evaluation of CSIRO research for the Forestry, Wood and Paper Industries Sector found that the economic benefits from a range of projects far outweighed their costs. Benefit/cost analyses were undertaken on five projects including using plantation systems for waste management and fire behaviour and management. It was found that, when the five research projects examined were taken together, the most likely scenarios saw benefits outstripping costs by a factor of 22. The evaluation also reported consistently positive feedback from research funders and users.

Fishing

Fisheries resources

This section covers Australia's fisheries resources and activities relating to their protection and use.

The Australian Fishing Zone (AFZ) covers an area 16% larger than the Australian land mass and is the third largest fishing zone in the world. Fish stocks in the AFZ are extremely diverse, and in 1998–99 it provided about three kilograms in edible weight of fresh and frozen fish for every Australian.

Production from the AFZ is insignificant by world standards. This reflects low productivity of the oceans rather than underuse of the resource. While some species are considered to be over-harvested, some fish resources such as albacore and southern whiting are not being used optimally. Over 3,000 species of marine and freshwater fish, and at least an equal number of crustacean and mollusc species, occur in and around Australia. Less than 600 of these are accessed commercially.

Australia's major commercially accessed species are prawns, rock lobster, abalone, tuna, other fin fish, scallops, and edible and pearl oysters. Australian fishing operators concentrate their efforts on estuarine, coastal, pelagic (surface) species and demersal (bottom living) species that occur on the continental shelf. The level of fishing activity has increased over the last decade to the point where almost all the major known fish, crustacean and mollusc resources are fully utilised. Some major fisheries such as southern bluefin tuna, gemfish and shark have suffered serious biological depletion.

Aquaculture, or 'fish farming', is an alternative to harvesting the naturally occurring fish stocks, and has considerable potential as a means of ensuring sustainability of harvesting yields. Aquaculture industries are established in all States, with species involved ranging from pearl oysters to freshwater trout. Aquaculture has experienced rapid growth over recent years, with the value of production rising from $188m in 1989–90 to $602m in 1998–99.

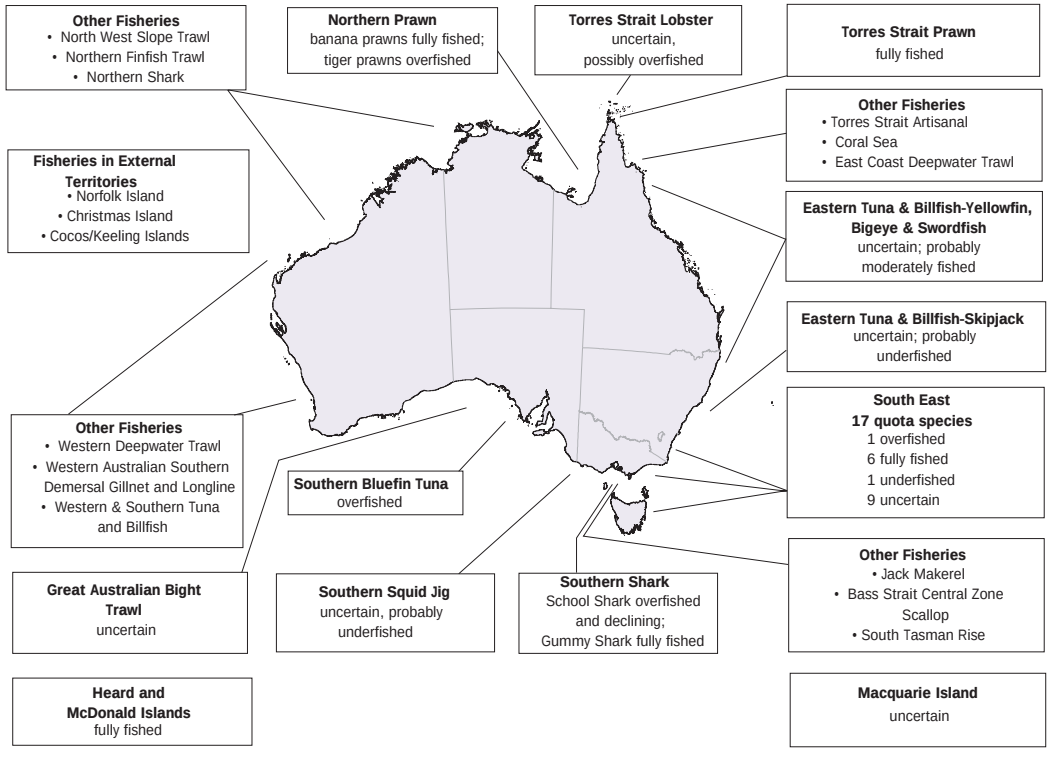
The status of Australia's Commonwealth managed or jointly managed fisheries resources is summarised in map 16.5.

Production, processing, exports and imports of fisheries products

Value of fisheries production

Table 16.6 shows the quantity and table 16.7 the gross value of the production of the Australian commercial fishing industry. Australian fisheries production covers total production from both Commonwealth and State managed fisheries and from aquaculture. Gross value of production is the value placed on recorded production at the

16.5 STATUS OF COMMONWEALTH MANAGED OR JOINTLY MANAGED FISHERIES RESOURCES



Source: Bureau of Rural Sciences 1999.

wholesale price realised in the principal markets. In general, the principal markets are the metropolitan markets in each State. However, in cases where commodities are consumed locally or where they become raw material for a secondary industry, these points are treated as the principal markets.

The gross value of Australian fisheries production rose by 8% ($160m) in 1998–99, to $2.04b (table 16.8) following on from a 6% increase the previous year. Contributing to this lastest rise was the 74% increase in the value of tuna production along with increases in the value of rock lobster (9%), other fin fish (7%) and prawns (6%) (table 16.9). In overall production there was little change over the year, with the rises in tuna and rock lobster production being offset by a fall in the catch of other fin fish (table 16.10).

Commonwealth fisheries accounted for 20% of the total value of Australian fisheries production in 1998–99 (table 16.7). Commonwealth fisheries are those managed for the Commonwealth Government by the Australian Fisheries Management Authority. State Governments manage inland fisheries and aquaculture in addition to those salt water fisheries not managed by the Commonwealth. The distribution of the management of fisheries between the Commonwealth and the States is determined following consultations held under the Offshore Constitutional Settlement Agreement.

16.6 AUSTRALIAN FISHERIES PRODUCTION, By State(a)—1998–99

	NSW	Vic.	Qld	SA	WA	Tas.	NT	C'wealth(b)	Aust.
	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes
Fish									
Tuna	—	—	—	6 365	22	—	4	(c)15 855	(d)17 255
Other	10 398	4 790	12 353	10 027	16 918	19 787	3 177	(e)48 491	125 941
Total	*10 398*	*4 790*	*12 353*	*16 392*	*16 940*	*19 787*	*3 181*	*64 346*	*143 196*
Crustaceans									
Prawns	2 695	46	9 950	2 761	4 709	—	—	(f)10 123	30 284
Rock lobster	110	471	550	2 729	13 063	1 353	—	501	18 777
Other	987	106	2 960	704	895	5	647	204	6 510
Total	*3 792*	*623*	*13 460*	*6 195*	*18 667*	*1 358*	*647*	*10 828*	*55 570*
Molluscs									
Abalone	323	1 435	—	933	340	2 559	—	—	5 590
Scallops	2	20	3 607	—	2 336	475	2	784	7 226
Oysters	5 318	—	65	1 441	—	2 453	—	—	9 277
Other	1 945	663	140	1 901	1 369	571	(g)276	(h)1 095	7 961
Total	*7 588*	*2 118*	*3 812*	*4 275*	*4 045*	*6 058*	*278*	*1 879*	*30 053*
Total quantity	**21 777**	**7 531**	**29 652**	**26 862**	**39 652**	**27 203**	**4 107**	**77 052**	**228 819**

(a) State totals include estimates of aquaculture production, but exclude hatchery and inland commercial fishery production. (b) Total includes all fisheries under federal jurisdiction. (c) Includes the southern bluefin, east coast, southern and western tuna fisheries. (d) Total has been adjusted to allow for southern bluefin tuna caught in the Commonwealth southern bluefin tuna fishery, as an input to farms in South Australia. (e) Includes the fish component of Commonwealth fisheries. (f) Includes the northern prawn, Torres Strait, south east and other fisheries. (g) Excludes aquaculture production. (h) Includes squid, octopus and cuttlefish from the south east and Great Australian Bight fisheries, and pearl oyster from the Torres Strait fishery.

Source: Australian Bureau of Agricultural and Resource Economics.

16.7 GROSS VALUE OF AUSTRALIAN FISHERIES PRODUCTION, By State(a)—1998–99

	NSW	Vic.	Qld	SA	WA	Tas.	NT	C'wealth(b)	Aust.
	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000
Fish									
Tuna	—	—	—	166 700	103	—	15	(c)105 324	(d)223 233
Other	30 386	15 271	66 384	25 443	39 447	79 509	18 247	(e)151 281	425 968
Total	*30 386*	*15 271*	*66 384*	*192 143*	*39 550*	*79 509*	*18 261*	*256 605*	*649 201*
Crustaceans									
Prawns	35 674	424	132 117	39 615	63 024	—	—	(f)137 343	408 197
Rock lobster	3 820	15 360	6 599	73 908	261 424	39 846	—	7 158	408 116
Other	6 663	3 444	16 014	4 269	6 613	44	7 810	1 463	46 320
Total	*46 156*	*19 228*	*154 730*	*117 791*	*331 061*	*39 890*	*7 810*	*145 965*	*862 632*
Molluscs									
Abalone	11 316	43 847	—	27 161	12 930	74 200	—	—	169 454
Scallops	—	40	17 853	—	10 160	5 848	7	1 834	35 742
Oysters	27 434	—	1 890	5 489	—	11 636	—	—	46 449
Other	6 158	1 890	700	5 368	198 451	2 879	(g)55 928	(h)3 685	275 059
Total	*44 908*	*45 777*	*20 443*	*38 018*	*221 541*	*94 563*	*55 935*	*5 518*	*526 703*
Total value	**121 451**	**80 275**	**241 557**	**347 953**	**592 152**	**213 962**	**82 006**	**408 089**	**2 038 535**

(a) State totals include estimates of aquaculture production, but exclude hatchery and inland commercial fishery production. (b) Total includes all fisheries under federal jurisdiction. (c) Includes the southern bluefin, east coast, southern and western tuna fisheries. (d) Total has been adjusted to allow for southern bluefin tuna caught in the Commonwealth southern bluefin tuna fishery, as an input to farms in South Australia. (e) Includes the fish component of the Commonwealth fisheries. (f) Includes the northern prawn, Torres Strait, south east and other fisheries. (g) Includes all aquaculture. (h) Includes squid, octopus and cuttlefish from the south east and Great Australian Bight fisheries, and pearl oyster from the Torres Strait fishery.

Source: Australian Bureau of Agricultural and Resource Economics.

16.8 GROSS VALUE OF FISHERIES PRODUCTION

	Value
	$m
1980–81	330
1981–82	344
1982–83	423
1983–84	449
1984–85	522
1985–86	635
1986–87	702
1987–88	828
1988–89	1 022
1989–90	1 092
1990–91	1 223
1991–92	1 376
1992–93	1 493
1993–94	1 679
1994–95	1 813
1995–96	1 690
1996–97	1 776
1997–98	1 879
1998–99(a)	2 039

(a) Estimate only.

Source: Australian Bureau of Agricultural and Resource Economics.

16.9 GROSS VALUE OF SELECTED MAJOR FISHERIES CATEGORIES

	1996–97	1997–98(a)	1998–99(a)
	$m	$m	$m
Prawns	344	384	408
Rock lobster	413	376	408
Tuna	96	128	223
Other fin fish	378	398	426
Abalone	153	182	169
Scallops	37	39	36
Oysters	52	48	46
Pearls (b)	171	189	182
Other n.e.i.	132	134	140
Total	**1 776**	**1 879**	**2 039**

(a) Estimate only. (b) Excludes Northern Territory.

Source: Australian Bureau of Agricultural and Resource Economics.

The value of Australian aquaculture production also increased in 1998–99, by $97.8m (19%) (table 16.11). Aquaculture accounted for 30% of the total value of Australian fisheries production in 1998–99, up slightly from its share of 27% in the previous year. The increase in the value of aquaculture production was mainly due to a $79.5m (91%) rise in the value of tuna production, with salmon and prawn increasing $8.1m (13%) and $7.8m (22%) respectively.

16.10 AUSTRALIAN FISHERIES PRODUCTION, By Category(a)

	1996–97	1997–98	1998–99
	tonnes	tonnes	tonnes
Fish			
Tuna	13 026	11 890	17 255
Other	128 528	134 659	125 941
Total	*141 555*	*146 549*	*143 196*
Crustaceans			
Prawns	27 736	29 602	30 284
Rock lobster	15 815	16 587	18 777
Other	7 661	7 557	6 510
Total	*51 212*	*53 746*	*55 570*
Molluscs			
Abalone	5 236	5 226	5 590
Scallops	6 283	5 759	7 226
Oysters	10 396	9 278	9 277
Other	7 374	7 600	7 961
Total	*29 289*	*27 862*	*30 053*
Total	**222 055**	**228 157**	**228 819**

(a) Includes an estimate for aquaculture production, but excludes production from inland commercial fisheries.

Source: Australian Bureau of Agricultural and Resource Economics.

16.11 GROSS VALUE OF AQUACULTURE PRODUCTION(a)

	1996–97	1997–98	1998–99
	$m	$m	$m
Fish			
Salmon	58.5	63.6	71.7
Tuna	40.2	87.2	166.7
Trout	11.5	11.6	7.8
Other(b)	11.8	13.5	15.9
Total	*122.0*	*175.9*	*262.0*
Crustaceans			
Prawn	33.6	36.2	44.0
Other(c)	5.4	5.4	6.3
Total	*39.0*	*41.7*	*50.3*
Molluscs			
Pearl oysters	171.4	188.9	181.8
Edible oysters	52.0	48.0	46.4
Other(d)	4.5	4.8	6.4
Total	*227.8*	*241.7*	*234.7*
Total(e)	**433.8**	**504.3**	**602.1**

(a) Excludes aquarium fish, hatcheries production, crocodiles, microalgae and aquarium worms. (b) Includes eels and other native fish. (c) Includes crabs and brine shrimp. (d) Includes mussels, scallops and giant clams. (e) Only this total line includes Northern Territory production.

Source: Australian Bureau of Agricultural and Resource Economics.

Table 16.12 shows the volume of Australian aquaculture production for the three years 1996–97 to 1998–99, with the latest year showing a 13% increase in total. Edible oysters accounted for the most aquaculture production in 1998–99 with 9,277 tonnes, virtually the same as the previous year. Salmon and tuna production in 1998–99 increased by 30% and 24% to 9,196 tonnes and 6,393 tonnes respectively.

16.12 AUSTRALIAN AQUACULTURE PRODUCTION

	1996–97	1997–98	1998–99
	tonnes	tonnes	tonnes
Fish			
Salmon	7 647	7 069	9 196
Trout	2 093	1 472	1 221
Tuna	2 123	5 168	6 393
Other	1 271	1 396	1 541
Total(a)	*13 134*	*15 101*	*18 349*
Crustaceans			
Prawn	1 564	2 059	2 413
Yabbies	215	306	253
Marron	52	48	49
Other	107	88	72
Total(b)	*1 938*	*2 502*	*2 787*
Molluscs			
Edible oysters	10 396	9 278	9 277
Pearl oysters	—	—	—
Other	1 616	1 456	1 667
Total(c)	*12 012*	*10 734*	*10 944*
Total	**27 084**	**28 339**	**32 080**

(a) Includes eels and other native fish. (b) Includes crabs and brine shrimp. (c) Includes mussels, scallops and giant clams.

Source: Australian Bureau of Agricultural and Resource Economics.

Processing of fish, crustaceans and molluscs

There is very little value added processing of fish products in Australia. Processing establishments vary in size, scope of operations and sophistication of technologies employed. The majority of establishments undertake only the most basic cleaning, filleting, chilling, freezing and packaging processes, but some have the capacity for significant product transformation. Much of the value that is added to the catch is due to correct handling and quick delivery by air to local or overseas markets.

Fish, crustaceans and molluscs intended for export are processed in establishments registered under the Export (Fish) Regulations. Edible fish for local consumption are mainly sent fresh-chilled to markets.

Exports and imports

Exports of fisheries products come under Commonwealth jurisdiction, while domestic market activity is the responsibility of the States and Territories.

A significant proportion of Australian fisheries production (edible and non-edible) is exported. In 1998–99, the value of exports rose by 2% to $1.5b (table 16.13). The value of rock lobster exports increased by 6% to $451m, making rock lobster Australia's highest value fisheries export in 1998–99, accounting for 30% of the total. Pearls, prawns and abalone were the next largest fisheries exports, worth $272m, $224m and $184m respectively. For some fisheries categories the value of exports exceeds the value of production, because exports are valued on a free on board (f.o.b.) basis which includes the value of packaging and distribution services to the point of export.

Japan continued to be the major destination for Australian exports of fisheries products, accounting for 31% of the total value in 1998–99. Hong Kong and Taiwan accounted for the next largest shares of exported Australian fisheries products, with 17% and 11% respectively of total value. Value of exports to the United States continued to rise in 1998–99, with a 31% increase following on from a 45% increase the previous year.

Western Australia continued to have the highest value of overall seafood exports ($406m, or 33% of the total value in 1998–99), due mainly to its domination of rock lobster exports (with 67%). Queensland, the next biggest exporter of seafood, moved shipments to the value of $273m, including $151m worth of prawns (67% of total prawn exports). South Australia earned most from fish exports ($90m), although Queensland exported a higher tonnage (6,652 tonnes worth $62m).

The total value of Australian imports of fisheries products increased in 1998–99, to an estimated $878m (table 16.14), although Australia remained a net exporter of fisheries products. Imports of canned fish (worth $165m) increased 16% to become the main single fisheries product imported, accounting for 19% of the total value of imported fisheries products. The next most valuable imported items were frozen fillets and prawns, worth $157m and $151m respectively. The main countries of origin of imported fisheries products were Thailand (27% of total import value), New Zealand (16%) and the United States of America (7%).

16.13 DESTINATION OF EXPORTS OF AUSTRALIAN FISHERIES PRODUCTS(a)

	1996–97		1997–98		1998–99	
Country	$m	%	$m	%	$m	%
Japan	447	34.7	483	32.8	462	30.8
Hong Kong (SAR of China)	236	18.3	245	16.6	248	16.6
Taiwan	217	16.8	179	12.2	170	11.4
United States of America	76	5.9	110	7.5	144	9.6
China	53	4.1	120	8.2	104	6.9
Singapore	40	3.1	41	2.8	43	2.9
Switzerland	8	0.6	9	0.6	31	2.1
Spain	10	0.8	13	0.9	23	1.5
New Zealand	12	0.9	14	1.0	14	0.9
France	4	0.3	6	0.4	14	0.9
Thailand	8	0.6	14	1.0	11	0.7
United Kingdom	4	0.3	5	0.3	7	0.5
Other	176	13.6	235	16.0	227	15.2
Total	**1 290**	**100.0**	**1 473**	**100.0**	**1 498**	**100.0**

(a) Includes non-edible products (e.g. marine fats and oils, fish meal, pearls and ornamental fish). Excludes sea products landed abroad directly from the high seas.

Source: International Trade database.

16.14 SOURCE OF AUSTRALIAN IMPORTS OF FISHERIES PRODUCTS(a)

	1996–97		1997–98		1998–99p	
Country	$m	%	$m	%	$m	%
Thailand	185	26.4	218	26.6	237	27.0
New Zealand	119	17.0	128	15.6	143	16.3
United States of America	48	6.8	59	7.2	61	6.9
South Africa	13	1.9	26	3.2	33	3.8
Viet Nam	20	2.8	22	2.7	32	3.6
Canada	19	2.7	21	2.5	27	3.1
Japan	23	3.3	33	4.0	25	2.8
Malaysia	27	3.8	28	3.4	25	2.8
Taiwan	18	2.6	20	2.4	22	2.5
Chile	17	2.4	23	2.8	21	2.4
Indonesia	10	1.4	18	2.2	19	2.2
India	3	0.4	11	1.3	15	1.7
China	9	1.3	13	1.6	13	1.5
Singapore	13	1.9	16	2.0	11	1.3
Hong Kong	6	0.8	6	0.7	11	1.3
Peru	14	2.0	7	0.9	10	1.1
Other	158	22.5	171	20.9	173	19.7
Total	**702**	**100.0**	**820**	**100.0**	**878**	**100.0**

(a) Includes non-edible products (e.g. marine fats and oils, fish meal, pearls and ornamental fish).

Source: International Trade data base.

Fisheries legislation and territorial arrangements

The Commonwealth has jurisdiction over waters between three and 200 nautical miles seaward of the territorial sea baseline of Australia and its external territories. This area, the AFZ, covers a total of 8.9 million square kilometres. Conversely, the States and the Northern Territory have jurisdiction over inland fisheries and marine waters up to three nautical miles. To aid the management of Australian fisheries, arrangements known as Offshore Constitutional Settlements (OCS) have been entered into, which transfer jurisdiction from the Commonwealth to the State or Territory.

Fisheries Management Act 1991 and the AFZ

The *Commonwealth Fisheries Management Act 1991* is the main fisheries legislation, and applies to commercial fishing for swimming and sedentary species in the AFZ. The establishment of the AFZ in 1979 brought portions of oceanic tuna stocks, and demersal and pelagic fish stocks previously utilised by foreign fishing vessels, under Australian control.

Fishery management plans are central to the Act and contain all essential rules applying to the management of a fishery. A management plan normally operates through a system of statutory fishing rights, which allows long term access to the fishery. The Act also provides for limited term fishing permits, which are primarily designed for the management of fish resources that are not yet under a management plan. Individual transferable quotas (ITQs) are commonly used to achieve a reduction in fishing levels. A particular fishery is assigned a total allowable catch, and the market for ITQs will determine the most efficient allocation of resources.

Australia has an international obligation, under the United Nations Convention on the Law of the Sea, to allow foreign nations access to surplus domestic fish stocks within the AFZ where such access does not conflict with Australian management and development objectives. To facilitate the process, the Act allows Australia to make bilateral agreements or joint venture arrangements with the government or commercial interests of other countries, under which foreign fishing licences will be granted.

In 1995, Australia signed the UN Fish Stocks Agreement to further our national interest in combating the problems of unsustainable fishing practices on the high seas. At present all countries have the right to fish the high seas. However, some fish species spend part of their lives within national fishing boundaries and adjacent high seas. The agreement aims for sustainable fishing of these stocks by means of a cooperative treaty. This is important for Australia because some of its significant fish species, such as orange roughy, tuna and billfish, are distributed beyond the limits of the AFZ or migrate through it.

Australia, Japan and New Zealand are parties to the Convention for the Conservation of Southern Bluefin Tuna (CCSBT), which came into force in 1994. As part of its conservation management responsibilities for the global southern bluefin tuna industry, the CCSBT Commission annually determines a total allowable catch for the fishery and allocates this between the three CCSBT parties in the form of national quotas.

The total allowable catch of SBT has been set at 11,750 tonnes since 1989, with national allocations for Australia, Japan and New Zealand of 5,265 tonnes, 6,065 tonnes and 420 tonnes respectively. These quotas have remained fixed as the parties have been unable to reach agreement on changes. Japan's attempts to raise its quota through a unilateral experimental fishing program resulted in Japan catching around 1,460 tonnes and 2,200 tonnes above its quota in 1998 and 1999 respectively. As a result Australia has implemented bans on Japan's access to the AFZ and Australian ports.

The Treaty on Fisheries between the Governments of Certain Pacific Island States and the Government of the United States (USA) forms the Schedule to the Act. The effect of this is that US tuna boats are given treaty licences in accordance with the provisions of the Treaty.

The *Environment Protection and Biodiversity Conservation Act 1999* replaces the *Whale Protection Act 1980* and the *Endangered Species Protection Act 1992* in providing protection for all cetaceans (whales, dolphins and porpoises) in Commonwealth waters. The States and Territories have similar legislation. Australia supports a ban on whaling in international waters and is progressing this through the International Whaling Commission processes.

Australian Fisheries Management Authority

The *Fisheries Administration Act 1991* establishes the Australian Fisheries Management Authority (AFMA) and prescribes its objectives. These are:

- implementing efficient and cost-effective fisheries management on behalf of the Commonwealth;
- ensuring that the utilisation of fisheries resources and any related activities are conducted in a manner consistent with the principles of ecologically sustainable development, in particular the need to have regard to the impact of fishing activities on non-target species and the marine environment;
- maximising economic efficiency in the utilisation of fisheries resources;
- ensuring accountability to the fishing industry and to the Australian community in AFMA's management of fisheries resources; and
- achieving government targets in relation to the recovery of the cost of AFMA.

The Act specifies AFMA's functions, which include a duty to engage in appropriate consultation and to devise and implement management plans, adjustment programs and exploratory/feasibility fishing programs. AFMA is also to establish priorities for management-related research and arrange for such research to be undertaken. AFMA's management responsibilities include arrangements with States and Territories. Under the Fisheries Management Act, AFMA is given additional functions in areas such as keeping a register of statutory fishing rights, surveillance and enforcement.

Other legislation

The *Fishing Levy Act 1991*, *Foreign Fishing Licences Levy Act 1991* and *Fisheries Agreements (Payments) Act 1991* enable the imposition of management levies and access fees payable by Australian and foreign fishermen, foreign governments and foreign commercial interests. The *Statutory Fishing Rights Charge Act 1991* enables a charge to be levied on the grant of new fishing rights.

The *Torres Strait Fisheries Act 1984* gives effect in Australian law to the fisheries elements of the Torres Strait Treaty. The Act applies in the area of Australian jurisdiction in the Torres Strait Protected Zone, and in areas outside but near that zone that have been proclaimed in respect of particular fisheries which Australia and Papua New Guinea have agreed to manage jointly under the treaty or which are referred to in the treaty.

Fisheries research

The main aim of fisheries research in Australia is to provide a background of biological, technical and economic information which will provide guidance for the efficient and sustainable utilisation of fisheries resources. Much of the research already undertaken has been directed at formulating recommendations for management of various fisheries. Research work, including feasibility fishing projects involving foreign fishing vessels, is also carried out and is expected to lead to the development of new fisheries, the expansion of underutilised fisheries, greater economy in operations and the use of more efficient equipment and methods.

The Fisheries Research and Development Corporation (FRDC) was established in July 1991 by Regulation under the *Primary Industries and Energy Research and Development Act 1989*. Its objectives include:

- increasing the economic, environmental or social benefits to members of the Australian fishing and aquaculture industry and to the community generally by improving the production, processing, storage, transport or marketing of fish and fish products; and
- achieving the sustainable use and management of fisheries resources.

FRDC investigates and evaluates the requirements for research and development in relation to the fishing industry; coordinates and funds such research and development activities; and facilitates the dissemination, adoption and commercialisation of results.

FRDC is funded by an annual unmatched grant equal to 0.5% of GVP (the average gross value of fisheries production over the three immediately preceding financial years) and by research levies collected from the fishing industry which the Government matches to a maximum of 0.25% of GVP. In 1998–99 the FRDC planned, funded and managed 592 projects worth $37.3m, compared with 540 projects worth $39.7m in 1997–98.

Aquaculture

Aquaculture is one of Australia's fastest growing primary industries. As indicated earlier in this chapter under *Fisheries resources*, the 1998–99 farmgate value of production was $602m, compared with $188m in 1989–90. The major sectors contributing to this growth were pearl and edible oysters, tuna, salmon, prawns and southern bluefin tuna.

Australia has enjoyed a relatively long history of success in the farming of the Sydney rock oyster. Pearl culture operations, prawn, barramundi, freshwater crayfish and ornamental fish farming are well established. The production of juveniles of several species of fin fish, molluscs and crustaceans has been undertaken for some years, initially for restocking wild populations and subsequently for grow-out operations.

Australian aquaculture is expected to continue to show strong growth for the next 10 years and, on current estimates, the value of production will be in excess of $1b by the end of this period. The industry provides regional development and employment opportunities in rural Australia, as well as contributing to export growth.

An Aquaculture Action Agenda was jointly announced by the Federal Ministers for Agriculture, Fisheries and Forestry, and Industry, Science and Resources on 24 May 2000. The aquaculture industry has strong growth prospects and offers enormous potential as a major contributor to Australia's economic growth and to rural and regional development. The boost provided by the Action Agenda program will assist Government and industry to develop strategies which maximise industry growth opportunities, increase export opportunities, improve innovation and expand the skills base of people working in the industry.

Developmental work is taking place in a number of areas including in a range of fin fish, freshwater crayfish (marron), mussels and algae. Research is continuing into the hatchery rearing of species such as abalone, scallops, giant clams, and flat and pearl oysters. Over half by value of the established aquaculture output goes to markets other than for direct consumption. However, the output of the newer industries goes mainly to markets for direct consumption.

The operational responsibility for the development of aquaculture in Australia rests with State and Territory Governments. A number of States have aquaculture and coastal development plans in place. These plans take into account the needs of the multiple user groups and provide a focus for aquaculture as an industry and as a legitimate user of water and land resources.

Aquaculture provides a basis for improved biological understanding of Australia's native marine and freshwater species and can be used to re-establish populations of endangered aquatic species. Aquaculture may also improve the catch in both recreational and commercial fisheries through restocking programs.

See also the Section *Fisheries management and aquaculture* in *Chapter 14, Environment*.

Recreational fishing

Recreational fishing in Australia is an important leisure activity for over three million Australians, with some 120,000 fishers identified as members of fishing clubs in 1996–97. Recreational fishing also supports about 90,000 Australian jobs. Two main industries are involved. The Australian fishing tackle and bait industry has an annual turnover in excess of $170m. The recreational boating industry, with around 60% being related to fishing, accounts for another $500m in turnover. In addition to Australian fishers, international tourists spend over $200m on fishing in Australia each year. There are often significant flow-on benefits to regional areas, including employment opportunities in the tackle, boating, tourism, charter and associated industries.

Bibliography

ABS publications

There are no ABS publications devoted to forestry and fishery statistics for Australia as a whole. Forestry and fishery statistics are available in unpublished ABS data, which can be obtained on request, or in publications on broader subjects:

Apparent Consumption of Foodstuffs, Australia (4306.0).

Business Operations and Industry Performance (8140.0).

Manufacturing Industry, Australia (8221.0).

Other publications

Australian Bureau of Agricultural and Resource Economics

—*Agriculture and Resources Quarterly* (various issues).

—*Australian Fisheries Statistics, 1999*.

—*Australian Forest Products Statistics* (December Quarter 1999).

Bureau of Rural Sciences

—*National Forest Inventory*, *1997*.

—*National Plantation Inventory, 2000.*

—*Fishery Status Reports*, *1999.*

Internet sites

Bureau of Rural Sciences, *http://www.affa.gov.au/outputs/ruralscience/html*

Commonwealth Department of Agriculture, Fisheries and Forestry—Australia, *http://www.affa.gov.au*

Commonwealth Scientific and Industrial Research Organisation, Forestry and Forest Products, *http://www.ffp.csiro.au*

Environment Australia, *http://www.environment.gov.au*

FISHBASE, *http://www.fishbase.org*

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Introduction

Mining, as defined in the 1993 edition of the *Australian and New Zealand Standard Industrial Classification (ANZSIC)*, broadly relates to the extraction of minerals occurring naturally as solids such as coal and ores, liquids such as crude petroleum, or gases such as natural gas. First stage processing of minerals and mineral extracts, while closely related to the mining industry, is included as part of the manufacturing industry.

Australia continues to rank highly as one of the world's leading mineral resource nations, and the minerals industry is the nation's largest export earner.

The mining industry contributed $23b (4%) to Australia's Gross Value Added (GVA) in 1998–99, a fall from $24.7b or 5% in 1997–98.

A century of mining in Australia

(Prepared by Coal and Mineral Industries Division of the Department of Industry, Science and Resources, drawing on a paper written by staff of the Australian Geological Survey Organisation which appears in Australian Mining Industry, 1998–99 (Cat. no. 8414.0).)

Overview

At the time of Federation, the mining industry was well established in Australia; many of the deposits being mined had been discovered 40 to 50 years earlier. Gold was the main mineral commodity, accounting for three-quarters of the total value of metalliferous mine production, with copper, lead and silver accounting for most of the remainder.

Although the mining industry had prospered in the early years of Federation, it was severely affected by the collapse of metal prices after the end of World War I. Many mines closed, and the value of mineral exports fell from $15.3m (in today's prices) in 1919–20 to $7.6m in 1921–22. The Mount Isa silver-lead-zinc deposit was discovered in 1923, and mining and smelting commenced in 1931. The existence of copper at Mount Isa was known from this time, but the copper lodes were not defined and mined until World War II.

Petroleum (which includes crude oil and natural gas) had been sought for many decades, but it was a latecomer to the mineral production scene in Australia. In 1900, at Roma in Queensland, natural gas was encountered in an artesian water bore which was being deepened. Gas continued to flow freely from the well, and in 1906 it was reticulated for town lighting (however, the flow failed just ten days later). This discovery marks the real beginning of petroleum exploration in Australia. Many wells were drilled subsequently in the Roma region. Some encountered quantities of oil and gas. In 1924 the first discovery of crude oil was made at Lake Bunga No 1 well near Lakes Entrance, Victoria.

The Depression in the early 1930s saw coal production fall by a third from a mid-1920 high of 14 million tonnes. Exports of coal, which had exceeded one million tonnes a year until the mid 1920s, had fallen to about 50,000 tonnes by the late 1940s due to increasing competition from petroleum products, which began to replace coal in industry and railways. This trend was exacerbated by prolonged industrial unrest.

In the late 1930s the mining industry, although well established, played only a minor role in the Australian economy. The need for new ore reserves of many minerals was the major concern of the industry in the late 1930s and early 1940s. Indeed, the paucity of new discoveries, after the flood of the previous century, had led some to the belief that there were few new resources to be found, and that the industry would gradually run down. In 1938 the Commonwealth Government placed an embargo on the export of iron ore, when reserves of high grade ore were believed to be no more than 260 megatonnes.

World War II brought the need for metals for the war effort; this gave rise to the realisation that Australia needed to have a greatly increased knowledge of the geology of the continent. The Bureau of Mineral Resources was subsequently formed by the Commonwealth Government in 1946. The resulting systematic geological and geophysical surveys across the continent and

the increasing focus of State and Northern Territory Geological Surveys on mineral resources were important reasons for the surge of mineral discoveries from the late 1940s.

Mineral explorers were able to search more efficiently by using geological maps and theories on the origin of mineral deposits to target specific areas for exploration. The better understanding showed also that Australia had a high potential for the discovery of many styles of mineral deposits.

This realisation, together with Australia's political stability, led in the early 1960s to an influx of major overseas mining companies bringing with them new expertise and ideas, in addition to increasing exploration expenditure. The discovery of new ore bodies was also greatly aided by the development of geochemical and geophysical exploration methods suited to Australian conditions. Many techniques developed in the northern hemisphere were not successful in the arid, deeply weathered terrain characteristic of most of Australia.

The economics of working some previously uneconomic deposits changed remarkably because of technological advances which lowered the cost of mining and transporting huge quantities of material, but these advances would not have been decisive without the general expansion of the world economy in the 1950s and 1960s, and in particular the emergence of Japan as a major buyer of coal, iron ore and bauxite.

In the 1950s the mainstays of the industry were lead, zinc, copper, gold and coal, of which only the first four were exported in any quantity. Uranium was discovered in 1949 and mining commenced in 1954 at Rum Jungle in the Northern Territory. In the mid-1960s, the Australian mining industry began to expand, with growth in both production and exports combined with a change in relative importance of the various commodities—gold and base metals declined, while coal, iron ore and 'other minerals' increased in relative terms. By the late 1960s Australia was a world force in black coal, bauxite, iron ore, nickel, manganese, titanium and zirconium.

A major expansion of Australia's aluminium industry followed the decision to mine bauxite in the Darling Range, Western Australia, in the early 1960s. The perception that high grade iron ore resources were limited in Australia was turned around with the discovery of vast resources in the Pilbara from the mid-1960s. A five year nickel exploration and discovery boom in Western Australia in the late 1960s set Australia on the path to becoming a major nickel producer for domestic and overseas markets.

In the early 1970s indications from exploration for oil were that onshore oilfields probably would be small and unlikely to be economic. However, the oil shocks of 1973 and 1979, when oil prices increased severalfold, completely changed the economics of the industry. Expenditure on exploration increased rapidly, from $49m in 1976 to $948m in 1982. Some known fields were developed, such as Palm Valley and some Bass Strait fields, and many new fields were discovered, especially in south-west Queensland and the adjoining part of South Australia.

The exploration success in the Gippsland shelf also turned attention to Australia's extensive continental shelf, and the first of the huge gas fields of the North West Shelf were discovered in 1971. The emergence of large markets for coking coal, particularly in Japan, together with the realisation of the economic importance of near-surface coal seams in the Bowen Basin in Queensland, meant that coal exports increased rapidly from the mid 1950s and received added impetus with the oil shocks of the 1970s.

In the late 1970s the rate of growth of the mining industry in Australia, which had been maintained for more than 15 years, began to slow. New mines had been developed around the world to meet a forecast demand for minerals, which turned out to be overly optimistic. The Australian industry's costs had increased but mineral prices generally had not. The industry was largely dependent on exports and had to compete for sales with an increasing number of mines in other countries; some of these mines were less affected by cost increases, or were assisted in various ways by the governments of those countries.

Many new coal mines were established in Australia after the second oil shock in 1979, but world demand stagnated, leaving the industry in Australia (and the world) with substantial surplus capacity. Metal prices failed to increase in line with the world economic upturn in the early 1980s, and few new metal mines were

opened. Australian production increased largely because of capacity increases at existing mines to achieve economies of scale.

By the mid-1980s one of the few bright spots in the Australian mining industry was gold. Because its price had been fixed, gold was largely ignored in the expansion of the industry after World War II. Interest revived to some extent when the price was freed in 1968, and strengthened with increasing confidence that the price increases of the late 1970s were likely to be sustained.

Other factors heightened the interest in gold. There was the development in the early 1980s of the efficient carbon-in-pulp method for recovering very fine-grained and low grade gold. This, and other developments with mining equipment, meant that it was now economically feasible to mine, by open cut or by underground methods, entire zones of gold bearing veins (whereas in the past only the main veins themselves would have been mined). So another gold boom emerged in the early 1980s. Australian gold production multiplied from 18 tonnes in 1981 to 57 tonnes in 1985.

The 1980s also saw increased vertical integration in the mining industry, most notably the processing of Australian bauxite to alumina and aluminium. This was a springboard for growth of some regional centres, such as Gladstone in Queensland.

The collapse of world crude oil prices in the first quarter of 1986 changed the fortunes of the petroleum exploration industry, and exploration expenditure bottomed out in 1987. The collapse, however, did not significantly affect the level of production or the expenditure on production and development during this period. Petroleum exploration in the 1980s resulted in the discovery of large resources of natural gas.

The Timor Sea became a focal point of petroleum exploration from 1983 when the Jabiru oil field was discovered. In 1986 this field became Australia's first production project based on floating production, storage and off-loading technology. The North West Shelf, in addition to supplying Western Australia, began a liquefied natural gas export project in 1989. In 1985, 96% of Australia's crude oil requirement was met by domestic production. Since then, however, oil self sufficiency has been declining slowly as demand has increased.

The 1990s were another period of change for the mining industry—a period of consolidation with considerable focus on further improving efficiency and safety of operations and movement towards 'globalisation'.

The economic crisis in Asia in the late 1990s reduced demand for many mineral commodities and fuelled further declines in metal prices. Again, Australian companies increased production of metalliferous commodities. With abundant production from other countries, this exacerbated over-supply and maintained downward pressure on metal prices. Despite far-reaching changes in world mineral production and consumption patterns and the financial crisis in Asia, the mineral industry was able to retain its role as a major source of export income for the Australian economy.

For gold producers, significant central bank selling in the late 1990s (notably in Australia, England, Russia, Malaysia, Lebanon, the Netherlands, Jordan and Canada) was another burden that led to price falls and diminished the role of gold as a national reserve asset. This contributed to the closure of some high cost operations.

At the end of the century Australia had become a major world producer and exporter of coal, iron ore, bauxite, alumina, diamonds, gold, nickel, copper, lead, zinc, silver, mineral sands, manganese ore, uranium and tantalum. Minerals and energy were the largest commodity export by value in 1998–99 at $39.2b, exceeding agriculture ($22.4b). Mining-related intellectual property was worth $1.2b in 1998–99 and was Australia's fifth biggest mineral export, behind coal, gold, aluminium and iron ore. This intellectual property includes geophysical and mining instrumentation, software and processing chemistry, mine site rehabilitation, engineering, and other world-class Australian technologies. The minerals industry contributed 36% of Australian exports of goods and services in 1998–99.

Australia had the world's largest economic demonstrated resources of lead, mineral sands (alluvial ilmenite, rutile and zircon), tantalum, uranium, silver and zinc. It also ranked in the top six countries for economic resources of black and brown coal, bauxite, copper, cobalt, diamonds, gold, iron ore, manganese ore and nickel. There were more than 400 medium to

large-sized mines in Australia, including mines in world-class deposits of most major, and several minor, mineral commodities.

The main milestones in the development of the mining industry over the last century are summarised in table 17.1 below.

Mining in the knowledge-based economy

The minerals industry in Australia has always been a leader in applying innovation and knowledge. Australia's minerals industry at the beginning of the 21st century is world class, not least because it is very much a part of the knowledge-based economy, and is very adept at using, gathering, interpreting, transforming and transmitting data and information using state-of-the-art technologies.

For example, Australia is a world leader in earth science software used to process, visualise and interpret remotely sensed earth science data from satellites and aircraft, and link it with ground-based information. The ability of the Australian minerals industries to capture the benefits of innovation and accumulated knowledge has made and continues to make them internationally competitive.

17.1 DEVELOPMENT OF THE AUSTRALIAN MINING INDUSTRY, Key events from 1900 to 2000

Year	Event
1900	Natural gas encountered in an artesian water bore at Roma (Qld) marked the beginning of petroleum-focused exploration.
1923	Discovery of the Mount Isa lead-zinc-silver deposit (Qld) followed by mining and smelting in 1931.
1924	Discovery of crude oil at Lake Bunga No. 1 well near Lakes Entrance (Vic.).
1953	First substantial flow of oil at Rough Range No. 1 well in north-west of Western Australia, but commercial field did not eventuate.
1955	Production of aluminium from the smelter in Bell Bay (Tas.) marked the start of Australia's aluminium industry.
1957	Commonwealth's Petroleum Search Subsidy Act, active from 1957 to 1974, successfully encouraged on- and offshore exploration, which led to discovery of about half of today's crude oil reserves.
1961	First commercial oil field discovered at Moonie (Qld).
1964–67	Series of important oil and gas discoveries: oil at Barrow Island (WA); gas in north-east South Australia and adjoining part of south-west Queensland; and the Barracouta gas field and Kingfish and Halibut oil fields off the Gippsland coast (Vic.).
1960s	Discovery and initial development of vast iron ore resources in the Pilbara region (WA).
1966	Discovery of high-grade nickel sulphide at Kambalda (WA) triggered five years of intensive exploration and set Australia on the path to becoming the world's third largest nickel producer.
1971	Discovery of the first huge gas fields of the North West Shelf.
1975	Discovery of the Olympic Dam copper-gold-uranium deposit (SA), one of the world's largest deposits of uranium.
1983	Discovery of the Jabiru oil field in the Timor Sea, followed by implementation of the first floating production, storage and off-loading technology from this field in 1986.
1980s	Adoption of fly-in/fly-out arrangements to service many remote mining operations, particularly in the metalliferous sector.
1989	First LNG exports from the North West Shelf.
1989	Australian and Indonesian Governments signed the Timor Gap Treaty that allowed petroleum exploration in the newly-created zone of cooperation in the Timor Sea.
1990s	World-class deposits discovered, including Century (zinc), Cadia-Ridgeway (copper-gold), Murrin Murrin (lateritic nickel) and Kunwarara (magnesite).
1992	The High Court held that the common law of Australia recognises a form of native land title.
1994	Substantive provisions of the *Native Title Act 1993* commenced operation, followed by a comprehensive package of amendments in 1998.
1996	Western Australia surpassed Victoria as the nation's leader in petroleum production.
1996	Launch of the Australian minerals industry's voluntary Code for Environmental Management.
1998	Release of the Federal Government's Minerals & Petroleum Resources Policy Statement.
1999	Development of the Laminaria-Corallina oilfield in the Timor Sea completed; at full production this is expected to contribute around a quarter of Australia's total crude oil and condensate.
1999	Domestic energy supplied by natural gas surpassed that by crude oil and condensate.
2000	Completion of the ten-year National Geoscience Mapping Accord provided a new generation of geoscientific maps and datasets of strategically important areas.

Source: Australian Geological Survey Organisation.

Over 60% of the world's mines use software created by Australian companies, and AUSTMINE figures show exports of $1.2b of mining-related intellectual property in 1998–99. This is well ahead of much publicised industries such as the wine industry, which has just pushed through the $900m level.

Innovative value adding in the Australian minerals industry extends from exploration and mining, through metal production and fabrication, to elaborately transformed manufactures. Although value adding is often equated with downstream processing (smelting and refining) of minerals, exploration and mining are in themselves value adding activities.

E-commerce

The mining industry has a very high level of business PCs and Internet use. This is placing the minerals industry in a good position to take up E-commerce, as evidenced by the initiative by the Australian company WMC to market nickel and cobalt on the Internet.

In August 1999 WMC moved its cobalt and nickel marketing on-line in what is a world first for trading in these commodities. The $100,000 Internet initiative paid for itself in the first month. The web site is changing the way cobalt and nickel are being traded internationally. The move has benefited WMC, which notes that it has doubled its international customer base and improved its premiums, and brought transparency particularly to the cobalt market. WMC also notes that Internet-sourced sales have cut transaction times down to about one minute because availability, pricing and shipping details that were formerly negotiated over the phone are now posted on-line.

Of WMC's customers, North American companies were particularly receptive to the on-line metal trading model, and it is believed that some North American companies will not trade any other way in the future.

Regional development

Apart from the mineral industries' importance to Australia's balance of trade, they are also particularly important in providing jobs and infrastructure development in regional Australia. Since 1967 these industries have built at least 25 new towns, 12 new ports, 20 airfields and 1,900 kilometres of rail line within Australia. Mining and directly associated manufacturing in metal and non-metallic mineral products, and coal and chemical products, employ over 400,000 Australians.

Mining operations are not typically labour intensive once in production, but during construction they provide employment for a great many skilled workers. Downstream processing projects can provide hundreds of jobs to local communities, not only in areas associated directly with construction and operation, but also indirectly through local service industries such as catering, cleaning, maintenance and entertainment.
These projects often result in improved local infrastructure including roads, schools and community leisure and health facilities.

Environmental protection

In the 1980s the mining industry became increasingly influenced by public concern for the quality of the environment. With the rising awareness that preservation of natural features such as scenery, and plant and animal habitats, had a value to society, governments increased the controls on discharge of potentially polluting emissions such as water containing sediments or chemicals, and noxious gases.

The industry was increasingly being required to justify its activities in competition with other potential uses of the land. Government environmental impact assessment processes took account of the likely effect of proposed projects on the surroundings before deciding whether they should go ahead. Many mined-out areas were now required to be rehabilitated by reshaping and revegetating the surface so that the site could be used for other purposes.

Land rights

The effect of land ownership by Indigenous people extended across Australia in the 1990s through a legislative process that commenced in the High Court in 1992. In a historic decision (Mabo (No. 2)), the Court decided that the common law of Australia recognises a form of native land title which exists in accordance with the laws and customs of Indigenous people where:

- those people have maintained their traditional connection with the land; and
- their title has not been extinguished by a law or other action of government (such as a grant of freehold title).

The Native Title Act (NTA) commenced on 1 January 1994, and in 1998 the Federal Parliament passed a comprehensive package of amendments which commenced on 30 September 1998. Under the NTA (or approved State/Territory legislation), applicants for onshore mining or petroleum titles are required to undertake formal negotiations or consultations with native title holders or registered native title claimants who have registered a claim over the area prior to the grant of the titles.

Export trends

From Federation to the mid 1960s Australia's mineral exports concentrated on Europe. However, from 1965 the destination of mineral exports changed, reflecting our location within the Asian region. In 1965, 41% of Australia's mineral exports went to Europe (and 24% of total exports were to the United Kingdom); 41% went to Asia (32% of the total going to Japan); and 16% went to America.

By 1998–99 these figures had changed dramatically: 14% to Europe (6% to the United Kingdom); 64% to Asia (26% to Japan, 12% to South Korea, and 6% to Chinese Taipei); and 4% to America.

Concluding remarks

Since Federation, the minerals industry has been important to Australia, both for development of regional Australia and for the income from its export earnings. The mining industry has created wealth for the nation and its people through the discovery and mining of mineral deposits and through processing the ore.

Australia mines, or has unworked deposits of, almost all mineral commodities. Australia is one of the world's leading miners of coal, bauxite, diamonds, gold, iron ore, lead, manganese, nickel, titanium (rutile and ilmenite), uranium, zinc and zircon.

Some commodities, such as petroleum, nickel, bauxite, diamonds and uranium, have had a relatively short production history in Australia. Others, such as gold, coal, base metals and iron ore, go back to the early days of the industry.

At the start of the 21st century, Australia's mining industry is global in its outlook, innovative and highly successful. It has also become recognised for its commitment and skills to sustain and improve the practice of mining in an environmentally responsible manner.

Summary of mining operations

In this chapter, the term 'mining industry' is used to refer to the group of industries engaged in mining for coal, oil and gas and metallic minerals. It does not cover other mining activities such as sand and gravel quarrying, mining for clay and other construction materials or mining for gemstones.

Table 17.2 shows that in 1997–98 mining industry turnover was $37.3b, 9% higher than the previous year, and value added at $23.8b was 6% higher. However, employment in the sector fell by 9% (5,293 persons) to 50,875 persons between June 1997 and June 1998 .

The coal mining industry remained the largest contributor to total turnover, accounting for 33%, slightly higher than recorded for 1996–97 (32%). The oil and gas extraction industry accounted for 25%. The other main contributors were the gold and iron ore mining industries which accounted for 14% and 11% respectively of total mining industry turnover in 1997–98.

Turnover in the coal mining industry increased by $1.3b (12%) to $12.3b in 1997–98. This was primarily due to a number of mines becoming fully operational during the year as well as increases in production at other mines, which offset the effects of lower prices. However, these events were not sufficient to fully offset the effects of several mines either being closed or placed on care and maintenance. As a result, employment in the coal mining industry fell by 3,636 persons (14%) over the year, the largest employment fall in any mining industry.

The iron ore mining industry reported a $529m (14%) increase in turnover to $4.3b, while the silver-lead-zinc ore mining industry reported a $197m (15%) increase to $1.5b. Table 17.3 contains a summary of the operations of mining industries in 1997–98 by State and Territory.

17.2 MINING, Summary of Operations by Industry—1997–98

	Employment at 30 June(a)	Wages and salaries(b)	Turnover	Inventories		Purchases and selected expenses	Value added	Net capital expenditure
				Open	Close			
	no.	$m	$m	$m	$m	$m	$m	$m
Coal mining	22 522	2 197	12 323	1 015	1 010	5 635	6 683	1 173
Oil and gas extraction	4 247	365	9 465	270	251	730	8 716	1 766
Metal ore mining								
Iron ore mining	5 073	430	4 275	383	417	1 480	2 829	425
Bauxite mining	1 662	96	984	95	75	326	638	151
Copper ore mining	2 338	136	1 391	293	252	617	733	550
Gold ore mining	7 681	438	5 152	592	537	3 035	2 062	683
Mineral sand mining	2 147	122	876	207	259	428	499	213
Silver-lead-zinc ore mining	3 276	217	1 507	161	179	581	943	682
Other(c)	1 929	133	1 372	338	339	708	665	1 160
Total metal ore mining	*24 106*	*1 573*	*15 556*	*2 069*	*2 057*	*7 174*	*8 370*	*3 864*
Total mining 1997–98	**50 875**	**4 134**	**37 344**	**3 353**	**3 318**	**13 540**	**23 770**	**6 803**
Total mining 1996–97	56 168	4 077	34 234	2 786	3 354	12 380	22 422	4 592

(a) Includes working proprietors. (b) Excludes amounts drawn by working proprietors. (c) ANZSIC Classes 1316 (Nickel ore mining) and 1319 (Metal ore mining n.e.c.).

Source: Mining Operations, Australia (8415.0).

17.3 MINING, Summary of Operations by State/Territory—1997–98

	Employment at 30 June(a)	Wages and salaries(b)	Turnover	Stocks		Purchases and selected expenses	Value added	Net capital expenditure
				Open	Close			
	no.	$m	$m	$m	$m	$m	$m	$m
NSW	13 729	1 279	5 975	505	501	2 913	3 058	568
Vic.	1 995	129	3 362	77	75	291	3 069	364
Qld	13 148	1 171	8 820	1 003	1 014	3 837	4 993	1 587
SA	1 859	98	1 160	103	92	276	872	450
WA	17 405	1 258	16 107	1 359	1 321	5 381	10 688	3 690
Tas.	980	67	424	60	47	247	164	49
NT	1 759	133	1 496	247	270	595	924	95
Aust.	**50 875**	**4 134**	**37 344**	**3 353**	**3 318**	**13 540**	**23 770**	**6 803**

(a) Includes working proprietors. (b) Excludes amounts drawn by working proprietors.

Source: Mining Operations, Australia (8415.0).

Exports

Australian mineral resource export earnings fell to $38.8b in 1998–99, a decrease of $1.8b or 4.5%. This was the first annual fall in export earnings since 1994–95. The weaker performance in 1998–99 mainly reflected significantly lower export prices for the majority of minerals and energy commodities, partly offset by a depreciation of the Australian dollar against the US dollar of 8%. Reflecting the fall in prices, the index of mineral resources export unit returns fell by 5.2%.

Black coal remained the biggest export earning mining commodity, with a value of $9.3b in 1998–99, representing 11% of total merchandise exports. Other major exports were gold ($6.3b, 7%), iron ore ($3.8b, 5%) and alumina ($2.8b, 3%).

Some of the commodities for which export earnings decreased in 1998–99 included: crude oil, down $381m (17%), iron and steel, down $293m (18%), nickel, down $260m (24%), refinery petroleum products, down $218m (20%), liquefied natural gas (LNG), down $174m (11%) and liquefied petroleum gas (LPG), down $70m (19%).

Commodities for which export earnings increased during 1998–99 included: copper, up $206m (17%), zinc, up $142m (14%), gold, up $75m (1%), iron ore, up $52m (1%) and diamonds, up $51m (9%). In a majority of cases increased export volumes were the main reason for these increases in export values.

Compared with 1997–98, Australian exports in 1998–99 of crude oil and other refinery feedstock fell by 3% to 14,300 megalitres (ML), and LPG exports fell by 12% to 2,500 ML, while automotive gasoline exports increased by 1% to 1,500 ML. Export earnings from crude oil and condensate fell by 19% to $1.6b, those from LNG fell by 11% to $1.4b and those from LPG fell by 19% to $297m.

Imports

Mineral resource imports were valued at $9b in 1998–99, an increase of $422m (5%) on 1997–98. The main contributors to the rise in imports in 1998–99 were: gold, up $359m (18%) to $2.4b, as Australia reprocessed Asian scrap; refinery petroleum products, up $102m (13%) to $868m; and crude oil, up $85m (2%) to $3.8b.

In 1998–99 imports of crude oil and other refinery feedstock increased by 19% to 29,733 ML and imports of petroleum products increased by 27%. Major petroleum products recording significant increases were automotive gasoline by 84% to 890 ML, aviation turbine fuel by 27% to 140 ML and diesel fuel by 87% to 1,436 ML, while fuel oil and LPG decreased respectively by 25% to 596 ML and 3% to 496 ML.

A significant factor in the rise in crude oil and petroleum product imports in 1998–99 was the Longford Plant disruption in September 1998. It resulted in a reduction in feedstock production which necessitated additional imports. Also, as Bass Strait production recovered, a large proportion of this production was exported as refineries had already arranged contracts for imports of crude.

Mineral production

The total value of minerals produced in the metallic minerals, coal, and oil and gas industries was $34.1b in 1997–98, an increase of $2.6b (8%) compared with 1996–97. The metallic minerals group was the major contributor to the total value of production with 44%, followed by the coal industry with 29% and the oil and gas industry with 27%.

Production increases were recorded in 1997–98 for five of the eight metallic minerals listed in table 17.4. The largest relative increase was for lead concentrate (by 21%) followed by gold bullion (by 7%) and bauxite (by 7%). The largest relative decrease was for copper concentrate (by 6%). The value of metallic minerals produced increased by $1.3b (9%) to $14.9b. This was primarily due to increases in the value of gold production by $339m (7%) to $4.9b, and the value of iron ore produced by $425m (12%) to $4.0b.

Production increases were recorded in 1997–98 for both black and brown coal of 9% and 17% respectively. The value of coal produced increased by $828m (9%) to $9.9b, mainly due to increases in the value of bituminous coal. Increases in the value of crude oil and natural gas produced were the major reasons for the total value of oil and gas production rising by $480m (5%) to $9.3b.

17.4 MINERAL PRODUCTION, Selected Minerals, Australia

	Units	1993–94	1994–95	1995–96	1996–97(a)	1997–98
Metallic minerals						
Bauxite	'000 t	43 306	45 384	50 724	46 874	50 418
Copper concentrate(b)	'000 t	(c)1338	(c)9423	(c)1316	1 769	1 665
Gold bullion (dore)(d)	kg	274 687	298 697	291 965	296 398	330 095
Iron ore(e)	'000 t	123 631	137 525	137 267	162 480	169 568
Lead concentrate	'000 t	873	766	774	782	943
Mineral sands(f)	'000 t	2 252	2 375	2 491	3 044	3 198
Uranium oxide (U308)(g)	t	2 751	2 631	5 105	5 996	5 797
Zinc concentrate(h)	'000 t	1 890	1 699	1 295	2 070	2 029
Total value of metallic minerals	*$m*	*(i)10 861*	*(i)11 715*	*12 708*	*13 617*	*14 895*
Coal						
Black coal	'000 t	177 874	191 903	194 492	206 169	225 181
Brown coal	'000 t	49 684	50 679	54 281	58 886	68 638
Total value of coal	*$m*	*(j)(k)7 418*	*(j)(k)7 340*	*(k)8 006*	*(k)9 089*	*(k)9 918*
Oil and gas						
Crude oil(l)	ML	29 583	31 301	30 763	29 556	32 310
Natural gas(m)	GL	15 959	17 486	19 169	n.a.	n.a.
Ethane	GL	202	208	199	n.a.	n.a.
Propane(n)	GL	2 115	1 999	2 092	2 142	2 421
Butane(n)	GL	1 622	1 480	1 544	1 584	1 883
Liquefied natural gas	'000 t	5 732	6 888	7 346	n.a.	n.a.
Total value of oil and gas	*$m*	*7 423*	*7 683*	*8 070*	*8 823*	*9 303*
Total value of metallic minerals, coal, oil and gas	**$m**	**25 702**	**26 738**	**28 784**	**31 529**	**34 116**

(a) Break in series—data for 1996–97 derived solely from information supplied through the ABS mining collection. Data for prior years derived from information supplied by State mines departments or directly to the ABS, supplemented in some cases by data from other sources. (b) Includes copper precipitate. (c) Excludes South Australia. (d) Includes alluvial gold. (e) Includes iron ore pellets. (f) Includes ilmenite, beneficiated ilmenite, leucoxene, monazite, rutile, synthetic rutile and zircon. (g) Uranium figures supplied from Australian Commodity Statistics, 1999 (ABARE). (h) Includes zinc-lead concentrate and lead-zinc concentrate. (i) Includes Tasmanian coal production. (j) Excludes Tasmania. (k) Excludes briquettes. (l) Stabilised. Includes condensate. (m) Includes field and plant usage. (n) Excludes refinery production.

Source: Mining Operations, Australia (8415.0); Australian Commodity Statistics, 1999 (ABARE).

Major commodities

The information in this section has been largely drawn from the publication *Australia's Identified Mineral Resources, 1999* published by the Australian Geological Survey Organisation.

Bauxite and alumina

Australia is the world's largest producer and second largest exporter of bauxite, the largest producer and exporter of alumina, and the fifth largest producer and third largest exporter of aluminium.

Generally Australian bauxite ore is not sold, but is processed to alumina for sale or for conversion to aluminium. In 1997–98 Australia produced 44.9 million tonnes (Mt) of bauxite, 13.5 Mt of alumina and 1.6 Mt of primary aluminium.

In 1998–99 some of the major commodity exports were aluminium with 1.5 Mt valued at $3.3b and representing 4% of total merchandise exports, and alumina with 11 Mt, valued at $2.8b or 3% of total merchandise exports. Japan was the major market for aluminium, taking 33% of exports.

Bauxite mining employed 1,662 people nationally at the end of June 1998.

Coal

In 1998 Australia produced 285 Mt of raw coal which yielded 225 Mt of saleable coal, increases of 5.1% and 3.6% respectively over 1998. About 71% of Australia's raw coal production came from open-cut mines. In 1998 Australia accounted for about 7% of the world's recoverable Economic Demonstrated Resources (EDR) of black coal and produced about 6% of the world's saleable black coal output.

Large quantities of black coal are mined in New South Wales and Queensland for both domestic and overseas consumption. The major use of black coal in Australia is for electricity generation; other uses include coke making for the iron and steel industry and as a source of heat in cement manufacturing.

The coal industry was the single largest employer in the mining sector at the end of June 1998, with 22,522 employees, or 44% of the total. This represented a drop of 3,636 (14%) over 1997. Black coal was Australia's biggest export earning commodity in 1998–99, accounting for $9.3b or 11% of the total value of merchandise exports. The main market for Australian coal was Japan, which purchased 73 Mt of Australian coal at a cost of $3.9b (43% of total sales).

Significant brown coal deposits occur in Victoria, South Australia, Western Australia and Tasmania. Australia produced over 7% of the world's brown coal in 1998. Brown coal is mined only in Victoria where it is used predominantly for electricity generation. Another important use is for the production of briquettes used for industrial and domestic heating in Australia and overseas.

In 1998, Australian brown coal production was about 65 Mt, up from 61 Mt in 1997. Planning to develop a brown coal mine at Maryvale in the LaTrobe Valley continues, Victoria's first new coal mine in almost two decades. The first coal is expected to be mined in 2004.

Copper

Established copper provinces, such as northwest Queensland and other areas of the country, are continuing to support new discoveries as well as extensions of resources at known deposits. As a consequence, Australia has again become a world class copper producing nation over the past decade.

Australia has the world's third largest EDR of copper, and ranks fifth in the world as a copper producer. In 1998 Australia's mine production was 604,000 tonnes (t) of contained copper, 11% higher than in 1997. Production was boosted by the start-up of two new mines and increased output from three others.

Exports of copper ores and concentrates totalled $968m in 1998–99, while exports of copper metal and copper articles totalled $677m. Copper mining employed 2,338 persons at the end of June 1998, representing 9.6% of total employees in the metal ore mining sector.

Diamonds

Australia's diamond production is the largest in the world for both gem/near gem and natural industrial diamond categories, with most production from the Argyle open pit and a minor contribution from the nearby Argyle alluvials operation.

In 1998–99 Australia produced 36 megacarats (Mct) of diamonds, a decrease of 17% over the previous year.

Exports of diamonds (sorted and unsorted) in 1998–99 totalled $621m. This is broadly equivalent to the 1997–98 export value of $625m. The two main destinations were Belgium-Luxembourg and the United Kingdom.

Gold

Australia's gold resources are mined in all States and the Northern Territory. The United States Geological Survey (USGS) estimate for world gold production in 1998 was 2,400 t. South Africa remained the leading producer with 19.4% of world output, followed by the USA with 14.6% and Australia with 13%.

Preliminary production data from the Australian Bureau of Agricultural and Resource Economics (ABARE) showed Australian gold output to be unchanged in 1998 at 312 t. Western Australia remained the dominant producer with an output of some 234 t (75% of total), slightly lower than in 1997. Ranking of the other States and the Northern Territory remained unchanged in 1998: Queensland was the second largest producer, with an estimated 32 t, followed by the Northern Territory (20 t), New South Wales (15 t), Victoria (5 t), Tasmania (4 t), and South Australia (1 t).

In 1998–99 gold was Australia's second biggest export earning commodity after black coal, accounting for 7% of total merchandise exports at a value of $6.3b. The main markets were United Kingdom ($1.6b) and Singapore ($1.3b).

Although gold prices in Australian dollar terms were slightly better in 1998 than in 1997, they remained low. Despite this situation there was considerable activity in the industry during the year with mining commencing at several new operations.

The gold mining industry employed 7,681 people at the end of June 1998, making it the second largest employer in the mining sector behind the coal industry.

Iron ore

Resources of iron ore occur in all Australian States and the Northern Territory. In 1998 virtually all of Australia's EDR were in Western Australia. Small tonnages occur in South Australia, Tasmania, and New South Wales. Australian iron ore production in 1998 is reported by ABARE as 155.7 Mt. Of the total, 148.9 Mt (95.6%) was won in Western Australia, 2.5% in Tasmania, and 1.9% in South Australia. Minor production of iron ore for non-steel industry use occurred in New South Wales and Queensland. The depressed state of the Asian steel sector hindered development within the Australian iron ore industry during 1998.

Iron ore accounted for $3.8b or 5% of total merchandise exports in 1998–99. Japan was Australia's largest market, taking 46% of exports in dollar terms. Iron ore mining employed 5,073 people at the end of June 1998.

Manganese ore

Australia's resources of manganese ore are the basis of a major mineral export industry as well as a significant domestic ferromanganese, silicomanganese and manganese dioxide processing industry.

With the closure of the mining and processing operations at Woodie Woodie in the east Pilbara district in October 1997, Australia's only operating manganese mine is on Groote Eylandt. Lower production from Groote Eylandt, coupled with the absence of manganese ore production from the east Pilbara district (WA), resulted in manganese ore production falling by about 35% to 1.5 Mt in 1998. Australia is now the world's sixth largest producer of manganese ore. In 1998, Australia produced an estimated 10% of world output.

The value of exports of manganese ore decreased by about 20% in 1998 to around $166m.

Mineral sands

The principal components of mineral sands are rutile, ilmenite and zircon. Australia is the world's leading producer and largest exporter of all three minerals. Rutile and ilmenite are titanium minerals used mainly in the production of titanium dioxide pigment. Zircon is used as an opacifier for glazes on ceramic tiles, in refractories and in the foundry industry.

Australia's resources of ilmenite increased substantially during 1998, up from 143.5 Mt in 1997 to 164.3 Mt, an increase of 14.5%. Following successful initial exploration for coarse-grained heavy mineral strandlines, most of the Murray Basin area in New South Wales, Victoria, and South Australia is now under active exploration. Production from the first mines in the Murray Basin was expected to commence in early 2000.

In 1998 Australia produced 2.4 Mt of ilmenite, 240,000 t of rutile and 400,000 t of zircon. The bulk of Australia's rutile and zircon production is exported, and about 55% of the ilmenite output is exported. The remaining ilmenite production is upgraded to synthetic rutile containing 92–93% titanium dioxide (TiO2).

In 1998 Australia had the world's largest EDR of ilmenite, rutile and zircon with 26%, 39% and 36% respectively, and produced about 36%, 50% and 50% respectively of world output of these minerals.

The mineral sand mining industry employed 2,147 persons at the end of June 1998.

Nickel

In 1998 Australia's EDR of nickel increased by 33.7% over 1997, from 6.72 Mt to a record 8.97 Mt, as a result of company reassessments at either existing mines or new projects nearing production. Australia is the world's largest holder of EDR of nickel.

In 1998 Australian production increased by 15%, to a record level of 933,000 t of nickel concentrates containing an estimated 142,000 t of nickel. All the production was from Western Australia. Australia accounted for about 12% of the estimated world nickel output of 1.17 Mt in 1998 and was the third largest producer after Russia and Canada. Australian exports of nickel in 1997–98 totalled $1.1b.

Tantalum

Australia is the world's largest producer of tantalum (Ta) in the form of tantalum concentrates, with an output of about 330 t of contained tantalum in 1998. This was about 75% of the total world output of 438 t. The main use of tantalum is in the electronics industry, particularly in the manufacture of tantalum capacitors. Rapid worldwide growth in the use of portable electronic devices—such as mobile phones, computers, and video cameras—has generated strong growth in demand for tantalum capacitors in recent years.

Despite continued high levels of production Australia's EDR increased by 58% in 1998 to 18,020 t of tantalum largely because of the new resources at the Greenbushes deposit, in the south-west of Western Australia.

Exports of tantalum and niobium ores and concentrates in 1998–99 were 2,547 t, an increase of 899k over 1997–98. The total value of tantalum exports in 1998-99 was $60m, an increase of 43% over 1997–98.

Uranium

Australia has the world's largest resources of uranium in the low cost Reasonably Assured Resources (RAR) category, with 26% of world resources in this category.

About 95% of Australia's total uranium resources in the low cost RAR category are within the following six deposits: Olympic Dam, South Australia; Ranger, Jabiluka and Koongarra in the Alligator Rivers Region, Northern Territory; and Kintyre and Yeelirrie, Western Australia. The Olympic Dam copper-uranium-gold-silver deposit is the world's largest deposit of low-cost uranium. Uranium oxide is currently produced at two mining/milling operations: Ranger and Olympic Dam. Australia's total production for 1998 was 5,790 tonnes of uranium oxide (t U_3O_8). Ranger produced 4,050 t of U_3O_8 and Olympic Dam produced 1,740 t of U_3O_8. Total production for 1998 was 11% less than in 1997.

Australia is one of the few countries where exploration expenditure increased in recent years, a result of the abolition of the 'three mines' policy in 1996 and improved demand for uranium. Following removal of the policy in March 1996, the Government received formal proposals to develop four new uranium mines: Jabiluka deposit, Beverley deposit, Honeymoon deposit and Kintyre deposit. Australia's uranium mining sector was the subject of a review by the Senate Select Committee on Uranium Mining and Milling which tabled its report in the Senate in May 1997. The Committee's majority report found that the major finding of the 1977 Ranger Uranium Environmental Inquiry (the Fox Report), that "The hazards of mining and milling uranium if these activities are properly regulated and controlled, are not such as to justify a decision not to develop Australian uranium mines", remained valid as the foundation for policy on the mining and milling of uranium in Australia.

Energy Resources of Australia Ltd completed the first stage of the Jabiluka mine development in mid-1999. Beverley deposit production is proposed to commence in the year 2000. Subject to necessary approvals being obtained, production at Honeymoon deposit is scheduled to start in 2000.

Exports of uranium ores and concentrates in 1998–99 totalled 5,989 t and earned $288m. All exports of Australian uranium are subject to stringent safeguards which provide assurance that none of the material is diverted from peaceful uses.

Zinc, lead, silver

Australia has the world's largest EDR of zinc (18%), lead (26%) and silver (15%). According to USGS world production data for 1998 Australia ranks as the largest producer of lead, second of zinc and fourth of silver. Australia's gold mines also contribute significantly to silver production.

EDR for zinc (34 Mt), lead (17.2 Mt) and silver (40.6 kt) decreased in 1998 by 6%, 1% and 2% respectively as a result of production and reassessment of resources at major mines.

Production is mainly from mines at Cannington, George Fisher, Hilton and Mount Isa in Queensland; McArthur River in the Northern Territory; Broken Hill and Elura in New South Wales; Hellyer and Rosebery in Tasmania; and Scuddles, Gossan Hill and the Lennard Shelf deposits in Western Australia. Development of the large Century mine, in northwest Queensland, was expected to commence in the final quarter of 1999. More than 1,300 people are employed on the project.

The silver-lead-zinc mining industry had employment of 3,276 people at the end of June 1998.

Crude oil and condensate

Australian production of crude oil and condensate in 1998–99 was 27,885 ML, a decrease of 18% over the 1997–98 record of 34,000 ML. Production of total crude oil and condensate from the Gippsland Basin accounted for 35% (or 9,732 ML) of total Australian crude oil production, followed by the North West Shelf with 29.5% (or 8,230 ML). The North West Shelf was the major producer of condensate during 1998–99 with 80% (6,346 ML) of total Australian production sourced in that region.

In 1998–99 exports of crude oil and other refinery feedstock decreased by 16% to $1.9b. The main markets were Japan, USA and Chinese Taipei.

Liquefied petroleum gas

Liquefied petroleum gas (LPG) is a valuable co-product of oil and gas production and petroleum refining. The major constituents of LPG are propane and iso- and normal-butane, which are gaseous at normal temperatures and pressures, and are easily liquefied at moderate pressures or reduced temperatures. Operations involving LPG are expensive in relation to other liquid fuels because LPG has to be refrigerated or pressurised when transported and stored. LPG is an alternative transport fuel for high mileage vehicles in urban areas, as well as a petrochemical feedstock and domestic fuel.

Production of naturally occurring LPG in Australia in 1998–99 was 3,904 ML, a drop of 12% over 1997–98. The major contributors were the Gippsland Basin (1,634 ML or 42% of total production) and the North West Shelf (1,355 ML or 35% of total production).

Australian LPG exports in 1998–99 totalled 2,486 ML, a decrease of 12% over 1997–98. Export earnings from LPG in 1998–99 were $297m, down $70m (19%) on the previous year.

Liquid natural gas

During 1998–99, 30,681 million cubic metres (Mm^3) of LNG were produced for domestic consumption and export, an increase of 1% from 1997–98 production. Production was dominated by the North West Shelf, which accounted for 16,343 (Mm^3) of natural gas, or 53% of the total.

Export earnings from LNG decreased by 11% to $1.4b in 1998–99.

Minerals processing and treatment

As few minerals can be directly used in the form in which they are mined, most minerals undergo processing and treatment before use.

Table 17.5 shows the production of the main manufactured products of mineral origin.

17.5 PRODUCTION OF PRINCIPAL MANUFACTURED PRODUCTS OF MINERAL ORIGIN

	Units	1994–95	1995–96	1996–97	1997–98	1998–99
METALS						
Non-ferrous						
Alumina	'000 t	12 940	13 293	13 252	13 581	14 207
Refined aluminium	'000 t	1 285	1 331	1 395	1 589	1 686
Refined copper	'000 t	281	300	305	284	310
Lead bullion(a)	'000 t	177	181	191	171	157
Refined lead	'000 t	205	224	202	185	197
Refined zinc	'000 t	312	330	319	304	323
Refined tin	t	455	550	570	650	595
Ferrous						
Pig iron	'000 t	7 449	7 554	7 545	7 928	7 513
Precious						
Refined gold	t	297	318	326	348	419
Refined silver	t	349	350	339	227	410
FUELS						
Petroleum products						
Diesel automotive oil	ML	11 365	12 202	12 968	13 183	12 968
Industrial and marine fuel	ML	129	78	45	48	32
Fuel oil	ML	2 431	1 998	1 795	1 662	1 634
Petrol	ML	17 911	18 358	18 084	18 589	18 705
BUILDING MATERIALS						
Clay bricks	m	1 860	1 455	1 467	1 532	1 594
Portland cement	'000 t	7 124	6 397	6 701	7 235	7 704
CHEMICALS						
Superphosphate	'000 t	1 590	1 697	1 511	1 819	1 464

(a) Metallic content.

Source: Australian Mineral Statistics (ABARE); Manufacturing Production, Australia (8301.0).

Mineral resources and geology

Australia has the world's largest EDR of lead, mineral sands (ilmenite, rutile and zircon), tantalum, uranium, silver and zinc. It claims a place also in the top six countries in the world for EDR of black and brown coal, cobalt, copper, diamonds, gold, iron ore, manganese ore and nickel.

The diversity of Australian geology provides the basis for its wide range of economically important minerals and variety of deposit types. Its classified geological settings range from major Precambrian Shields composed of Archaean (older than 2.5 billion years) granite greenstone terrains, through to extensive Proterozoic (2.5 to 0.5 billion years) basins and metamorphic belts, to the younger Palaeozoic fold belts (0.5 to 0.25 billion years). Most significant mineral deposits discovered in the past two decades were hidden beneath cover and this is likely to be the pattern in the future, because prospective rocks in some 80% of the continent are concealed by a veneer of deeply weathered rocks or sedimentary strata. The weathering occurred particularly during the Mesozoic and Cainozoic periods (0.25 billion years to the present) and weathered rocks also host important mineral deposits.

The Archaean and Proterozoic basement rocks, underlying most of the western two-thirds of Australia, have been the source of much of the country's mineral wealth to date. Large deposits such as the gold and nickel mines of the Kalgoorlie region and the iron ore deposits of the Pilbara region (Western Australia); the base metal deposits at Broken Hill (New South Wales), Mount Isa (Queensland), McArthur River (Northern Territory); the copper-uranium-gold deposit at Olympic Dam (South Australia); the Argyle diamond deposit, and the uranium deposits of the Alligator Rivers area of the Northern Territory all occur in the Precambrian rock. In eastern Australia, the major deposits are of Palaeozoic age and include the base metal deposits at Elura, Cobar (New South Wales); Hellyer and Rosebery, the Mount Lyell copper-gold deposit, and the Renison tin deposit (Tasmania); and Kidston, Mount Leyshon (Queensland) and most other gold deposits. The large black coal deposits of New South Wales and Queensland are of upper Palaeozoic and Mesozoic age. Deposits formed in Tertiary times include the brown coal of Victoria; the oil shales of eastern Queensland; the bauxite of Weipa (Queensland), Gove (Northern Territory) and the Darling Ranges (Western Australia); the lateritic nickel deposits of Queensland and Western Australia; and the mineral sands deposits of the Murray Basin (Victoria and New South Wales) and Eneabba (Western Australia).

The continuing discovery of world class deposits in both the established and new mineral provinces confirms Australia's high mineral potential. Major discoveries since 1990 include the Century (zinc), Cannington (lead, zinc, silver) and Ernest Henry (copper-gold) deposits in the major Carpentaria–Mount Isa base metal province; the Cadia and Ridgeway (gold-copper) deposit in central western New South Wales; and the Bronzewing (gold) and Silver Swan (nickel) deposits in the Eastern Goldfields of Western Australia.

Australia's most important petroleum basins are under Bass Strait and off north-western Australia. Petroleum has been identified in Australian sediments as old as middle Proterozoic, but the main onshore petroleum accumulations are in sedimentary strata of middle Palaeozoic and younger ages and include the Bowen/Surat, Cooper/Eromanga, Otway and Perth Basins.

Mineral exploration

Exploration involves the search for new ore occurrences or undiscovered oil or gas, and/or appraisal intended to delineate or greatly extend the limits of known deposits of minerals or oil or gas reservoirs by geological, geophysical, geochemical, drilling or other methods. This includes construction of shafts and adits primarily for exploration purposes, but excludes activity of a developmental or production nature. Exploration for water is excluded.

Mineral exploration expenditure

Expenditure in Australia during the last five years on private mineral exploration other than for petroleum is summarised in table 17.6.

Exploration expenditure in 1998–99 was 6% lower than in 1994–95, and much lower than in recent years. Queensland, with expenditure lower by $83m (47%) than in 1994–95, was the main contributor to the fall over that period. Despite a fall of 21% in expenditure from 1997–98 to 1998–99, Western Australia continued to account for the majority of exploration expenditure, remaining at 62% of the national total.

17.6 PRIVATE MINERAL EXPLORATION EXPENDITURE(a), By State/Territory

State/Territory	1994–95 $m	1995–96 $m	1996–97 $m	1997–98 $m	1998–99 $m
New South Wales	79.2	80.4	94.1	88.2	65.6
Victoria	31.2	42.6	51.8	43.1	37.0
Queensland	176.0	181.0	160.7	133.2	93.8
South Australia	20.9	24.1	35.1	45.0	41.9
Western Australia	495.5	519.5	691.7	660.4	523.1
Tasmania	14.9	18.8	26.0	20.7	11.9
Northern Territory	75.8	93.9	88.9	75.9	64.5
Australia	**893.3**	**960.3**	**1 148.6**	**1 066.8**	**837.8**

(a) Excludes expenditure on petroleum exploration.

Source: Mineral And Petroleum Exploration, Australia (8412.0).

17.7 TOTAL METRES DRILLED, By State/Territory—1998–99

Drilling method	NSW '000 metres	Vic. '000 metres	Qld '000 metres	SA '000 metres	WA '000 metres	Tas. '000 metres	NT '000 metres	Aust. '000 metres
Diamond	162.0	n.p.	119.0	38.0	789.0	n.p.	51.0	1 227.0
Reverse circulation	n.p.	n.p.	215.0	69.0	2 059.0	n.p.	n.p.	2 862.0
Percussion	n.p.	n.p.	45.0	n.p.	n.p.	n.p.	n.p.	270.0
Rotary air blast	61.0	n.p.	238.0	90.0	1 512.0	—	n.p.	2 137.0
Aircore/Vacuum	n.p.	n.p.	n.p.	n.p.	1 236.0	—	37.0	1 588.0
Other	n.p.	—	n.p.	n.p.	n.p.	—	n.p.	51.0
Total	**524.0**	**n.p.**	**661.0**	**305.0**	**5 759.0**	**n.p.**	**544.0**	**8 134.0**

Source: Mineral and Petroleum Exploration, Australia September Quarter 1999 (8412.0).

17.8 TOTAL DRILLING EXPENDITURE, By State/Territory—1998–99

Drilling method	NSW $m	Vic. $m	Qld $m	SA $m	WA $m	Tas. $m	NT $m	Aust. $m
Diamond	17.5	n.p.	11.4	n.p.	86.4	n.p.	4.8	131.2
Reverse circulation	n.p.	n.p.	8.8	2.1	84.3	n.p.	n.p.	111.9
Percussion	1.8	n.p.	2.8	n.p.	n.p.	n.p.	n.p.	9.0
Rotary air blast	n.p.	n.p.	5.6	1.0	16.9	—	2.7	27.1
Aircore/Vacuum	n.p.	n.p.	n.p.	n.p.	23.1	—	n.p.	31.1
Other	n.p.	—	n.p.	n.p.	n.p.	—	n.p.	2.8
Total	**26.2**	**n.p.**	**30.2**	**9.6**	**216.5**	**n.p.**	**16.9**	**313.0**

Source: Mineral and Petroleum Exploration, Australia, September Quarter 1999 (8412.0).

Drilling methods used in Australia

The most common drilling method used in 1998–99 was reverse circulation, accounting for 35% (2.8 million metres) of the total. This method incurred the second highest drilling expenditure, and accounted for 36% ($12m) of total expenditure. The number of metres drilled by the rotary air blast method was the second highest drilling method used with 2.1 million metres (26% of total), but accounted for only 9% of total expenditure. The method that accounted for the highest drilling expenditure was diamond drilling, which accounted for 42% ($131m) of total expenditure.

Tables 17.7 and 17.8 show metres drilled and expenditure by drilling methods for all areas (including exploration on production leases and all other areas) by State and Territory.

17.9 PRIVATE PETROLEUM EXPLORATION EXPENDITURE

	1994–95	1995–96	1996–97	1997–98	1998–99
	$m	$m	$m	$m	$m
Onshore	170.8	174.8	251.9	232.2	182.3
Offshore	511.7	550.3	601.0	748.9	685.4
Total	**682.5**	**725.1**	**853.0**	**981.2**	**867.7**

Source: Mineral And Petroleum Exploration, Australia (8412.0).

Petroleum exploration expenditure

Total private petroleum exploration expenditure was $868m in 1998–99 (table 17.9). This was 27% higher than in 1994–95. Offshore exploration expenditure contributed the largest increase between 1994–95 and 1998–99, up $174m (34%) to $685m, while onshore exploration expenditure increased by $12m (7%) to $182m. However, expenditure on both types of exploration fell in 1998–99, onshore exploration by 21% and offshore exploration by 8%, resulting in an overall fall of 12% over 1997–98 expenditure.

Administrative and financial arrangements

The 2000 edition of Year Book Australia contains details of various administrative arrangements related to mining and mineral exploration activities. Additional information covering pricing and taxation issues for petroleum are also covered there.

Mineral rights

Mineral rights in Australia are held by the State and Territory Governments, and the granting of exploration and mining titles is administered by them under the respective State or Territory legislation. The Commonwealth Government holds rights to minerals on Australia's continental shelf beyond coastal waters of the States and the Northern Territory, and to certain prescribed substances in the Northern Territory, within the meaning of the Atomic Energy Act (principally uranium). The Commonwealth Government has constitutional powers with respect to international trade, customs and excise, taxation and foreign investment.

Mineral royalties

Mineral resources are owned by the Crown in Australia, either by the State and Territory Governments within their borders (and up to three nautical miles offshore), or by the Commonwealth Government in offshore areas outside the three nautical mile limit.

Accordingly, royalties are collected by State and Territory Governments for mining onshore and up to three nautical miles offshore, and by the Commonwealth outside that limit.

State royalties regulations vary in regard to types of royalties, rates levied and those commodities subject to royalties.

In recent years, some State Governments have negotiated special royalty arrangements with companies which are seeking mineral leases for large-scale developments. These royalty rates may vary, depending on whether production is for export or for domestic processing. Examples of this type of royalty agreement are the Argyle Project in Western Australia and the Olympic Dam mine in South Australia.

Administrative arrangements

The Commonwealth Minister for Industry, Science and Resources has portfolio responsibility for national energy policy matters, including the commercial development of hydrocarbon fuels and minerals in the Australian offshore area. The Department of Industry, Science and Resources provides support for a number of advisory bodies including the Australian and New Zealand Minerals and Energy Council, and the National Oil Supplies Emergency Committee.

The Department is also responsible for the implementation of action required from Australia's membership of the International Energy Agency and for the national system of accounting for control of nuclear materials under Australia's Agreement with the International Atomic Energy Agency.

Research

Research into exploration, mining, ore dressing and metallurgy is conducted by government bodies, universities, private enterprise, and by the combined efforts of all these. A summary of the main organisations and their functions follows.

Australian Geological Survey Organisation (AGSO)

AGSO is Australia's national geoscientific agency. On behalf of the Commonwealth Government it aims to enhance the potential for the Australian community to obtain economic, social and environmental benefits through the application of first class geoscientific research and information in the following fields:

- petroleum and minerals exploration promotion and technical policy advice;
- marine-zone geoscience; and
- geohazards mitigation and geomagnetism.

AGSO provides expert geoscientific advice on minerals, petroleum, coastal and marine issues and seismological and geological hazard analysis. It also contributes to Commonwealth Government involvement in international geoscientific activities and development assistance programs. AGSO also has a specific role in the technical definition of Australia's marine jurisdiction under the UN Convention on the Law of the Sea.

AGSO's activities include regional mapping and analysis of major mineral provinces and petroleum basins; regional environmental mapping; earthquake and nuclear monitoring; and the development of an accessible national geoscience information system.

AGSO is the prime custodian of the nation's geoscientific databases. There is a long-term commitment to developing and maintaining databases on the composition, structure, dynamics and evolution of the Australian continent and continental shelf. Traditionally these databases have been aimed at the search for minerals and oil, but increasingly they are directed to environmental and land management issues.

Commonwealth Scientific and Industrial Research Organisation (CSIRO)

CSIRO contributes to the development of sustainable and competitive minerals and energy industries in Australia through research and development activities.

This is achieved by the provision of research and development capabilities to support existing and emerging industries, as well as providing for the next generation of technology, products and processes. At the same time, CSIRO endeavours to bring about safe and ecologically sustainable development through research and advice on environmental issues related to client industries. By working closely with industry, government and other organisations, CSIRO helps transform research outcomes into new or improved business opportunities.

The research activities are conducted by CSIRO divisions as part of work programs in support of the following sectors defined by CSIRO:

- the Minerals Exploration and Mining sector;
- the Mineral Processing and Metal Production sector;
- the Petroleum sector; and
- the Energy sector,

under the guidance of the respective industry-based Sector Advisory Committees.

See *Chapter 16, Forestry and fishing* and *Chapter 25, Science and innovation* for more information on the CSIRO.

AMIRA International (Australian Mineral Industries Research Association Limited)

AMIRA International is a not-for-profit private sector company, established in 1959 to facilitate the technical advancement of its members in the mineral, coal, petroleum and associated industries. It has membership and support of about 100 companies in Australia and internationally.

AMIRA International brokers and manages jointly funded research projects on a fee for service basis. Project sponsors are required to be AMIRA members. Typically, at any one time there are 75 projects under management valued at $35m.

The primary benefit delivered by AMIRA International is the output from project sponsorship.

Australian Bureau of Agricultural and Resource Economics (ABARE)

ABARE is a professionally independent agency devoted to applied economic research.

For over 50 years ABARE has worked with industry and government to provide stakeholders in Australia's rural and resource industries with

up-to-date public policy analysis and commodity forecasts.

ABARE's research seeks to clearly and independently identify the benefits and costs of alternative policy options for consideration by government and private decision makers. ABARE's data about domestic and international economic performance help clients achieve increased productivity, enhanced value and improved market access.

ABARE services include:

- deriving supply and demand projections;
- assessing the outlook for commodity prices;
- examining patterns of national and world production and consumption;
- analysing the impact of economic policies;
- developing analytical computer programs and economic policies;
- undertaking regional and environmental economic assessments; and
- providing economic assessments of factors affecting the competitiveness of the resources sector.

ABARE undertakes economic research on issues affecting the full range of major minerals, energy, agricultural and natural resources industries, as well as on climate change, and on macroeconomic, microeconomic and trade issues relating to these industries.

Bibliography

ABS publications

Australian Mining Industry (8414.0).

Manufacturing Production, Australia (8301.0).

Mineral and Petroleum Exploration, Australia (8412.0).

Mining Operations, Australia (8415.0).

Other references

Australian Geological Survey Organisation, *Australia's Identified Mineral Resources*.

Australian Bureau of Agricultural and Resource Economics (ABARE):

—*Australian Commodity Statistics*.

—*Australian Mineral Statistics*.

Commonwealth Department of Industry, Science and Resources (DISR), *Australian Petroleum Statistics*.

Internet sites

ABARE, *http://www.abare.gov.au*

Australian Bureau of Statistics, *http://www.abs.gov.au*

—A Mining theme page may be found under the category *Themes*, providing information about the ABS's Mining statistics, and links to other useful Internet sites.

Australian Geological Survey Organisation, *http://www.agso.gov.au*

Australian Institute of Petroleum, *http://www.aip.com.au*

Australian Mineral Industries Research Association Limited, *http://www.amira.com.au*

Commonwealth Department of Industry, Science and Resources, *http://www.isr.gov.au*

Commonwealth Scientific and Industrial Research Organisation, *http://www.csiro.au*

Joint Coal Board, *http://www.jcb.org.au*

Other sources

State government departments and instrumentalities are important sources of minerals and energy data, particularly at the regional level, while a number of private corporations and other entities operating within the mining and energy fields publish or make available a significant amount of information.

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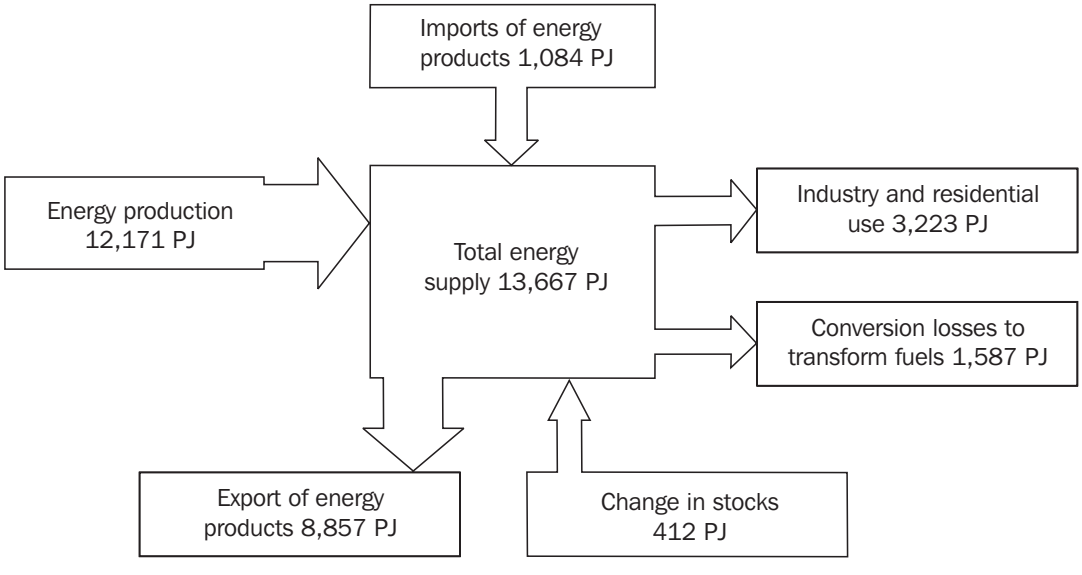
Introduction

The production and supply of energy constitute one of the most important sectors of the Australian economy. As well as supplying the power on which industry and households depend, the sector provides employment and investment opportunities, and is a major source of export earnings, all of which contribute substantially to the welfare and standard of living of Australians.

The fuels mined in Australia are either consumed here, stockpiled for future consumption or export, or exported to other countries. In some cases, consumption takes place in Australia to produce another kind of fuel for export (e.g. Coke, LPG). Some fuels are imported into Australia, mainly crude oil.

The relationships involved in the sources and uses of energy are illustrated in figure 18.1, the energy model for Australia for 1997–98, which sets out the quantities (Peta Joules) of energy imported, produced, used, stockpiled and exported.

18.1 ENERGY MODEL, Australia—1997–98



Source: Australian Energy: Market Developments and Projections to 2014–15 (ABARE).

Over the past decade the issues surrounding energy production and consumption have received increasing attention because of the established link between the waste products of fossil fuel consumption, primarily carbon dioxide, and global climate warming.

Australia's dependence on fossil fuel combustion for the generation of energy and transport contributes to the increasing concentration of carbon dioxide in the atmosphere. In 1996 Australia's per capita emissions of carbon dioxide were more than four times the world average and nearly 50% greater than the average for OECD countries.

National and international responses to the prospect of global climate change have led to the development of many policies and programs aimed at reducing the emission of greenhouse gases. Their main objective is to reduce the rate of increase of fossil fuel consumption and the resulting greenhouse gas emissions. Currently, the main methods employed to achieve this objective include increasing the efficiency of use of fossil fuels; replacing coal and oil with natural gas where possible; and encouraging the use of renewable energy sources (see also the section *Greenhouse gases)*.

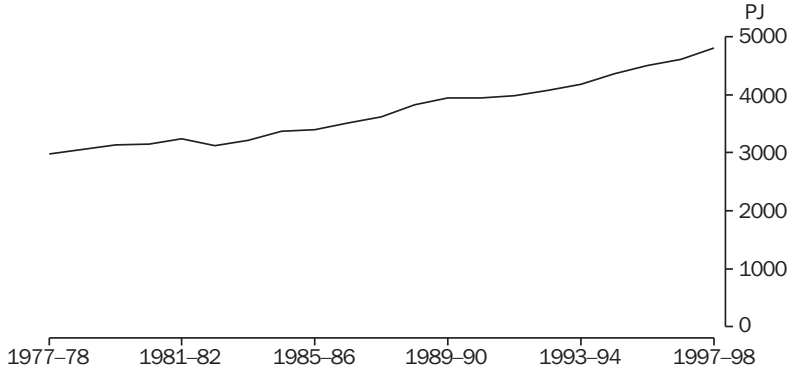
Of the recent changes in the Australian energy sector, perhaps the most important have been the reforms in the energy market. The major change has been the replacement of the previous system of publicly owned State authorities with a more open competitive market. These changes are intended to increase the efficiency of the energy sector, open up the market to small energy producers, and deliver benefits to consumers, industry and the economy.

The total amount of energy used per annum in Australia has risen by 61% over the past two decades, from 2,985 Peta Joules (PJ, or J x 10^{15}) in 1977–78 to 4,810 PJ in 1997–98 (graph 18.2). This increase reflects the growth of both the Australian population and the economy. The amount of energy used per capita has increased by 24% over this period, from 209 Giga Joules (GJ, or J x 10^{9}) per person in 1977–78 to 258 GJ in 1997–98.

Australia's dependence on fossil fuels is readily apparent when the primary fuels consumed are ranked in order of use. In 1997–98, fossil fuels accounted for 94% of energy consumed in Australia. Crude oil and black coal were the main fuels, representing 34% and 29% of energy consumed respectively (graph 18.3). Natural gas represented 18% of energy consumed, followed by brown coal (13%), and renewable fuel sources (6%). Comparison of these figures and those for 1977–78 indicates a decline of 14 percentage points in the proportion of energy derived from crude oil and an increase of 8 percentage points in the proportion derived from natural gas.

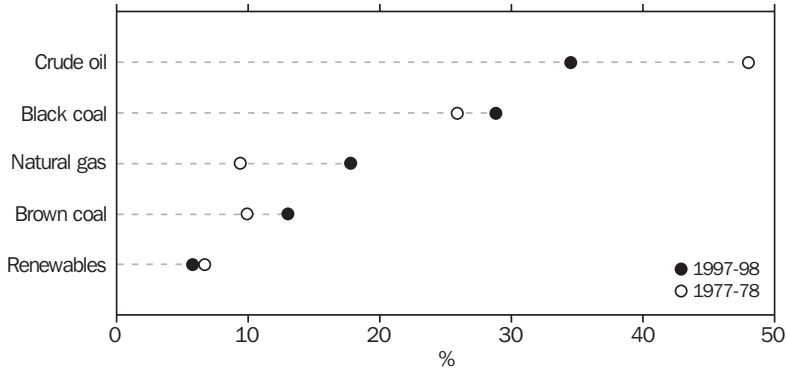
In 1997–98, Australia's total energy use (energy consumed within the country, not including conversion losses) was 3,223 PJ. This is relatively large, given Australia's small population.

18.2 AUSTRALIAN ENERGY USE—1977–78 to 1997–98



Source: Australian Energy: Market Developments and Projections to 2014–15 (ABARE).

18.3 ENERGY SOURCES USED, Australia—1977–78 and 1997–98



Source: Australian Energy: Market Developments and Projections to 2014–15 (ABARE).

18.4 ENERGY CONSUMPTION, Selected Countries—1995–96

	Australia	Canada	United States of America	France	United Kingdom	China	Japan	Indonesia	Viet Nam
Industry(a)									
Peta Joules (no.)	**1 089.0**	2 934.5	17 966.8	2 082.9	1 943.5	16 428.2	6 034.9	922.4	261.0
Change since 1986 (%)	**32.7**	14.5	0.9	12.3	8.5	51.1	22.3	183.2	199.7
Transport									
Peta Joules (no.)	**1 091.5**	2 116.4	23 385.8	1 964.9	2 088.0	2 617.2	3 768.1	790.0	163.7
Change since 1986 (%)	**29.4**	27.0	21.0	29.2	27.5	60.0	50.4	146.0	262.0
Other									
Peta Joules (no.)	**587.8**	2 565.3	19 082.2	2 736.1	2 767.9	6 640.3	4 310.3	627.2	98.4
Change since 1986 (%)	**31.3**	20.8	15.4	18.0	11.7	29.0	41.6	47.0	221.9
Total									
Peta Joules (no.)	***2 767.9***	*7 616.6*	*60 434.8*	*6 783.5*	*6 798.9*	*25 685.6*	*14 112.9*	*2 339.6*	*522.9*
Change since 1986 (%)	***31.1***	*19.9*	*12.6*	*19.1*	*15.1*	*45.5*	*34.6*	*117.9*	*221.1*
Consumption per capita									
GJ per capita(b)	**151.3**	254.2	227.6	116.2	115.7	21.1	112.1	11.9	6.9

(a) Includes non-energy use. (b) Excludes conversion losses.

Source: International Energy Agency; Organisation for Economic Co-operation and Development 1998.

In 1995–96, based on International Energy Agency methodology, Australia ranked 18th among countries on the basis of energy consumption, but 49th based on population size. Between 1986 and 1996, Australian energy consumption increased by 31%, placing Australia eighth among OECD countries in consumption increase. This increase was spread evenly across industry, transport and other sectors. Table 18.4 shows energy consumption for selected countries in 1995–96, the percentage increase in their consumption since 1986, and their per capita consumption. There is great disparity in per capita consumption between some countries. Canadians consumed 254 GJ per capita, while people in two developing countries, Viet Nam and Indonesia, consumed 12 GJ and 7 GJ per capita respectively. These two countries had also increased their energy consumption considerably over the decade preceding 1995–96—by as much as 221% in Viet Nam.

Energy resources

Australia's main energy resources are coal, uranium, natural gas, crude oil, condensate and liquid petroleum gas (LPG). Australia is a net exporter of energy products, primarily focused on black coal and uranium markets. Black coal, brown coal and uranium are the largest known resources of energy within Australia's borders. Australian known resources of uranium are the largest in the world; Australian black coal resources are the sixth largest in the world.

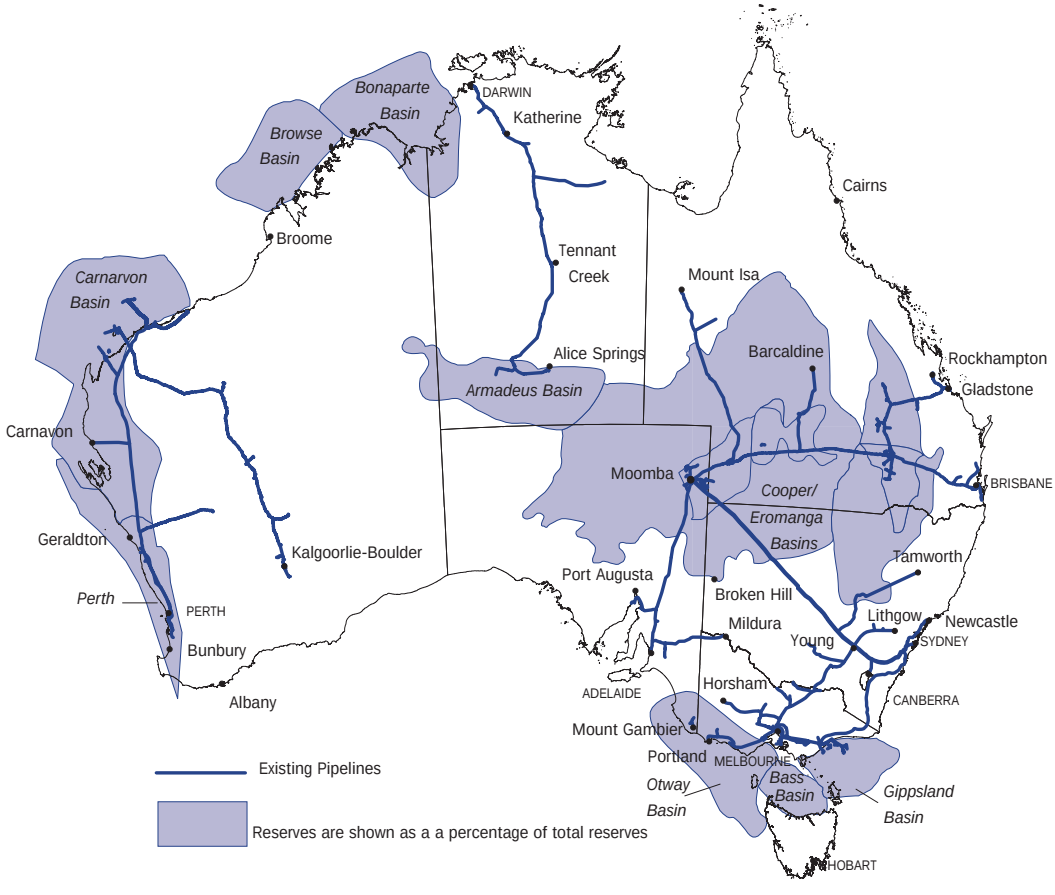
Australia's proven coal resources are large. Map 18.5 shows that the majority of discovered coal resources and coal mines are close to densely populated areas that have port facilities or electricity generating utilities.

Map 18.6 shows the extent of access to gas resources in Australia. There are three major pipeline systems: in Western Australia connecting the Carnavon and Perth basins with Perth and Kalgoorlie; in the the Northern Territory connecting Darwin and Alice Springs to the Amadeus basin; and the Eastern pipeline system connecting the Cooper, Eromanga and Bass Strait basins to the major cities in eastern Australia.

18.5 AUSTRALIAN COAL RESOURCES

Source: LANDINFO 2000.

18.6 AUSTRALIAN GAS RESOURCES



Source: The Australian Gas Association, 2000.

Australia's non-renewable energy sources are large when considered in energy values. An estimated 2.2 million PJ of energy were available for exploitation in 1998 (table 18.7), of which black coal (1.4 million PJ) accounted for 65% of all available energy resources. Non-fossil fuel resources represented 13% of total subterranean energy resources, yet these resources were accessed only for exports. Australia also has a large potential for solar-driven renewable energy, owing to high hours of sunlight received in remote areas. Renewable sources of energy are discussed further in *Conservation initiatives*.

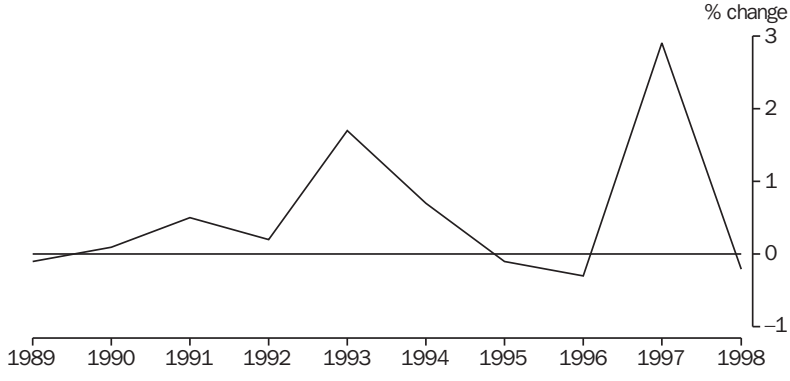
Over the ten years shown in table 18.7, resources have only changed marginally, indicating that pressure to develop energy resources is not affecting the amount of overall resources available. Graph 18.8 shows a flat or slightly increasing trend of change in the supply of energy resources for Australia.

18.7 AUSTRALIA'S DEMONSTRATED ENERGY RESOURCES, By Resource Type

	Black coal	Brown coal	Crude oil	Natural gas	Condensate	LPG	Uranium	Total
	PJ	PJ	PJ	PJ	PJ	PJ	PJ	PJ
1989	1 357 750	405 169	9 620	37 245	4 403	2 972	222 780	2 039 939
1990	1 363 504	404 733	9 953	36 153	4 329	2 998	220 430	2 042 100
1991	1 370 050	404 412	9 546	37 050	4 551	3 445	222 780	2 051 834
1992	1 381 077	401 066	9 028	39 195	4 921	3 551	217 140	2 055 978
1993	1 336 690	400 697	9 213	38 688	4 995	3 498	296 570	2 090 351
1994	1 335 380	400 212	10 952	50 427	5 735	4 050	297 510	2 104 266
1995	1 335 396	400 212	10 249	49 296	6 734	3 787	295 630	2 100 916
1996	1 330 644	399 368	8 880	53 040	7 067	4 550	292 340	2 097 903
1997	1 388 691	398 845	9 805	57 447	7 030	4 760	289 050	2 155 628
1998	1 390 884	397 700	8 880	53 040	7 141	4 576	289 050	2 151 271

Source: Unpublished data, Mineral Account, Australia; Australian Geological Survey Organisation.

18.8 CHANGE IN ENERGY RESOURCES, Australia



Source: Unpublished data, Mineral Account, Australia; Australian Geological Survey Organisation.

Table 18.9 shows the net present value (NPV) of demonstrated energy assets and of all demonstrated mineral assets measured within Australia. The NPV is the expected value of the resource based on current market value, with some modifications based on depletion and economic forces. The net present value of an asset is defined in depth in the ABS publication *Australian National Accounts: National Balance Sheet* (5241.0.40.001). The estimated value of energy resources in 1998 was 30% of the estimated value of total mineral assets. The values of black coal and natural gas feature strongly among energy minerals in 1998, accounting for 38% and 34% of total energy mineral assets, respectively. Black coal and natural gas are also among the most exported Australian energy products, as discussed in *Energy supply and use*.

Table 18.9 shows a 57% increase in the value of energy mineral assets over the period 1989 to 1998. Mineral assets increased by 116% over the period. The increase in the value of minerals was due largely to increases in black coal, natural gas and condensate, which more than compensated for falls in the value of crude oil, uranium and LPG.

The value of energy resources has fluctuated over the period, falling in the early 1990s before recovering, but the NPV of these commodities compared to that of total mineral commodities seems to be decreasing over time (graph 18.10). This effect is mainly due to non-energy minerals increasing in value faster than energy minerals.

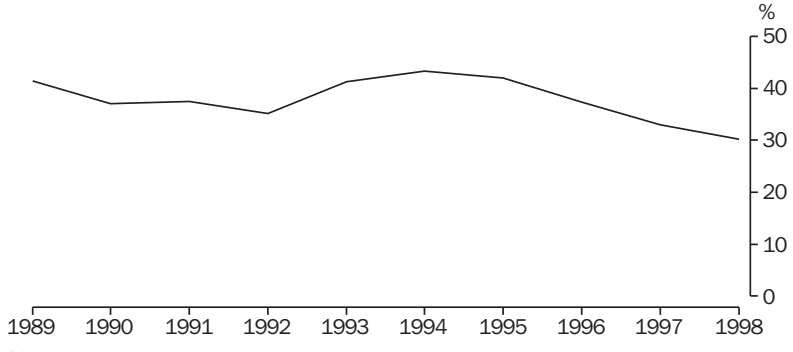
In 1998 energy resources were valued at $36,000 per PJ while still in the ground. Crude oil, condensate and natural gas were the most valuable assets (table 18.11). The value of crude oil was $1,375,000 per PJ in 1998, compared to $21,000 per PJ of black coal and $6,000 per PJ of uranium. Australia tends to export lower value commodities and to supplement imports of higher value energy products with domestic production. For example, in 1997–98 coal exports were 4,613 PJ and exports of uranium were approximately 3,000 PJ. Imports and exports of energy minerals are discussed further in *Energy supply and use*.

18.9 NET PRESENT VALUE OF ENERGY ASSETS, By Resource Type

	Black coal	Brown coal	Crude oil	Natural gas	Condensate	LPG	Uranium	Total energy assets	Total mineral assets
	$m	$m	$m	$m	$m	$m	$m	$m	$m
1989	7 066	293	15 081	16 705	2 766	4 585	3 162	49 658	119 514
1990	3 492	215	11 063	14 664	1 641	2 198	2 743	36 016	97 182
1991	3 950	138	13 543	14 351	2 511	1 865	2 587	38 945	103 935
1992	1 741	100	13 831	15 008	2 662	1 363	2 227	36 932	105 092
1993	8 644	209	16 277	18 998	3 338	1 086	2 020	50 572	122 655
1994	10 847	348	18 686	20 676	3 549	1 341	1 686	57 133	131 896
1995	16 793	301	18 472	25 638	4 391	1 798	1 558	68 951	164 224
1996	14 338	237	16 571	26 477	4 550	1 826	1 534	65 533	175 901
1997	22 507	469	14 502	28 272	5 470	2 220	1 624	75 064	227 724
1998	29 412	508	12 215	26 758	5 262	1 987	1 802	77 944	258 485

Source: Australian National Accounts: National Balance Sheet (5241.0.40.001).

18.10 VALUE(a) OF ENERGY ASSETS, Proportion of Total Mineral Assets



(a) Net present value.

Source: Australian National Accounts: National Balance Sheet (5241.0.40.001).

18.11 ENERGY RESOURCES, Relative Value

	Black coal	Brown coal	Crude oil	Natural gas	Condensate	LPG	Uranium	Total energy
	$'000/PJ	$'000/PJ	$'000/PJ	$'000/PJ	$'000/PJ	$'000/PJ	$'000/PJ	$'000/PJ
1989	5.2	0.7	1 567.7	448.5	628.2	1 542.8	14.2	24.3
1990	2.6	0.5	1 111.5	405.6	379.1	733.1	12.4	17.6
1991	2.9	0.3	1 418.7	387.3	551.7	541.3	11.6	19.0
1992	1.3	0.2	1 532.0	382.9	540.9	383.9	10.3	18.0
1993	6.5	0.5	1 766.7	491.1	668.3	310.5	6.8	24.2
1994	8.1	0.9	1 706.2	410.0	618.8	331.1	5.7	27.2
1995	12.6	0.8	1 802.3	520.1	652.1	474.8	5.3	32.8
1996	10.8	0.6	1 866.1	499.2	643.8	401.3	5.2	31.3
1997	16.2	1.2	1 479.0	492.1	778.1	466.4	5.6	34.8
1998	21.1	1.3	1 375.6	504.5	736.9	434.2	6.2	36.2

Source: Derived from Australian National Accounts: National Balance Sheet (5241.0.40.001).

Energy supply and use

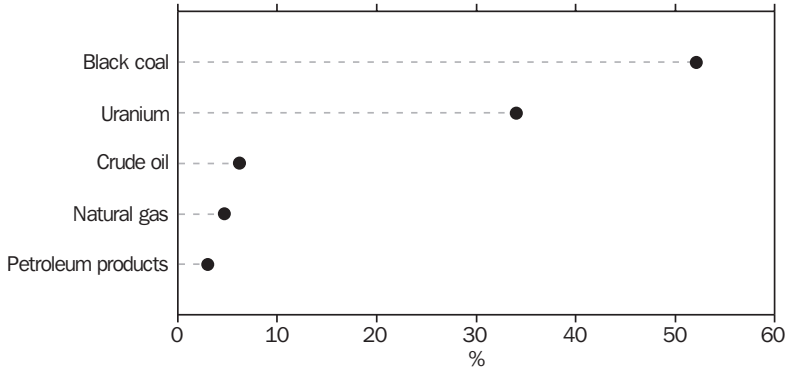
Energy use in Australia is driven by demand; as discussed in *Energy resources*, it is not currently limited by supply. Demand is driven by the energy requirements of the various sectors of the Australian economy, including the export of fuels. As these sectors have grown, along with the Australian population, the consumption of energy has increased. However, as per capita figures demonstrate, consumption has increased at a greater rate than the population. This can be broadly attributed to increases in the standard of living; economic growth; and changes in the structure of the population. For the last three decades household formation has occurred at a faster rate than population growth. Between 1971 and 1996 the population of Australia increased by 40%, from 12.8 million to 19.9 million. However, over the same period the number of households increased by 74%, from 3.7 million to 6.4 million. This shift in structure has probably had a significant impact on energy consumption since households are one of the main units of consumption.

The biggest consumer of the energy produced in Australia is the export sector (graph 18.12). In 1997–98, of the 12,171 PJ of energy resources produced, 8,857 PJ, or 73%, were exported. These energy resources were mainly in the form of black coal and uranium. The export of coal, petroleum, gas and uranium earned Australia $15,700m in 1997–98, representing 18% of the value of all exports in that year. In comparison, $4,362m was spent on energy imports, mainly crude oil and petroleum products. Over the period 1978 to 1998 the total energy value (PJ) of black coal exported tripled, while the energy value of black coal consumed in Australia increased by 61%. The proportion of domestic black coal production exported rose from 58% in 1978–79 to 78% in 1997–98.

Table 18.13 shows estimates of energy use in Australia. These comprise estimates of the energy value of fuels sold overseas (exports); conversion losses, which are primarily heat losses sustained when converting from primary energy to secondary energy (e.g. from coal to electricity or crude oil to petroleum); and industry and residential energy use (the energy used by industries in the process of producing a product or service, and used by households).

Electricity generation was the largest consumer (1,272 PJ) of total primary energy supply in 1997–98, most of it lost as heat (the average efficiency of large thermal electricity generation plants is around 32%). The transport sector (road, rail, air and water combined) consumed 1,202 PJ, and manufacturing industries 989 PJ, making them the second and third largest energy consuming sectors respectively. Combined, these three sectors consumed 72% of Australia's total domestic energy supply. Energy consumption by the electricity generation industry increased by 107% between 1977–78 and 1997–98, reflecting rapid growth in some end use sectors in which electricity is a prime energy source, such as the commercial sector. Mining also experienced a large increase in energy end use, 263% between 1977–78 and 1997–98 (ABARE 1999).

18.12 ENERGY RESOURCE EXPORTS, Proportion by Energy Commodity—1997–98



Source: Australian Energy: Market Developments and Projections to 2014–15 (ABARE).

18.13 TOTAL ENERGY USE, Australia

Energy use	1977–78 PJ	1982–83 PJ	1987–88 PJ	1992–93 PJ	1997–98 PJ
Exports of energy products					
Black coal	1 111.0	1 608.4	2 910.4	3 660.6	4 612.9
Uranium	578.5	2 118.5	2 139.4	1 075.8	3 015.1
Other	164.0	157.3	430.3	847.3	1 229.0
Total exports of energy products	*1 853.5*	*3 884.2*	*5 480.1*	*5 583.7*	*8 857.0*
Conversion losses(a)					
Electricity production	615.9	773.4	893.4	1 020.5	1 272.3
Other	308.3	255.9	252.6	275.9	314.8
Total conversion losses	*924.2*	*1 029.3*	*1 146.0*	*1 296.4*	*1 587.1*
Industry and residential use					
Agriculture	43.3	49.7	55.1	61.1	68.8
Mining	72.9	75.4	118.2	191.8	264.6
Iron and steel	124.8	82.3	96.5	96.2	99.5
Chemical	95.4	107.1	125.9	129.8	149.5
Other industry	486.2	483.4	602.1	657.4	740.4
Construction	35.3	34.9	39.4	41.6	46.9
Road transport	572.8	646.2	761.9	829.2	936.0
Rail transport	30.5	28.2	32.7	29.3	29.4
Air transport	79.5	84.1	107.2	140.0	183.6
Water transport	114.3	74.6	59.6	45.6	53.4
Commercial	95.7	109.8	134.2	164.0	205.3
Residential	261.0	273.1	296.2	347.2	384.6
Other(b)	49.7	44.8	48.0	52.1	60.4
Total Industry and residential use	*2 061.4*	*2 093.4*	*2 477.0*	*2 785.0*	*3 223.0*
Total energy use	**4 838.8**	**7 006.9**	**9 103.2**	**9 665.3**	**13 666.7**

(a) The energy lost in the process of converting primary energy to secondary energy. (b) Comprises lubricants, greases, bitumen and solvents.

Source: Unpublished data, ABARE.

Table 18.14 shows estimates of energy supply (the total amount of energy available during the year, including imports, exports and changes to stockpiles). During the period 1977–78 to 1997–98, the total energy produced in Australia increased from 3,935 PJ to 12,171 PJ, an increase of 209% (or an average annual increase of 5.8% over the period). Imports, which are primarily crude oil and petroleum products, have increased at a lower rate (83%) than local production, from 593 PJ in 1977–78 to 1,084 PJ in 1997–98. Another notable trend is the increase in production of natural gas, from 283 PJ in 1977–78 to 1,272 PJ in 1997–98, reflecting the growth in the gas distribution network.

Conservation initiatives

Australia is geologically fortunate in having very large reserves of coal and natural gas. However, as discussed in the Introduction, the consequence of utilising fossil fuels is the release of carbon dioxide locked away millions of years ago. Ready access to cheap fossil fuel has also meant that alternative energy sources have been underdeveloped. The adoption of targets to reduce greenhouse gas emissions, established under the Kyoto Agreement, has focused attention on the efficiency with which we use fossil fuels and the possible adoption of renewable energy sources. Although representing a small proportion of overall energy consumption, perhaps the two most important such initiatives are the 2% renewable energy target and the development of Greenpower schemes. These schemes represent a major change in the approach to energy production in Australia and may enable Australia to pioneer new, innovative technologies that could form the basis for important export industries.

Renewable energy resources are those that can be used at a rate which can be sustained indefinitely. The main forms are hydro-electricity, solar heaters or photovoltaic cells, wind generators, geothermal plants, ocean or tidal generators and biomass generators (which use organic-based fuel sources such as wood, bagasse (sugar cane fibre), landfill gases and ethanol).

18.14 TOTAL ENERGY SUPPLY, Australia

	1977–78	1982–83	1987–88	1992–93	1997–98
	PJ	PJ	PJ	PJ	PJ
Energy production					
Black coal	1 902.6	2 658.4	3 610.5	4 778.0	5 885.0
Brown coal	297.4	329.4	424.9	466.8	631.6
Wood	80.9	85.1	90.6	104.7	109.7
Bagasse	68.3	71.9	73.9	78.0	112.1
Crude oil and ORF(a)	938.7	816.6	1 156.9	1 136.0	1 256.6
Petroleum products(b)	77.3	77.1	104.0	100.1	117.6
Natural gas	283.1	466.2	610.5	983.1	1 272.0
Hydro-electricity	52.0	46.5	53.9	61.0	58.2
Solar energy	0.4	1.6	2.4	2.4	3.7
Uranium	234.1	2 177.3	1 970.7	1 270.9	2 724.6
Total energy production	*3 934.7*	*6 730.1*	*8 098.3*	*8 981.0*	*12 171.0*
Imports of energy products					
Crude oil and ORF	434.0	455.9	370.6	751.6	968.1
Petroleum products	158.5	101.7	124.8	108.7	115.4
Total imports of energy ptoducts	*592.5*	*557.6*	*495.4*	*860.3*	*1 083.8*
Change in stocks	311.4	–280.9	509.5	–176.0	412.2
Total energy supply	**4 838.8**	**7 006.9**	**9 103.2**	**9 665.3**	**13 666.7**

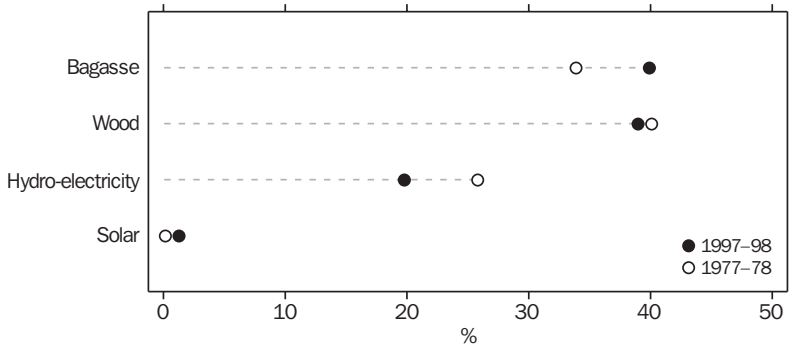
(a) Oil refinery feedstock. (b) Includes naturally occurring LPG.

Source: Unpublished data, ABARE.

The renewable energy initiative, set in 1997 by the Prime Minister's Statement *Safeguarding the Future: Australia's response to climate change*, is a mandatory target for electricity retailers and large electricity purchasers to source an additional 2% of their electricity from renewable or specified waste product energy sources by 2010. The main objectives of this policy are to accelerate development of renewable energy sources in order to reduce greenhouse gas emissions and to provide the impetus for establishing a commercially competitive renewable energy industry.

Over the two decades prior to 1997–98, the estimated contribution to Australia's energy consumption from renewable sources increased by 39%, from 202 PJ in 1977–78 to 281 PJ in 1997–98. However, as a proportion of Australia's total energy consumption, the contribution declined slightly, from 7% to 6%. Over those two decades the proportion of renewable energy derived from wood changed only slightly, while that from bagasse increased by 6 percentage points; hydro-electricity's share decreased by 6 percentage points (graph 18.15).

18.15 AUSTRALIAN RENEWABLE ENERGY CONSUMPTION, Proportion by Source—1977–78 and 1997–98



Source: Australian Energy: Market Developments and Projections to 2014–15 (ABARE).

In 1996–97 it was estimated that the share of renewable energy in national electricity production was about 10%, ranging from less than 1% in the Northern Territory and South Australia, to nearly 100% in Tasmania (ABARE 1998).

Renewable energy sources are used extensively in everyday life e.g. in drying washing, drying fruit and providing light. Australia has the resources to increase the proportion of energy contributed from solar, wind, biomass and other energy sources, and so decrease or slow the expansion of our consumption of greenhouse gas emitting fossil fuels.

Current renewable energy developments include windfarms, small hydro-electricity plants, photovoltaic panels and biomass fuelled plants such as generators powered by landfill gas.

Although windmills are a common feature of the Australian landscape, they are generally used to pump groundwater to holding tanks. Small wind-powered generators have also commonly been used in remote areas to generate electricity. More recently, large scale wind generators have been installed that are connected into the electricity grid and are capable of supplying a total of about 20 MW of electricity (table 18.16). Currently, the largest windfarm in Australia, located at Crookwell in NSW, has eight 600 KW turbines that together can generate up to 4.8 MW of electricity.

18.16 LOCATIONS OF LARGE SCALE WIND INSTALLATIONS

Operating wind installations	State	Capacity MW
Crookwell	New South Wales	4.80
Esperance	Western Australia	2.00
King Island	Western Australia	0.75
Koorangang Island	New South Wales	0.60
Thursday Island	Queensland	0.45
Denham	Western Australia	0.23
Malabar	New South Wales	0.15
Coober Pedy	South Australia	0.15
Flinders Island	Tasmania	0.10
Breamlea	Victoria	0.06
Murdoch	Western Australia	0.03
Aurora	Victoria	0.01
Coconut Island	Queensland	0.01

Source: New Era, New Energy. Renewable Energy Action Agenda Discussion Paper, Department of Industry, Science and Resources 1999.

Currently Australia has the capacity to generate about 7,580 MW from large scale hydro-electricity generators, most of which are located in Tasmania and in the Snowy Mountains in NSW.

Development since the mid 1980s has centred on small-scale hydro-electricity schemes. These can either make use of existing structures (dams, weirs, pipelines etc.) and harness energy that was previously wasted, or use diversion pipes that return flows to the river. In 1999, there were 13 operating small hydro-electricity installations located in Victoria, New South Wales and Western Australia, with a generating capacity of about 200 MW (Redding Energy Management 1999).

Biomass energy is derived from plant or animal material. Commonly used sources in Australia include wood, bagasse, landfill gas and sewage gas.

Landfill gas is mainly a mix of about 55% methane and 40% carbon dioxide that is produced by the decomposition of organic materials deposited in landfill sites. The high methane content enables the gas to be burnt on site to power small electrical generators. This use of landfill gas has the additional advantage of reducing the potential greenhouse impact of the gas emitted from the landfill, since burning methane produces mainly water vapour and carbon dioxide, which has a smaller potential greenhouse effect than methane. The estimated capacity of landfill gas installations in Australia in 1997 was 72 MW (DPIE 1997).

Bagasse is burnt on site in sugar refineries to produce steam and electricity for their own use and, more recently, for sale into the national electricity market (a process often referred to as co-generation). Bagasse is the largest contributor of renewable energy in Australia, producing about 112 PJ of energy in 1997–98, or 40% of renewable energy produced in that year (ABARE). The sugar mills are mainly located in Queensland and New South Wales and have an estimated capacity of 250 MW. The industry has been assessed as having the potential to supply considerably more electrical energy into the grid—as high as 1,000 MW (DPIE 1997).

Photovoltaics, or solar cells, can directly generate electricity from light. In Australia they have been extensively used in remote regions to power settlements and homes, pumps, automatic navigation and communications systems, etc. More recently, large arrays have been constructed to generate directly into the electricity grid, such as the 50 kW solar array at Queanbeyan, NSW. Currently, photovoltaic technology is expensive, but its cost is projected to fall as global demand increases (DPIE 1997).

Greenpower schemes

Consumers who join Greenpower schemes undertake to increase their payment for their electricity supply to fund the development of renewable energy sources. The innovator of these schemes was the NSW Sustainable Energy Development Authority (SEDA), which commenced the program in 1997. The Authority has developed an accreditation program for Greenpower schemes to ensure that consumers receive what they pay for. In June 2000, seventeen electricity retailers were offering accredited schemes with about 68,000 customers (SEDA 2000). Discussions are currently taking place between Commonwealth and State and Territory authorities to develop a nationally consistent Greenpower accreditation scheme (DISR 1999).

For consumers, Greenpower schemes represent the first convenient means by which they can exercise choice over the source of their electricity and support renewable energy. The renewable power sources adopted by electricity suppliers include solar, wind and hydro-electric power, as well as energy from waste such as landfill gas or bagasse.

Table 18.17 presents information from an ABS household survey canvassing people's views and practices regarding environmental issues. The table examines the extent to which Australian households are connected to Greenpower schemes. A total of 228,000 households reported being connected to a Greenpower scheme in March 1999, just over 3% of Australian households. This relatively low uptake is likely to be significantly affected by the low level of awareness among consumers. Almost 80% of households not connected to a Greenpower scheme reported that they were not aware of such schemes.

The 1997 Policy Statement *Safeguarding the Future: Australia's Response to Climate Change* included commitments aimed at reducing greenhouse gas emissions from the Commonwealth Government's own operations by adopting energy efficiency measures. These include fuel consumption targets for the Commonwealth vehicle fleet, minimum energy consumption ratings on appliances and equipment, and minimum energy ratings on housing.

Environmental issues

Greenhouse gases

The largest single source of Australia's greenhouse gas emissions is the production and consumption of energy. The National Greenhouse Gas Inventory (NGGI) estimated that in 1998 greenhouse gas emissions by the energy sector were equivalent to 363 million tonnes of carbon dioxide, representing 80% of total emissions in that year (table 18.18). The main producer of emissions in the energy sector was electricity generation, which is mainly produced by burning coal.

18.17 HOUSEHOLD CONNECTION TO GREENPOWER SCHEMES, By State and Territory—March 1999

	NSW	Vic.	Qld	SA	WA	Tas.	NT(a)	ACT	**Aust.**
					'000				
Connected	24.9	*6.9	19.0	*1.8	10.4	164.1	*0.2	*0.8	**228.1**
Not connected	2 116.9	1 591.8	1 191.8	563.4	664.6	12.8	46.9	111.1	**6 299.2**
Don't know	243.6	141.9	121.1	40.3	40.2	9.6	*5.1	*6.1	**607.8**
Total	2 385.4	1 740.6	1 331.9	605.5	715.2	186.4	52.2	118.0	**7 135.2**
					PER CENT				
Connected	1.0	*0.4	1.4	*0.3	1.5	88.0	*0.4	*0.7	**3.2**
Not connected	88.7	91.4	89.5	93.1	92.9	6.8	89.9	94.2	**88.3**
Don't know	10.2	8.2	9.1	6.7	5.6	5.1	*9.7	*5.1	**8.5**

(a) Refers to mainly urban areas only.

Source: Environmental Issues: People's Views and Practices (4602.0).

18.18 CARBON DIOXIDE-EQUIVALENT EMISSIONS AND REMOVALS, By Sector—1990 and 1998

	1990	1998	Change	Change
	Mt CO_2-e(a)	Mt CO_2-e(a)	Mt CO_2-e(a)	%
Energy				
Stationary Energy	208.5	258.7	50.2	24.1
Transport	61.5	72.6	11.1	18.0
Fugitive	29.5	31.5	2.0	6.7
Total energy sector	*299.6*	*362.9*	*63.3*	*21.1*
Industrial processes	12.0	9.8	–2.2	–18.4
Agriculture	90.6	92.2	1.6	1.8
Forestry and other(b)	–27.2	–24.5	2.7	–10.1
Waste	14.9	15.5	0.6	4.2
Net emissions	**389.8**	**455.9**	**66.1**	**16.9**

(a) Comprises all greenhouse gases expressed as the equivalent mass of CO_2 based on their global warming potential. (b) This sector absorbs CO_2, acting as a 'sink'. It is therefore expressed as a negative value.

Source: Australian Greenhouse Office, 2000(b).

Pollution

Wherever fuels are mined, produced or transported, there is always the risk of environmental damage, spillage or other accidents. Fortunately, Australia has only suffered two major oil spills from shipping accidents, the *Ocean Grandeur* in the Torres Strait in 1970 (1,067 tonnes) and the *Kirki* off Western Australia in 1991 (17,700 tonnes). However, there have been several moderate spills through the 1990s, most recently a discharge of about 250 to 300 tonnes of crude oil into Sydney Harbour in 1999 from the *Laura D'Amato*. The risk of further spills stemming from shipping accidents is considered to be quite high (SoE 1996).

Other environmental impacts of energy use include photochemical smogs from vehicle pollution and woodfires, and environmental damage and pollution from mining and production processes.

Carbon credits/emission trading

The 1997 Kyoto international negotiations on greenhouse gas emissions reviewed the adequacy of commitments made by developed countries to reduce their greenhouse gas emissions. During the negotiations, Australia argued for differential targets depending on circumstances in each country. On this basis, Australia was allocated a target of restricting emissions to a maximum of 8% above 1990 levels in the target period 2008 to 2012.

The Kyoto protocol also included the provision for countries to offset emissions by taking into account carbon that has been stored in carbon sinks (such as trees) since 1990, provided that the storage was the result of direct human-induced land use change or forestry activity. Other provisions included *joint implementation*, where a developed country can invest in projects in other developed countries to acquire credits to assist in meeting their targets; *clean development mechanism*, where a developed country can invest in emission reducing projects in developing countries to earn credits; and *emissions trading*, where developed countries are allowed to participate in emissions trading to meet their targets.

The practical details of how these mechanisms will work have yet to be finalised. However, the main advantage of allowing free-market trading in carbon credits is that it will help minimise the costs of meeting targets. For example, an emitter with the opportunity to reduce their emissions cheaply, could do so in excess of their target and then have credits to sell, perhaps to an emitter that does not have the option to reduce their emissions so cheaply. The system has the advantage that it provides great flexibility on how targets are met and reduces the degree of government administration required. An emissions trading system could also incorporate carbon sinks based on the mass of carbon stored in the sink.

The National Greenhouse Strategy (NGS) which began in 1996, extending the National Greenhouse Response Strategy formulated in 1992, is the main mechanism for meeting Australia's international commitments. The NGS is a policy initiative implemented by the Commonwealth Government and State/Territory Governments with the intention of creating voluntary involvement down to the local government, industry and community level. The objective of limiting greenhouse gas emissions

especially impacts on the Australian energy market, and has already led to reforms of the energy production and delivery systems and the promotion of renewable energy sources as an alternative to fossil fuel sources.

Some of the key issues of the Kyoto protocol that have yet to be resolved include the mechanisms for emission trading, precise definitions relating to forestry activities, how changes in land use are to be included, and how changes in carbon stocks in the sinks are to be measured. Under the protocol, by 2007 Australia must have a national system to estimate emissions and removals into sinks due to human related activity. A National Carbon Accounting System is being established to fulfil that obligation (AGO 2000a).

Bibliography

ABS publications

Australians and the Environment (4601.0).

Electricity, Gas, Water and Sewerage Operations, Australia (8226.0).

Energy Accounts for Australia (4604.0).

Environmental Issues: People's Views and Practices (4602.0).

International Merchandise Trade, Australia (5422.0).

Manufacturing Production, Australia: Energy Products (8368.0).

Mineral Account, Australia (4608.0).

Australian National Accounts: National Balance Sheet (5241.0.40.001).

Other references

Australian Bureau of Agricultural and Resource Economics (ABARE):

—1998, *The Renewable Energy Target*, ABARE Current Issues No. 98.3, August 1998, Canberra.

—1999 *Australian Energy: Market Developments and Projections to 2014–15*, Canberra.

Australian Geological Survey Organisation 2000, *Australia's Identified Mineral Resources 2000*, Canberra.

Australian Greenhouse Office:

—2000a, *Greenhouse Sinks and the Kyoto Protocol: an issues paper*, Canberra.

—2000b, *National Greenhouse Gas Inventory: Analysis of Trends and Greenhouse Indicators*, Canberra.

Commonwealth Department of Industry, Science and Resources 1999, *New Era, New Energy: Renewable Energy Action Agenda, Discussion Paper*, Canberra.

Commonwealth Department of Primary Industries and Energy:

—1997, *Renewable Energy Industry: survey on present and future contributions to the Australian economy*, Canberra.

—1998, *National Greenhouse Strategy*.

International Energy Agency 1998, *Energy Balances of OECD Countries, Paris.*

Prime Minister of Australia 1997, *Safeguarding the Future: Australia's Response to Climate Change*.

Redding Energy Management 1999, *2% Renewables Target in Power Supplies: potential for Australian capacity to expand to meet the target*, for the Australian Greenhouse Office.

State of the Environment (SoE) Advisory Council 1996, *Australia—State of the Environment Report 1996*, Melbourne.

Sustainable Energy Development Authority 2000, *Green Power Status Report—June 2000*, Sydney.

The Australian Gas Association 2000, *Gas Statistics Australia, 2000,* Canberra.

Other sources

The following organisations also produce energy statistics:

- Australian Institute of Petroleum;
- Commonwealth Department of Industry, Science and Resources;
- Electricity Supply Association of Australia; and
- Joint Coal Board.

State government departments and instrumentalities are also important sources of energy data, particularly at the regional level. A number of private corporations and other entities operating within the energy field also publish or make available a significant amount of information.

Internet sites

Australian Greenhouse Office, *http://www.greenhouse.gov.au*

Australian Renewable Energy Website (Australian Greenhouse Office), *http://renewable.greenhouse.gov.au*

Commonwealth Department of Industry, Science and Resources, *http://www.isr.gov.au*

Energy Australia, *http://www.energy.com.au*

Organisation for Economic Co-operation and Development, *http://www.oecd.org*

Sustainable Energy Development Authority (NSW), *http://www.seda.nsw.gov.au*

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Introduction

Manufacturing broadly relates to the physical or chemical transformation of materials or components into new products, whether the work is performed by power-driven machinery or by hand.

The manufacturing industry is an important sector of the Australian economy, contributing around 13% of Australia's gross domestic product (GDP) and around 12% of employment. However, despite significant increases in the value of the manufacturing industry's gross value added (by more than 15% over the past ten years), the industry's share of Australian GDP has fallen over the past 20 years from around 18% to its current level of 13%.

Similarly, employment in the manufacturing industry has fallen from around 1.1 million persons 20 years ago to 937,000 persons at June 1999.

This chapter presents a range of data about the manufacturing sector as a whole, and about broad categories of manufacturing industry. These categories are referred to as 'subdivisions'.

Some data are provided from the annual manufacturing survey, for which the latest results relate to 1998–99, while others, also relating to 1998–99 in most instances, have been derived from various monthly and quarterly surveys.

Manufacturing from settlement to the start of the new century

Before Federation

The first Australian factories were based on the waterfront—repairing visiting vessels, brewing beer and making biscuits. The early industrialisation of the late 19th century led to an expansion into the fringe suburbs of the main coastal settlements, creating thousands of new jobs for boilermakers, engineers, iron founders and brickmakers. The decline in goldfields activity earlier in the century had left many English immigrants unemployed and, as was said, "threw them into" the newly industrialised workforce and suburbs. At the end of the century, despite rapid industrialisation the manufacturing sector was still dominated by many smaller factories. Even in Victoria, the most industrialised colony, factories of more than fifty employees drew only half of the registered workforce. The older trades in small workshops, such as saddlemaking, coachbuilding and dressmaking, still outnumbered the new, expanding engineering trades developed by the burgeoning tram and railways industries.

Federation to Depression

Federation and the dismantling of interstate tariffs allowed the manufacturing sector to trade and prosper across the nation. Total employment in the sector rose from 190,000 in 1903 to 328,000 in 1913. However, proportionally the sector remained small, contributing only 13% of GDP in 1911. International protective tariffs allowed the sector to grow more strongly as did the requirements of World War I. Federal population policies after the war depended on the steady growth of the manufacturing sector, under the protection of tariffs. The sector facilitated high rates of post-war immigration at a time when Australian rural export industries were actually shedding labour. The Newcastle Steelworks were opened during the war and hastened the growth and diversification of metal-working industries.

By 1929, 440,000 people were employed in Australian manufacturing. The previously dominant clothing and textiles industry had steadily declined in employment, while the metals and machinery industry emerged as a major contributor to both employment and production. In particular, the new motor vehicle industry of the 1920s strengthened this sector. With Holden already well established, Ford soon followed with a large motor body assembly plant in Geelong, in response to the growing demand for motor cars.

Depression and World War II

While employment had increased rapidly in the early years of Federation, the Great Depression had a devastating effect on national employment. Between 1901 and the start of the Depression, manufacturing's total employment had increased threefold. The rate of increase then declined to 1.8 times between the late 1920s and late 1940s, lowering manufacturing's share of total employment from 22% in 1921 to 18% in 1931. However, manufacturing led the recovery from the Depression, accounting for 25% of total employment by 1940–41, which overtook even the rural sector's share.

The 1940s surge in the relative importance of manufacturing coincided with periods of significant structural change in the sector. Traditional areas such as food processing, wood working and clothing gave way to the more industrially advanced areas of metals and engineering, and chemicals. World War II provided fertile ground for the development and expansion of key industries for the production of munitions, ships, aircraft, machinery and chemicals. Indeed World War II could well be thought of as marking the industrialisation of Australia. Although mass production of food, textiles clothing and footwear was already well established, the war gave great impetus to heavy industry, chemicals and specialised engineering. In particular, the outbreak of war with Japan and Australian responsibility for supplies in the south-west Pacific aided greatly the development of the sector, and it outstripped all previous levels.

Although World War II saw a peak in female participation in the manufacturing sector, there has been surprisingly little change in the relative participation rates of women in manufacturing in the 20th century. In 1901 female workers constituted 22% of the entire sector. While this proportion peaked during World War II at 30%, women had in fact already gained a share of 28% during World War I and the Depression. Today women make up 27% of the manufacturing work force and still predominate in the footwear, clothing and textiles industry. World War II did, however, contribute to a sharp fall in unemployment numbers, in developing the manufacturing sector and, of course, in the enlistment of men and women from the labour force into armed service. As well, the resultant skills acquisition and strategic development of industry, together with the rapid diversification of scientific and technical knowledge, established a sound basis for the expansion and growth in the post-war era.

1950s and 1960s—industrialisation and growth in demand for consumer goods

The 1950s and 60s proved to be highly productive decades for the sector. Growth of manufacturing output per employee from Federation to World War II had varied from 1.0 to 1.3% per annum (excluding the years of the Great Depression). During the 1950s and 60s, however, growth rose dramatically to an average of 4.3% per annum. Over this period the expansion of manufacturing productivity per annum was 11% higher than in the agricultural sector and almost double that of the economy as a whole. The entire economy was expanding, fuelled by large scale immigration and technical and scientific innovation, as well as the increasing availability of raw materials after protracted wartime shortages. With manufacturing seen as vital for national development, the pre-war protective tariff remained, and import licensing restrictions and controls were retained until 1960. As a result, by the beginning of the 1960s manufacturing's share of GDP and employment had reached historic heights.

Increased national income and population drove the demand for consumer goods. The white goods industry mushroomed after World War II, and by 1950 the first large scale production of Australian motor vehicles had begun. The development of the motor vehicle industry created further demands for steel, gas, plastics and rubber. In 1960 one person in 16 of the entire Australian workforce was employed in the manufacture, distribution or servicing of this industry. Traditional industries such as food, clothing, sawmilling and wood products continued to decline, in both production and employment. In contrast, the more capital intensive industries such as electrical goods, chemicals and industrial metals steadily increased in size. For example, employment in the metals and engineering industry, as a proportion of total manufacturing employment, increased from 18% in 1871 to 48% in 1968, reflecting its centrality to the Australian industrialisation process. This increase was matched by a steady decline in the relative importance of food processing (from 21% in 1871 to 11% in 1968), woodworking (13% to 7%) and textiles and clothing (23% to 14%). As well, demand for other consumer and producer

goods in the 1960s provided a challenge for the development of Australian electronic industries.

During this period the structural changes to the sector were significant, but not so great as to ensure Australia's relative competitiveness, particularly in the 1960s. By this time the rapid growth afforded by the domestic market in the 1950s had ended and, although manufacturing exports increased, the rate of growth was small and compared poorly with that in other developed countries.

1970s and 1980s—recession and recovery

By the 1970s the world economic environment had changed dramatically. The 'stagflation' of the Australian economy reflected the greater world recession, triggered by oil price rises in 1973–74. In Australia, both the manufacturing and rural sectors experienced substantial decline in employment levels between 1973 and 1980, by 80,000 and 15,000 respectively. Manufacturing fared worst of all sectors, its share of employment falling from 25% in 1970 to 18% in 1985. As well its proportion of total GDP fell from a high of 29% in 1960 to 18% in 1985. Throughout this period Australia's international competitiveness was affected by both external and domestic issues. Increasing competition from newly industrialised Asian nations and fluctuating exchange rates, together with domestic workforce developments, led to dramatic change in the Australian workforce and production across all sectors, and manufacturing in particular.

In 1947 Australia had 2.2 million people in paid work. By 1980 this figure had risen to 6.6 million. While the country's population had doubled, its workforce had trebled, even though young people were remaining in education longer, and workers were retiring earlier. Women and migrant workers fuelled the employment explosion. The campaign for equal pay and sharp rises in all real wage costs caused a squeeze from rapidly escalating costs and intensified import competition. Tariff cuts in particular compounded the problem and, accordingly, import quotas were imposed on those goods most affected by competitive external producers. The clothing industry, for example, was in sharp decline after its peak in 1971, and this industry, along with the textiles, footwear and whitegoods industries, was the subject of quantitative import restrictions.

Despite significant rationalisation, manufacturing responded to economic recovery in the 1980s more slowly than other sectors. In 1982 a difficult period for heavy industry was signalled by Australian Iron and Steel's announcement of the impending loss of 2,500 jobs in the Port Kembla steelworks. Meanwhile, at Whyalla in South Australia, BHP had closed its shipbuilding works in 1978, forced out of business, it was argued, by foreign competition. By the 1980s most manufacturing industries were adopting various forms of automation, especially for 'pick and place' tasks such as the loading and unloading of die-cast machines, spot welding, molten metal pouring and forging. For example, by 1980 production in the clay brick industry was 80% automated. 'Numerical control', involving the use of computer technology for improving the capability of machine tools, which had been used in the 1960s for the production of complex parts, was being applied by 1980 to more simple machinery tasks. Such automation was welcomed by manufacturers pressed by rising labour costs and vigorous import competition. However, in the 1980s Australia was already a 'post-industrial' society, in which manufacturing had come to account for a declining proportion of employment, and in which most net growth in employment occurred in service industries.

By 1988–89 manufacturing turnover was largest in the food, beverages and tobacco industry, which also employed the greatest number of workers in the sector. This industry's turnover, at $30,757m, represented 20% of the total for the sector. Despite industrial rationalisation, the basic metal products industry maintained a high share of both turnover and employment; in 1988–89 its turnover was $19,408m, 13% of the total for the sector. Clothing and footwear, however, had continued to decline, with turnover representing just 4% of the total for the sector.

International perspectives—the 1980s and 1990s

From 1980 to 1997 manufacturing's contribution to Australia's GDP fell from 17% to 13%. This contrasted markedly with manufacturing's virtually unchanged share (19%) of the United States GDP, and the slight increase in Japan—from 25% to 27%—over the same period. In fact, the contribution of manufacturing to the GDP of all industrialised

countries fell by only 2%, from 24% in 1980 to 22% in 1997.

Consistent with world trends, Australian manufacturing became increasingly export oriented throughout the 1980s and 1990s. In 1984–85 some 16% of the sales of manufacturing firms were to overseas markets. By 1997–98 this figure had risen to 26%. Import penetration of Australian markets increased more slowly over the same period, from 26% in 1984–85 to 36% by 1997–98. Australia's products featured competitively only in certain industries. In 1997 Australia ranked fifth for share of world value of non-ferrous metals, yet contributed only 4% of world supply. This share had remained relatively constant since 1985. In the supply of metal products Australia fell in world ranking from 10th to 12th in the same period, though its share of world supply remained unchanged. In food products, Australia's world ranking has remained at 12th, its share also remaining constant at 1.6%. In wearing apparel Australia's competitiveness has declined; in 1985 Australia ranked 14th, contributing 1.3% of production. However since 1995 Australia has not featured in the top 15 producers of wearing apparel.

Contribution to GDP

Table 19.1 shows that the total volume of production (gross value added) of the manufacturing industry in chain volume terms (measuring 'real' output unaffected by price change) has increased steadily from 1992–93 to 1998–99. Manufacturing gross value added (its contribution to GDP) has increased by 10% over the past five years, 10% over the past 10 years and 37% over the past 20 years. However, in percentage terms manufacturing's contribution to GDP has been trending down for some years (as indicated in the preceding article), and has declined by 1.6 percentage points of GDP since 1992–93.

Over the period 1992–93 to 1998–99, gross value added rose in eight of the nine manufacturing subdivisions, with the largest growth being recorded in Machinery and equipment manufacturing (by 23%), Petroleum, coal, chemical and associated product manufacturing (by 18%), Non-metallic mineral product manufacturing (by 16%) and Wood and paper product manufacturing (by 16%). Production levels declined over the same period in only Textile, clothing, footwear and leather manufacturing (by 3%).

19.1 MANUFACTURING GROSS VALUE ADDED, Chain Volume Measures(a) by Industry Subdivision and Contribution to GDP

Industry subdivision	1992–93 $m	1993–94 $m	1994–95 $m	1995–96 $m	1996–97 $m	1997–98 $m	1998–99 $m
Food, beverage and tobacco manufacturing	11 704	12 127	12 255	12 598	12 843	13 303	13 367
Textile, clothing, footwear and leather manufacturing	3 742	3 792	3 704	3 499	3 497	3 439	3 599
Wood and paper product manufacturing	4 622	4 714	4 853	4 899	5 108	5 278	5 145
Printing, publishing and recorded media	6 151	6 278	6 610	6 725	7 069	7 040	6 744
Petroleum, coal, chemical and associated product manufacturing	8 141	8 542	8 801	9 306	9 439	9 526	9 636
Non-metallic mineral product manufacturing	3 586	3 665	3 664	3 395	3 458	3 530	4 104
Metal product manufacturing	12 168	12 701	12 510	12 826	13 394	13 047	13 595
Machinery and equipment manufacturing	11 952	12 952	13 763	14 357	14 474	14 388	15 096
Other manufacturing	2 335	2 482	2 509	2 481	2 484	2 517	2 514
Total manufacturing(b)	*64 366*	*67 237*	*68 665*	*70 096*	*71 792*	*72 068*	*73 800*
Contribution to GDP(c) (%)	**15.1**	**15.1**	**14.9**	**14.5**	**14.3**	**13.7**	**13.5**

(a) Reference year for these chain volume measures is 1997–98. (b) Chain volume measures are not additive for most periods; the component measures do not sum to a total in the same way as the corresponding current price components do. (c) Strictly gross value added at basic prices, chain volume measures.

Source: Australian System of National Accounts (5204.0).

Manufacturing trends

Industry value added (IVA) measures the value of industry outputs less the value of materials and services purchased and used up in the production of that output. Graph 19.2 depicts growth in chain volume measures of IVA for the period 1993–94 to 1998–99 inclusive. Total IVA for 1998–99 in chain volume terms was $71,981m, representing a 3.9% increase over 1997–98, with an 11.4% increase over the five year period from 1993–94.

Structure of the manufacturing industry

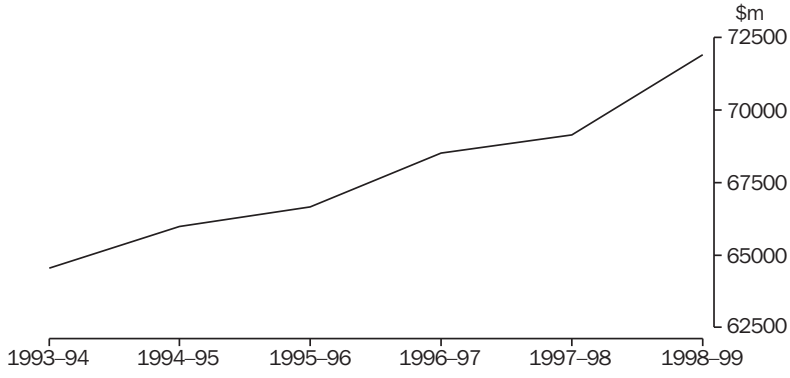
At 30 June 1999, manufacturing establishments in Australia employed 937,400 persons. During 1998–99 those establishments paid $35,099m in wages and salaries and generated $220,555m of turnover and $68,296m of value added (table 19.3).

The manufacturing subdivisions with the most persons employed at 30 June 1999 were Machinery and equipment manufacturing (198,100), Food, beverage and tobacco manufacturing (170,600) and Metal product manufacturing (149,200). Non-metallic mineral product manufacturing (35,400) was the smallest employer, accounting for only 3.8% of manufacturing employment. Information on manufacturing employment by State/Territory is in table 19.8.

Food, beverage and tobacco manufacturing was the largest contributor to total manufacturing turnover and the second largest to total industry value added (IVA). The industry's turnover of $49,085m was 22% of the total for manufacturing and its value added of $13,775m accounted for 20%. Other subdivisions making major contributions were Machinery and equipment manufacturing (20% of turnover and of value added), Metal product manufacturing (18% and 16%) and Petroleum, coal, chemical and associated product manufacturing (15% and 14%). Information on industry value added and turnover by State/Territory is contained in tables 19.6 and 19.7 respectively.

The generally direct relationship between employment and contribution to IVA is indicated in graph 19.4. The four industry subdivisions that employed 66% of the manufacturing workforce in 1998–99: Machinery and equipment manufacturing; Food, beverage and tobacco manufacturing; Metal product manufacturing; and Printing, publishing and recorded media, also contributed 66% of IVA.

19.2 INDUSTRY VALUE ADDED, Chain Volume Measures—1993–94 to 1998–99



Source: Manufacturing Industry, Australia, 1998–99 (8221.0).

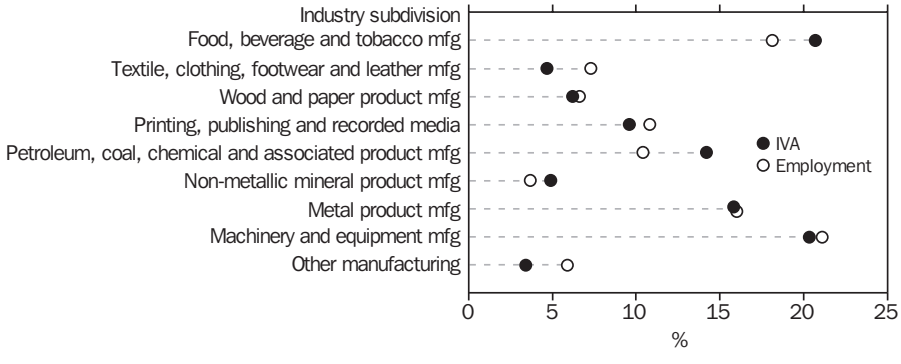
19.3 MANUFACTURING, Summary of Operations by Industry—1998–99

Industry subdivision	Employment at 30 June(a) '000	Wages and salaries(b) $m	Turnover $m	Industry value added $'000
Food, beverage and tobacco manufacturing	170.6	6 146	49 085	13 775
Textile, clothing, footwear and leather manufacturing	68.0	1 949	9 705	3 257
Wood and paper product manufacturing	60.2	2 120	11 963	4 221
Printing, publishing and recorded media	103.8	3 871	16 402	6 675
Petroleum, coal, chemical and associated product manufacturing	96.5	4 223	33 602	9 577
Non-metallic mineral product manufacturing	35.4	1 456	9 930	3 383
Metal product manufacturing	149.2	5 942	39 207	11 208
Machinery and equipment manufacturing	198.1	7 882	43 935	13 883
Other manufacturing	55.6	1 510	6 727	2 315
Total manufacturing	**937.4**	**35 099**	**220 555**	**68 296**

(a) Includes working proprietors. (b) Excludes the drawings of working proprietors.

Source: Manufacturing Industry, Australia, Preliminary (8201.0).

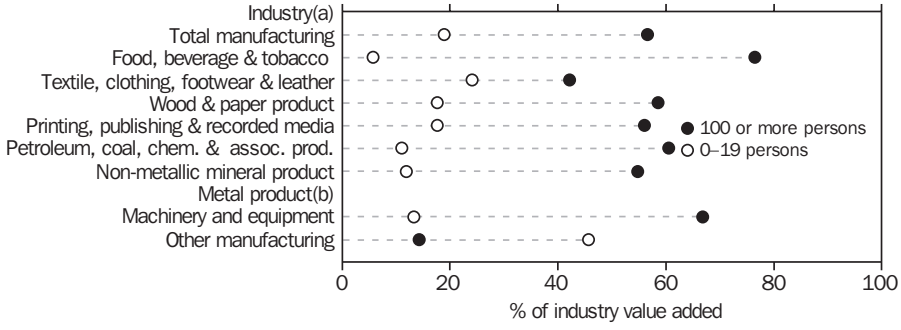
19.4 INDUSTRY VALUE ADDED AND EMPLOYMENT, Distribution by Industry Subdivision—1998–99



Source: Manufacturing Industry, Australia, 1998–99 (8221.0).

The most significant contributions to IVA, as depicted in graph 19.5 came from manufacturing establishments employing 100 or more persons, with a total contribution of 57%. Small establishments (those employing up to 19 persons) still contributed a significant 19% of total IVA. The greatest contributors to IVA among larger establishments were food, beverage and tobacco manufacturers, contributing 77% of total IVA generated by larger establishments. In contrast, this industry subdivision contributed only 6% of IVA generated by small establishments. Among small establishments the largest contributing subdivision was Other manufacturing (46%).

19.5 INDUSTRY VALUE ADDED, Distribution by Employment Size—1998–99



(a) ANZSIC subdivision in most instances. (b) Data for Metal product manufacturing have not been included.

Source: Manufacturing Industry, Australia, 1998–99 (8221.0).

Industry value added by State

In 1998–99 New South Wales and Victoria (each with 33% of national manufacturing value added) continued to be the largest contributors to IVA (table 19.6). New South Wales contributed 43% of the national value added of the Printing, publishing and recorded media industry, and between 28% and 39% of the national value added of the remaining manufacturing industries. Victoria contributed 56% of the national value added of the Textile, clothing, footwear and leather manufacturing industry, 40% of the national value added of the Machinery and equipment manufacturing industry and between 22% and 35% of the national value added of the remaining manufacturing industries.

Although Queensland accounted for only 14% of national manufacturing value added overall, it contributed 22% for Non-metallic mineral product manufacturing and 20% for Food, beverages and tobacco manufacturing. South Australia, which accounted for 9% of national manufacturing value added overall, contributed 15% of national value added for Machinery and equipment manufacturing.

19.6 MANUFACTURING INDUSTRY VALUE ADDED, By State/Territory—1998–99

Industry subdivision	NSW $m	Vic. $m	Qld $m	SA $m	WA $m	Tas. $m	NT $m	ACT $m	Aust. $m
Food, beverage and tobacco manufacturing	3 935	4 285	2 753	1 515	744	489	21	25	13 775
Textile, clothing, footwear and leather manufacturing	913	1 826	186	145	114	67	2	5	3 257
Wood and paper product manufacturing	1 333	1 151	662	350	273	416	14	22	4 221
Printing, publishing and recorded media	2 842	2 097	707	343	501	71	25	89	6 675
Petroleum, coal, chemical and associated product manufacturing	3 601	3 448	1 157	584	695	81	10	2	9 577
Non-metallic mineral product manufacturing	1 118	890	571	190	460	120	24	9	3 383
Metal product manufacturing	4 369	2 623	1 894	745	1 184	167	212	13	11 208
Machinery and equipment manufacturing	3 988	5 514	1 266	2 151	694	209	19	43	13 883
Other manufacturing	730	760	406	153	225	19	4	18	2 315
Total manufacturing	**22 829**	**22 594**	**9 603**	**6 175**	**4 891**	**1 649**	**330**	**225**	**68 296**

Source: Manufacturing Industry, Australia, Preliminary (8201.0).

Turnover

Turnover is a key measure of the performance of establishments in an industry. It covers the sales of goods and services by an establishment (together with transfers of goods to other parts of the same business) and also includes all other operating revenue generated by the establishment.

In 1998–99 Victoria (with 33% of national manufacturing turnover) and New South Wales (with 32%) continued to be the largest manufacturing States (table 19.7). New South Wales contributed 46% of the national turnover of the Printing, publishing and recorded media industry, and between 26% and 37% of the national turnover of the remaining manufacturing industries. Victoria contributed 51% of the national turnover of the Textile, clothing, footwear and leather manufacturing industry, 42% of the national turnover of the Machinery and equipment manufacturing industry and between 23% and 35% of the national turnover of the remaining manufacturing industries.

Although Queensland accounted for only 15% of national manufacturing turnover overall, it contributed 21% of national turnover for Food, beverages and tobacco manufacturing. South Australia, which accounted for 9% of national manufacturing turnover overall, contributed 17% of national turnover for Machinery and equipment manufacturing; Tasmania, which accounted for 2% of national manufacturing turnover overall, contributed 10% of national turnover for Wood and paper product manufacturing.

Employment

Victoria (33%) and New South Wales (32%) dominate manufacturing employment in Australia, accounting for almost two-thirds of national manufacturing employment at 30 June 1999 (table 19.8). In all industries, either New South Wales or Victoria is the largest employing State.

New South Wales manufacturing establishments employ 42% of the national total for the Printing, publishing and recorded media, and 35% for the Metal product manufacturing industry. Victoria accounts for some 51% of all persons working in the Textile, clothing, footwear and leather manufacturing industry in Australia.

Queensland establishments employ 22% of persons in Food, beverage and tobacco manufacturing and 18% of those in Non-metallic mineral product manufacturing. South Australia accounts for 14% of employment in the Machinery and equipment manufacturing industry.

For further information on employed wage and salary earners and the characteristics of the manufacturing labour force, refer to *Chapter 6, Labour*.

19.7 MANUFACTURING INDUSTRY TURNOVER, By State/Territory—1998–99

Industry subdivision	NSW $m	Vic. $m	Qld $m	SA $m	WA $m	Tas. $m	NT $m	ACT $m	Aust. $m
Food, beverage and tobacco manufacturing	14 293	15 054	10 314	4 581	3 137	1 508	78	120	49 085
Textile, clothing, footwear and leather manufacturing	2 944	4 958	620	659	328	181	4	10	9 705
Wood and paper product manufacturing	3 682	3 396	1 877	1 005	737	1 182	33	51	11 963
Printing, publishing and recorded media	7 505	5 219	1 533	731	1 024	152	40	198	16 402
Petroleum, coal, chemical and associated product manufacturing	12 329	11 241	4 691	1 606	3 467	230	35	3	33 602
Non-metallic mineral product manufacturing	3 253	2 537	1 888	593	1 307	250	73	28	9 930
Metal product manufacturing	13 751	9 040	6 851	2 737	5 068	1 122	607	33	39 207
Machinery and equipment manufacturing	11 427	18 598	3 583	7 368	2 289	508	53	110	43 935
Other manufacturing	2 006	2 321	1 110	590	584	53	14	49	6 727
Total manufacturing	**71 189**	**72 364**	**32 466**	**19 869**	**17 941**	**5 187**	**936**	**603**	**220 555**

Source: Manufacturing Industry, Australia, Preliminary (8201.0).

19.8 MANUFACTURING INDUSTRY EMPLOYMENT By State/Territory—1998–99

Industry subdivision	NSW '000	Vic. '000	Qld '000	SA '000	WA '000	Tas. '000	NT '000	ACT '000	Aust. '000
Food, beverage and tobacco manufacturing	47.9	48.5	38.3	16.3	13.0	5.6	0.5	0.5	170.6
Textile, clothing, footwear and leather manufacturing	19.2	34.9	5.4	3.9	3.1	1.4	0.1	0.1	68.0
Wood and paper product manufacturing	17.1	17.1	12.8	5.2	4.2	3.4	0.2	0.3	60.2
Printing, publishing and recorded media	43.8	32.6	11.7	5.2	7.7	1.3	0.4	1.2	103.8
Petroleum, coal, chemical and associated product manufacturing	34.0	36.3	11.8	7.2	6.2	0.9	0.1	—	96.5
Non-metallic mineral product manufacturing	10.5	10.0	6.4	2.3	5.2	0.6	0.2	0.1	35.4
Metal product manufacturing	52.4	38.2	26.2	11.4	16.2	3.3	1.5	0.2	149.2
Machinery and equipment manufacturing	60.9	69.2	23.5	27.8	13.0	2.7	0.4	0.7	198.1
Other manufacturing	16.5	18.6	9.7	4.5	5.2	0.6	0.1	0.4	55.6
Total manufacturing	**302.3**	**305.3**	**145.6**	**83.7**	**73.7**	**19.7**	**3.5**	**3.5**	**937.4**

Source: Manufacturing Industry, Australia, Preliminary (8201.0).

Industrial disputes

There were 208 industrial disputes in the manufacturing industry in calendar 1999. These disputes involved just under 114,000 employees and resulted in the loss of over 184,000 working days (table 19.9). Compared with 1998, this represented a substantial rise (by 66%) in the number of disputes. This is the second successive year that the number of industrial disputes in the manufacturing industry has risen. The number of employees involved in industrial disputes in 1999 also rose markedly (by 176%) from the number in 1998, and this was also reflected in a large rise (by 94%) in the number of working days lost.

The manufacturing industry accounted for 29% of all industrial disputes during 1999, compared with 24% in 1998. Manufacturing industry employees involved in industrial disputes made up 25% of all employees involved in disputes during 1999, a marked increase on the 12% recorded for 1998 and slightly higher than the 21% experienced in 1997. Working days lost due to manufacturing industrial disputes accounted for 28% of all working days lost during 1999, representing a substantial increase on the 18% share recorded in 1998, but only slightly higher than the 1997 share (27%).

19.9 INDUSTRIAL DISPUTES

Year	Manufacturing	All industries
TOTAL INDUSTRIAL DISPUTES (no.)		
1995	156	643
1996	112	543
1997	78	447
1998	125	518
1999	208	729
EMPLOYEES INVOLVED DIRECTLY AND INDIRECTLY ('000)		
1995	86.1	344.3
1996	48.8	577.7
1997	65.8	310.1
1998	41.2	348.3
1999	113.9	460.9
WORKING DAYS LOST ('000)		
1995	159.9	547.6
1996	103.5	928.5
1997	145.6	534.2
1998	95.3	526.2
1999	184.5	650.4

Source: Industrial Disputes, Australia (6322.0).

Trade union membership

Trade union membership in the manufacturing industry has been falling steadily during the last 12 years, the proportion of employees with trade union membership decreasing from a little over 50% in the mid 1980s to a little over 30% in 1999. This represents a fall in union membership of around 200,000 manufacturing employees over that period.

From 1998 to 1999 the numbers of manufacturing employees with union membership fell by just over 8%, reducing the proportion of manufacturing employees with union membership from 34.5% to 32.8% (table 19.10).

Despite the fall in membership numbers, the manufacturing industry continues to have a higher rate of union membership than the average for all industries. In percentage terms, union membership in all industries has followed a downward trend similar to that in manufacturing.

Table 19.11 shows that, while 36% of permanent manufacturing employees belonged to a trade union in 1999, only 14% of casual manufacturing employees were union members. Membership rates for permanent female employees (25%) and casual female employees (12%) each remained significantly lower than for corresponding male employees.

19.10 EMPLOYEES WITH TRADE UNION MEMBERSHIP

	Manufacturing		All industries	
	Trade union members	Proportion of total employment	Trade union members	Proportion of total employment
Period	'000	%	'000	%
August 1988	546.7	48.5	2 535.9	41.6
August 1990(a)	520.9	46.1	2 659.6	40.5
August 1992	455.3	44.4	2 508.8	39.6
August 1994	421.6	40.8	2 283.4	35.0
August 1996	410.1	38.7	2 194.3	31.1
August 1997	378.2	36.6	2 110.3	30.3
August 1998	354.4	34.5	2 037.5	28.1
August 1999	325.8	32.8	1 878.2	25.7

(a) Excludes persons aged 70 years and over.

Source: Trade Union Members, Australia (6325.0); Employee Earnings, Benefits and Trade Union Membership, Australia (6310.0).

19.11 PROPORTION OF TRADE UNION MEMBERS, By Sex—August 1999

	Manufacturing	All industries
Employees	%	%
MALES		
Permanent	39.3	32.3
Casual	14.5	11.3
Total	36.4	27.7
FEMALES		
Permanent	25.0	29.5
Casual	12.3	10.2
Total	22.2	23.4
PERSONS		
Permanent	36.0	31.1
Casual	13.6	10.7
Total	32.8	25.7

Source: Employee Earnings, Benefits and Trade Union Membership, Australia (6310.0).

Capital expenditure

As table 19.12 shows, new capital expenditure by private sector businesses in the manufacturing industry fell by almost 15% between 1997–98 and 1998–99, after an increase of 8% between 1996–97 and 1997–98. Eight of the nine manufacturing subdivisions experienced a decrease in new capital expenditure; the greatest percentage fall was in Non-metallic mineral product manufacturing (by 43%) followed by Machinery and equipment manufacturing (by 37%) and Other manufacturing (by 31%). Only Metal product manufacturing showed increased capital expenditure (by 16%).

Comparing private new capital expenditure levels in 1998–99 with those of two years earlier shows higher levels in five of the nine manufacturing subdivisions. Largest increases were in Printing, publishing and recorded media (by 35%) and Metal product manufacturing (by 29%). Substantial falls were recorded for Non-metallic mineral product manufacturing (by 54%) and Machinery and equipment manufacturing (by 33%).

19.12 PRIVATE NEW CAPITAL EXPENDITURE IN MANUFACTURING INDUSTRY

Industry subdivision	1996–97 $m	1997–98 $m	1998–99 $m
Food, beverage and tobacco manufacturing	1 997	2 443	2 088
Textile, clothing, footwear and leather manufacturing	251	289	263
Wood and paper product manufacturing	920	906	785
Printing, publishing and recorded media	587	796	790
Petroleum, coal, chemical and associated product manufacturing	1 664	1 595	1 511
Non-metallic mineral product manufacturing	1 071	870	498
Metal product manufacturing	1 501	1 666	1 940
Machinery and equipment manufacturing	2 007	2 130	1 335
Other manufacturing	199	301	208
Total manufacturing	**10 198**	**10 996**	**9 417**

Source: Private New Capital Expenditure, Australia, Actual and Expected Expenditure (5626.0).

Sales and output

The value of sales by private manufacturing businesses increased by 4% in 1998–99 over 1997–98 (table 19.13). Non-metallic mineral product manufacturing recorded the largest increase (16%), followed by Machinery and equipment manufacturing (6%) and Textile, clothing, footwear and leather manufacturing (6%). The only fall was recorded for Printing, publishing and recorded media (2%).

Manufacturing output (sales adjusted for changes in the level of stocks) increased by 4% between 1997–98 and 1998–99. Eight of the nine manufacturing subdivisions increased their output, with the largest increases recorded in Non-metallic mineral product manufacturing (by 21%), Machinery and equipment manufacturing (by 7%) and Metal product manufacturing (by 6%). The only fall was recorded for Printing, publishing and recorded media (by 3%).

The largest contributors to manufacturing output in 1998–99 were Food, beverage and tobacco manufacturing (22%), Machinery and equipment manufacturing (20%), Petroleum, coal, chemical and associated product manufacturing (18%) and Metal product manufacturing (15%).

19.13 SALES AND OUTPUT(a) BY PRIVATE MANUFACTURING BUSINESSES, Chain Volume Measures(b)

	Sales of goods produced		Output of goods	
Industry subdivision	1997–98 $m	1998–99 $m	1997–98 $m	1998–99 $m
Food, beverage and tobacco manufacturing	46 348	46 752	46 833	47 399
Textile, clothing, footwear and leather manufacturing	8 991	9 523	9 049	9 453
Wood and paper product manufacturing	13 851	14 268	13 956	14 459
Printing, publishing and recorded media	11 083	10 846	11 121	10 787
Petroleum, coal, chemical and associated product manufacturing	36 019	36 566	36 097	37 180
Non-metallic mineral product manufacturing	9 508	11 033	9 310	11 236
Metal product manufacturing	29 994	31 547	30 238	32 154
Machinery and equipment manufacturing	39 010	41 511	39 306	41 876
Other manufacturing	6 753	6 965	6 847	6 920
Total manufacturing(c)	**201 556**	**209 011**	**202 746**	**211 465**

(a) Output is calculated as sales of goods produced minus opening stocks plus closing stocks. (b) Reference year for chain volume measures is 1997–98. (c) Chain volume measures are not additive for most periods; the component measures do not sum to a total in the same way as the corresponding current price components do.

Source: Stocks and Sales, Selected Industries, Australia (5629.0).

Company profits

Profits before income tax earned by incorporated manufacturing businesses fell by 6% between 1997–98 and 1998–99, following a rise of 15% from 1996–97 to 1997–98 (table 19.14). Profits fell between 1997–98 and 1998–99 in four of the nine manufacturing subdivisions; by far the largest fall was recorded in Metal product manufacturing (of $1,060m, or 53%). Largest rises were in Wood and paper product manufacturing ($188m, or 27%), Non-metallic mineral product manufacturing ($194m, or 16%) and Printing, publishing and recorded media ($164m, or 14%).

Industry subdivisions contributing most to manufacturing industry profits for 1998–99 were Food, beverage and tobacco manufacturing (27%), Petroleum, coal, chemical and associated product manufacturing (21%), Machinery and equipment manufacturing (13%) and Printing, publishing and recorded media (12%).

Principal manufactured commodities

Table 19.15 shows the production of selected manufactured commodities for the three years 1996–97 to 1998–99.

Price indexes

The ABS compiles two price indexes relating to the manufacturing sector: the Price Indexes of Materials Used in Manufacturing Industries; and the Price Indexes of Articles Produced by Manufacturing Industries (see *Chapter 28, Prices* for more details). Tables 19.16 and 19.17 set out index numbers for selected components of those indexes.

19.14 PROFITS BEFORE INCOME TAX, Manufacturing Companies

Industry subdivision	1996–97 $m	1997–98 $m	1998–99 $m
Food, beverage and tobacco manufacturing	2 285	2 947	2 966
Textile, clothing, footwear and leather manufacturing	203	232	198
Wood and paper product manufacturing	625	694	882
Printing, publishing and recorded media	1 098	1 185	1 349
Petroleum, coal, chemical and associated product manufacturing	1 925	2 246	2 290
Non-metallic mineral product manufacturing	602	723	837
Metal product manufacturing	1 502	1 989	929
Machinery and equipment manufacturing	1 842	1 537	1 413
Other manufacturing	42	73	72
Total manufacturing	**10 126**	**11 627**	**10 936**

Source: Company Profits, Australia (5651.0).

19.15 SELECTED COMMODITIES PRODUCED BY MANUFACTURING ESTABLISHMENTS(a)

Commodity	Unit of quantity	1996–97	1997–98	1998–99
Red meat	'000 t	2 716	2 927	2 994
Chicken meat	'000 t	497	551	565
Cheese	'000 t	285	300	320
Butter	'000 t	147	154	176
Beer(b)	mill. L	1 735	1 757	1 729
Tobacco and cigarettes	t	22 193	21 257	21 045
Newsprint	'000 t	422	402	400
Wood pulp	'000 t	949	958	871
Undressed sawn timber	'000 m^3	3 382	3 650	3 602
Hardwood woodchips	'000 t	4 779	5 665	4 856
Automotive gasoline	mill. L	18 084	18 592	18 705
Fuel oil	mill. L	1 795	1 673	1 635
Aviation turbine fuel	mill. L	5 284	5 423	5 219
Automotive diesel oil	mill. L	12 968	13 183	12 968
Portland cement	'000 t	6 701	7 236	7 704
Clay bricks	m	1 468	1 532	1 594
Ready mixed concrete	'000 m^3	15 544	17 412	18 601
Basic iron, spiegeleisen and sponge iron	'000 t	7 346	7 928	7 453
Blooms and slabs of iron or steel	'000 t	7 775	8 356	7 698
Alumina	'000 t	13 253	13 538	14 208
Zinc	'000 t	319	304	323
Silver	'000 t	340	227	410
Copper	'000 t	305	286	313
Lead	'000 t	202	185	199
Tin	'000 t	570	650	595
Gold	'000 t	327	349	419
Electricity	mill. kWh	168 415	176 212	179 630
Gas(c)	PJ	636	649	675

(a) Data in this table exclude production by single establishment businesses employing fewer than four persons. (b) Includes ale, stout and porter. Excludes extra light beer containing less than 1.15% by volume of alcohol. (c) Available for issue through mains. Includes natural gas.

Source: Manufacturing Production, Australia (8301.0).

19.16 PRICE INDEXES, Materials Used in Manufacturing Industries(a)(b)

Industry	1992–93	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
Food, beverages and tobacco	104.3	107.7	111.0	111.7	106.2	110.0	110.5	110.8
Textiles and textile products	88.1	89.9	103.0	100.9	93.0	96.3	94.0	91.6
Knitting mills and clothing	108.1	107.7	109.3	111.4	105.9	107.1	106.4	102.6
Footwear	99.4	102.4	109.5	111.7	111.0	109.7	110.3	107.4
Leather and leather products	93.2	99.6	101.9	95.1	95.0	91.9	93.5	97.8
Sawmilling and timber products	109.2	115.3	111.3	114.0	113.7	119.8	119.8	123.0
Paper and paper products	95.6	89.7	95.8	108.3	97.0	96.4	97.6	99.8
Printing and publishing	103.3	102.7	101.1	114.1	105.8	105.5	108.1	107.7
Petroleum and coal products	121.7	101.9	100.2	103.5	117.2	108.4	94.4	157.8
Chemicals	105.7	103.5	107.8	113.9	110.7	111.9	111.4	114.0
Rubber and plastics	104.5	106.9	118.8	122.0	113.4	113.4	110.1	110.8
Non-metallic mineral products	116.6	109.8	114.3	113.7	113.1	112.6	111.3	110.7
Basic metal products	94.7	87.6	94.0	99.4	93.1	93.4	91.7	92.5
Fabricated metal products	100.9	100.8	104.4	108.7	106.2	107.3	106.2	106.1
Transport equipment and parts	108.0	115.0	116.2	115.1	110.1	113.5	116.8	120.5
Electronic equipment and other machinery	101.8	102.7	106.5	107.8	102.7	104.6	103.7	103.4
Other manufacturing	106.3	111.5	112.3	112.8	110.9	113.8	115.3	118.8
All materials	**106.4**	**104.7**	**107.6**	**110.1**	**106.0**	**107.0**	**105.9**	**115.8**

(a) Reference base year 1989–90 = 100.0. (b) The index is on a net basis and relates in concept only to materials that enter Australian manufacturing industry from other sectors of the Australian economy or from overseas.

Source: Price Indexes of Materials Used in Manufacturing Industries, Australia (6411.0).

19.17 PRICE INDEXES, Articles Produced by Manufacturing Industries(a)(b)

Industry	1992–93	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
Food, beverages & tobacco	108.8	112.8	115.2	117.8	117.8	117.8	122.6	125.1
Textiles & textile products	98.6	99.0	102.3	103.0	103.0	103.0	102.9	103.8
Knitting mills, clothing, footwear and leather	108.2	109.2	110.2	113.2	113.2	113.2	117.9	119.5
Log sawmilling and other wood products	106.1	113.3	116.6	116.2	116.2	116.2	121.0	126.0
Paper and paper products	111.2	109.0	108.8	113.0	113.0	113.0	110.4	111.3
Printing, publishing and recorded media	116.3	119.7	123.9	132.3	132.3	132.3	143.6	148.9
Petroleum and coal products	121.5	107.5	102.1	105.5	105.5	105.5	86.8	137.5
Chemicals	106.5	105.7	108.9	112.2	112.2	112.2	110.8	111.7
Rubber and plastics	105.6	107.0	108.9	112.8	112.8	112.8	114.0	114.9
Non-metallic mineral products	109.7	111.1	114.3	114.7	114.7	114.7	117.1	117.5
Basic metal products	95.3	94.6	101.6	104.1	104.1	104.1	98.7	104.8
Fabricated metal products	106.3	106.4	107.7	110.5	110.5	110.5	113.6	115.2
Transport equipment and parts	109.9	112.8	114.3	115.9	115.9	115.9	117.8	119.6
Electronic equipment and other machinery	104.9	105.5	106.8	107.9	107.9	107.9	109.1	109.9
Other manufacturing	109.3	111.7	114.4	117.3	117.3	117.3	121.4	123.8
All Manufacturing Industry Index	**107.3**	**108.5**	**110.9**	**113.7**	**113.7**	**113.7**	**115.6**	**120.6**

(a) Reference base year 1989–90 = 100.0. (b) For a full description of Division C, Manufacturing and the subdivisions within the Manufacturing Division, see Australian and New Zealand Standard Industrial Classification (ANZSIC) (1292.0), 1993 edition.

Source: Price Indexes of Articles Produced by Manufacturing Industry, Australia (6412.0).

Research and experimental development (R&D)

Research and experimental development (R&D) activity, in the business context, is defined as systematic investigation or experimentation involving innovation or technical risk, the outcome of which is new knowledge, with or without a specific practical application or new or improved products, processes, materials, devices or services. R&D activity also extends to modifications to existing products/processes. In 1998–99, manufacturing industry accounted for slightly less than 50% of R&D expenditure by all industries (down from 54% in 1997–98).

As table 19.18 shows, between 1997–98 and 1998–99 there was a fall of 7% in R&D expenditure within the manufacturing industry, from $2,142m to $1,983m. Of those subdivisions which decreased their R&D expenditure, the most significant falls were $64m (15%) in Motor vehicle and part and other transport equipment manufacturing, and $62m (19%) in Metal product manufacturing. This was partly offset by rises in four industries, the most significant being $26m (14%) by Food, beverage and tobacco manufacturing.

Industries contributing the most to manufacturing R&D expenditure in 1998–99 were Electronic and electrical equipment and appliance manufacturing (19%), Motor vehicle and part and other transport equipment manufacturing (19%) and Petroleum, coal, chemical and associated product manufacturing (17%). Together, these industries account for 55% of total R&D expenditure of the manufacturing industry sector.

Table 19.19 shows that, of the manufacturing industry's total R&D expenditure for 1998–99, 11% was on capital expenditure, 42% on labour costs and 47% on other current expenditure. The Food, beverage and tobacco manufacturing and Metal product manufacturing industries devoted the highest proportion of their total R&D expenditure to capital expenditure (each devoting 22%). Metal product manufacturing accounted for the highest share (27%) of total capital expenditure on R&D by manufacturing industries.

While labour costs accounted for 42% of total R&D expenditure by manufacturing industries overall in 1998–99, they accounted for 54% of R&D expenditure by the Industrial machinery and equipment manufacturing industry.

19.18 EXPENDITURE ON RESEARCH AND DEVELOPMENT, Manufacturing Businesses

Industry	1996–97 $m	1997–98 $m	1998–99 $m
Food, beverage and tobacco manufacturing	231	180	206
Textile, clothing, footwear and leather manufacturing	21	22	19
Wood and paper product manufacturing	191	117	89
Printing, publishing and recorded media	17	19	26
Petroleum, coal, chemical and associated product manufacturing	309	314	340
Non-metallic mineral product manufacturing	66	72	64
Metal product manufacturing	361	331	269
Motor vehicle and part and other transport equipment manufacturing	401	436	372
Photographic and scientific equipment manufacturing	91	93	102
Electronic and electrical equipment and appliance manufacturing	362	398	378
Industrial machinery and equipment manufacturing	144	124	110
Other manufacturing	46	36	18
Total manufacturing	**2 240**	**2 142**	**1 983**

Source: Research and Experimental Development, Businesses, Australia (8104.0).

19.19 TYPE OF EXPENDITURE ON RESEARCH AND DEVELOPMENT, Manufacturing Businesses—1998–99

Industry	Capital expenditure $m	Labour costs(a) $m	Other current expenditure $m	Total $m
Food, beverage and tobacco manufacturing	45.8	75.0	85.3	206.1
Textile, clothing, footwear and leather manufacturing	1.0	9.0	9.3	19.3
Wood and paper product manufacturing	13.1	22.3	53.4	88.9
Printing, publishing and recorded media	1.5	14.6	9.7	25.8
Petroleum, coal, chemical and associated product manufacturing	32.9	140.2	166.4	339.5
Non-metallic mineral product manufacturing	5.5	22.1	26.7	54.3
Metal product manufacturing	59.0	88.0	121.7	268.8
Motor vehicle and part and other transport equipment manufacturing	24.8	157.1	189.9	371.8
Photographic and scientific equipment manufacturing	6.5	57.6	38.1	102.4
Electronic and electrical equipment and appliance manufacturing	21.5	182.1	174.9	378.8
Industrial machinery and equipment manufacturing	6.6	59.6	43.5	109.8
Other manufacturing	2.5	9.1	6.0	17.6
Total manufacturing	**220.8**	**836.7**	**925.1**	**1 982.6**

(a) Includes wages and salaries, payroll tax, payments to contract staff on the payroll, fringe benefits tax and workers' compensation, holiday pay, long service leave payments, sick pay, and employer contributions to superannuation and pension schemes.

Source: Research and Experimental Development, Businesses, Australia (8104.0).

Direct exports by manufacturers

Table 19.20 shows the proportions of manufacturing employment and turnover accounted for by manufacturing establishments, classified by the extent to which they directly engage in exporting activity. It also shows the value of those direct exports as a percentage of total sales of goods produced.

Generally, exporting establishments have higher turnover per person employed than non-exporting establishments. In 1997–98, establishments which undertook some exporting accounted for 44% of manufacturing employment, but contributed slightly over 60% of manufacturing turnover. Industries where exporting establishments contributed the most to industry turnover were Petroleum, coal, chemical and associated product manufacturing (75% of industry turnover) and Machinery and equipment manufacturing (71%). Industries where exporting establishments contributed least to industry turnover were Printing, publishing and recorded media (27%), and Other manufacturing (26%). On average, exporting establishments showed higher wages and salaries per person employed than non-exporting establishments.

Overall, manufacturers directly exported 16% of the goods they produced in 1997–98. Industries with the highest levels of direct exporting were Metal product manufacturing (27%) and Food, beverage and tobacco manufacturing (20%). Industries which exported less than 5% of the goods they produced were Printing, publishing and recorded media (4.6%), Non-metallic mineral product manufacturing (3.5%) and Other manufacturing (3.2%).

Businesses which employed 100 or more persons had the highest proportion of exports in their sales (18%), followed by businesses which employed 0–49 people (13%) and business employing 50–99 people (11%).

19.20 MANUFACTURING ESTABLISHMENTS, Summary of Operations by Proportion of Exports—1997–98

	Establishments that do not export		Establishments with exports				
			Up to and including 50% of sales of goods produced		Of more than 50% of sales of goods produced		
Industry subdivision	Employment at end of June(a) %	Turnover %	Employment at end of June(a) %	Turnover %	Employment at end of June(a) %	Turnover %	Exports as % of sales of goods produced %
Food, beverage and tobacco manufacturing	45.4	37.3	40.3	47.6	14.3	15.1	19.7
Textile, clothing, footwear and leather manufacturing	60.1	43.4	33.7	43.2	6.2	13.4	16.3
Wood and paper product manufacturing	71.2	57.9	27.9	38.1	0.9	4.0	7.6
Printing, publishing and recorded media	80.2	72.6	19.3	25.1	0.5	2.2	4.6
Petroleum, coal, chemical and associated product manufacturing	38.9	25.5	58.8	72.0	2.3	2.5	10.0
Non-metallic mineral product manufacturing	66.2	69.2	32.1	29.3	1.7	1.4	3.5
Metal product manufacturing	56.1	35.0	35.0	43.5	8.9	21.4	26.9
Machinery and equipment manufacturing	43.4	28.8	47.8	59.5	8.8	11.7	18.0
Other manufacturing	79.7	74.0	19.2	24.4	1.1	1.6	3.2
Total manufacturing	**55.5**	**39.8**	**37.7**	**49.2**	**6.8**	**11.0**	**16.3**

(a) Includes working proprietors.

Source: Manufacturing Industry, Australia (8221.0).

Bibliography

ABS publications

Australian National Accounts: Concepts, Sources and Methods (5216.0).
Australian National Accounts: National Income, Expenditure and Product (5206.0).
Company Profits, Australia (5651.0).
Employed Wage and Salary Earners, Australia (6248.0).
Employee Earnings, Benefits and Trade Union Membership, Australia (6310.0).
Industrial Disputes, Australia (6322.0).
Integration of Economic Statistics: The Conceptual and Operational Framework (1113.0).
Labour Force, Australia (6203.0).
Manufacturing Industry, Australia (8221.0).
Manufacturing Industry, Australia, Preliminary (8201.0).
Manufacturing Production, Australia (8301.0).
Manufacturing, Australia (8225.0).
Price Indexes of Materials Used in Manufacturing Industries, Australia (6411.0).
Price Indexes of Articles Produced by Manufacturing Industry, Australia (6412.0).
Private New Capital Expenditure, Australia, Actual and Expected Expenditure (5626.0).
Research and Experimental Development, Businesses, Australia (8104.0).
Stocks and Sales, Selected Industries, Australia (5629.0).
Trade Union Members, Australia (6325.0).

Internet sites

Commonwealth Department of Industry, Science and Resources, *http://www.isr.gov.au*
Productivity Commission, *http://www.pc.gov.au*
The Australian Industry Group, *http://www.aigroup.asn.au*

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Introduction

The construction industry has a major influence on every Australian. It provides the homes in which we live, the places in which most of us work and play, our schools and hospitals, and the infrastructure such as roads, water and electricity supply, and telecommunications, essential for our day to day living. A number of other parts of the Australian economy are also closely linked to the construction industry and its activities. These include in particular, parts of the manufacturing, wholesale and retail trade and finance industries, in supplying components, fittings and furnishings, and in financing construction. Parts of the professional services industry—such as the architectural and engineering professions—are also closely linked to the construction industry.

The construction industry engages in three broad areas of activity: residential building (houses, flats, etc.), non-residential building (offices, shops, hotels, etc.), and engineering construction (roads, bridges, water and sewerage, etc.). Construction activity is undertaken by both the private and public sectors in Australia. The private sector is engaged in all three categories of construction, and plays the major role in residential and other building activity. The public sector plays a key role in initiating and undertaking engineering construction activity, and building activity relating to health and education.

In 1998–99, the construction industry contributed about 6.0% to the gross product of all industries, as measured by production-based Gross Domestic Product (chain volume measures). In May 1999 it employed 648,000 people, either as employees or as self-employed contractors. This represented 7.4% of the employment in all industries.

Performance of the construction industry

Summary by industry

The first detailed survey of the construction industry since the 1980s was undertaken for the reference year 1996–97. The survey found that there were some 194,300 operating businesses in the construction industry at end June 1997, with total employment of 484,100 (table 20.1 and graph 20.2). The construction trade services part of the construction industry accounted for over 80% of the number of businesses and almost three-quarters of the people working in the industry.

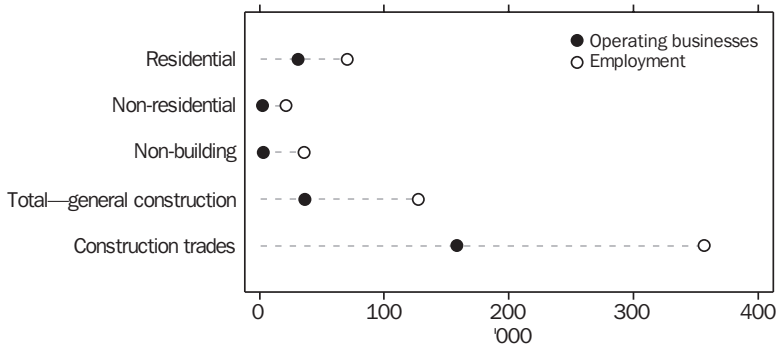
Table 20.1 presents, for all businesses in the construction industry, summary measures of performance, assets and liabilities by component industry. Operating profit before tax was higher in the construction trades and residential construction parts of the industry. These parts of the industry also reported the highest profit margins. Despite the dominance of the construction trades in the number of businesses and employment, the general construction part of the industry accounted for over half of total income (56%) and operating expenses (60%). Over half the assets and liabilities of the construction industry were also held in the general construction part of the industry.

20.1 CONSTRUCTION INDUSTRY, Summary of Performance by Industry—1996–97

		Building construction			General construction			
Selected indicators	Units	Residential construction	Non-residential building construction	Total	Non-building construction	Total	Construction trade services	**Total construction**
Operating businesses—June 1997	'000	31.0	2.1	33.1	3.1	36.3	158.0	**194.3**
Employment—June 1997	'000	70.3	21.3	91.6	35.6	127.2	356.9	**484.1**
Wages and salaries	$m	891.2	773.2	1 664.4	1 645.1	3 309.5	4 870.4	**8 179.8**
Turnover	$m	13 829.0	10 416.6	24 245.5	8 383.1	32 628.6	25 270.2	**57 898.8**
Total income	$m	14 108.5	10 491.4	24 599.9	8 461.9	33 061.8	25 532.9	**58 594.7**
Total operating expenses	$m	13 113.8	10 552.5	23 666.3	8 127.0	31 793.3	21 604.8	**53 398.1**
Operating profit before tax	$m	1 117.7	70.3	1 188.0	362.3	1 550.3	3 914.3	**5 464.6**
Profit margin	%	8.1	0.7	4.9	4.3	4.8	15.5	**9.5**
Total assets	$m	8 202.1	3 785.5	11 987.7	5 404.9	17 392.6	8 172.4	**25 565.0**
Total liabilities	$m	5 795.5	2 685.3	8 480.8	3 580.5	12 061.3	4 557.8	**16 619.1**

Source: Private Sector Construction Industry, Australia (8772.0).

20.2 CONSTRUCTION INDUSTRY, Operating Businesses and Employment by Component Industry—June 1997



Source: Private Sector Construction Industry, Australia (8772.0).

Summary by State/Territory

Table 20.3 presents, for all businesses in the construction industry, summary measures of performance, assets and liabilities by State and Territory. New South Wales, Victoria and Queensland dominate the industry in terms of the amount of total income, expenses and operating profit before tax, as well as number of businesses and employment (graph 20.4).

Performance averages and ratios provide some insights into the State and Territory data. Average employment per business ranged between 2.0 and 2.6 persons Australia-wide. The lowest average employment per business occurred in the Australian Capital Territory and Tasmania, and the highest average employment occurred in Western Australia.

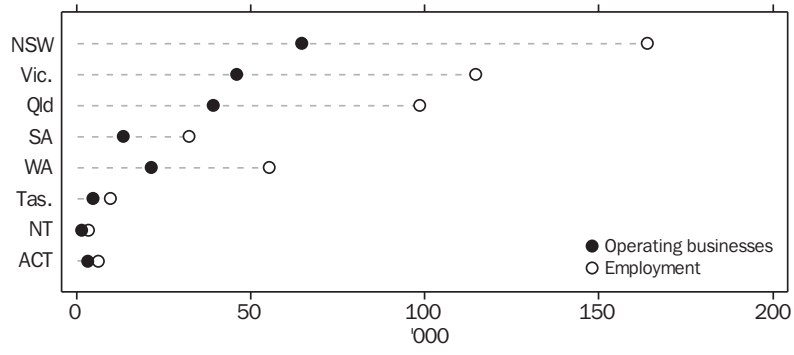
Average income and operating expenses per business also varied between the larger and smaller States. The lowest average income and operating expenses per business occurred in Tasmania, and the higher levels in Queensland, South Australia and Victoria. Despite Tasmania's lower average income and expenses per business, businesses in that State experienced the highest average profit margin (19.9%), followed by those in the Northern Territory (13.5%) and Western Australia (12.5%).

20.3 CONSTRUCTION INDUSTRY, Summary of Performance by State/Territory—1996–97

Selected indicators	Units	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	**Aust.**
Operating businesses—June 1997	'000	64.7	46.0	39.3	13.4	21.4	4.7	1.6	3.2	**194.3**
Employment—June 1997	'000	163.8	114.5	98.6	32.2	55.4	9.8	3.5	6.2	**484.1**
Wages and salaries	$m	2 804.2	2 054.9	1 684.6	428.4	998.9	90.4	50.9	67.6	**8 179.8**
Turnover	$m	18 002.8	14 147.6	13 490.9	4 180.4	6 215.3	620.2	370.2	*871.3	**57 898.8**
Total income	$m	18 363.4	14 247.9	13 600.8	4 221.8	6 287.0	629.6	367.1	*877.0	**58 594.7**
Total operating expenses	$m	16 720.5	13 211.0	12 377.0	3 930.9	5 538.7	508.3	321.4	*790.3	**53 398.1**
Operating profit before tax	$m	1 796.7	1 085.9	1 234.6	331.2	772.7	123.4	49.8	*70.4	**5 464.6**
Profit margin	%	10.0	7.7	9.2	7.9	12.5	19.9	13.5	8.1	**9.5**
Total assets	$m	9 419.6	6 127.2	6 065.1	1 487.7	2 130.8	105.1	*117.7	111.7	**25 565.0**
Total liabilities	$m	6 314.8	3 695.7	3 916.4	863.3	1 608.6	*63.1	*73.7	*83.6	**16 619.1**

Source: Private Sector Construction Industry, Australia (8772.0).

20.4 CONSTRUCTION INDUSTRY, Operating Businesses and Employment by State/Territory—June 1997



Source: Private Sector Construction Industry, Australia (8772.0).

Trends in construction activity

Trends over recent years in the level of activity of the construction industry as a whole are shown in table 20.5, which shows the value of work done, in chain volume terms, by kind of activity. Chain volume measures show changes in value after the direct effects of price changes have been eliminated. The table illustrates that, in 1998–99, residential construction accounted for 38% of the activity, with engineering construction accounting for a further 35%, and non-residential construction for the remaining 26%. These were similar to the proportions in 1997–98, with residential and engineering construction both growing by 8% over the period and non-residential construction growing slightly less (by 5%).

The table also illustrates how the pattern of building activity changes over time. The pattern was very different in 1993–94. In that year, residential building accounted for 45% of total construction activity, non-residential building contributed just under a quarter of activity (22%) and engineering construction the remaining 32%. By 1996–97, the proportion of total construction activity occurring in residential building had declined, replaced by growth in the proportion of total activity coming from non-residential building and engineering construction. Engineering construction has increased its proportion of total construction activity over the past eight years.

Graph 20.6 shows the data from table 20.5 in a longer time series. It shows the decline in the value of residential construction from mid 1995, followed by a steady recovery from about mid 1997.

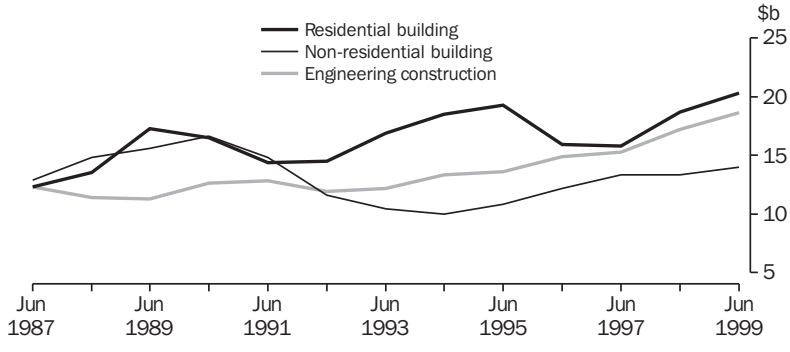
20.5 TOTAL CONSTRUCTION ACTIVITY, Value of Work Done By Type of Activity, Chain Volume Measures(a)

Financial year	Residential building $m	Non-residential building $m	Engineering construction $m	**Total construction(b) $m**
1991–92	14 467	11 568	11 886	**37 289**
1992–93	16 916	10 381	12 236	**38 989**
1993–94	18 539	9 985	13 253	**41 489**
1994–95	19 255	10 849	13 583	**43 616**
1995–96	15 943	12 184	14 869	**42 888**
1996–97	15 817	13 281	15 328	**44 509**
1997–98	18 739	13 329	17 229	**49 296**
1998–99	20 274	14 016	18 638	**52 928**

(a) Reference year for these chain volume measures is 1997–98. (b) Chain volume measures are not additive for most periods; the component measures do not sum to a total in the same way as the corresponding current price components do.

Source: Building Activity, Australia (8752.0); Engineering Construction Activity, Australia (8762.0).

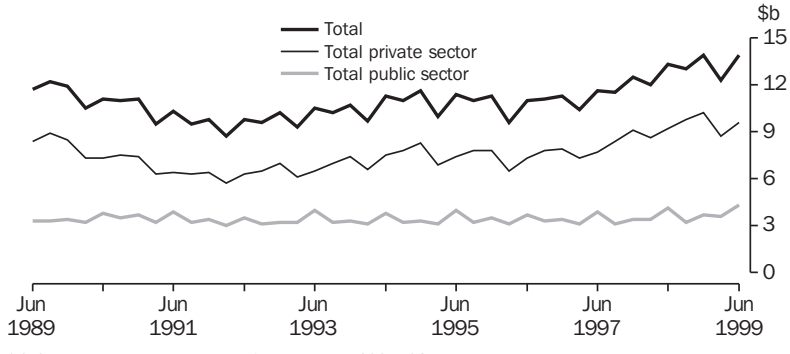
20.6 ANNUAL CONSTRUCTION ACTIVITY(a), By Type of Activity



(a) Chain volume measures, reference year 1997–98.

Source: Building Activity, Australia (8752.0); Engineering Construction Activity, Australia (8762.0).

20.7 QUARTERLY CONSTRUCTION ACTIVITY(a), By Sector



(a) Chain volume measures, reference year 1997–98.

Source: Building Activity, Australia (8752.0); Engineering Construction Activity, Australia (8762.0).

Graph 20.7 shows that construction activity for the public sector has remained relatively constant at around $3b each quarter over the last ten years. The volatility evident in the total construction series is mainly due to private sector construction activity. The growth in total construction activity from the June quarter 1997 until the March quarter 1998 was driven by the growth in private sector activity.

More detailed information on the value of residential and non-residential building work done, in chain volume terms, is presented in table 20.8. The value of building work done rose by $2,222m (7%) to $34,290m in 1998–99, following a rise of 10% in 1997–98. The 1998–99 growth occurred in most sectors, with the value of non-residential building and other residential building both contributing around 30% of the increase. The value of house building contributed 27% of the growth.

Residential building

Residential building involves the construction of dwelling units, which comprise new houses, new other residential buildings (flats, apartments, villa units, townhouses, duplexes, etc.), and dwellings created as part of alterations and additions to existing buildings (including conversions to dwelling units) and as part of the construction of non-residential buildings.

The trend in total dwelling unit approvals grew for three and half years from February 1991, peaking in July 1994 (graph 20.9). The trend then declined until December 1995, to a level almost 40% below the July 1994 peak. The trend for dwelling units approved was relatively flat between December 1995 and June 1996 prior to strong growth until April 1998. Growth was relatively flat during 1998–99.

During the first half of 1999–2000 there was a significant increase in approvals as a result of activity brought forward ahead of the Goods and Services Tax. However, since December 1999 approvals have declined sharply to a level below those of late 1995.

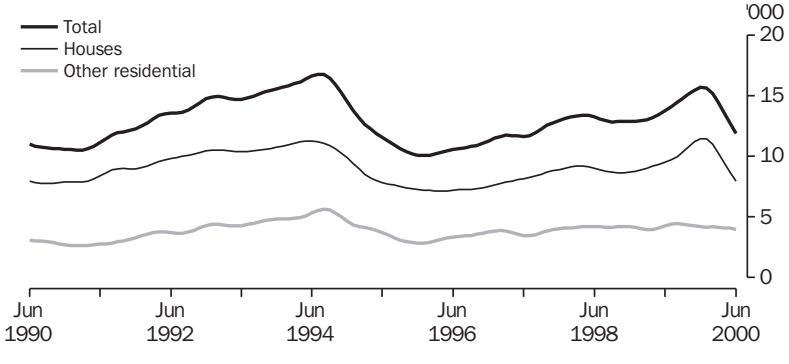
20.8 BUILDING ACTIVITY, Value of Work Done by Type of Activity, Chain Volume Measures(a)

	New residential building					
	Houses	Other residential buildings	Total	Alterations and additions to residential buildings	Non-residential building	**Total building(b)**
	$m	$m	$m	$m	$m	**$m**
1992–93	10 805	3 474	14 591	2 331	10 381	**27 385**
1993–94	11 675	4 074	16 079	2 467	9 985	**28 700**
1994–95	11 558	4 766	16 574	2 687	10 849	**30 262**
1995–96	9 209	3 932	13 353	2 590	12 184	**28 131**
1996–97	9 158	3 911	13 229	2 588	13 281	**29 065**
1997–98	10 996	4 540	15 728	3 011	13 329	**32 068**
1998–99	11 605	5 200	17 080	3 194	14 016	**34 290**

(a) Reference year for chain volume measures is 1997–98. (b) Chain volume measures are generally not additive—for most periods, the component measures do not sum to a total in the same way as the corresponding current price components do.

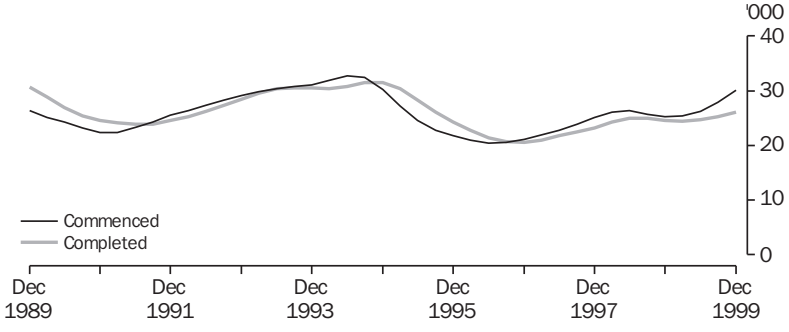
Source: Building Activity, Australia (8752.0).

20.9 NUMBER OF DWELLING UNITS APPROVED, Trend Estimates



Source: Building Approvals, Australia (8731.0).

20.10 NUMBER OF NEW HOUSES COMMENCED AND COMPLETED, Trend Estimates



Source: Building Activity, Australia (8752.0).

New houses

Graph 20.10 illustrates the cyclical pattern of new house commencements. Lows were recorded in 1990 and 1996, with peaks in 1994 and 1998. New house construction grew throughout 1992, 1993 and 1994, the number of commencements peaking in the June quarter 1994. New house commencements fell in each quarter of 1994–95 and 1995–96, but grew in each quarter of 1996–97. There was continued growth in the trend up to the June quarter 1998 for new house commencements, although the rate of growth in the trend eased in the first half of 1998. After a slight contraction in the second half of 1998, growth in the number of new house commencements recovered in 1999.

The graph also illustrates the relationship between new house commencements and completions. Generally, in periods of downturn in new house construction activity, completions exceed commencements, while in periods of growth this pattern is reversed.

Table 20.11 shows that new house commencements are the major component of residential building activity. In 1999 new houses accounted for 72% of the number of new residential dwelling units commenced (i.e. excluding approvals for conversions). This proportion is similar for approvals and completions.

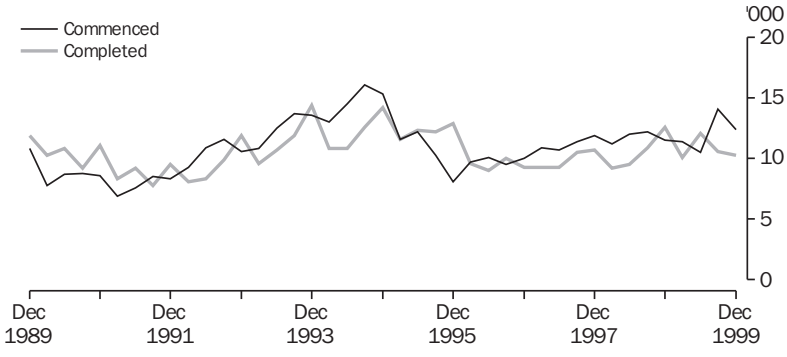
The table also shows that residential building activity is dominated by the private sector. In 1999 this sector accounted for 98% of approvals, commencements and completions of new houses. The public sector was slightly more significant in 'new other residential building' work, accounting for between 6% and 7% of approvals, commencements and completions.

20.11 RESIDENTIAL BUILDING, By Public/Private Sector—1999

	New houses	New other residential dwelling units	Conversions, etc.
	no.	no.	no.
Private sector			
Approved	116 146	43 500	2 531
Commenced	105 584	42 798	2 605
Completed	97 068	37 095	3 345
Public sector			
Approved	2 220	2 876	46
Commenced	2 090	2 865	39
Completed	2 457	2 807	62
Total			
Approved	118 366	46 376	2 577
Commenced	107 674	45 663	2 644
Completed	99 525	39 902	3 407

Source: Building Approvals, Australia (8731.0); Building Activity, Australia (8752.0).

20.12 NUMBER OF NEW OTHER RESIDENTIAL UNITS CONSTRUCTED



Source: Building Activity, Australia (8752.0).

New other residential building

Other residential building refers to structures other than houses which are built for accommodation purposes. This includes buildings such as blocks of flats, home units, attached townhouses, villa units, terrace houses, semi-detached houses and maisonettes. The level of activity for this type of building is highly variable and does not follow the regular pattern experienced in house construction. This is because of the generally larger size of other residential building construction jobs and the varying extent of speculative building of private townhouses, flats, home units and similar residential building projects over time.

Whereas table 20.11 presented the number of new other residential dwelling units approved, commenced and completed in 1999, graph 20.12 shows a ten year time series of commencements and completions of these types of buildings ending with the December quarter 1999. Despite quarter to quarter volatility, it can be seen that the completions series generally has lagged the commencements series by one to two quarters, although this pattern has been less clear since the June quarter 1997.

The number of new other residential dwelling units commenced in the December quarter 1999 was 8% higher than in the December quarter 1998 and 4% greater than in the December quarter 1997. On the other hand, the number of other residential dwelling units completed in the December quarter 1999 was 18% lower than in the December quarter 1998 and 4% lower than in the December quarter 1997.

Other dwellings

Apart from the construction of new residential buildings, dwellings can also be created as part of alterations and additions to existing buildings (including conversions to dwelling units) and as part of the construction of non-residential buildings.

Table 20.11 shows that 2,577 such dwelling units were approved in 1999.

Value of residential building

Table 20.13 shows total approvals for new residential building were valued at $19,708m in 1999, and the value of work done was slightly lower at $19,094m. The value of new house approvals accounted for 74% of the value of new residential building approved, and new other residential building for 26%.

20.13 VALUE OF RESIDENTIAL BUILDING—1999

	Approved	Work done
	$m	$m
New residential buildings		
New houses	14 565	13 568
New other residential buildings	5 143	5 525
Total new residential buildings	*19 708*	*19 094*
Alterations and additions to residential buildings(a)	3 180	3 164

(a) Valued at $10,000 or more.

Source: Building Approvals, Australia (8731.0); Building Activity, Australia (8752.0).

The Australian housing stock: 1911 and 1996

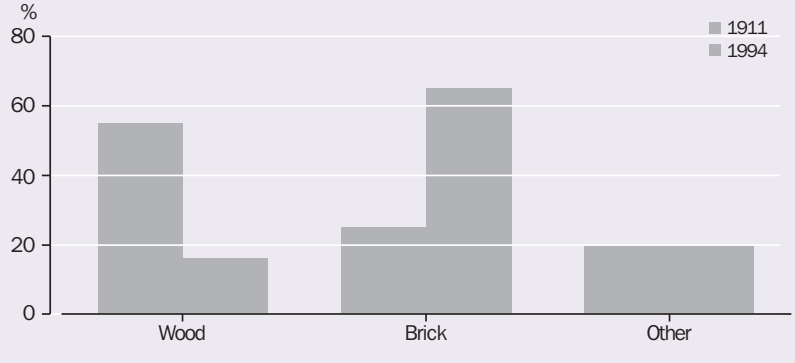
(Anthony King, Australian Housing and Urban Research Institute)

The past 100 years have seen a massive increase in the Australian housing stock. In the period from 1911 to 1996 there was a fourfold increase in the Australian population—from 4.5 million to 17.9 million. The housing stock did not just keep up with this rapid rate of population increase; it increased at almost double the rate. From just under a million dwellings in 1911, the Australian housing stock had grown to over 7 million dwellings by 1996. The outcome has been a marked decline in the average number of occupants of each dwelling—from around 4.5 in 1911 to around 2.5 by 1996.

There have also been changes in the structure of the Australian housing stock. While the great majority of the population has been housed in private dwellings throughout the period, the proportion has increased—from 91% in 1911 to 97% by 1996—with a corresponding decline in the share of the population living in 'non-private' dwellings. In 1911, 8% of the population lived in non-private dwellings, most notably boarding houses and hotels. The corresponding proportion for 1996 was just over 3%, and now the most prevalent forms of living in non-private dwellings are homes for the aged and educational institutions. A further feature has been a considerable increase in the unoccupied share of the housing stock—from almost 4% in 1911 to over 9% by 1996. This reflects the shift from a period of housing shortage to one of housing affluence, with many of the 680,000 unoccupied dwellings identified at the 1996 Census being second or holiday homes.

The quality of the housing stock has improved markedly. The average size of dwellings has increased; coupled with the increase in the number of dwellings mentioned above, this has given rise to far more dwelling space per person now than 100 years ago. We can directly compare information on dwelling construction materials over the period. Timber or brick constituted the main material of the outer walls of 80% of private dwellings in both 1911 and 1994, though the balance between the two has been reversed (see graph 20.14). Most dwellings in 1911 had wooden walls, while today two-thirds have more solid and durable brick walls. After timber and brick, the next most common materials in 1911 were stone, 'calico, canvas and hessian', and iron. In 1994 timber and brick were followed by fibro cement and concrete.

20.14 OCCUPIED PRIVATE DWELLINGS, Main Materials of Outer Walls—1911 and 1994



Source: Census of the Commonwealth of Australia 1911; Australian Housing Survey 1994 (4181.0).

In 1911, almost 40% of the Australian population and and the housing stock were located in the metropolitan areas of the six State capitals. This concentration has increased, rising to over 60% by 1996. These metropolitan populations are, of course, now accommodated in a much larger area. There has been a ten-fold increase in the metropolitan area of the six State capitals since 1911. This has been accompanied by a decline in the overall population density for the six State capitals, but little change in their overall dwelling density—from around 110 dwellings per square kilometre in 1911 to 120 dwellings per square kilometre in 1996. There are different stories for each city—Sydney and Melbourne, for example, experienced marked declines in dwelling densities—and for particular parts of each city, but the overall pattern of different paths for population and dwelling densities is a further reflection of the striking decline in average occupants per dwelling over the period since 1911.

Non-residential building

As table 20.15 shows, the total value of non-residential building work approved in 1999 was 11% lower than in 1998. During the same period, the value of work done increased by 4%.

The 1999 value of non-residential building work done was 20% higher than the value of work approved, whereas in 1998 the value of approvals was similar to the value of work done. A pattern of the value of work done exceeding the value of approvals has, in the past, indicated a period of slowing of activity in this sector as existing jobs are finished, with less new work coming on stream.

In 1999 shops, offices and other business premises together accounted for about half the value of non-residential building approved and of work done. This was similar to their share of approvals and work done in 1998.

20.15 VALUE OF NON-RESIDENTIAL BUILDING

	1998		1999	
	Approved	Work done	Approved	Work done
	$m	$m	$m	$m
Hotels, etc.	1 009	1 125	895	1 289
Shops	2 223	2 322	2 202	2 650
Factories	928	917	882	900
Offices	2 215	2 460	1 817	2 551
Other business premises	2 375	2 260	1 593	2 078
Educational	1 394	1 387	1 560	1 452
Religious	82	85	121	113
Health	1 585	1 321	1 149	1 408
Entertainment and recreational	999	1 410	1 045	1 503
Miscellaneous	713	739	801	593
Total non-residential building(a)	**13 524**	**14 026**	**12 064**	**14 536**

(a) Valued at $50,000 or more.

Source: Building Approvals, Australia (8731.0); Building Activity, Australia (8752.0).

Engineering construction

This section contains estimates of engineering construction activity in Australia for both public and private sector organisations. These estimates, together with the preceding data on residential and non-residential building, complete the picture of construction activity in Australia.

The total value of engineering construction work in 1999 ($19,022m) was 2% higher than in 1998 (table 20.16). The increase of $449m was substantially due to the increase in work done for the public sector (by $893m), which offset a fall of $444m for work done for the private sector. The value of the work done for the public sector in 1999 accounted for 59% of the value of all work done, up from 56% in 1998.

Two-thirds (66%) of the value of all engineering work done in 1999 related to roads, highways and sub-divisions, heavy industry and telecommunications. In 1998, these projects accounted for 69% of the value of all work done.

Price indexes of materials used in building

The two price indexes below measure the changes in prices of selected materials used in the construction of buildings.

Price index of materials used in house building

The all groups index (a weighted average of the six State capital cities) rose by 3.3 index points in 1999–2000. This follows a rise of 1.3 index points in the previous financial year. Table 20.17 shows that there were rises in all capital cities, the largest in Sydney (5.2 index points) and Melbourne (3.7 index points).

20.16 VALUE OF ENGINEERING CONSTRUCTION WORK DONE, By Public/Private Sector and Nature of Project

	1998			1999		
	For the private sector	For the public sector	Total	For the private sector	For the public sector	Total
	$m	$m	$m	$m	$m	$m
Roads, highways and subdivisions	2 145	3 826	5 971	1 812	3 995	5 807
Bridges	27	250	277	91	356	447
Railways	197	954	1 151	163	766	929
Harbours	245	136	380	103	116	219
Water storage and supply	138	340	478	140	473	613
Sewerage and drainage	88	537	625	97	644	741
Electricity generation, transmission and distribution	646	919	1 565	1 115	1 085	2 199
Pipelines	367	73	440	399	93	492
Recreation	623	228	851	442	284	726
Telecommunications	66	2 972	3 038	169	3 269	3 438
Heavy industry	3 657	70	3 728	3 230	103	3 333
Other	57	12	69	53	26	79
Total	8 256	10 317	18 573	7 812	11 210	19 022

Source: Engineering Construction Activity, Australia (8762.0).

20.17 PRICE INDEX OF MATERIALS USED IN HOUSE BUILDING, Six State Capital Cities(a)(b)

Financial year	Weighted average of six State capital cities	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart
1993–94	112.0	111.3	112.1	113.5	117.1	109.1	112.8
1994–95	115.4	115.0	115.9	115.9	118.8	112.7	117.3
1995–96	115.7	115.9	115.4	115.1	118.2	114.8	120.7
1996–97	116.1	116.3	115.3	115.3	120.6	115.3	120.1
1997–98	118.2	119.7	117.1	117.1	123.3	115.9	121.0
1998–99	119.5	121.6	118.0	118.2	125.0	116.1	122.2
1999–00	122.8	126.8	121.7	120.8	127.2	117.7	123.8

(a) Reference base year 1989–90 = 100.0. (b) The separate city indexes measure price movement within each city individually. They do not compare price levels between cities.

Source: Price Index of Materials Used in House Building, Six State Capital Cities (6408.0).

Price index of materials used in building other than house building

The index for materials used in building other than house building rose in 1999–2000 by just under one index point (table 20.18). This increase in the average reflected rises in all capital cities.

Table 20.19 presents the composition of the index in terms of the materials used. This shows that the rise in the index reflected increases between 1998–99 and 1999–2000 in most of the selected materials components. The exceptions were ready mixed concrete (a decrease of 2.7 index points), structural steel (down 1.4 index points) and reinforcing steel bar fabric and mesh (down 5.4 index points).

20.18 PRICE INDEX OF MATERIALS USED IN BUILDING OTHER THAN HOUSE BUILDING, Six State Capital Cities(a)(b)

Financial year	Weighted average of six State capital cities	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart
1993–94	107.5	107.0	106.7	110.2	107.9	107.1	110.1
1994–95	110.4	110.3	108.9	112.9	110.9	110.1	112.2
1995–96	112.7	112.6	111.1	115.0	112.7	113.2	115.1
1996–97	113.2	113.1	110.9	115.9	114.1	114.6	116.3
1997–98	114.2	114.4	111.4	117.2	115.1	114.6	117.4
1998–99	115.2	115.2	113.2	118.4	115.5	114.1	118.5
1999–00	116.1	116.0	114.4	119.3	116.1	115.4	119.0

(a) Reference base year 1989–90 = 100.0. (b) The separate city indexes measure price movements within each city individually. They do not compare price levels between cities.

Source: Price Index of Materials Used in Building Other than House Building, Six State Capital Cities (6407.0).

20.19 PRICE INDEX OF MATERIALS USED IN BUILDING OTHER THAN HOUSE BUILDING(a)

Material	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
Structural timber	127.1	128.3	120.5	116.4	121.7	125.4	131.1
Clay bricks	107.8	111.0	110.0	108.7	114.6	119.1	123.7
Ready mixed concrete	106.7	112.4	108.2	106.6	107.2	106.3	103.6
Steel decking cladding and sheet products	107.5	108.9	110.9	112.9	114.9	114.4	114.9
Structural steel	104.3	105.3	109.3	112.5	113.1	113.4	112.0
Reinforcing steel bar fabric and mesh	112.7	111.5	112.0	111.6	112.7	109.9	104.5
Aluminium windows	99.7	105.4	108.4	108.5	109.0	110.5	114.3
Non-ferrous pipes and fittings	102.4	118.1	129.4	128.8	135.6	128.6	131.5
Builders' hardware	115.3	116.6	119.5	118.3	120.0	123.4	130.0
Paint and other coatings	119.9	123.3	129.1	135.7	136.0	142.7	148.8
All groups	**107.5**	**110.4**	**112.7**	**113.2**	**114.2**	**115.2**	**116.1**

(a) Reference base year 1989–90 = 100.0.

Source: Price Index of Materials Used in Building Other Than House Building, Six State Capital Cities (6407.0).

Average weekly earnings in the construction industry

Average weekly earnings provide useful information on the cost of labour in the construction industry. This complements the information provided in the previous section on the cost of materials in the industry.

Average weekly earnings for wage and salary earners have generally increased steadily in the construction industry over most of past seven years. The May 2000 estimate was the exception to this general rise, with a fall from the May 1999 estimate of around $30 per week for both the full-time adult employees and all employees categories. The fall was brought about by compositional changes in the survey population for this reference period.

Notwithstanding the fall in May 2000, average weekly earnings for all employees in the construction industry continued to be higher than the all industries average. In May 2000 the average weekly earnings of $720 for all employees in the construction industry was 13% more than the all industries average.

20.20 AVERAGE WEEKLY EARNINGS, Construction and All Industries

	Construction		All industries	
	Full-time adult employees	All employees	Full-time adult employees	All employees
	$	$	$	$
May 1993	646	579	633	518
May 1994	709	635	656	532
May 1995	730	662	688	548
May 1996	751	681	715	564
May 1997	792	718	737	578
May 1998	808	739	768	596
May 1999	831	750	791	611
May 2000	(a)797	(a)720	822	636

(a) Fall due to compositional changes. Several aspects can contribute to such changes, including variations in the proportions of full-time, part-time, casual and junior employees; in the occupational distribution within and across industries; in the distribution of employment between industries; and in the proportion of male and female employees. Such effects may apply differently within different States and Territories, and over time.

Source: Average Weekly Earnings (6302.0).

Industrial disputes

Of the 729 industrial disputes during 1999, 247 (34%) affected the construction industry (table 20.21). These disputes involved (either directly or indirectly) 124,400 construction industry employees and resulted in the loss of 165,100 working days. This represents 25% of the total number of working days lost due to all industrial disputes in Australia in 1999.

20.21 INDUSTRIAL DISPUTES, Construction and All Industries—1999

	Construction	All industries
Total industrial disputes (no.)	247	729
Employees involved (directly and indirectly) ('000)	124.4	460.9
Working days lost ('000)	165.1	650.4

Source: Industrial Disputes, Australia (6322.0).

Table 20.22 shows that in 1999 the construction industry recorded an average of 381 working days lost per thousand employees, compared with an average of 87 across all industries. Victoria, Queensland and New South Wales were the most strike affected, with 635, 379 and 215 working days lost per thousand construction industry employees, respectively. Tasmania and the Northern Territory reported little or no strike activity in the construction industry in 1999.

20.22 WORKING DAYS LOST DUE TO INDUSTRIAL DISPUTES, Construction and All Industries by State/Territory(a)—1999

	Construction	All industries
	per '000 employees	per '000 employees
NSW	215	126
Vic.	635	116
Qld	379	38
SA	99	27
WA	99	57
Tas.	3	2
NT	4	3
ACT	135	30
Aust.	**381**	**87**

(a) The basis for the calculation of working days lost per thousand employees was changed in January 1995 to use estimates of employees taken from the ABS Labour Force Survey only.

Source: Industrial Disputes, Australia (6322.0).

Trade union membership

Table 20.23 shows the general trend of declining membership of trade unions across all industries. The proportion of trade union membership in the construction industry is generally similar to that for all industries combined. During the 12 months to August 1999 there was a rise in the number of trade union members in the construction industry, from 100,600 to 110,600. This resulted in a small rise in the proportion of trade union members in the industry, to the same proportion as in all industries combined.

In the construction industry, a higher proportion of full-time employees (28%) than part-time employees (6%) were trade union members (table 20.24). Across all industries a much higher proportion of female employees were trade union members (23%) than in the construction industry (3%).

20.23 EMPLOYEES WHO WERE TRADE UNION MEMBERS, Construction Industry—1992 to 1999(a)

	Construction	All industries
NUMBER OF MEMBERS ('000)		
1992	124.5	2 508.8
1993	110.1	2 376.9
1994	113.4	2 283.4
1995	105.1	2 251.8
1996	109.6	2 194.3
1997	115.0	2 110.4
1998	100.6	2 037.5
1999	110.6	1 878.2
PROPORTION OF EMPLOYEES IN TRADE UNIONS (%)		
1992	42.1	39.6
1993	35.3	37.6
1994	34.1	35.0
1995	30.6	32.7
1996	29.7	31.1
1997	33.5	30.3
1998	25.2	28.1
1999	25.7	25.7

(a) At August.

Source: Trade Union Members, Australia (6325.0).

20.24 PROPORTION OF TRADE UNION MEMBERS, By Sex—August 1999

	Construction	All industries
	%	%
MALES		
Full-time	29.5	30.0
Part-time	*12.8	13.3
Total	*28.5*	*27.7*
FEMALES		
Full-time	*6.1	27.0
Part-time	*0.0	19.1
Total	*3.0*	*23.4*
TOTAL		
Full-time	28.1	29.0
Part-time	*6.4	17.5
Total	**25.7**	**25.7**

Source: Trade Union Members, Australia (6325.0).

Bibliography

ABS publications

Australian Housing Survey, Selected Findings, 1994 (4181.0).

Australian National Accounts: National Income, Expenditure and Product (5206.0).

Average Weekly Earnings (6302.0).

Building Activity, Australia (8752.0).

Building Approvals, Australia (8731.0).

Census of the Commonwealth of Australia, 1911, Volume 1 (Commonwealth Bureau of Census and Statistics).

Census of Population and Housing, Selected Social and Housing Characteristics, Australia (2015.0).

Employee Earnings, Benefits and Trade Union Membership, Australia (6310.0).

Engineering Construction Activity, Australia (8762.0).

Industrial Disputes, Australia (6321.0).

Labour Force, Australia (6203.0).

Price Index of Materials Used in Building Other Than House Building, Six State Capital Cities (6407.0).

Price Index of Materials Used in House Building (6408.0).

Private Sector Construction Industry, Australia (8772.0).

Trade Union Members, Australia (6325.0).

Internet sites

Australian Housing and Urban Research Institute, *http://www.ahuri.edu.au*

Commonwealth Department of Industry, Science and Resources, *http://www.isr.gov.au*

Master Builders Australia Inc., *http://www.ozemail.com.au/mbaust/mba.htm* (an FTP contents index is at *http://www.ozemail.com.au/~mbaust)*

Property Council of Australia, *http://www.propertyoz.com.au*

Real Estate Institute of Australia, *http://www.reia.asn.au*

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Introduction

The service industries sector is the most significant and fastest growing component of the Australian economy. This chapter presents an overview of the sector and provides a range of statistical information for a selection of service industries, with a particular focus on those that have recently been surveyed as part of the ABS rotating program of service industries collections.

For the purposes of this chapter, the service industries sector has been defined as all industries other than the goods producing industries (agriculture, mining, manufacturing, electricity, construction, and gas and water supply). In terms of the *Australian and New Zealand Standard Industrial Classification (ANZSIC)*, the service industries cover wholesale and retail trade, accommodation, cafes and restaurants, transport and storage, communication services, finance and insurance, property and business services, government administration and defence, education, health and community services, cultural and recreational services, and personal and other services.

Overview

The service industries sector is the largest component of the Australian economy in terms of number of businesses, employment and gross value added.

Of the estimated 1,107,000 private sector businesses in Australia in 1998–99, some 744,000 or about two-thirds were in the service industries. For small businesses (those with less than 20 employees), the proportions are similar, service industries accounting for 68% of just over one million small businesses in Australia (table 21.1).

In terms of industry output or gross value added, the service industries are dominant, accounting for 67% of the gross value added of all industries in 1998–99 (table 21.2). Within the service industries sector, output in chain volume terms (measuring 'real' output unaffected by price change) increased by 27% in the period from 1993–94 to 1998–99, outstripping output growth in the goods producing sector by 11 percentage points over the same period. This resulted in a small increase in the share of total output for the service industries, from 64.7% in 1993–94 to 66.7% in 1998–99.

The largest contributor to the service industries sector in 1998–99 was the property and business services industry, which accounted for 18% of the gross value added of the service industries sector and 12% of the gross value added of all industries. The next largest, within the service industries sector, was finance and insurance services which accounted for 11% of the gross value added of the sector.

In the five year period from 1993–94 to 1998–99, service industries gross value added increased on average by 5% per year in real terms. In contrast, the gross value added of the goods producing industries increased by an annual rate of 3%.

The communication services industry recorded the largest percentage increase in output in the five year period with an increase of 61% in real terms, the equivalent of an annual growth rate of 10%. The next highest growth rate was recorded by the wholesale trade industry with a 39% increase in output over the five year period, an annual growth rate of nearly 7%. The three areas in the service industries sector where growth in real terms was lowest in the period 1993–94 to 1998–99 were government administration and defence (7%), education (8%), and health and community services (16%).

As table 21.3 shows, in terms of employment the service industries sector is even more dominant, accounting for 74% of total employment for all industries in 1998–99, compared with 71% in 1993–94. Total employment in the service industries sector in 1998–99 was 6,355,700 persons.

21.1 NUMBER OF BUSINESSES—1998–99

Industry	Unit	Small businesses	Other businesses	**Total**
Goods producing industries	'000	337.4	25.5	**362.9**
Service industries	'000	714.1	30.1	**744.2**
Total all industries	'000	1 051.5	55.6	**1 107.1**
Businesses in service industries as a percentage of all businesses	%	67.9	54.1	**67.2**

Source: Small Business in Australia, 1999 (1321.0).

21.2 GROSS VALUE ADDED(a), Chain Volume Measures(b) By Industry

	1993–94	1998–99	Increase
	$m	$m	%
Goods producing industries			
Agriculture	16 326	19 044	16.6
Mining	18 898	23 873	26.3
Manufacturing	67 240	73 800	9.8
Electricity, gas and water	12 946	13 496	4.2
Construction	25 858	34 334	32.8
Total	*141 268*	*164 547*	*16.5*
Service industries			
Wholesale trade	22 463	31 226	39.0
Retail trade	24 902	31 140	25.1
Accommodation, cafes and restaurants	10 460	13 314	27.3
Transport and storage	25 142	31 372	24.8
Communication services	11 758	18 945	61.1
Finance and insurance	26 857	37 696	40.4
Property and business services	43 045	59 547	38.3
Government administration and defence	21 379	22 906	7.1
Education	24 613	26 541	7.8
Health and community services	28 491	33 092	16.1
Cultural and recreational services	8 966	10 544	17.6
Personal and other services	10 418	12 928	24.1
Total	*258 494*	*329 251*	*27.4*
Total all industries(c)	**399 762**	**493 798**	**23.5**
	%	%	
Service industries as a percentage of all industries	64.7	66.7	. .

(a) At basic prices, which include subsidies, but are before any taxes on products. (b) Reference year for chain volume measures is 1997–98. (c) Excludes ownership of dwellings.

Source: Australian System of National Accounts, 1998–99 (5204.0).

In the five year period since 1993–94, employment in the service industries increased by 840,900 persons or 15%, representing an annual growth rate of 3%. In the same period the goods producing industries recorded an increase in employment of only 42,000 persons. This represented an increase of 2% and equates to an annual growth rate of just under 0.4%.

Within the service industries, the major employing industry was retail trade with employment in 1998–99 of 1,298,500 persons, accounting for 15% of all employment. Other large employing service industries were property and business services (945,000 persons), health and community services (817,400 persons), and education (603,500 persons). The industries showing the greatest employment growth in the five year period since 1993–94 were property and business services, a 47% increase from 641,800 persons to 945,000 persons, cultural and recreational services with an increase of 25% in the period, and accommodation, cafes and restaurants with an increase of 18%. In contrast, employment in the government administration and defence sector fell by 6% over the same period, while employment in the wholesale industry declined by 1%.

21.3 EMPLOYED PERSONS, By Industry

	1993–94(a)	1998–99(a)	Increase
	'000 persons	'000 persons	%
Goods producing industries			
Agriculture	408.7	421.8	3.2
Mining	89.4	79.6	–11.0
Manufacturing	1 092.3	1 082.5	–0.9
Electricity, gas and water	92.2	64.7	–29.8
Construction	558.1	634.1	13.6
Total	*2 240.7*	*2 282.7*	*1.9*
Service industries			
Wholesale trade	510.5	506.7	–0.7
Retail trade	1 114.3	1 298.5	16.5
Accommodation, cafes and restaurants	347.5	411.3	18.4
Transport and storage	362.6	408.7	12.7
Communication services	132.9	151.4	13.9
Finance and insurance	317.0	319.9	0.9
Property and business services	641.8	945.0	47.2
Government administration and defence	368.3	345.3	–6.2
Education	552.4	603.5	9.3
Health and community services	709.0	817.4	15.3
Cultural and recreational services	167.2	209.3	25.2
Personal and other services	291.3	338.7	16.3
Total	*5 514.8*	*6 355.7*	*15.2*
Total all industries	**7 755.5**	**8 638.4**	**11.4**
	%	%	
Service industries as a percentage of all industries	71.1	73.6	. .

(a) Annual average.

Source: Labour Force, Australia (6203.0).

Statistics for selected service industries

The remainder of the chapter presents statistics for a selection of service industries. The information provided is based primarily on the rotating program of service industries collections conducted by the ABS. The exceptions are the retail trade and wholesale trade industries where information has been drawn from the monthly and quarterly sales collections respectively.

Retail and wholesale trade

Retail trade

The retail trade industry comprises businesses primarily engaged in the resale of new or used goods to final consumers for personal or household consumption, or in selected repair activities such as repair of household equipment or motor vehicles.

Retail turnover is an important current economic indicator and a guide to consumer confidence. Turnover estimates for the retail trade industry are used to monitor changes in consumer buying patterns. As graph 21.4 shows, in volume terms retail turnover grew by 3.8% in 1998–99, a slight increase on the 3.2% growth achieved in 1997–98. In 1996–97 growth was virtually zero, while growth of 3.8% was recorded in 1995–96. In the period 1989–90 to 1998–99, growth in retail turnover was strongest in 1994–95, at 5.5%.

Table 21.5 presents annual chain volume estimates of turnover (in 1997–98 dollars) by retail industry group. Increases in volume terms were recorded during 1998–99 by each of the industry groups, ranging from 0.3% for the Household good retailing group to 12.2% for the Clothing and soft good retailing group. The solid growth in the sales of the latter group in 1998–99 contrasts with an increase of only 1.7% in that industry group over the period from 1988–89 to 1997–98.

21.4 ANNUAL CHANGE IN RETAIL TURNOVER—1989–90 to 1998–99

Source: Unpublished data, Retail Trade Survey.

21.5 RETAIL TURNOVER, Chain Volume Estimates(a) By Industry

Year	Food retailing $m	Department stores $m	Clothing and soft good retailing $m	Household good retailing $m	Recreational good retailing $m	Other retailing $m	Hospitality and services $m	**Total(b) $m**
1988–89	42 030	10 772	8 443	11 295	6 125	8 676	20 523	**107 864**
1989–90	43 442	10 837	8 113	11 586	6 513	9 320	21 191	**110 907**
1990–91	44 283	10 429	8 044	11 138	6 187	9 400	20 642	**109 880**
1991–92	46 060	10 801	8 366	11 478	6 253	9 894	19 794	**112 460**
1992–93	46 281	10 962	8 077	12 186	6 027	10 043	19 219	**112 718**
1993–94	46 771	11 043	8 097	13 024	6 259	10 960	20 024	**116 172**
1994–95	49 257	11 390	8 316	13 762	6 626	11 600	21 661	**122 566**
1995–96	51 584	11 698	8 487	14 383	6 987	12 138	22 039	**127 262**
1996–97	51 948	11 628	8 368	15 138	6 647	12 586	20 807	**127 103**
1997–98	53 769	11 962	8 589	15 286	6 775	13 646	21 126	**131 153**
1998–99	54 674	12 367	9 636	15 332	6 867	14 400	22 887	**136 164**

(a) The reference year for chain volume measures is 1997–98. (b) Chain volume measures are not additive for most periods; the component measures do not sum to a total in the same way as the corresponding current price components do.

Source: Unpublished data, Retail Trade Survey.

The Food retailing industry group constitutes the largest component of retail trade, accounting for 40% of total retail turnover in 1998–99. The 30% growth in turnover of the Food retailing industry in the period from 1988–89 to 1998–99 was slightly stronger than the overall growth in retailing of 26%. Over the decade, growth was strongest in the Other retailing industry group (66%) and the Household good retailing group (36%). The weakest growth over this period was in the Hospitality and services industry and the Recreational good retailing industry group, which both increased by only 12%.

A comparison of the shares of total retailing held by the industry groups shows that the Food, household good and Other retailing groups increased their shares over the period. In contrast the Hospitality and services industry's share of total retail turnover fell from 19% in 1988–89 to 17% in 1998–99. Other industries to show a decrease in their shares were Department stores, Clothing and soft good retailing, the Hospitality and selected other services group and the Recreational good retailing group.

Wholesale trade

The wholesale trade industry covers those businesses involved in the resale of new or used goods to businesses or to institutional (including government) users.

21.6 WHOLESALE SALES, Chain Volume Estimates(a) by Industry

	Basic material wholesaling	Machinery and motor vehicle wholesaling	Personal and household good wholesaling	**Total(b)**
	$m	$m	$m	**$m**
1994–95	46 496	65 716	57 613	**159 191**
1995–96	45 454	65 797	55 204	**160 597**
1996–97	47 135	67 910	53 689	**165 177**
1997–98	51 534	70 966	56 034	**178 534**
1998–99	56 925	77 311	57 982	**192 329**

(a) Reference year for chain volume measures is 1997–98. (b) Chain volume measures are not additive for most periods; the component measures do not sum to a total in the same way as the corresponding current price components do.

Source: Unpublished data, Inventories and Sales, Selected Industries, Australia.

Along with the retail trade industry, the wholesale trade industry is a significant component of the Australian economy and provides a key indicator of economic activity. Table 21.6 presents annual chain volume estimates of wholesale sales (in 1997–98 dollars) by industry since 1994–95. In volume terms, wholesale sales in 1998–99 increased by 7.7% over 1997–98 sales. This followed increases of 8.1% in 1997–98 and 2.9% in 1996–97.

Machinery and motor vehicle wholesaling was the largest component of the wholesale trade industry, accounting for 40% of total wholesale sales in 1998–99. In the period 1994–95 to 1998–99, sales of the Basic material wholesaling industry increased by 22%, while sales of the Personal and household good wholesaling industry increased by less than 1%.

The changing face of the retail industry—1948 to 1992

The ABS conducted its first census of the retail industry in respect of 1947–48 and has repeated them at about six yearly intervals until the most recent, undertaken in respect of 1991–92. This article outlines some of the main changes in the characteristics of the retail industry over the 44 years between those two collections.

At the broad level (table 21.7) the industry has clearly experienced considerable change over the period. The number of retail outlets has nearly doubled, from the 114,000 retail locations operating in 1947–48 to almost 210,000 locations in 1991–92. At the same time, the turnover of the retail industry has increased from just over $2b (one billion pounds as it was then) to more than $138b in 1991–92. Average turnover per location has increased from $17,500 in 1947–48 to over $650,000 in 1991–92. Of course population growth and inflation are major contributors to the enormous increase in turnover, the Australian population increasing by nearly 170% and the Consumer Price Index almost nineteen fold over the period. However, after adjusting for population growth and inflation there has been a real and significant increase in turnover per head of population, nearly 66% over the period, which represents an annual growth rate of 1.2%.

While the aggregate numbers are of interest, the composition of the industry provides insights to the changing face of retail. While the changing descriptions of retail businesses over time make comparisons a little difficult, particularly with the widespread existence in 1947–48 of the general store and the mixed business store, broad comparisons can be made with reasonable confidence. For example in 1947–48 over 40% (45,941) of retail locations in Australia were primarily involved in food retailing (table 21.8), the largest categories being grocers, a group comprising confectioners, milk bars and cafes, and mixed businesses.

21.7 RETAIL INDUSTRY, By State

	1947–48			1991–92		
State/Territory	Number of retail outlets no.	Turnover $m	Turnover per head of population $	Number of retail outlets no.	Turnover $m	Turnover per head of population $
New South Wales	42 101	825	273	70 707	48 796	8 183
Victoria	34 333	575	275	54 330	33 331	7 482
Queensland	15 642	285	252	36 902	24 745	8 167
South Australia	10 207	169	256	17 619	10 726	7 362
Western Australia	7 826	139	270	19 721	13 718	8 274
Tasmania	3 555	62	238	5 905	3 458	7 357
Northern Territory	168	3	275	1 674	1 408	8 381
Australian Capital Territory	133	4	185	2 752	2 509	8 505
Total	**113 965**	**2 062**	**267**	**209 614**	**138 695**	**7 928**

Source: Retailing in [State/Territory], 1991–92 (8623.1—8623.8); Census of Retail Establishments, Year Ended 30 June 1948, Bulletin No. 1 Australia (Commonwealth Bureau of Census and Statistics).

In 1991–92, on the other hand, while the number of food retailing locations had increased by 43% to 65,734 locations (see table 21.9), food retailing accounted for less than a third of all retail locations. Furthermore, by 1991–92 over 50% (34,443 locations) of the food retailing locations were involved in either takeaway food (20,034 locations) or cafes and restaurants (14,409 locations). The comparable sector in 1947–48, namely confectioners, milk bars, cafes etc., accounted for only 8,659 locations. In the absence of the rapid growth in takeaway food retailing, and in cafes and restaurants, there would have been a decline in the number of food retailing locations.

21.8 FOOD RETAILING, By Sector—1947–48

Sector	Retail locations no.	Proportion of total food retailing locations %
Grocers	11 118	24.2
Mixed businesses	7 459	16.2
Confectioners, milk bars and cafes	8 659	18.8
Butchers	6 540	14.2
Bakers and cake shops	4 717	10.3
Fruiterers	5 002	10.9
Delicatessens	1 261	2.7
Fishmongers and poulterers	1 185	2.6
Total food retailing	**45 941**	**100.0**

Source: Census of Retail Establishments, Year Ended 30 June 1948, Bulletin No. 1, Australia (Commonwealth Bureau of Census and Statistics).

21.9 FOOD RETAILING, By Sector—1991–92

Sector	Retail locations no.	Proportion of total food retailing %
Supermarkets and grocery stores	9 476	14.4
Fresh meat, fish and poultry retailing	7 337	11.2
Fruit and vegetable retailing	3 650	5.6
Bread and cake retailing	4 755	7.2
Takeaway food retailing	20 334	30.9
Specialised food retailing n.e.c.	5 773	8.8
Cafes and restaurants	14 409	21.9
Total food retailing	**65 734**	**100.0**

Source: Retailing in [State/Territory], 1991–92 (8623.1–8623.8).

The emergence of the takeaway food store was not the only phenomenon during the period, which also saw the emergence of the supermarket to replace the many corner grocery stores and mixed business stores operating in 1947–48. Whereas in 1947–48 there were 18,577 grocers and mixed business locations, by 1991–92 there were only 9,476 supermarkets and grocery stores. Of course the impact of the supermarket was not restricted to grocery and mixed business stores. In the same period the number of fruit and vegetable retailers declined by 27%; fresh meat, fish and poultry retailers declined by 5%; and the number of bread and cake retailers remained largely unchanged.

Offsetting the low growth in food retailing were a number of areas of rapid increase. The most notable increase, not surprisingly given the expanding role of the motor vehicle in the period, was in motor vehicle retailing and services. In this category the number of locations increased more than fourfold, from about 7,500 in 1947–48 to over 32,000 locations in 1991–92, and turnover increased from $264m in 1947–48 to $44b in 1991–92. Other retail areas experiencing large increases in the number of locations were hairdressers (from 8,400 to 15,700 locations), clothing stores (from 10,200 to 15,600 locations), newsagents and bookstores (from 2,700 to 6,900 locations) and chemists and cosmetic stores (from 3,000 to 5,600 locations).

The takeaway store was not the only industry to emerge in the period. Also contributing to the growth in the number of locations was the emergence of new retail activities such as video hire outlets (3,200 locations in 1991–92) and photographic film processing (1,500 locations).

Hospitality industries

Accommodation

The accommodation industry, an important part of the tourism and hospitality sector, consists of hotels, motels, caravan parks and similar businesses mainly engaged in providing short term accommodation. It excludes those hotels that provide short term accommodation, but whose main activity is selling alcoholic beverages for consumption on the premises.

At 30 June 1998, there were 6,143 businesses in the accommodation industry. This represented a 16% increase over the number at June 1996. These businesses employed a total of 97,201 persons at 30 June 1998, an increase of 20% since June 1996. Females accounted for almost 59% of total employment within the industry.

As table 21.10 shows, the total income of the industry in 1997–98 was $6,763m, with takings from accommodation accounting for the majority (61%) of this total. Other significant income items included takings from meals (17%) and sales of liquor and other beverages (8%). Labour costs ($2,035m) accounted for just over 32% of total expenses ($6,269m), making it the most significant expense item. The resulting operating profit before tax in 1997–98 was $502m, representing an operating profit margin for the period of 7.8%, the same as for 1995–96.

21.10 ACCOMMODATION INDUSTRY

	1995–96	1997–98	Increase
	no.	no.	%
Businesses at 30 June	5 288	6 143	16.2
	persons	persons	%
Employment at 30 June	81 086	97 201	19.9
	$m	$m	%
Income			
Takings from accommodation	3 253	4 141	27.3
Other income	2 006	2 621	30.6
Total	*5 259*	*6 763*	*28.6*
Expenses			
Labour costs	1 592	2 035	27.8
Other expenses	3 265	4 234	29.7
Total	*4 857*	*6 269*	*29.1*
Operating profit before tax	401	502	25.2
	%	%	
Operating profit margin	7.8	7.8	. .

Source: Accommodation Industry, Australia 1997–98 (8695.0).

Clubs, pubs, taverns and bars

Along with the accommodation industry, the clubs, pubs, taverns and bars industries are important elements of the tourism and hospitality sector. The clubs industry covers businesses mainly engaged in the provision of hospitality services to members, while the pubs, taverns and bars industry covers businesses which mainly sell alcoholic beverages for consumption on the premises.

At the end of June 1998, there were 8,541 businesses in the clubs, pubs, taverns and bars industries combined, employing 148,996 persons (table 21.11). During 1997–98, the total income of the clubs, pubs, taverns and bars industries was $14,266m, an increase of 28% over 1994–95. After expenses, the combined operating profit before tax for these industries was $1,242m, representing an operating profit margin of 8.8%.

At 30 June 1998, there were 3,749 businesses in the clubs industry, a 14% increase in the three years since June 1995. Employment increased by almost 8% in the same period, to 67,272 persons at 30 June 1998. The majority (56%) of employees worked on a casual basis.

The provision of gambling services is an important aspect of the clubs industry; 53% of the total income of the industry in 1997–98 was attributable to gambling. The clubs industry generated total income of $6,013m in 1997–98 (an increase of 27% since 1994–95); after expenses this resulted in an operating profit before tax of $561m. The operating profit margin for the clubs industry was 9.4%, clubs with gambling facilities having a higher operating profit margin (9.6%) than clubs without gambling facilities (7.1%).

There were 4,792 businesses in the pubs, taverns and bars industry at 30 June 1998, an 11% increase since June 1995. In the three years from June 1995, employment in the industry increased by 14% to 81,724 persons at 30 June 1998. As in the clubs industry, most employment (65%) in the pubs, taverns and bars industry was on a casual basis.

The increasing influence of gambling activity in the pubs, taverns and bars industry was reflected in the 130% increase in gambling income in the period 1994–95 to 1997–98. Businesses in the industry generated gambling income of $1,326m in 1997–98. Despite this growth, sales of liquor and other beverages ($5,848m) were still the major source of income. After expenses, operating profit before tax in the industry was $681m. In terms of operating profit margin, pubs, taverns and bars with gambling facilities outperformed those without gambling facilities (8.9% compared to 5.7%) in 1997–98. The overall operating profit margin for the industry was 8.3%, up significantly on 4.1% in 1994–95.

Selected business professions

Accounting services

At 30 June 1996, there were 8,389 businesses in the accounting services industry. Most accounting businesses were small, 95% employing fewer than 20 employees. There were 18 businesses in the industry employing 100 or more persons, less than 1% of total businesses, but these 18 large businesses accounted for significant proportions of total employment (26%) and total income (39%).

There were 66,792 persons employed in the accounting services industry at the end of June 1996. The majority (83%) of employment was on a full-time basis. Females accounted for 51% of total employment in the industry. While females comprised 76% of support staff, they represented only 17% of working principals and 41% of accountants working as employees.

As shown in table 21.12, during 1995–96 the accounting services industry generated $4,939m in total income, an average of $588,800 per business. After expenses, the industry recorded an operating profit before tax of $955m, representing an operating profit margin of 19.4%, slightly less than in 1992–93.

Income from accounting services ($4,407m) contributed 89% of total income in 1995–96. As shown in table 21.13, taxation services (36%) generated the largest proportion of income from accounting services, followed by general business and personal accounting services (30%) and auditing services (20%).

Computing services

The computing services industry consists of businesses mainly involved in providing services such as data processing, information storage and retrieval, computer maintenance, computer consultancy, and other computing services. The ABS conducted a survey of the computing services industry for 1998–99, the first survey of the industry since 1995–96. In the intervening three years, the industry has changed significantly, as shown in table 21.14.

21.11 CLUBS (HOSPITALITY) AND PUBS, TAVERNS AND BARS INDUSTRIES

	1994–95	1997–98	Increase
CLUBS (HOSPITALITY)			
	no.	no.	%
Businesses at 30 June	3 284	3 749	14.2
	persons	persons	%
Employment at 30 June	62 536	67 272	7.6
	$m	$m	%
Income			
Sales of meals and alcohol and other beverages	1 729.8	2 111.1	22.0
Takings from gambling	2 355.4	3 207.6	36.2
Total	*4 729.4*	*6 012.5*	*27.1*
Operating profit before tax	429.1	561.0	30.7
	%	%	
Operating profit margin	9.2	9.4	. .
PUBS, TAVERNS AND BARS			
	no.	no.	%
Businesses at 30 June	4 325	4 792	10.8
	persons	persons	%
Employment at 30 June	71 437	81 724	14.4
	$m	$m	%
Income			
Sales of meals and alcohol and other beverages	5 278.2	6 530.1	23.7
Takings from gambling	576.1	1 325.6	130.1
Total	*6,390.1*	*8,253.3*	*29.2*
Operating profit before tax	258.2	681.1	163.8
	%	%	
Operating profit margin	4.1	8.3	. .
CLUBS (HOSPITALITY) AND PUBS, TAVERNS AND BARS			
	no.	no.	%
Businesses at 30 June	7 609	8 541	12.2
	persons	persons	%
Employment at 30 June	133 973	148 996	11.2
	$m	$m	%
Income			
Sales of meals and alcohol and other beverages	7 008.1	8 641.3	23.3
Takings from gambling	2 931.4	4 533.1	54.6
Total	*11 119.5*	*14 265.8*	*28.3*
Operating profit before tax	687.3	1242.1	80.7
	%	%	
Operating profit margin	6.2	8.8	. .

Source: Clubs, Pubs, Taverns and Bars, Australia, 1997–98 (8687.0).

In the three years since June 1996, the number of businesses in the industry increased by just over 50%, from 9,679 businesses at 30 June 1996 to 14,731 businesses at 30 June 1999. Employment in the industry increased significantly (by 35%, or 10% per annum), with employment at 30 June 1999 of 74,395 persons.

Total income of the industry in the financial year 1998–99 was $10,474m, an increase of 30% on that recorded in 1995–96. This represented an increase of 9% per annum over the three year period. The provision of computing services accounted for 87% of all income in 1998–99. Income from the provision of telecommunications services more than doubled from $148m in 1995–96 to $312m in 1998–99.

In contrast, income from the sale of computer and communication hardware, parts and consumables fell significantly in the period, from $1,047m in 1995–96 to $535m in 1998–99.

The total expenditure of businesses in the computer services industry during 1998–99 was $9,654m. This resulted in an operating profit before tax of $836m, which represented an operating profit margin of 8.2%, significantly higher than the 5.7% recorded in 1995–96, but lower than the 9.5% recorded in 1992–93.

21.12 ACCOUNTING SERVICES INDUSTRY

	1992–93	1995–96	Increase
	no.	no.	%
Businesses	8 699	8 389	–3.6
	persons	persons	%
Employment			
Principals	14 143	15 409	9.0
Qualified employees	18 277	22 207	21.5
Other employees	27 580	29 175	5.8
Total employment	*60 000*	*66 792*	*11.3*
	$m	$m	%
Total income	4 086.4	4 939.1	20.9
Operating profit before tax	828.6	954.6	15.2
	%	%	
Operating profit margin	20.5	19.4	. .

Source: Legal and Accounting Services, Australia, 1995–96 (8678.0).

21.13 INCOME FROM ACCOUNTING SERVICES—1995–96

Type of accounting service	Value $m	Contribution to total %
Auditing	895.9	20.3
General business and personal accounting	1 311.6	29.8
Insolvency, reconstruction	236.3	5.4
Investment financial planning advice	167.1	3.8
Taxation	1 574.6	35.7
Other accounting services	221.7	5.0
Total	**4 407.2**	**100.0**

Source: Legal and Accounting Services, Australia, 1995–96 (8678.0).

The computing services industry was concentrated in New South Wales and Victoria, which together accounted for 75% of total employment and 78% of total income in 1998–99. States' shares of both employment and income were well above their shares of the Australian population in 1998–99 (34% and 25% respectively). The average income per business in the industry was $711,000. Businesses operating in the Australian Capital Territory (average income of $853,600) and New South Wales ($813,000) had the highest average income per business. The lowest were recorded in Tasmania ($255,000) and the Northern Territory ($252,800).

Consultant engineering services

The ABS conducted a survey of the consultant engineering services industry for 1995–96, to update the results of a survey in respect of 1992–93. There were 5,514 businesses in the industry at 30 June 1996 (table 21.15). This represented an increase of only 1% in the three year period since June 1993.

The consultant engineering services industry employed a total of 30,736 persons at 30 June 1996, of which full-time employment accounted for 83% (25,384 persons). Employment in the industry at 30 June 1996 represented a 9% increase since June 1993. In addition to 30,736 employed persons, a further 8,212 persons were working on a contract or agency basis in the industry at 30 June 1996. The number of staff working on this basis more than doubled since June 1993, when there were 3,954 contract and agency staff. Overall 38,948 persons were working in the industry at 30 June 1996, an increase of 21% since June 1993.

The 5,514 businesses operating at 30 June 1996 generated total income of $3,233m and had expenses of $2,736m. The main sources of income were civil engineering ($505m), mining and geotechnical engineering services ($463m), and building/structural engineering services ($391m). The main items of expense were labour costs and payments to contractors and agency staff, which together accounted for 64% of all expenses in 1995–96.

The consultant engineering services industry recorded an operating profit before tax of $351m for the 1995–96 financial year, which represented an operating profit margin of 11.0%. This was a significant increase on the profit margin (6.7%) recorded in 1992–93.

Businesses in the consultant engineering services industry were concentrated in four States. Businesses operating in New South Wales accounted for 28% of total income, while Victoria (29%), Queensland (18%), and Western Australia (18%) were the other significant contributors.

21.14 COMPUTING SERVICES INDUSTRY

	1992–93	1995–96	1998–99	Percentage growth from 1995–96 to 1998–99	Annualised percentage growth from 1995–96 to 1998–99
	no.	no.	no.	%	%
Businesses at 30 June	4 894	9 679	14 731	52.2	15.0
	persons	persons	persons	%	%
Employment at 30 June	30 056	55 046	74 395	35.2	10.6
	$m	$m	$m	%	%
Income					
Income from the provision of computer services and the sale and licensing of packaged software	3 251.2	6 504.7	9 409.2	44.7	13.1
Income from the provision of telecommunications services	95.5	147.9	312.3	111.2	28.3
Income from the sale of computer and communication hardware, parts and consumables	488.8	1 047.8	525.1	–49.9	–20.6
Other income	264.7	387.9	227.4	–41.4	–16.3
Total	*4 100.2*	*8 088.3*	*10 474.0*	*29.5*	*9.0*
Expenses					
Labour costs	1 293.6	2 726.8	4 065.0	49.1	14.2
Payments to contractors and consultants for computing and communications services	294.6	892.0	1 396.4	56.5	16.1
Other expenses	2 160.9	4 022.7	4 193.0	4.2	1.4
Total	*3 749.1*	*7 641.5*	*9 654.4*	*26.3*	*8.1*
Operating profit before tax	364.9	455.1	835.6	83.6	22.5
	%	%	%		
Operating profit margin	9.5	5.7	8.2	. .	. .

Source: Computing Services Industry, Australia, 1998–99 (8669.0).

21.15 CONSULTANT ENGINEERING SERVICES INDUSTRY

	1992–93	1995–96	Increase
	no.	no.	%
Businesses at 30 June	5,454	5,514	1.1
	persons	persons	%
Employment at 30 June			
Full-time	23,244	25,384	9.2
Part-time	4,964	5,352	7.8
Total	*28,208*	*30,736*	*9.0*
Contract and agency staff	3,954	8,212	107.7
	$m	$m	%
Total income	2,358	3,233	37.1
Expenses			
Labour costs	971	1,242	27.9
Payments to contract and agency staff	449	499	11.1
Other expenses	782	996	27.3
Total	*2,202*	*2,736*	*24.3*
Operating profit before tax	156	351	125.4
	%	%	
Operating profit margin	6.7	11.0	. .

Legal services

At the end of June 1999 there were 11,026 organisations involved in the legal services industry. The large majority (98%) of these organisations were either solicitor practices (7,115 organisations) or barrister practices (3,704 organisations). The remaining organisations comprised 39 patent attorney businesses, nine government solicitors, eight legal aid authorities and 152 community legal centres.

The 7,115 solicitor practices (table 21.16) operating at 30 June 1999 represented an increase of 11% on the 6,403 practices operating at 30 June 1996. Employment within solicitor practices increased by 10% over the same period, with 67,278 persons employed at the end of June 1999. There were 25,044 qualified solicitors and barristers working in solicitor practices at 30 June 1999. Other persons working for solicitor practices were para legals (6,383 persons), articled clerks (1,894 persons) and other staff (33,957 persons). On average there were 1.7 other staff for every qualified solicitor.

During 1998–99, solicitor practices generated $6,192m in income, representing an average gross income per practice of $870,200. The main sources of income were from commercial law ($1,821m), property law ($1,152m) and personal injury law ($966m). These three fields of law accounted for 64% of solicitor practice income.

The total expenses of solicitor practices during 1998–99 were $4,252m, a 19% increase since 1995–96. Labour costs ($2,132m) accounted for 50% of total expenses. The major components of labour costs were wages and salaries paid to solicitors and barristers of $805m (representing $63,300 per employed solicitor/barrister) and wages and salaries paid to other employees of $1,153m (representing $27,300 per other employee).

After expenses, the operating profit before tax of solicitor practices during 1998–99 was $1,940m. The operating profit margin in 1998–99 was 31.4%, a small increase on the operating profit margin of 27.5% in 1995–96.

During 1998–99 solicitor practices spent 1,782,000 hours on pro bono work, which was made up of 826,000 hours providing legal services without expecting a fee, 835,200 hours providing legal services at a reduced fee and 120,300 hours of involvement in free community legal education and law reform work.

At the end of June 1999 there were 3,704 barrister practices, an 11% increase over the number of practices operating at the end of June 1996 (table 21.17). At 30 June 1999 there were 5,908 persons working in barrister practices. In terms of employment, all barrister practices were small businesses, with average employment per practice of 1.6 persons. There were 3,704 qualified barristers, the remainder being support staff. Males comprised 89% of barristers.

Barrister practices generated $843m in income during 1998–99, a 23% increase on the $687m generated in 1995–96.

The main sources of income for barrister practices in 1998–99 were from personal injury law ($235m), commercial law ($228m), and criminal law ($89m). Significant income was also sourced from administrative and constitutional law ($54m), family law ($43m), banking and finance law ($38m), intellectual property law ($33m) and property law ($31m).

Total expenses of barrister practices during 1998–99 were $299m. The two major expenses were chamber fees of $54m and labour costs of $49m. The operating profit before tax of these practices was $544m, which represented an operating profit margin of 64.7%. This compares with an operating profit margin of 60.5% in 1995–96.

21.16 SOLICITOR PRACTICES

	Units	1995–96	1998–99	Percentage change %
Practices at 30 June	no.	6 403	7 115	11.1
Employment at 30 June				
Qualified solicitors/barristers	persons	23 495	25 044	6.6
Other	persons	37 555	42 234	12.5
Total	persons	*61 051*	*67 278*	*10.2*
Income				
Income from legal services				
Commercial and finance	$m	1 509.0	2 194.3	45.4
Property	$m	1 022.2	1 152.3	12.7
Personal injury	$m	735.8	966.4	31.3
Family	$m	275.4	279.1	1.3
Other	$m	985.2	1 235.1	25.4
Total	*$m*	*4 527.7*	*5 827.2*	*28.7*
Other income	$m	307.9	364.3	18.3
Total	*$m*	*4 835.6*	*6 191.5*	*28.0*
Expenses				
Labour costs	$m	1 816.5	2 131.7	17.4
Other expenses	$m	1 757.6	2 120.0	20.6
Total	*$m*	*3 574.1*	*4 251.7*	*19.0*
Operating profit before tax	$m	1 325.1	1 939.8	46.4
Operating profit margin	%	27.5	31.4	. .

Source: Legal Services Industry, Australia, 1998–99 (8667.0).

21.17 BARRISTER PRACTICES

Type of legal service	Units	1995–96	1998–99	Percentage change %
Practices at 30 June	no.	3 350	3 704	10.6
Employment at 30 June	persons	5 779	5 908	2.2
Income				
Income from legal services				
Personal injury	$m	161.1	234.9	45.8
Commercial and finance	$m	273.1	266.4	–2.5
Criminal	$m	63.0	89.0	41.3
Other	$m	174.9	247.0	104.3
Total	*$m*	*672.1*	*837.3*	*24.6*
Other income	$m	14.6	5.5	–62.3
Total	*$m*	*686.7*	*842.8*	*22.7*
Expenses				
Labour costs	$m	*66.5*	*49.3*	*–25.9*
Other expenses	$m	*220.9*	*249.8*	*25.4*
Total	*$m*	*287.4*	*299.2*	*4.1*
Operating profit before tax	$m	411.7	543.6	32.0
Operating profit margin	%	60.5	64.7	. .

Source: Legal Services Industry, Australia, 1998–99 (8667.0).

Real estate services

The real estate services industry covers businesses mainly engaged in valuing, purchasing, selling (by auction or private treaty), managing or renting real estate on behalf of other people. The most recent survey of the industry was in respect of 1998–99.

There were 7,589 private sector businesses in the real estate services industry at 30 June 1999 (table 21.18). This represented a fall of 6% in the three year period since June 1996. At 30 June 1999 there were 52,079 persons employed in the industry, a decrease of 5% since June 1996. The industry comprised 21,276 sales staff (41% of total employment), 9,439 property managers (18%), 2,399 leasing staff (5%), 1,581 valuers (3%) and 17,384 other staff, who were mainly administrative staff. Female staff (28,167 persons) accounted for 54% of total industry employment at the end of June 1999, compared to 49% in June 1996.

During 1998–99, private sector businesses in the real estate services industry generated $3,903m in income, an increase of 19% since 1995–96. Most income (64%) was derived from property sales and leasing commissions. The other major source of income was property management commissions, which accounted for 24% of total income. After expenses, the industry had an operating profit before tax of $465m. This represented an operating profit margin of 12.0%, significantly higher than the operating profit margin (8.2%) recorded in 1995–96.

Businesses in the real estate services industry were concentrated in four States. In 1998–99, New South Wales accounted for 34% of total income, while Victoria (26%), Queensland (19%) and Western Australia (12%) were also major contributors.

In conjunction with the survey of real estate services, the ABS conducted its first survey of government valuer-general organisations, in respect of 1998–99. Results of this survey are presented in table 21.19.

At the end of June 1999, there were nine government valuer-general organisations, employing 979 persons, of which 602 worked as valuers.

The large majority (96%) of total income ($131m during 1998–99) came from property valuations, which also included government funding for this valuation activity. Of the total expenses of $126m, 42% was attributable to labour costs. Other major expenses were contract payments to private sector valuers ($23m) and corporate overhead payments ($19m).

21.18 REAL ESTATE SERVICES INDUSTRY

	Units	1995–96	1998–99
Businesses at 30 June			
Real estate agency	no.	n.a.	6 216
Property valuation service	no.	n.a.	429
Conveyancing	no.	n.a.	463
Other	no.	n.a.	481
Total	*no.*	*8 079*	*7 589*
Employment at 30 June	persons	54 817	52 079
Income			
Income from property sales and leasing commissions	$m	2 018.8	2 502.8
Income from property management commissions	$m	855.7	925.0
Other income	$m	412.9	475.0
Total	*$m*	*3 287.5*	*3 902.7*
Expenses			
Labour costs	$m	1 600.1	1 847.5
Other expenses	$m	1 422.9	1 590.2
Total	*$m*	*3 023.1*	*3 437.7*
Operating profit before tax	$m	264.4	465
Operating profit margin	%	8.2	12.0

Source: Real Estate Services Industry, Australia, 1998–99 (8663.0).

21.19 GOVERNMENT VALUER-GENERAL ORGANISATIONS

	Units	Value	%
Organisations at 30 June	no.	9	. .
Employment at 30 June			
Permanent full-time	persons	865	88.4
Permanent part-time	persons	37	3.8
Casual/temporary	persons	77	7.9
Total	*persons*	*979*	*100.0*
Income			
Income from property valuations	$m	125.5	95.9
Other income	$m	5.4	4.1
Total	*$m*	*130.9*	*100.0*
Expenses			
Labour costs	$m	53.4	42.4
Other expenses	$m	72.6	57.6
Total	*$m*	*126.0*	*100.0*

Source: Real Estate Services Industry, Australia, 1998–99 (8663.0).

Travel agency services

The travel agency services industry covers those businesses whose main activity is the provision of travel agency services such as transport and/or accommodation bookings and tour wholesaling or retailing. The ABS conducted a survey of this industry in respect of 1996–97, to follow up on the results of the first survey in respect of 1986–87.

As shown in table 21.20 there were 3,266 businesses involved in the travel agency services industry at 30 June 1997. These businesses comprised 2,842 retail travel agent businesses, 174 wholesalers/ticket consolidators, 170 inbound tour operators and 80 tourist bureaux.

The industry generated total income of $1,980m in 1996–97. Retail travel agency businesses accounted for $1,129m (57%), while wholesalers/ticket consolidators were the other major contributor, accounting for $483m (24%) of total income.

Total employment of the industry at 30 June 1997 was 24,451 persons, the majority (80% or 19,502 persons) employed full-time. The retail travel agents accounted for 68% (16,505 persons) of total employment in the industry.

The travel agency services industry generated an operating profit before tax of $37m in 1996–97. This represented an operating profit margin of 2.0% for the year. However, the operating profit margin varied considerably by type of travel agency business. While retail travel agents and inbound tour operators both recorded positive operating margins (8.1% and 6.5% respectively),

wholesale travel agency businesses recorded a negative operating profit margin (–16.8%), from a net loss of $73m in 1996–97.

Market research services

The ABS conducted its first survey of the market research services industry in respect of 1998–99. The industry is composed of businesses mainly engaged in providing market research services, but excludes businesses mainly providing business consulting services and/or marketing services.

At the end of June 1999 there were 272 businesses in the industry, of which 224 businesses mainly provided market research consultancy services, and 48 businesses mainly provided field work services supporting other businesses in the industry (table 21.21).

At 30 June 1999 there were 10,744 persons working in the market research services industry, including 1,580 consultants, researchers and data analysts with an average salary of $60,900. In comparison, the average salary of the 9,164 other employees was $9,000, reflecting the very high incidence (75%) of casual staff.

During 1998–99 total income within the market research services industry was $456m, the key components being quantitative research ($307m) and qualitative research, which accounted for $104m. Labour costs ($203m) represented 53% of total expenses ($384m). An operating profit before tax of $72m in 1998–99 represented an operating profit margin of 15.9%.

21.20 TRAVEL AGENCY SERVICES INDUSTRY—1996–97

	Units	Retailers	Wholesalers and ticket consolidators	Inbound tour operators	Tourist bureaux	**Total**
Businesses at 30 June	no.	2 842	174	170	80	**3 266**
Employment at 30 June						
Full-time	persons	13 508	3 985	1 699	310	**19 502**
Part-time	persons	2 997	577	1 078	298	**4 949**
Total	*persons*	*16 505*	*4 562*	*2 777*	*608*	***24 451***
Income						
Ticket sales	$m	903.4	373.9	287.5	6.0	**1 570.8**
Other travel related income	$m	133.8	40.2	18.3	2.2	**194.6**
Other income	$m	92.1	68.7	34.3	19.1	**214.2**
Total	*$m*	*1 129.3*	*482.8*	*340.1*	*27.3*	***1 979.5***
Expenses						
Labour costs	$m	407.1	156.8	70.3	13.7	**647.9**
Other expenses	$m	628.7	395.4	248.9	14.7	**1 287.7**
Total	*$m*	*1 035.8*	*552.2*	*319.2*	*28.4*	***1 935.6***
Operating profit before tax	$m	89.4	–72.5	21.3	–0.9	**37.3**
Operating profit margin	%	8.1	–16.8	6.5	–5.3	**2.0**

Source: Travel Agency Services Industry, Australia, 1996–97 (8653.0).

21.21 MARKET RESEARCH SERVICES INDUSTRY—1998–99

	Units	Value
Businesses at 30 June		
Market research consultancy businesses	no.	224
Field work for market research consultancy businesses	no.	48
Total	*no.*	*272*
Employment at 30 June		
Consultants, researchers and data analysts	persons	1 580
Administrative support	persons	651
Data collection/processing	persons	8 414
Other	persons	98
Total	*persons*	*10 744*
Income		
Income from market research services		
Qualitative research	$m	104.2
Quantitative research	$m	306.5
Other (including desk research)	$m	28.1
Total	*$m*	*438.8*
Other income	$m	16.9
Total	*$m*	*455.8*
Expenses		
Labour costs	$m	203.4
Other expenses	$m	180.5
Total	*$m*	*383.9*
Operating profit before tax	$m	71.9
Operating profit margin	%	15.9

Source: Market Research Services, Australia, 1998–99 (8556.0).

During 1998–99 total income from market research activity was $439m (96% of total income). Table 21.22 shows that 144 businesses in the industry received income of $98m from market research in fast moving consumer goods. The other main spheres of work were other retail with 126 businesses receiving $62 million, and finance and insurance services with 132 businesses receiving $56 million.

In 1998–99 the market research services industry was concentrated in New South Wales, with 59% of market research businesses operating in that State and accounting for 50% of total industry employment and 53% of total industry income. The only other State with substantial market research activity was Victoria, which accounted for 31% of total industry employment and 31% of total industry income.

21.22 INCOME FROM MARKET RESEARCH, By Sphere of Work—1998–99

	Businesses at end June(a)	Value	Proportion of total income
	no.	$m	%
Fast moving consumer goods	144	97.5	22.2
Retail (excluding fast moving consumer goods)	126	62.2	14.2
Tourism and hospitality	83	22.0	5.0
Communication and information technology	122	31.4	7.2
Automotive	66	18.1	4.1
Utilities	73	17.6	4.0
Finance and insurance services	132	56.1	12.8
Health and pharmaceutical	118	43.1	9.8
Media	61	40.6	9.3
Other	127	50.1	11.4
Total	**272**	**438.8**	**100.0**

(a) Businesses may have more than one sphere of work. Hence the counts of businesses for each sphere of work do not sum to the total.

Source: Market Research Services, Australia, 1998–99 (8556.0).

Selected business services

Cleaning services

The ABS conducted its first survey of the cleaning services industry in respect of 1998–99. The industry includes businesses mainly engaged in the cleaning of windows and building interiors, and related cleaning services. Businesses mainly involved in the cleaning of building exteriors or cleaning of carpets and curtains are excluded.

At the end of June 1999 there were 5,938 businesses in the cleaning services industry, of which 2,864 were sole proprietorships or partnerships. As shown in table 21.23, the cleaning of commercial buildings and offices was the main cleaning activity for 2,899 businesses (49% of all businesses in the industry).

At June 30 1999, total employment in the cleaning services industry was 95,001 persons, of whom 90,267 persons (95%) worked as cleaners. Nearly half (48%) of the persons working in the industry were permanent part-time employees. Casual employees accounted for 26% and full-time employees accounted for 22% of total employment. The remaining 5% of employment comprised working proprietors and partners.

During 1998–99 the total income of the cleaning services industry was $2,137m, of which $2,044m was derived from general cleaning services. Some 42% of the latter came from the cleaning of commercial buildings and offices, 16% from the cleaning of education premises, 15% from retail premises and 8% from industrial premises.

Labour costs of $1,377m represented 70% of total expenses ($1,981m) of the cleaning services industry during 1998–99. The average labour costs per employee were $15,200, which reflected the high incidence of casual and part-time employees working in the industry. After expenses, the operating profit before tax for the cleaning services industry was $156m, representing an operating profit margin of 7.3%.

Of the 5,938 businesses in the cleaning services industry, only 101 businesses (less than 2% of all businesses) employed more than 100 persons. These large businesses accounted for 52% of industry income, and 55% of industry employment.

21.23 CLEANING SERVICES INDUSTRY—1998–99

	Units	Value
Businesses at 30 June		
Sole proprietor or partnership	no.	2 864
Incorporated company	no.	2 415
Trust	no.	659
Total	*no.*	*5 938*
Businesses by main cleaning activity		
Commercial buildings/office premises	no.	2 899
Industrial premises	no.	345
Retail premises	no.	532
Domestic premises	no.	717
Event venues	no.	28
Education premises	no.	776
Hospitality premises	no.	449
Health premises	no.	85
Transport facilities	no.	38
Other	no.	69
Total	*no.*	*5 938*
Employment at 30 June		
Cleaning	persons	90 267
Other	persons	4 734
Total	*persons*	*95 001*
Income		
Income from general cleaning services		
From the private sector	$m	1 555.4
From the public (government) sector	$m	488.7
Total	*$m*	*2 044.1*
Other income	$m	92.9
Total	*$m*	*2 137.0*
Expenses		
Labour costs	$m	1 377.1
Payments to sub-contractors for general cleaning services	$m	166.0
Purchases	$m	100.2
Other expenses	$m	337.9
Total	*$m*	*1 981.0*
Operating profit before tax	$m	155.5
Operating profit margin	%	7.3

Source: Cleaning Services Industry, Australia, 1998–99 (8672.0).

Security services

The first ABS survey of the security services industry was conducted in respect of 1998–99. The industry is defined as all businesses mainly engaged in providing security, protection and private enquiry services. It excludes police services and businesses mainly providing locksmith services, alarm installing, or manufacturing and wholesaling of alarms.

At the end of June 1999 there were 1,714 businesses in the security services industry (table 21.24). The provision of static guard/crowd control services was the main activity of 811 businesses within the sector, and the provision of mobile patrol services was the main activity of 420 businesses. Of the remainder, 368 businesses were mainly involved in private investigative and enquiry services, 54 businesses in security monitoring services, and 26 businesses in cash-in-transit/armoured car services.

21.24 SECURITY SERVICES INDUSTRY—1998–99

	Units	Value
Businesses by main security activity at 30 June		
Cash-in-transit/armoured car service	no.	26
Mobile patrol service	no.	420
Static guard/crowd control service	no.	811
Security monitoring service	no.	54
Private investigator/enquiry service	no.	368
Other security services	no.	35
Total	*no.*	*1 714*
Employment at 30 June	persons	31 752
Income		
Income from security services		
Mobile patrol service	$m	320.9
Static guard/crowd control service	$m	532.2
Security monitoring service	$m	121.2
Private investigator/enquiry service	$m	53.3
Other security services	$m	311.6
Total	*$m*	*1 339.2*
Other income	$m	55.6
Total	*$m*	*1 394.8*
Expenses		
Labour costs	$m	756.2
Payments to sub-contractors for security services	$m	205.9
Other expenses	$m	341.5
Total expenses	*$m*	*1 303.6*
Operating profit before tax	$m	89.7
Operating profit margin	%	6.5

Source: Security Services, Australia, 1998–99 (8557.0).

At 30 June 1999 there were 31,752 persons working in the security services industry. Casual employees accounted for 47% of total employment, while full-time employees and permanent part-time employees accounted for 37% and 14% respectively.

During 1998–99, the total income of the security services industry was $1,395m. Businesses in the industry carried out a diverse range of security work, with 38% of total income generated from static guard and crowd control services, 23% from mobile patrol services and 22% from other security services including cash-in-transit and armoured car services. Other major sources of income were security monitoring services (9% of total income) and private investigator and enquiry services (4% of total income).

Expenses of $1,304m were incurred by the security services industry during 1998–99. Labour costs of $756m accounted for 58% of total expenses. In 1998–99, the industry recorded an operating profit before tax of $90m, which represented an operating profit margin of 6.5%.

At 30 June 1999 there were 19 businesses in the security services industry employing 100 persons or more. These businesses accounted for 54% of industry employment and 63% of industry income in 1998–99; the operating profit before tax of these large businesses was $68m, accounting for 76% of the industry's operating profit before tax.

Medical and dental professions

Private medical practice

The ABS conducted its first survey of the private medical practice industry in respect of 1994–95. At 30 June 1995, there were 22,298 businesses in the industry, with slightly more general practice medical businesses than specialist medical businesses.

The businesses in the industry employed 106,134 persons at 30 June 1995, including 33,987 medical practitioners, 7,446 nurses and 44,104 support staff (table 21.25). The incidence of full-time and part-time employment varied significantly by broad occupation category. A large proportion (70%) of medical practitioners worked full-time, while only 41% of administrative/support staff and 38% of nurses were employed on a full-time basis.

The private medical practice industry generated gross income of $7,241m in 1994–95, specialist medical businesses accounting for 61% ($4,405m) of the total. Fee for medical service was the major income item, accounting for $6,562m or 91% of total income. Expenses for the industry totalled $5,391m, of which wages and salaries paid ($2,649m) was the largest component (49%). Wages and salaries paid to medical practitioners totalled $1,367m.

After allowance for expenses, the operating profit before tax of medical practice businesses was $1,850m, specialist medical businesses accounting for the bigger share (58%). The operating profit margin of the industry was 25.8%.

Dental services

The ABS conducted its first survey of the dental services industry in respect of 1997–98. Of the 5,257 businesses in the industry at 30 June 1998, 3,339 (71%) were unincorporated businesses (i.e. sole proprietors or partnerships). As shown in table 21.26, the 5,257 businesses operated from 6,384 locations, 81% of them in capital cities.

At the end of June 1998, there were 24,108 persons working in the dental services industry, 74% of whom were female. While only 21% of dental practitioners were female, 97% of support staff were female. The average wage of support staff employees was $19,100, reflecting (in part) the fact that only 53% of support staff were working full-time. By comparison, 74% of dental practitioners were working full-time at 30 June 1998.

During 1997–98, the industry generated total income of $1,685m. Fee for service income was the major component, accounting for 97% ($1,641m) of total income. Total expenses during 1997–98 were $1,234m. Labour costs accounted for 46% ($568m) of total expenses.

The dental services industry generated an operating profit before tax of $451m in 1997–98, which represented an operating profit margin of 26.9%. The operating profit margins of businesses in the oral surgery services sector (34.1%), and the other specialist dental services sector (33.8%) were significantly higher than that recorded by the general dental services sector (25.2%).

21.25 PRIVATE MEDICAL PRACTICE INDUSTRY—1994–95

	Units	General practice medical businesses	Specialist medical businesses	**Total**
Businesses at 30 June	no.	11 933	10 364	**22 298**
Employment at 30 June				
Medical practitioners	persons	20 825	13 161	**33 987**
Other	persons	33 831	38 316	**72 147**
Total	*persons*	*54 657*	*51 477*	***106 134***
Gross income	$m	2 836.3	4 404.6	**7 240.9**
Expenses				
Wages and salaries				
Medical practitioners	$m	611.3	755.9	**1 367.2**
Other	$m	502.6	779.5	**1 282.2**
Total wages and salaries	*$m*	*1 113.9*	*1 535.5*	***2 649.4***
Other expenses	$m	944.2	1 797.0	**2 741.2**
Total	*$m*	*2 058.1*	*3 332.5*	***5 390.6***
Operating profit before tax	$m	778.2	1 072.1	**1 850.3**
Operating profit margin	%	27.6	24.6	**25.8**

Source: Private Medical Practice Industry, Australia, 1994–95 (8685.0).

21.26 DENTAL SERVICES INDUSTRY—1997–98

	Units	General dental services	Oral surgery services	Other specialist services	**Total**
Businesses at 30 June	no.	4 621	126	510	**5 257**
Number of locations					
Capital city	no.	4 190	214	696	**5 099**
Other	no.	961	71	252	**1 285**
Total	*no.*	*5 151*	*285*	*948*	***6 384***
Employment at 30 June					
Practitioners	persons	6 539	144	685	**7 368**
Other	persons	13 800	558	2 382	**16 740**
Total	*persons*	*20 339*	*702*	*3 067*	***24 108***
Income					
Fee for service	$m	1 317.6	56.8	266.9	**1 641.3**
Other income	$m	35.7	2.7	5.4	**43.9**
Total	*$m*	*1 353.4*	*59.5*	*272.3*	***1 685.2***
Expenses					
Labour costs	$m	470.9	18.1	79.4	**568.4**
Other expenses	$m	543.0	21.5	101.1	**665.6**
Total	*$m*	*1 013.8*	*39.6*	*180.5*	***1 234.0***
Operating profit before tax	$m	339.5	20.0	91.7	**451.2**
Operating profit margin	%	25.2	34.1	33.8	**26.9**

Source: Dental Services, Australia, 1997–98 (8551.0).

Allied health professions

Audiology and audiometry services

The first ABS survey of the audiology and audiometry industry was conducted in respect of 1997–98. This industry includes businesses mainly engaged in providing audiology and audiometry services such as hearing assessment and the sale and fitting of hearing instruments.

As shown in table 21.27, at 30 June 1998 there were 146 audiology and audiometry businesses in Australia, operating from 985 locations (362 of which were located in capital cities). These businesses employed a total of 1,367 persons at 30 June 1998, and generated total income of $158m in 1997–98. Fee for service income of $127m represented 81% of total income, $72m of which was in the form of payments from the Office of Hearing Services.

In 1997–98, the audiology and audiometry industry had an operating profit before tax of just under $1m, which represented an operating profit margin of 0.7%.

Table 21.28 shows that audiology and audiometry businesses provided a range of services during 1997–98, including the fitting and post-fitting of hearing instruments (140 businesses), sale of hearing instruments (135 businesses) and consultation and diagnostic work (134 businesses). Only 49% of audiology and audiometry businesses were involved in the provision of workplace assessment services.

21.27 AUDIOLOGY AND AUDIOMETRY SERVICES INDUSTRY—1997–98

	Units	Value
Businesses at 30 June	no.	146
Private practice locations at 30 June		
Capital city	no.	362
Other	no.	623
Total	*no.*	*985*
Employment at 30 June		
Audiologists	persons	503
Audiometrists	persons	162
Other	persons	702
Total	*persons*	*1 367*
Income		
Fee for service	$m	127.4
Other income	$m	30.6
Total	*$m*	*157.9*
Expenses		
Labour costs	$m	56.8
Purchases of hearing instruments	$m	55.1
Other expenses	$m	45.1
Total	*$m*	*156.9*
Operating profit before tax	$m	0.9
Operating profit margin	%	0.7

Source: Audiology and Audiometry Services, Australia, 1997–98 (8554.0).

21.28 AUDIOLOGY AND AUDIOMETRY ACTIVITIES, By Number and Proportion of Businesses—1997–98

	Total	Proportion of businesses undertaking activity
	no.	%
Consultation and diagnostic work	134	91.8
Fitting and post-fitting of hearing instruments	140	95.9
Sale of hearing instruments	135	92.5
Sale of assistive listening devices	111	76.0
Repair and maintenance of hearing instruments	128	87.7
Hearing rehabilitation and counselling	126	86.3
Workplace assessments	72	49.3
All businesses(a)	**146**	**100.0**

(a) Businesses are counted once for each activity in which they are involved. Hence the counts of businesses by type of activity do not sum to the total.

Source: Audiology and Audiometry Services, Australia, 1997–98 (8554.0).

Chiropractic and osteopathic services

The ABS conducted its first survey of chiropractic and osteopathic businesses in private practice in respect of 1997–98. As shown in table 21.29, there were 2,150 chiropractic and osteopathic businesses in the industry at 30 June 1998, consisting of 1,776 chiropractic businesses and 374 osteopathic businesses. The majority (56%) of these businesses were unincorporated businesses (i.e. sole proprietorships or partnerships).

Practitioners accounted for 43% of employment within the industry, the remainder being support staff. The average wages and salaries paid to employed practitioners were similar for the two professions, employed chiropractors being paid $36,300 and osteopaths $34,300. In comparison, the average wage of support staff within the chiropractic and osteopathic services industry was $14,000 during 1997–98, partly reflecting the fact that the majority of support staff (67%) worked part-time.

During 1997–98, the industry received total income of $268m. Fee for service income was the major component, accounting for 95% ($254m) of total income. The industry incurred expenses of $212m, of which labour costs of $102m were the major component.

In 1997–98, the chiropractic and osteopathic services industry generated an operating profit before tax of just under $55m, representing an operating profit margin of 20.4%. The operating profit margin for osteopathic services was 29.5%, compared to 19.4% for chiropractic services.

Optometry and optical dispensing services

The ABS conducted its first survey of the optometry and optical dispensing services industry in respect of 1997–98. At 30 June 1998 there were 1,557 optometry and optical dispensing businesses in the industry. The majority (60%) of these businesses provided both optometry and optical dispensing services, while 25% provided optometry services only, the remaining 15% providing only optical dispensing services.

As shown in table 21.30, there were 8,915 persons working in the industry at the end of June 1998. Optometrists (2,702 persons) and optical dispensers (2,448 persons) accounted for 58% of total employment. Females accounted for 61% of persons working in the industry. However, the proportion of females varied by occupation, only 36% of optometrists and 54% of optical dispensers being female. In contrast, females accounted for 82% of all other staff.

During 1997–98, the optometry and optical dispensing industry generated total income of $818m. Sales of optical goods accounted for 80% of total industry income. Included in sales of optical goods were sales of:

- 1,949,000 frames (with lenses) at an average sale price of $211 per frame (with lenses);
- 1,082,000 sets of lenses (without frames) at an average sale price of $99 per set of lenses (without frame); and
- 337,000 frames (without lenses) at an average sale price of $123 per frame (without lenses).

Fees from optometry services during the period were $150m, 85% of which was from Medicare bulk billing payments.

Total expenses during 1997–98 for the optometry and optical dispensing industry were $733m. Purchases of optical goods ($253m) were the most significant expense item, followed by labour costs ($223m). On average, employed optometrists were paid wages and salaries of $40,900 during 1997–98. In contrast, the average wages and salaries paid to optical dispensers were $25,000, and those for other staff were $20,200—partly attributable to the relatively large proportion (45%) of other staff who worked part-time.

After expenses, the industry recorded an operating profit before tax of $89 million for 1997–98, representing an operating profit margin of 10.9%.

21.29 CHIROPRACTIC AND OSTEOPATHIC SERVICES—1997–98

	Units	Chiropractic services	Osteopathic services	**Total**
Businesses at 30 June	no.	1 776	374	**2 150**
Private practice locations at end June				
Capital city	no.	1 570	359	**1 929**
Other	no.	710	116	**826**
Total	*no.*	*2 280*	*475*	**2 755**
Employment at end June				
Practitioners	persons	2 111	398	**2 509**
Other	persons	3 033	328	**3 361**
Total	*persons*	*5 144*	*726*	***5 870***
Income				
Fee for service	$m	228.9	25.1	**254.0**
Other income	$m	10.4	3.7	**14.1**
Total	*$m*	*239.2*	*28.8*	***268.0***
Expenses				
Labour costs	$m	93.7	8.4	**102.1**
Other expenses	$m	98.3	11.7	**110.0**
Total	*$m*	*192.0*	*20.2*	***212.2***
Operating profit before tax	$m	46.2	8.4	**54.6**
Operating profit margin	%	19.4	29.5	**20.4**

Source: Chiropractic and Osteopathic Services, Australia 1997–98 (8550.0).

21.30 OPTOMETRY AND OPTICAL DISPENSING SERVICES, 1997–98

	Units	Value
Businesses at 30 June	no.	1 557
Locations at end June		
Capital city	no.	2 196
Other	no.	840
Total	*no.*	*3 036*
Employment at end June		
Optometrists	persons	2 702
Optical dispensers	persons	2 448
Other	persons	3 765
Total	*persons*	*8 915*
Income		
Sales of goods	$m	653.4
Fee for optometry service	$m	150.3
Other income	$m	14.7
Total	*$m*	*818.4*
Expenses		
Labour costs	$m	223.3
Purchases	$m	252.9
Other expenses	$m	256.8
Total	*$m*	*733.0*
Operating profit before tax	$m	89.1
Operating profit margin	%	10.9

Source: Optometry and Optical Dispensing Services, Australia 1997–98 (8553.0).

Physiotherapy services

At the end of June 1998 there were 3,266 businesses in the physiotherapy services industry, operating from 4,050 private practice locations. The majority (72%) of physiotherapy businesses were unincorporated businesses i.e. sole proprietorships or partnerships.

As shown in table 21.31, there were 9,055 persons working in the industry as at 30 June 1998. Females accounted for 74% (6,719) of persons working, with 66% of physiotherapists and 88% of support staff being female. In total, 61% of persons in the physiotherapy services industry worked part-time.

In 1997–98, fee for service income accounted for $344m (95%) of total income ($364m). The physiotherapy services industry incurred expenses of $270m during the period, the majority of which was attributable to labour costs (54% of total expenses).

The operating profit before tax for the industry was $93m in 1997–98, resulting in an operating profit margin of 25.7%.

21.31 PHYSIOTHERAPY SERVICES INDUSTRY—1997–98

	Units	Physiotherapy services
Businesses at 30 June	no.	3 266
Private practice locations at 30 June		
Capital city	no.	3 097
Other	no.	953
Total	*no.*	*4 050*
Employment at 30 June		
Practitioners	persons	5 663
Other	persons	3 392
Total	*persons*	*9 055*
Income		
Fee for service	$m	344.0
Other income	$m	20.1
Total	*$m*	*364.1*
Expenses		
Labour costs	$m	145.8
Other expenses	$m	123.9
Total	*$m*	*269.7*
Operating profit before tax	$m	93.1
Operating profit margin	%	25.7

Source: Physiotherapy Services, Australia 1997–98 (8552.0).

Community services

The ABS conducted its first comprehensive survey of the community services industry in respect of 1995–96. The survey covered businesses and organisations mainly involved in the provision of child care services, accommodation for the aged, other residential care services, non-residential care services and nursing homes.

At 30 June 1996, there were 7,207 businesses and organisations in the community services industry. Of these, 70% were 'not for profit' organisations (i.e. businesses whose status does not permit them to be a source of income, profit or financial gain for the entities which establish, control or finance them). The 2,115 'for profit' organisations were mainly concentrated in the child care industry (61%) and nursing homes (25%).

As shown in table 21.32, the industry employed 248,953 persons at 30 June 1996. The majority (68%) of these were employed on a part-time basis. The proportion of persons employed on a part-time basis varied from industry to industry, with the nursing homes industry having the highest incidence (78%).

In addition to 248,953 persons employed, a further 211,144 persons were working in the industry at 30 June 1996 as volunteers. These were particularly important in the non-residential care services n.e.c. industry, with 146,444 persons providing volunteer services to businesses in the industry at 30 June 1996.

The community services industry generated $7,295m in income in 1995–96. Government funding was the source of $3,905m (54%) while sales of goods and services accounted for 32% of income ($2,351m). The role of government funding was particularly significant in the nursing homes industry, accounting for 60% of total income. Total expenses of the community services industry were $6,951m, labour costs representing the largest proportion (65%).

Libraries, museums and commercial art galleries

Libraries

The ABS conducted its first comprehensive survey of the libraries industry in respect of 1996–97. The survey covered all businesses and organisations whose main activity was the acquisition, collection, organisation, conservation and loan of library materials such as books, magazines, manuscripts, musical scores, maps and prints. It also included archival service activities. In addition, the library activities of local government authorities were included in the survey. Libraries with restricted access such as those operated by educational institutions (universities and schools), and libraries operated by businesses for internal reference purposes, were excluded from the survey.

As shown in table 21.33, at 30 June 1997 there were 564 organisations in the libraries industry, operating from 1,468 locations and employing 11,877 persons. Of these, 59% were employed on a full-time basis.

Total income of the industry in 1996–97 was $667m. The great majority of income was from government funding, which accounted for $597m or 90%. Expenses of the industry totalled $631m, wages and salaries accounting for over half (52%) of all expenses.

In 1996–97 there were 89.6 million visits to public libraries, which represented nearly five visits per person for the year. These visits resulted in public library loans of 153.9 million books and other materials, a ratio of 1.7 loans per visit.

21.32 COMMUNITY SERVICES INDUSTRY—1995–96

	Units	Child care services	Accommod-ation for the aged	Residential care services n.e.c.	Non-residential care services n.e.c.	Nursing homes	**Total**
Businesses/organisations at 30 June							
'For profit' organisations	no.	1 290	159	79	50	538	**2 115**
'Not for profit' organisations	no.	1 515	534	529	2 191	323	**5 092**
Total	*no.*	*2 805*	*693*	*608*	*2 241*	*860*	***7 207***
Employment at 30 June							
Full-time	persons	15 474	9 976	7 488	25 004	21 943	**79 885**
Part-time	persons	20 661	23 445	9 358	38 650	76 954	**169 068**
Total	*persons*	*36 135*	*33 421*	*16 846*	*63 654*	*98 897*	***248 953***
Volunteers for the month of June	persons	19 538	18 684	10 899	146 444	15 579	**211 144**
Income							
Government funding	$m	455.9	464.5	293.5	929.9	1 761.6	**3 905.4**
Sales of goods and services	$m	357.7	454.6	90.9	444.4	1 003.2	**2 350.8**
Other income	$m	20.3	150.5	83.9	615.3	168.4	**1 038.4**
Total	*$m*	*833.9*	*1 069.6*	*468.3*	*1 989.6*	*2 933.2*	***7 294.6***
Expenses							
Labour costs	$m	536.0	618.2	352.2	971.8	2 056.5	**4 534.7**
Other expenses	$m	255.7	373.7	152.2	898.7	736.3	**2 416.6**
Total	*$m*	*791.7*	*991.9*	*504.4*	*1 870.5*	*2 792.8*	***6 951.3***

Source: Community Services, Australia, 1995–96 (8696.0).

21.33 LIBRARIES INDUSTRY—1996–97

	Units	Public libraries	Archival service organisations	Other libraries	**Total**
Organisations at 30 June	no.	527	9	28	**564**
Locations at 30 June	no.	1 427	11	30	**1 468**
Employment at 30 June					
Full-time	persons	5 940	763	266	**6 969**
Part-time	persons	4 722	122	64	**4 908**
Total	*persons*	*10 662*	*885*	*330*	***11 877***
Income					
Government funding	$m	506.9	73.5	16.2	**596.7**
Other income	$m	51.5	7.0	11.4	**69.9**
Total	*$m*	*558.4*	*80.6*	*27.7*	***666.6***
Expenses					
Wages and salaries	$m	282.6	32.2	12.0	**326.8**
Other expenses	$m	246.5	44.6	12.6	**303.7**
Total	*$m*	*529.1*	*76.8*	*24.6*	***630.5***

Source: Libraries and Museums, Australia, 1996–97 (8649.0).

Museums

In conjunction with the first survey of the libraries industry, the ABS also conducted its first comprehensive survey of the museums industry in respect of the 1996–97 financial year. The survey covered all businesses and organisations for which the main activity was the operation of art museums, museums and historic houses. Also included in the survey were the museum activities of local government authorities, where their operations had paid staff. Non-employing museums were excluded from the survey, as were businesses whose main activity was the sale of artwork (for the latter see *Commercial art galleries* below).

In total, there were 224 organisations in the museums industry at 30 June 1997 (table 21.34), operating from 352 locations. Museums constituted the most common type of business in the industry (102 organisations), and there were 32 art museum organisations, 69 local government authorities operating museums and 21 organisations operating historic houses.

Employment in the industry totalled 5,636 persons, of whom 65% were employed full-time. There were also 8,443 volunteers working in the industry during June 1997. For the year 1996–97 there were 8,482,500 paid admissions to museums, generating admissions income of $41m, which represented an average admittance price of $4.83. In addition there were 8,304,300 free admissions.

Total income of the industry in 1996–97 was $425m. In addition to the $41m in admissions income, the other main item of income was government funding of $271m, which accounted for 64% of all income. Expenses for the year totalled $402m, with labour costs accounting for 45%.

Commercial art galleries

As part of the cultural industries surveys undertaken in respect of 1996–97, the ABS conducted its first survey of the commercial art galleries industry. The industry is made up of businesses mainly engaged in the display and sale of artwork. Therefore the survey results exclude direct sales by the artist, and sales of artwork by auction houses, art museums, department stores etc.

As shown in table 21.35, at 30 June 1997 there were 457 commercial art gallery businesses operating in Australia, employing 1,156 persons. Females accounted for 62% of total employment; 56% of females worked part-time. In comparison, the majority (74%) of males in the industry worked full-time.

The total income of commercial art gallery businesses in 1996–97 was $87m. Income of $50m was generated by the sale of artwork owned by the business, while a further $26m was earned from commissions on the sale of artwork on consignment.

After expenses, the commercial art galleries industry generated an operating profit before tax of $2.8m in 1996–97, representing an operating profit margin of 3.5%.

The total value of artwork sold by commercial art galleries, either on own account or on commission, was $131m. It is estimated that commercial art galleries accounted for only 25% of all artwork sales in 1996–97, the remaining sales being either direct from the artist or through other outlets such as auction houses and art museums. Sales of Aboriginal and Torres Strait Islander artwork in commercial art galleries totalled $15m in 1996–97, 11% of total gross sales. Sales of overseas artwork in 1996–97 totalled only $2.5m, 2% of total gross sales.

21.34 MUSEUMS INDUSTRY—1996–97

	Units	Art museums	Museums	Local government museums/art museums	Historic houses	**Total**
Organisations at 30 June	no.	32	102	69	21	**224**
Locations at 30 June	no.	32	111	92	117	**352**
Employment at 30 June						
Full-time	persons	941	2 203	176	347	**3 667**
Part-time	persons	289	1 038	268	375	**1 969**
Total	*persons*	*1 230*	*3 240*	*444*	*722*	***5 636***
Volunteers during the month of June	persons	1 654	4 300	1 745	744	**8 443**
Admissions						
Paid admissions	'000	1 599	5 325	398	1 161	**8 483**
Free admissions	'000	3 162	3 351	1 599	192	**8 304**
Total	*'000*	*4 762*	*8 676*	*1 997*	*1 353*	***16 787***
Income						
Government funding	$m	80.7	157.5	18.4	14.0	**270.6**
Admissions income	$m	9.1	22.8	1.0	8.2	**41.0**
Other income	$m	40.5	54.3	2.7	16.1	**113.5**
Total	*$m*	*130.3*	*234.6*	*22.0*	*38.3*	***425.2***
Expenses						
Labour costs	$m	48.3	106.6	9.7	16.2	**180.8**
Other expenses	$m	61.1	128.8	9.5	21.5	**221.0**
Total	*$m*	*109.4*	*235.3*	*19.2*	*37.8*	***401.7***

Source: Libraries and Museums, Australia, 1996–97 (8649.0).

21.35 COMMERCIAL ART GALLERIES INDUSTRY—1996–97

	Units	
Businesses at 30 June	no.	457
Employment at end June		
Males	no.	434
Females	no.	721
Persons	*no.*	*1 156*
Income		
Commission income from the sales of artworks on consignment	$m	25.7
Income from sales of artworks owned by the business	$m	49.5
Other income	$m	12.1
Total	*$m*	*87.3*
Cost of artworks sold		
Purchases of artworks for resale	$m	30.2
Plus opening stocks of artworks	$m	28.0
Less closing stocks of artworks	$m	25.5
Total	*$m*	*32.7*
Other expenses		
Wages and salaries(a)	$m	11.3
Other	$m	40.4
Total	*$m*	*51.7*
Operating profit before tax	$m	2.8
Operating profit margin	%	3.5

(a) Excludes drawings of working proprietors and partners of unincorporated businesses.

Source: Commercial Art Galleries, Australia, 1996–97 (8651.0).

Radio and television services

The ABS conducted its second survey of the radio and television services industries, in respect of 1996–97, following a survey in respect of 1993–94. In the three years since the first survey, there was significant change, particularly in the television services industry with the emergence of pay television. Table 21.36 summarises the main results for the two years.

Within the radio industry, while the number of businesses fell marginally, employment increased by 5% to 5,064 persons at 30 June 1997. There were also 11,203 volunteers working in community and other non-commercial radio stations. A significant increase (21%) in income, and a small rise (7%) in expenses during the period resulted in an operating profit before tax of $93m for 1996–97. This represented an operating profit margin of 14.9%, compared with 3.6% in 1993–94.

The television services industry underwent significant change after 1993–94. This is illustrated in table 21.36, which shows a major turnaround in operating profit before tax. In 1993–94 the industry recorded an operating profit of $378m, while in 1996–97 there was an operating loss of $324m. The reason was the emergence of pay television broadcasting businesses, which recorded a loss of $1,058m in 1996–97, more than offsetting the $734m operating profit before tax recorded by commercial free-to-air broadcasters.

Commercial free-to-air broadcasters experienced an operating profit margin of 28.2% in 1996–97. However, due to the losses incurred by pay television broadcasters, the television industry as a whole experienced a sharp decline in its operating profit margin, from 17.7% in 1993–94 to –9.7% in 1996–97.

21.36 RADIO AND TELEVISION SERVICES INDUSTRIES(a)

	1993–94	1996–97	Increase
RADIO SERVICES			
	no.	no.	%
Businesses at 30 June			
Commercial broadcasters	117	103	–12.0
Community broadcasters	130	121	–6.9
Other broadcasters	18	37	105.6
Total	*265*	*261*	*–1.5*
	persons	persons	%
Employment at 30 June			
Commercial broadcasters	4 273	4 361	2.1
Community broadcasters	517	499	–3.5
Other broadcasters	39	204	423.1
Total	*4 829*	*5 064*	*4.9*
	$m	$m	%
Total income	513.9	622.7	21.1
Operating profit before tax	18.5	92.6	. .
	%	%	
Operating profit margin	3.7	14.9	. .
TELEVISION SERVICES			
	no.	no.	%
Businesses at 30 June			
Free-to-air broadcasters	n.a.	34	. .
Pay television broadcasters	n.a.	7	. .
Community broadcasters	n.a.	7	. .
Total	*43*	*48*	*11.6*
	persons	persons	%
Employment			
Free-to-air broadcasters	n.a.	6 758	. .
Pay television broadcasters	n.a.	2 085	. .
Community broadcasters	n.a.	30	. .
Total	*8 422*	*8 873*	*5.4*
	$m	$m	%
Income			
Sale of airtime	1 982	2 365	19.3
Other income	242	986	216.9
Total	*2 224*	*3 351*	*50.7*
Operating profit before tax			
Free-to-air broadcasters	n.a.	734	. .
Pay television broadcasters	n.a.	–1 058	. .
Community broadcasters	n.a.	0	. .
Total	*378*	*–324*	. .
	%	%	
Operating profit margin	17.7	–9.7	. .

(a) Excludes public broadcasters.

Source: Radio and Television Services, Australia, 1996–97 (8680.0).

Film industry

Film and video production

As part of the cultural industries program of collections undertaken in 1996–97, the ABS conducted a survey of the film and video production industry. This industry covers businesses mainly engaged in the production of motion pictures on film or video tape for theatre or television. Also included are businesses mainly providing production services such as casting, film editing and titling. This was the second ABS survey of the industry, following a survey in respect of 1993–94.

As shown in table 21.37, there were 2,003 businesses in the film and video production industry at 30 June 1997, a 70% increase on the 1,179 businesses in the industry at 30 June 1994. Employment increased by 57% to 9,438 persons in the three year period from 30 June 1994, of whom 62% were employed full-time.

The film and video production industry generated $1,129m in total income for 1996–97, of which $681m (60% of total income) was from the production of commissioned works. The industry recorded an operating loss of $67m for 1996–97, representing an operating profit margin of –6.1%. This was a considerable improvement on the results for 1993–94 when the industry had an operating loss of $98m and an operating profit margin of –21.0%.

Table 21.38 shows that the main activity of businesses in the industry was making productions specifically for television ($533m), which accounted for 55% of the total value of production activity in 1996–97 ($977m). The other major activities were the production of commercials and advertisements ($197m) and feature films ($192m) which each accounted for 20% of total activity.

Film and video distribution

In conjunction with the survey of the film and video production industry, the ABS also conducted a survey of employing businesses in the film and video distribution industry in respect of 1996–97. The industry is made up of businesses mainly engaged in leasing or wholesaling motion pictures on film or video tape to organisations for exhibition or sale. It also includes channel providers to pay television operators. The ABS had undertaken a previous survey of this industry in respect of 1993–94.

As shown in table 21.39, the industry is small with only 66 businesses, compared with 69 businesses operating at 30 June 1994. Employment in the industry increased by 37% to 1,341 persons over the three year period to 30 June 1997. The great majority (83%) of persons were employed full-time.

Total income of the industry in 1996–97 was $974m, an increase of 52% over 1993–94. A major contributing factor to this increase was the emergence during the period of pay television channel provider businesses, which generated $156m in subscriber income in 1996–97.

21.37 FILM AND VIDEO PRODUCTION INDUSTRY—1996–97

	Units	1993–94	1996–97	% change
Businesses at 30 June	no.	1 179	2 003	69.9
Employment at 30 June				
Full-time	persons	n.a.	5 857	n.a.
Part-time	persons	n.a.	3 581	n.a.
Total	*persons*	*5 998*	*9 438*	*57.4*
Income				
Income from the production of commissioned works	$m	239.8	681.3	184.1
Income from the provision of production and post-production services	$m	184.0	222.6	21.0
Other income	$m	183.9	224.6	22.1
Total	*$m*	*607.7*	*1 128.5*	*85.7*
Expenses				
Labour costs	$m	203.6	351.7	72.8
Income from the provision of post-production/film laboratory services	$m	62.5	73.0	16.8
Other expenses	$m	439.8	770.7	75.2
Total	*$m*	*705.8*	*1 195.5*	*69.4*
Operating profit/loss before tax	$m	–98.1	–66.9	31.8
Operating profit margin	%	–21.0	–6.1	. .

Source: Film and Video Production and Distribution, Australia, 1996–97 (8679.0).

In spite of the increase in income, the operating profit before tax of the industry declined from $40m in 1993–94 to only $3m in 1996–97. Pay television channel provider businesses were a major contributor to this turnaround, recording a loss in 1996–97 of $21m.

21.38 FILM AND VIDEO PRODUCTION ACTIVITY—1996–97

Type of activity	Value $m	Contribution to total %
Productions made specifically for television	532.6	54.5
Commercials and advertisements	196.8	20.1
Feature films	192.4	19.7
Corporate/marketing/training videos	40.7	4.2
Documentaries	2.9	0.3
Short films	0.7	0.1
Other	11.0	1.1
Total	**977.1**	**100.0**

Source: Film and Video Production and Distribution, Australia, 1996–97 (8679.0).

Motion picture exhibition

The ABS conducted a survey of the motion picture exhibition industry for 1996–97, the first survey of the industry since 1993–94. In the intervening three years, the industry experienced very significant growth in terms of income and employment, as shown in table 21.40.

While the number of businesses declined from 224 at 30 June 1994 to only 188 businesses at 30 June 1997, a fall of 16%, most other measures showed significant increases. The number of screens increased by 39% to 1,050 screens at 30 June 1997, while the number of seats available increased from 227,000 at 30 June 1994 to 323,000 at 30 June 1997. Overall the number of paid admissions increased by 22% from 60.0 million in 1993–94 to 73.3 million in 1996–97. The latter represents 4 visits per person, based on the Australian population of 18.5 million persons at the end of June 1997. Cinemas operated by the eight largest businesses (all with income greater than $8m) had 74% of these paid admissions.

Employment in the industry was 7,739 persons at 30 June 1997, an increase of 35% on the 5,729 persons employed at June 1994. Of the former, the majority (80%) were employed part-time.

Total income of the industry for the financial year 1996–97 was $832m, an increase of 31% on that recorded in 1993–94. Box office receipts were the major component of income, accounting for 66% ($552m), while sales of food and beverages accounted for 17% of income.

The major items of expenses for the industry in 1996–97 were labour costs, which accounted for $123m (17%) and film hire/rental which accounted for $211m (30%). After deduction of expenses, the industry experienced an operating profit before income tax of $120m, representing an operating profit margin of 14.9%, up marginally on 12.0% in 1993–94.

21.39 FILM AND VIDEO DISTRIBUTION INDUSTRY—1996–97

	Units	1993–94	1996–97	% change
Businesses at 30 June	no.	69	66	–4.3
Employment at 30 June				
Full-time	persons	808	1 107	37.0
Part-time	persons	173	234	35.3
Total	*persons*	*981*	*1 341*	*36.7*
Income				
Rental/lease income	$m	324.5	434.1	33.8
Sales	$m	227.1	253.2	11.5
Subscriber income	$m	. .	156.0	. .
Other	$m	89.1	130.6	46.6
Total	*$m*	*640.7*	*973.9*	*52.0*
Expenses				
Labour costs	$m	34.2	62.1	81.6
Other expenses	$m	566.9	908.7	60.3
Total	*$m*	*601.1*	*970.8*	*61.5*
Operating profit/loss before tax	$m	39.6	3.1	–92.2
Operating profit margin	%	6.9	0.3	. .

Source: Film and Video Production and Distribution, Australia, 1996–97 (8679.0).

21.40 MOTION PICTURE EXHIBITION INDUSTRY

	1993–94	1996–97	Increase
	no.	no.	%
Businesses at 30 June	224	188	–16.1
Cinema screens at 30 June	754	1 050	39.3
Cinema seats at 30 June	227 000	323 000	42.3
Paid admissions	60 047 000	73 262 000	22.0
	persons	persons	%
Employment at 30 June			
Full-time	1 205	1 545	28.2
Part-time	4 523	6 194	36.9
Total	*5 729*	*7 739*	*35.1*
	$m	$m	%
Income			
Gross box office receipts	447.5	551.8	23.3
Sales of food and beverages	105.0	142.1	35.3
Other income	82.8	138.3	67.0
Total	*635.3*	*832.2*	*31.0*
Expenses			
Labour costs	99.0	123.1	24.3
Film hire/rental	168.1	211.2	25.6
Other expenses	293.0	378.9	29.3
Total	*560.1*	*713.2*	*27.3*
Operating profit before tax	75.1	119.9	59.7
	%	%	
Operating profit margin	12.0	14.9	. .

Source: Motion Picture Exhibition, Australia, 1996–97 (8654.0).

Performing arts

The ABS conducted its first survey of the performing arts industries in respect of 1996–97. These industries are made up of businesses mainly engaged in activities including the provision of music and theatre productions, the operation of performing arts venues, and the provision of other services to the arts such as casting agency operation and costume design.

There were 1,399 employing businesses in the performing arts industries at 30 June 1997. These consisted of 881 businesses in the music and theatre production industry, 150 in the performing arts venue industry, and 369 in the services to the arts industry. The industries combined employed 13,359 persons at 30 June 1997, and generated total income of $1,281m in 1996–97. After expenses, operating profit before tax for 1996–97 was $34m, representing an operating profit margin of 3.8% (table 21.41).

There were 68,994 paid performances in the music and theatre production industry during 1996–97. There were 12.8 million paid attendances at these performances. In terms of paid attendance, the most popular types of productions were musicals (3.3 million attendances) and popular music productions (3.1 million).

Sports industries

The sports industries cover businesses and organisations involved in horse and dog racing, operations of sports grounds and facilities, other sports, and services to sports. These industries were surveyed by the ABS for the first time in respect of 1994–95.

There were 5,066 businesses and organisations in the sports industries at 30 June 1995. These businesses employed 58,414 persons at 30 June 1995 (table 21.42). Employment was highest in the months March to September, peaking in April (59,835 persons). The lowest month for employment was December with 48,455 persons. There were a further 112,877 unpaid volunteers in these industries at 30 June 1995, which represented 66% of persons working in the sports industries.

21.41 PERFORMING ARTS INDUSTRIES—1996–97

	Units	Music and theatre production	Performing arts venues	Other services to the arts	Total
Businesses at 30 June	no.	881	150	369	1 399
Performing arts spaces at 30 June	no.	48	315	. .	362
Employment at 30 June					
Working proprietors and partners	persons	354	. .	87	442
Employees	persons	5 727	5 601	1 589	12 918
Total	*persons*	*6 082*	*5 601*	*1 676*	*13 359*
Income					
Government funding	$m	179.3	88.9	26.1	294.3
Income from box office	$m	264.9	76.9	. .	341.8
Other income	$m	150.0	165.8	329.4	645.2
Total	*$m*	*594.3*	*331.6*	*355.5*	*1 281.3*
Expenses					
Labour costs	$m	223.2	105.2	42.0	370.5
Contract payments to performers/artists	$m	32.8	7.2	78.7	118.7
Other expenses	$m	335.8	208.0	212.2	756.0
Total	*$m*	*591.8*	*320.4*	*332.9*	*1 245.2*
Operating profit before tax	$m	2.6	9.1	22.6	34.3
Operating profit margin	%	0.7	4.4	7.0	3.8

Source: Performing Arts Industries, Australia, 1996–97 (8697.0).

The sports industries generated $2,517m in income during 1994–95 and had an operating profit before tax of $169.7m. This represented an operating profit margin of 7.3%. A factor affecting the operating profit margin is the existence of many 'not for profit' organisations in these industries (42% of total businesses and organisations in 1994–95).

Gambling services

The ABS conducted its second survey of the gambling services industries in respect of 1997–98. The industries include businesses mainly engaged in lotteries and lotto operations, casino operations and other gambling services such as totalisator and bookmaker operations, but not the gambling services provided by clubs, pubs, taverns and bars, which accounted for about 41% of net takings from gambling in 1997–98 (see the *Clubs, pubs, taverns and bars* section).

As table 21.43 shows, there were 1,776 businesses in the gambling services industries at 30 June 1998, a decrease of 13% since the end of June 1995. However, employment increased from 32,062 to 37,035 persons in the same period, most of this increase being attributable to casinos, which increased employment by 4,694 persons during the period.

21.42 SPORTS INDUSTRIES—1994–95

	Units	Horse and dog racing	Sports ground and facilities n.e.c.	Sports and services to sports n.e.c.	**Total**
Businesses/organisations at 30 June	no.	898	1 581	2 588	**5 066**
Employment at 30 June					
Full-time	persons	4 869	7 208	6 879	**18 956**
Part-time	persons	9 249	14 355	15 854	**39 458**
Total	*persons*	*14 118*	*21 563*	*22 732*	***58 414***
Volunteers at 30 June	persons	258	11 865	100 754	**112 877**
Total Income	$m	789.1	796.3	931.6	**2 517.0**
Operating profit before tax	$m	50.6	49.0	70.1	**169.7**
Operating profit margin	%	6.6	6.5	8.7	**7.3**

Source: Sports Industries, Australia, 1994–95 (8686.0).

The industry generated total income of $7,935m in 1997–98. The major contributor was net takings from gambling, which increased by 37% over 1994–95, to $7,086m (89% of total income). Total income for the casinos industry grew by 64% in the period 1994–95 to 1997–98, a much higher rate than for lotteries (25%) and other gambling services (28%). Nevertheless, in terms of operating profit margin the lotteries and other gambling services industries (8.6% and 18.4% respectively) outperformed casinos (–10.8%). This was partly due to the very high abnormal expenses incurred by casinos in 1997–98.

Total expenses in 1997–98 for the gambling services industry was $7,518m; the major expense item was gambling/gaming taxes and levies, which accounted for just over 35% of total expenses.

Further information is included in the article *Gambling in Australia* in *Year Book Australia, 2000*.

21.43 GAMBLING SERVICES INDUSTRIES

	Units	Lotteries	Casinos	Other gambling services	**Total**
Businesses at 30 June					
1994–95	no.	178	14	1 849	**2 041**
1997–98	no.	134	13	1 629	**1 776**
Change	%	–24.7	–7.1	–11.9	**–13.0**
Employment at 30 June					
1994–95	no.	2 006	15 837	14 219	**32 062**
1997–98	no.	2 782	20 531	13 722	**37 035**
Change	%	38.7	29.6	–3.5	**15.5**
Net takings from gambling					
1994–95	$m	1 885.1	1 381.8	1 909.5	**5 176.4**
1997–98	$m	2 440.3	2 165.1	2 480.8	**7 086.2**
Change	%	29.5	56.7	29.9	**36.9**
Commissions from gambling					
1994–95	$m	19.9	0.9	85.2	**106.0**
1997–98	$m	17.0	1.5	99.4	**117.9**
Change	%	–14.5	66.7	16.7	**11.2**
Total income (net of payouts to players)					
1994–95	$m	2 039.9	1 650.5	2 093.9	**5 784.3**
1997–98	$m	2 545.1	2 709.7	2 680.5	**7 935.3**
Change	%	24.8	64.2	28.0	**37.2**
Operating profit before tax					
1994–95	$m	250.2	107.4	405.4	**762.9**
1997–98	$m	217.2	–287.9	489.7	**419.0**
Change	%	–13.2	–368.2	20.8	**–45.1**
Operating profit margin					
1994–95	%	12.5	6.5	19.6	**13.4**
1997–98	%	8.6	–10.8	18.4	**5.3**

Source: Gambling Industries, Australia, 1997–98 (8684.0).

Bibliography

ABS publications

Accommodation Industry, Australia, 1997–98 (8695.0).

Audiology and Audiometry Services, Australia, 1997–98 (8554.0).

Australian National Accounts: National Income, Expenditure and Product (5206.0).

Australian System of National Accounts 1998–99 (5204.0)

Census of Retail Establishments, Year Ended 30 June 1948, Bulletin No. 1, Australia (Commonwealth Bureau of Census and Statistics).

Chiropractic and Osteopathic Services, Australia, 1997–98 (8550.0).

Cleaning Services Industry, Australia, 1998–99 (8672.0).

Clubs, Pubs, Taverns and Bars, Australia, 1997–98 (8687.0).

Commercial Art Galleries, Australia, 1996–97 (8651.0).

Community Services, Australia, 1995–96 (8696.0).

Computing Services Industry, Australia, 1998–99 (8669.0).

Consultant Engineering Services, Australia, 1995–96 (8693.0).

Dental Services, Australia, 1997–98 (8551.0).

Film and Video Production and Distribution, Australia, 1996–97 (8679.0).

Gambling Industries, Australia, 1997–98 (8684.0).

Inventories and Sales, Selected Industries, Australia (5629.0).

Labour Force, Australia (6203.0).

Legal and Accounting Services, Australia, 1995–96 (8678.0).

Legal Services Industry, Australia, 1998–99 (8667.0).

Libraries and Museums, Australia, 1996–97 (8649.0).

Motion Picture Exhibition, Australia, 1996–97 (8654.0).

Optometry and Optical Dispensing Services, Australia, 1997–98 (8553.0).

Performing Arts Industries, Australia, 1996–97 (8697.0).

Physiotherapy Services, Australia, 1997–98 (8552.0).

Private Medical Practice Industry, Australia, 1994–95 (8685.0).

Radio and Television Services, Australia 1996–97 (8680.0).

Real Estate Services Industry, Australia, 1998–99 (8663.0).

Retail Trade, Australia (8501.0).

Retailing in New South Wales, 1991–92 (8623.1).

Retailing in Victoria, 1991–92 (8623.2).

Retailing in Queensland, 1991–92 (8623.3).

Retailing in South Australia, 1991–92 (8623.4).

Retailing in Western Australia, 1991–92 (8623.5).

Retailing in Tasmania, 1991–92 (8623.6).

Retailing in Northern Territory, 1991–92 (8623.7).

Retailing in Australian Capital Territory, 1991–92 (8623.8).

Security Services, Australia, 1998–99 (8557.0).

Small Business in Australia, 1999 (1321.0).

Sound Recording Studios, Australia, 1996–97 (8555.0).

Sports Industries, Australia, 1994–95 (8686.0).

Travel Agency Services Industry, Australia, 1996–97 (8653.0).

Internet sites

Australian Services Network (formerly Coalition of Services Industries), *http://www.acsi.asn.au*

Commonwealth Department of Industry, Science and Resources, *http://www.isr.gov.au*

Productivity Commission, *http://www.pc.gov.au*

22 Tourism

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Introduction

Tourism encompasses most short-term travel away from the normal place of work and residence, including travel undertaken for business and pleasure.

It is defined by the World Tourism Organization (WTO) as: "the activities of persons travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes".

This identifies 'tourism' as being more than just leisure travel. It also encompasses travel for business, health, education, religious and other reasons.

Tourism comprises both domestic and international travel. In an economic context, its effects are to generate economic activity and to transfer such activity between different parts of the economy. As it involves the consumption or purchase by tourists—or 'visitors' in the WTO terminology—of any good or service, its economic impact ranges over many sectors of the economy. The impact of tourism is most directly felt by sectors such as transport and tour operators, accommodation establishments, theme parks and attractions, entertainment and arts venues, museums and historical sites, restaurants, travel agents and souvenir retailers. However, other sectors also benefit both directly and indirectly from tourism demand.

Tourism also draws on services provided by the Commonwealth Government, the State and Territory Governments and local government organisations without direct charge to tourists. These include the construction and maintenance of roads, airports, harbours, railways and national parks, tourism promotion, immigration and customs services, information services and the provision of a large number of recreational facilities.

While tourism has been an economic factor in Australia for a very long time, in recent times it has grown to the extent that it is now recognised as a major contributor to total economic activity. In particular, international tourism has experienced substantial growth in the past decade or so, and the holding of the Summer Olympics in Sydney in September 2000 is expected to have long term positive effects on inbound international visitors well into the next decade. This has focused the need for improved standards of facilities and service, and has contributed to a recognition that tourism covers a sophisticated set of economic activities with great potential for future domestic and export earnings.

Because of Australia's island status and distance from most of its international source markets, tourism in this country will continue to be dominated by domestic tourism for the foreseeable future. Despite high annual growth rates, international tourism still only accounts for around a quarter of total tourism activity. While international tourism is forecast to continue to enjoy significantly higher growth rates than domestic tourism, it will be well into the new century before it matches the level of activity of domestic tourism.

Economic importance of tourism

The Australian Tourism Satellite Account produced by the ABS represents the first attempt at placing tourism in a national accounting framework, using international standards. The Tourism Satellite Account shows that, for 1997–98, tourism's contribution to gross domestic product (GDP) was 4.5%.

Domestic tourism accounted for 79% of total tourism GDP, with households contributing more than four-fifths of this proportion. International tourism contributed 21% to total tourism GDP.

Expenditure by international visitors on Australian-produced goods and services (tourism-related exports) accounted for 11% of all exports during 1997–98.

The 512,900 persons employed in tourism-related activities in 1997–98 represented 6% of all employed persons. Of the persons employed in tourism-related activities, 37% were part-time, and 49% were female.

The 4.2 million international visitors in 1997–98 had an average consumption per head of $3,031 on Australian-supplied goods and services. The 75 million domestic overnight visitors during 1997–98 had an average consumption per head of $465, while the 155 million domestic day trips accounted for an average consumption of $69 per head.

Growth in tourism flows to Australia in the mid to late 1980s was at almost twice the international growth rate in tourism flows to all countries. However, Australia's share of world tourism is still

small, accounting for only around 0.5% of total international visitor arrivals in all countries. Because Australia is a long-haul destination for most international visitors, this share is never likely to be large. However, starting from a low base, there is still considerable potential for growth.

The number of international visitors to Australia increased at an average of 25% per year from 1984 to 1988. However, 1989 saw a 7.5% fall in arrivals to 2.1 million, following the strong contributions of Expo 88 and the Bicentennial to the growth in the previous year, but also reflecting the adverse impact of the disruption to domestic airline services caused by the airline pilots' dispute in late 1989. Arrivals recovered by 6.5% to 2.2 million in 1990 and then increased to a new record level of 2.4 million in 1991, and grew by double digit rates in most years to reach 4.4 million by 1997. The number of arrivals in 1998 was 4.2 million, representing a 3.5% drop in arrivals over 1997. There were almost 4.5 million arrivals in 1999, a 7.0% increase over 1998.

The domestic travel market was relatively stagnant in the late 1980s, and experienced an overall small downward trend in visitor nights during the early 1990s. Because of changes in survey methods, it is not possible to compare the figures from 1998 on with earlier figures. Visitor nights in 1999 were virtually unchanged from 1998.

Domestic tourism

In 1999, Australian residents, 15 years of age and over, spent a total of 294.2 million nights visiting other parts of the country (table 22.1). Each trip took an average of four nights, and each person in the population made an average of five trips during the year. Residents of the Australian Capital Territory were the most frequent travellers (average of eight trips), while residents of the Northern Territory tended to stay away for the longest period (average of seven nights). All of these features of domestic tourism are virtually unchanged from those in 1998.

As table 22.2 shows, 'pleasure/holiday' was the main purpose of visit, accounting for the biggest proportion of visitor nights (49%), followed by 'visiting friends/relatives' (30%). 'Business' visits accounted for 15% of all visitor nights, while 'other' reasons accounted for 5%.

New South Wales was the most popular destination, accounting for almost a third of all visitor nights (32%). Queensland was the next most popular destination, attracting just over a quarter of all visitor nights (27%), while Victoria accounted for nearly a fifth of all visitor nights (18%).

22.1 SUMMARY OF PERSON TRIPS AND NIGHTS AWAY(a), By State/Territory of Origin—1999

State/Territory of origin	Estimated population as at 30 June 1999 '000(b)	Person trips '000	Average trips per person	Total nights away '000	Average nights away per person trip
New South Wales	5 095	25 525	5.0	98 664	3.9
Victoria	3 764	17 421	4.6	68 260	3.9
Queensland	2 763	14 144	5.1	57 084	4.0
South Australia	1 199	5 222	4.4	22 373	4.3
Western Australia	1 463	6 268	4.3	28 504	4.5
Tasmania	370	1 768	4.8	7 769	4.4
Northern Territory	142	657	4.6	4 618	7.0
Australian Capital Territory	245	1 962	8.0	6 927	3.5
Australia	**15 042**	**72 969**	**4.9**	**294 198**	**4.0**

(a) For persons aged 15 years and over. (b) Population aged 15 years and over.

Source: National Visitor Survey, Bureau of Tourism Research.

22.2 VISITOR NIGHTS(a), By State/Territory of Destination and Main Purpose of Visit—1999

State/Territory of destination	All business '000	Pleasure/holiday '000	Visiting friends/relatives '000	Other '000	Total(b) '000
New South Wales	13 322	43 821	31 168	4 004	93 871
Victoria	6 801	26 664	16 736	1 823	52 540
Queensland	11 250	40 333	20 401	4 678	78 055
South Australia	2 643	8 890	6 182	1 150	19 263
Western Australia	5 342	14 644	7 084	1 185	29 205
Tasmania	1 366	4 554	2 138	(d)319	8 522
Northern Territory	1 532	3 172	909	(d)258	6 430
Australian Capital Territory	1 948	1 593	2 232	(d)169	5 962
Australia(c)	**44 209**	**143 932**	**86 849**	**13 598**	**294 198**

(a) By Australian residents, 15 years of age and over. (b) Includes visitor nights where purpose of visit was not asked. (c) Includes other and not stated. (d) Subject to sampling variability too high for practical purposes.

Source: National Visitor Survey, Bureau of Tourism Research.

22.3 VISITOR NIGHTS(a), Type of Accommodation Used by State/Territory—1999

Accommodation type	NSW '000	Vic. '000	Qld '000	SA '000	WA '000	Tas. '000	NT '000	ACT '000	Aust.(b) '000
Hotel, resort, motel, motor inn	21 637	10 918	19 838	4 029	6 023	2 466	1 975	2 102	68 994
Guest house/B&B	1 862	968	553	*349	466	*282	*27	*3	4 511
Self-catering cottage/apartment	6 985	3 655	10 257	1 191	2 513	673	*174	554	26 003
Caravan park or commercial camping ground	10 919	6 380	7 196	2 294	3 177	642	944	*196	32 002
Friends' or relatives' property	40 141	22 564	29 316	7 995	11 507	2 991	1 427	2 641	118 582
Own property (e.g. holiday house)	4 534	3 703	2 199	1 430	1 102	573	*46	*69	13 671
Caravan or camping by side of the road, or on private (non-commercial) property	2 938	2 143	2 925	795	1 744	398	736	*33	11 712
Other/not stated(c)	3 299	1 696	4 378	780	1 720	350	542	464	13 111
Total(d)	**93 871**	**52 540**	**78 055**	**19 263**	**29 205**	**8 522**	**6 340**	**5 962**	**294 198**

(a) Australian residents aged 15 years and over. (b) Includes other and not stated. (c) Other accommodation includes backpacker/hostel, university/school dormitory/college, hospital/hospital related accommodation for relatives, and privately owned boat/yacht etc. (d) Includes visitor nights where accommodation type was not asked.

Source: National Visitor Survey, Bureau of Tourism Research.

In 1999 the most frequently used accommodation by domestic travellers was the property of friends or relatives (40% of visitor nights), followed by hotels, resorts and motels (23%) and caravan parks or commercial camping grounds (11%). A similar pattern occurred in New South Wales, Victoria, South Australia, Western Australia and the Northern Territory. However in Queensland, Tasmania and the Australian Capital Territory, self catering cottages/apartments were more popular than caravan parks, accounting for 13%, 8% and 9% of visitor nights respectively (table 22.3).

Intrastate visits accounted for the majority of total domestic tourism visitor nights (58%). They are a particularly important component of domestic tourism for Western Australia, New South Wales and Victoria, where 70%, 65% and 62% respectively of domestic visitor nights in the State were accounted for by residents of the State in 1999 (table 22.4).

In terms of numbers of visitor nights, net beneficiaries from domestic tourism (i.e. where inbound interstate visitor nights are greater than outbound interstate visitor nights) are Queensland, Western Australia, Tasmania and the Northern Territory. While Queensland is the biggest relative net beneficiary, with 2.2 times as many inbound nights as outbound nights, Victoria is the biggest relative net contributor, with 1.8 times as many outbound nights as inbound nights.

22.4 VISITOR NIGHTS(a), By State/Territory of Residence and States/Territories Visited—1999

	State or Territory of residence								
	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Aust.
State/Territory visited	'000	'000	'000	'000	'000	'000	'000	'000	'000
Destination									
New South Wales	60 910	12 753	9 858	2 933	1 945	761	557	4 153	93 871
Victoria	8 238	32 787	3 192	3 802	2 071	1 107	*423	920	52 540
Queensland	18 280	12 433	39 523	2 909	1 769	1 275	635	1 231	78 055
South Australia	2 483	3 489	1 038	10 354	757	*227	786	*129	19 263
Western Australia	2 439	3 127	1 470	848	20 323	*270	541	*187	29 205
Tasmania	1 087	1 802	566	505	*395	3 900	*9	*257	8 522
Northern Territory	1 531	1 056	669	653	799	*112	1 576	*34	6 430
Australian Capital Territory	3 607	805	514	*369	*444	*117	*90	*15	5 962
Australia(b)	**98 664**	**68 260**	**57 084**	**22 373**	**28 504**	**7 769**	**4 618**	**6 927**	**294 198**

(a) For Australian residents aged 15 years and over. (b) Includes other and not stated.

Source: National Visitor Survey, Bureau of Tourism Research.

International inbound tourism

Characteristics

There were 4,459,510 visitors in 1999, representing a 7% increase in visitor arrivals from 1998. This increase indicates a recovery from the 3.5% decline in visitor arrivals experienced in 1998, which was uncharacteristic of the high increases recorded earlier in the decade (table 22.5).

22.5 INBOUND VISITORS

	Visitors	Change(a)
Year	no.	%
1991	2 370 400	7.0
1992	2 603 270	9.8
1993	2 996 220	15.1
1994	3 361 720	12.2
1995	3 725 830	10.8
1996	4 164 830	11.8
1997	4 317 870	3.7
1998	4 167 210	–3.5
1999	4 459 510	7.0

(a) From previous year.

Source: Overseas Arrivals and Departures, Australia (3401.0).

Reflecting the overall increase in visitor arrivals for 1999, there were significant increases from the previous year in inbound visitors from most countries. Of arrivals from Asian countries, the largest increase was from Korea (63%), showing an almost complete recovery from the 72% decline experienced in 1998. Arrivals from Malaysia also experienced a complete recovery from the 22% decline in the previous year.

Arrivals from Singapore increased by 8%, but falls were recorded in visitors from Hong Kong, Japan and Indonesia, 6.5%, 5.8% and 2.2% respectively (table 22.6).

The number of visitor arrivals from countries outside Asia continued to increase from the previous year, with arrivals from the United Kingdom increasing by 14%, from the United States of America by 12% and from New Zealand by 3%. Visitor arrivals from other European countries increased by 10% in 1999, after experiencing a 3% decline in 1998.

In 1998 Japan had been Australia's most important source of international visitors. However, a decline of Japanese visitors in 1999 saw New Zealand become Australia's most important source, accounting for 16.3% of total inbound visitors. This was closely followed by Japan which accounted for 15.9% of inbound visitors, the United Kingdom (13%), United States of America (9%), and other European countries (8%).

The largest category of international visitors during 1999 was those arriving for 'holiday' purposes, who accounted for 56% of all visitor arrivals. Another 19% arrived for the purpose of 'visiting friends/relatives' and 12% arrived for 'business' purposes or to attend a 'convention/conference'.

New Zealand was the main source of visitors for 'business' (25%), and 'convention/conference' (19%). United Kingdom provided the most visitors (24%) for 'visiting friends and relatives' and for 'employment' (26%). Japan provided 24% of 'holiday' visitors, and 'Other Asia' was the main source (16%) of visitors arriving for 'education'.

22.6 INBOUND VISITORS, By Country/Region of Residence and Main Purpose of Trip—1999

	Main purpose of trip								
Country/region of residence	Convention/ conference '000	Business '000	Visiting friends/ relatives '000	Holiday '000	Employment '000	Education '000	Other and not stated '000	Total visitors '000	Change on 1998 %
New Zealand	20.7	109.3	197.6	333.0	11.0	5.1	52.1	728.8	2.7
Other Oceania	4.1	11.0	27.0	61.3	1.2	6.9	26.3	137.8	8.0
Germany	2.5	10.1	19.2	100.5	1.0	3.5	7.8	144.5	13.4
United Kingdom	7.6	36.4	207.0	270.7	11.6	3.4	32.2	568.9	14.1
Other Europe	13.0	33.4	75.9	187.0	3.6	12.2	33.7	358.9	10.3
Indonesia	2.1	8.9	16.2	38.2	0.9	14.4	10.3	91.0	–2.2
Malaysia	3.6	8.9	26.2	81.5	0.8	11.0	7.8	139.8	24.7
Singapore	5.4	29.0	29.0	178.6	0.9	13.5	10.6	267.0	8.1
Hong Kong (SAR of China)	2.4	14.6	25.5	74.9	0.5	8.7	7.6	134.0	–6.5
Japan	3.8	27.3	20.5	604.9	2.9	11.3	36.9	707.5	–5.8
Korea	2.8	8.9	15.3	61.7	0.5	8.4	11.1	108.6	63.0
Taiwan	1.7	5.4	7.9	109.1	0.4	7.7	15.3	147.5	–1.6
Other Asia	11.8	42.2	51.2	103.8	2.9	23.7	34.8	270.2	19.4
United States of America	16.8	72.5	82.7	191.6	4.0	15.4	34.2	417.1	11.5
Other America	4.5	9.8	28.8	51.7	1.4	5.1	9.3	110.6	10.9
Middle East and North Africa	1.9	4.2	13.3	26.3	0.4	1.1	5.2	52.4	24.5
Other Africa	2.6	9.1	20.9	27.7	0.9	1.4	8.3	70.8	–0.1
Not stated	—	—	0.3	0.2	—	—	3.5	4.0	62.2
Total	**107.1**	**441.0**	**864.4**	**2 502.7**	**44.6**	**152.7**	**347.0**	**4 459.5**	**7.0**

Source: Overseas Arrivals and Departures, Australia (3401.0).

22.7 INBOUND VISITORS, By Intended Length of Stay and Main Purpose of Trip—1999

	Main purpose of trip								
Intended length of stay	Convention/ conference '000	Business '000	Visiting friends/ relatives '000	Holiday '000	Employment '000	Education '000	Other and not stated '000	Total visitors '000	Proportion of total %
Under 1 week	36.8	207.5	96.7	783.2	4.9	6.6	81.4	1 217.1	27.3
1 week and under 2 weeks	48.3	124.0	186.7	828.6	7.0	19.3	189.2	1 403.0	31.5
2 weeks and under 1 month	18.3	56.5	270.4	516.8	3.0	13.2	31.5	909.7	20.4
1 month and under 2 months	2.6	20.2	162.6	193.9	2.5	8.4	14.0	404.1	9.1
2 months and under 3 months	0.3	10.3	51.8	56.8	2.5	8.3	6.0	136.0	3.0
3 months and under 6 months	0.5	13.7	64.6	65.9	4.8	25.4	9.9	184.7	4.1
6 months and under 12 months	0.2	8.8	31.7	57.8	20.0	71.5	15.0	205.0	4.6
Total	**107.1**	**441.0**	**864.4**	**2 502.7**	**44.6**	**152.7**	**347.0**	**4 459.5**	**100.0**

Source: Overseas Arrivals and Departures, Australia (3401.0).

The long travelling distances needed for most international visitors to arrive in Australia contribute to a relatively long stay in this country. In 1999, 41% of visitors stayed for more than two weeks, while 21% stayed for more than a month (table 22.7). A factor contributing to the relatively long stays is that 67% of travellers 'visiting friends or relatives' stayed for more than two weeks. Visitors arriving for 'education' purposes also tended to be long stayers (73% for greater than two weeks and 45% for six months), but their absolute numbers were relatively small in comparison those with with other reasons for travel.

Visitor arrivals are only slightly seasonal, with arrival numbers in each month falling into a predictable, narrow range. In 1999 most arrivals were in December (10% of total arrivals), while fewest arrivals (6.7%) were in May (table 22.8). A number of factors contribute to the relative lack of seasonality, primarily the attractive climate experienced in different parts of Australia throughout the whole year and the wide diversity of source countries.

New South Wales is by far the most popular State for all categories of international visitors. In 1999, 36% of all nights spent by international visitors were spent in New South Wales (up from 34% in 1998). Queensland was the next most popular State, accounting for 23% of all international visitor nights. Victoria accounted for 19% and Western Australia 12% of international visitor nights. Tasmania was the least popular State or Territory, accounting for a little under 2% of international visitor nights in 1999 (table 22.9).

Expenditure

In 1999, international visitors to Australia each spent an average of $4,006 on their trip (a small fall on average expenditure in 1998). The highest spenders tended to be visitors from China, Europe and North America. Of these, visitors from China spent the most, an average of $5,637, followed by visitors from Canada ($5,387), Germany ($5,351) and the United States of America ($5,320). The lowest average expenditure, $1,829 per visitor, was by visitors from New Zealand (table 22.10).

22.8 INBOUND VISITORS, By Month and Main Purpose of Trip—1999

	Main purpose of trip								
Month	Convention/ conference '000	Business '000	Visiting friends/ relatives '000	Holiday '000	Employment '000	Education '000	Other and not stated '000	Total visitors '000	Proportion of total %
January	4.7	31.8	69.3	186.9	5.3	21.9	31.2	351.0	7.9
February	6.7	38.9	66.6	226.6	3.8	29.3	26.7	398.6	8.9
March	9.2	40.3	82.1	219.7	3.4	8.4	26.1	389.0	8.7
April	13.6	34.5	63.1	184.2	3.5	9.4	25.8	334.1	7.5
May	9.5	42.3	51.0	160.8	3.0	6.6	24.9	298.1	6.7
June	5.0	33.8	59.9	178.0	3.8	9.7	26.9	317.1	7.1
July	10.6	35.7	67.6	205.8	4.2	29.3	35.2	388.5	8.7
August	9.3	38.0	56.7	212.2	3.6	7.5	28.3	355.6	8.0
September	11.5	36.6	67.0	198.0	3.7	7.5	29.0	353.1	7.9
October	12.2	37.9	77.0	221.8	3.4	10.8	33.9	397.0	8.9
November	11.4	44.2	83.6	237.0	3.9	5.8	30.8	416.7	9.3
December	3.6	27.0	120.7	271.8	2.9	6.5	28.3	460.8	10.3
Total	**107.1**	**441.0**	**864.4**	**2 502.7**	**44.6**	**152.7**	**347.0**	**4 459.5**	**100.0**

Source: Overseas Arrivals and Departures, Australia (3401.0).

22.9 INBOUND VISITOR NIGHTS(a), By State/Territory and Main Purpose of Trip—1999

	Main purpose of trip					
State/Territory	Business '000	Visiting friends/relatives '000	Holiday '000	All other reasons '000	Total '000	Total %
New South Wales	2 266	6 807	14 626	14 634	38 334	35.6
Victoria	1 331	4 360	5 566	9 237	20 494	19.1
Queensland	689	4 216	14 296	5 727	24 928	23.2
South Australia	220	923	1 634	1 765	4 542	4.2
Western Australia	424	3 085	3 871	4 969	12 349	11.5
Tasmania	74	279	635	706	1 694	1.6
Northern Territory	136	308	2 218	383	3 044	2.8
Australian Capital Territory	155	362	372	1 272	2 161	2.0
Australia	**5 309**	**20 340**	**43 218**	**38 691**	**107 558**	**100.0**

(a) All visitors aged 15 years and over.

Source: International Visitor Survey, Bureau of Tourism Research.

After payments for package tours and prepaid international airfares, expenditure on food, drink and accommodation was the next highest outlay, averaging $846 per visitor (table 22.11). High spenders on food, drink and accommodation tended to be from Europe, China, Canada and the United Kingdom. Visitors from Asian countries tended to be the highest spenders on shopping, those from Indonesia recording the highest average expenditure on shopping ($654), followed by visitors from China ($606) and Taiwan ($582).

Persons visiting for 'other' reasons (e.g. education, employment, health) spent the most on average ($6,514 per person), followed by business visitors ($4,182). Relatively high expenditure on prepaid international airfares and on food, drink and accommodation contributed to an overall high average expenditure by these two categories of visitors. Persons visiting for 'other' reasons were also the highest spenders on shopping and education fees (table 22.11).

22.10 AVERAGE VISITOR EXPENDITURE, By Country/Region of Residence and Expenditure Item—1999

	Items of expenditure								
Country/region of residence	Package tours	Prepaid international airfares	Transport	Food, drink and accommodation	Shopping	Entertainment and gambling	Education fees	Other	Total
	$	$	$	$	$	$	$	$	$
New Zealand	221	437	195	488	342	76	11	59	1 829
Germany	1 292	1 471	847	1 191	295	59	107	90	5 351
United Kingdom	802	1 677	554	1 226	347	113	8	95	4 823
Other Europe	1 060	1 565	758	1 364	400	106	139	147	5 539
Indonesia	144	596	482	1 002	654	160	1 174	338	4 550
Malaysia	241	497	331	763	400	247	812	106	3 397
Singapore	453	511	331	811	443	184	644	111	3 489
Hong Kong (SAR of China)	489	788	350	1 004	483	169	520	131	3 933
Japan	1 995	302	261	384	573	48	114	43	3 720
Korea	794	545	305	969	506	128	399	129	3 775
Taiwan	984	436	320	650	582	88	587	112	3 759
Thailand	290	536	428	992	491	319	772	140	3 967
China	767	920	512	1 304	606	215	1 001	312	5 637
Other Asia	240	991	436	954	626	156	712	174	4 289
United States of America	1 188	1 954	468	969	329	86	236	90	5 320
Canada	1 053	1 789	594	1 238	367	112	107	127	5 387
Other countries	451	1 129	325	708	511	80	122	117	3 443
All countries	**884**	**969**	**412**	**846**	**438**	**106**	**248**	**103**	**4 006**

Source: International Visitor Survey, Bureau of Tourism Research.

22.11 AVERAGE VISITOR EXPENDITURE, By Expenditure Item and Main Purpose of Trip—1999

	Main purpose of trip				
Expenditure items	Business	Visiting friends and relatives	Holiday	All other reasons	Total
	$	$	$	$	$
Package tours	307	164	1 326	580	884
Prepaid international airfares	1 805	1 198	691	1 109	969
Transport	315	285	399	689	412
Food, drink and accommodation	1 163	501	687	1 669	846
Shopping	361	429	444	484	438
Entertainment and gambling	77	80	97	197	106
Education fees	24	70	26	1 475	248
Other	131	67	54	311	103
All items	**4 182**	**2 795**	**3 724**	**6 514**	**4 006**

Source: International Visitor Survey, Bureau of Tourism Research.

Inbound tour operators

The latest data for the operations of inbound tour operators relate to 1995–96. Of the 2.4 million overseas 'holiday' visitors who arrived in Australia in that year, inbound tour operators handled 1.6 million (68%). These overseas visitors coming to Australia on package tours paid a total of $1.4b to Australian inbound tour operators for the Australian content of their tour.

Passengers from Japan accounted for 42% of the total passengers involved and 56% of the total value of gross invoices (i.e. all amounts received for ground content, e.g. coach transfers, accommodation, meals, cruises, etc., received in Australia). Passengers from Asia (excluding Japan) represented 33% of total passengers and accounted for 21% of the total value of gross invoices.

Europe (including the United Kingdom and Ireland) accounted for 14% of passengers and 14% of the total value of gross invoices, and the Americas for 7% of passengers and 8% of the total value of gross invoices.

At 30 June 1996, inbound tour operators employed 3,000 persons full-time and 720 persons part-time in Australia. In addition, they employed 410 persons full-time overseas.

Australia's tourism marketing expenditure overseas

The latest data about Australia's marketing expenditure on tourism relate to 1996–97. In that year, Australian tourism-related organisations (excluding the Australian Tourist Commission) spent $280m marketing their products overseas. Of this total expenditure, 29% was directed towards the Japanese market, 27% towards other Asian countries, 20% towards the United Kingdom and Europe, and 15% towards the United States and Canada.

Of the total expenditure, 23% was by inbound tour operators, 18% by accommodation operators, 13% by State tourism authorities and 5% by regional tourist bodies. Other operators (including airlines, exhibition organisers, incentive travel operators, and professional conference organisers) accounted for 30% of total tourism marketing expenditure overseas.

International outbound tourism

While the number of foreign visitors coming to Australia increased in 1999 after a fall in 1998, the number of Australian residents departing for overseas has been increasing over the last six years (table 22.12). Until 1996 the annual percentage increase in Australians visiting overseas was smaller than the increase in visitor arrivals. However, in 1997 and 1998 the percentage increase in Australians travelling abroad was greater than the increase in international visitors coming to Australia, with those departing up by 7% and 8% respectively when compared with visitors arriving (up 4% in 1997, and down 4% in 1998). In 1999 the 7% increase of inbound visitors compared with only a 1.5% increase in outbound visitors. The number of inbound visitors remained higher than the number of outbound visitors, by just over 1.2 million persons in 1999. Consequently, tourism continues to improve the net contribution of the travel item to Australia's balance on current account.

22.12 AUSTRALIAN RESIDENTS TRAVELLING ABROAD

		Change
Year	no.	%
1991	2 099 400	–3.2
1992	2 276 260	8.4
1993	2 267 080	–0.4
1994	2 354 310	3.8
1995	2 518 620	7.0
1996	2 731 970	8.5
1997	2 932 760	7.3
1998	3 161 060	7.8
1999	3 209 990	1.5

Source: Overseas Arrivals and Departures, Australia (3401.0).

Australians travel abroad to visit a wide variety of destinations. As table 22.13 shows, the most popular main destination is New Zealand, accounting for 15% of Australian residents visiting abroad in 1999. This was followed by the United States (11%) and the United Kingdom (10%). Australian residents departing to Indonesia, who accounted for 9% of all departures in 1999, fell by almost 20%.

Nearly half (46%) of Australian residents visiting abroad in 1999 went for 'holiday' purposes, while a further 25% went to 'visit friends/relatives' (table 22.13). Holidays were the main purpose of

trips for Australians travelling to all destinations, except for those travelling to the Philippines, Middle East and North Africa and 'Other Asia' where 'visiting friends/relatives' was the main purpose.

Australians travelling for 'business' purposes accounted for 16% of Australian outbound travellers. Their main destinations were New Zealand, the United States, 'Other Asia' and Singapore.

The long distances Australian residents travel to other countries is reflected in the length of time spent abroad. In 1999 only 12% stayed abroad less than a week, while 33% stayed away for over a month (table 22.14). In addition to distances involved in getting to destination countries, the high proportion of Australians 'visiting friends/relatives' also contributed to long periods of stay, as such travellers traditionally tend to stay in destination countries longer than other types of visitors. In 1999, 51% of such visitors stayed away for over a month.

22.13 AUSTRALIANS TRAVELLING ABROAD, By Country/Region of Main Destination and Main Purpose of Trip—1999

	Main purpose of trip								
Country/region of main destination	Convention/ conference '000	Business '000	Visiting friends/ relatives '000	Holiday '000	Employment '000	Education '000	Other and not stated '000	Total '000	Change on 1998 %
Fiji	3.4	7.8	13.8	84.2	0.8	1.2	4.1	115.3	16.2
New Zealand	19.4	99.7	162.7	173.3	4.8	4.4	24.7	488.9	4.0
Other Oceania	2.3	23.4	16.2	77.9	17.1	3.1	8.4	148.4	3.0
Italy	3.6	6.7	16.3	34.4	0.5	1.3	1.5	64.2	1.9
United Kingdom	8.6	34.5	121.2	151.4	8.9	3.1	9.7	337.4	–1.7
Other Europe	15.9	33.0	93.2	98.6	3.2	5.5	12.5	262.0	–1.2
Indonesia	5.0	22.6	13.5	224.0	5.4	1.9	8.3	280.6	–19.7
Malaysia	6.8	22.0	25.5	57.1	3.3	0.8	4.5	119.9	7.1
Philippines	1.2	10.9	24.0	14.9	0.5	0.2	3.5	55.2	–3.7
Singapore	8.2	40.8	20.5	58.5	5.4	1.6	5.8	140.8	14.9
Thailand	4.4	14.6	10.4	102.0	1.3	0.5	3.8	137.0	0.9
China	2.7	25.3	25.6	28.5	2.6	1.9	4.4	90.9	10.8
Hong Kong (SAR of China)	5.3	35.1	37.3	44.9	7.3	1.6	4.8	136.4	–7.5
Other Asia	6.8	52.1	92.5	75.1	6.7	8.3	11.9	253.4	8.4
United States of America	39.5	69.8	57.7	157.1	6.3	5.8	10.9	347.0	7.6
Other America	4.2	9.9	25.8	42.5	1.8	1.5	3.0	88.6	15.2
Middle East and North Africa	1.1	6.5	29.6	27.0	3.6	1.2	6.7	75.8	3.4
Other Africa	2.6	10.6	14.0	19.9	1.2	0.6	3.5	52.3	1.0
Not stated	0.1	0.4	—	4.4	0.4	—	10.5	15.8	43.3
Total	**141.0**	**525.8**	**799.8**	**1 475.5**	**81.1**	**44.3**	**142.5**	**3 210.0**	**1.5**

Source: Overseas Arrivals and Departures, Australia (3401.0).

22.14 AUSTRALIANS TRAVELLING ABROAD, By Intended Length of Stay and Main Purpose of Trip—1999

	Main purpose of trip								
Intended length of stay	Convention/ conference '000	Business '000	Visiting friends/ relatives '000	Holiday '000	Employment '000	Education '000	Other and not stated '000	Total '000	Proportion of total %
Under 1 week	35.8	184.4	49.8	97.8	4.8	3.4	14.1	390.0	12.2
1 week and under 2 weeks	58.8	141.6	113.6	537.3	5.7	9.0	47.7	913.7	28.5
2 weeks and under 1 month	34.3	102.8	228.7	442.8	12.0	11.1	29.5	861.3	26.8
1 month and under 2 months	9.4	42.4	213.0	231.4	9.2	3.8	15.7	524.9	16.4
2 months and under 3 months	1.7	18.8	83.0	70.5	5.9	3.1	8.9	191.9	6.0
3 months and under 6 months	0.7	19.0	73.8	54.0	11.9	4.8	11.1	175.3	5.5
6 months and under 12 months	0.4	16.8	37.9	41.7	31.6	9.2	15.4	153.0	4.8
Total	**141.0**	**525.8**	**799.8**	**1 475.5**	**81.1**	**44.4**	**142.5**	**3 210.0**	**100.0**

Source: Overseas Arrivals and Departures, Australia (3401.0).

While the number of Australian residents departing for visits abroad varies from month to month, there are not large seasonal fluctuations in departures. Table 22.15 shows that the largest numbers of departures in 1999 were in September (10%), while February recorded the lowest number of departures (6%).

22.15 AUSTRALIANS TRAVELLING ABROAD, By Month of Departure and Main Purpose of Trip—1999

	Main purpose of trip								
Month	Convention/ conference '000	Business '000	Visiting friends/ relatives '000	Holiday '000	Employment '000	Education '000	Other and not stated '000	Total '000	Proportion of total %
January	7.9	37.6	54.4	107.5	9.6	5.2	10.6	232.7	7.2
February	8.6	40.7	48.1	84.3	6.2	2.3	8.3	198.5	6.2
March	12.4	47.5	69.1	118.1	6.3	3.3	12.4	268.9	8.4
April	11.3	47.4	55.2	109.2	6.9	2.5	11.8	244.3	7.6
May	14.9	50.1	62.2	116.3	5.8	2.3	10.8	262.4	8.2
June	13.3	46.2	79.9	126.7	6.7	3.7	12.8	289.3	9.0
July	13.7	43.1	65.1	141.4	6.8	3.7	12.7	286.6	8.9
August	14.5	45.1	62.6	138.0	6.8	3.5	10.6	281.1	8.8
September	16.0	46.0	71.6	168.6	6.2	8.4	13.8	330.7	10.3
October	13.6	48.0	55.9	122.6	6.3	2.8	12.8	262.0	8.2
November	11.0	49.1	62.4	99.7	6.8	3.7	11.8	244.4	7.6
December	3.8	25.0	113.5	143.2	6.7	3.1	14.0	309.3	9.6
Total	**141.0**	**525.8**	**799.8**	**1 475.5**	**81.1**	**44.4**	**142.4**	**3 210.0**	**100.0**

Source: Overseas Arrivals and Departures, Australia (3401.0).

Tourist accommodation

At December 1999 there were 190,079 rooms available in Australia in hotels, motels, guest houses and serviced apartments having 15 or more rooms or units (table 22.16). This was an increase of 4% over the number available at December 1998. The number of serviced apartments having 15 or more rooms or units increased by 9% (to 600) over the same period. During 1999 the supply of accommodation in hotels, motels, guest houses and serviced apartments (with 15 or more rooms or units) exceeded demand (the number of room nights occupied), with room occupancy rates of 63% for hotels, 54% for motels, and 60% for serviced apartments.

22.16 TOURIST ACCOMMODATION(a)—1999

		Quarter ended				
	Units	March	June	September	December	Year ended December 1999
LICENSED HOTELS WITH FACILITIES(b)						
Establishments	no.	753	747	753	766	766
Guest rooms	no.	71 637	71 908	72 265	73 416	73 416
Bed spaces	no.	193 366	194 135	194 757	196 329	196 329
Room occupancy rates	%	62.4	60.1	64.9	65.1	63.1
Bed occupancy rates	%	38.0	35.9	40.0	40.1	38.5
Gross takings from accommodation	$'000	514 165	476 859	537 904	574 687	2 103 616
MOTELS AND GUEST HOUSES WITH FACILITIES(b)						
Establishments	no.	2 386	2 398	2 396	2 413	2 413
Guest rooms	no.	84 614	84 972	85 267	86 019	86 019
Bed spaces	no.	251 693	253 031	253 219	255 588	255 588
Room occupancy rates	%	53.7	52.9	56.3	54.8	54.4
Bed occupancy rates	%	32.2	30.8	33.5	32.3	32.2
Gross takings from accommodation	$'000	322 196	316 845	356 224	347 480	1 342 744
SERVICED APARTMENTS(b)						
Establishments	no.	564	575	582	600	600
Guest rooms	no.	27 610	28 423	29 308	30 644	30 644
Bed spaces	no.	96 217	99 507	102 314	107 748	107 748
Room occupancy rates	%	60.6	56.2	63.9	60.8	60.4
Bed occupancy rates	%	37.8	33.8	39.8	37.3	37.2
Gross takings from accommodation	$'000	166 699	152 662	183 666	190 280	693 307
TOTAL HOTELS, MOTELS AND SERVICED APARTMENTS(b)						
Establishments	no.	3 703	3 720	3 731	3 779	3 779
Guest rooms	no.	183 861	185 303	186 840	190 079	190 079
Bed spaces	no.	541 276	546 673	550 290	559 665	559 665
Room occupancy rates	%	58.1	56.2	60.8	59.7	58.7
Bed occupancy rates	%	35.2	33.1	37.0	36.0	35.4
Room nights occupied	'000	9 586	9 427	10 396	10 414	39 822
Gross takings from accommodation	$'000	1 003 060	946 366	1 077 794	1 112 447	4 139 666

(a) Comprising establishments with 15 or more rooms or units. (b) For definitions see the source below.

Source: Tourist Accommodation, Australia, December quarter 1999 (8635.0).

The most recent data relating to the origin of guests staying in hotels, motels and guest houses relate to 1994–95. In that year, overseas visitors accounted for 23% of room nights occupied in these establishments, compared with 37% for interstate visitors and 40% for intrastate visitors (table 22.17).

Queensland and the Northern Territory had the highest proportions of overseas room nights to total room nights, each having 29%. Next highest were New South Wales with 25% and Western Australia with 20%, followed by Victoria (17%), the Australian Capital Territory (13%), South Australia (12%) and Tasmania (8%). The strong popularity of New South Wales and Queensland is reflected in the fact that 70% of overseas room nights in hotels, motels and guest houses were spent in these States.

The Australian Capital Territory, Tasmania and the Northern Territory were the most dependent on interstate visitors. On the other hand, in New South Wales and Queensland, interstate visitors accounted for only a third of total room nights in hotels, motels and guest houses.

22.17 ORIGIN OF GUESTS STAYING IN HOTELS, MOTELS AND GUEST HOUSES WITH FACILITIES—1994–95

	Origin of guests (room nights occupied)			
	Intrastate	Interstate	Overseas	Total
State/Territory	'000	'000	'000	'000
New South Wales	5 076	3 949	2 963	11 988
Victoria	2 511	2 158	986	5 655
Queensland	3 616	3 054	2 715	9 385
South Australia	845	902	233	1 980
Western Australia	1 425	1 128	643	3 196
Tasmania	326	638	89	1 053
Northern Territory	241	576	332	1 149
Australian Capital Territory	36	706	110	852
Total	**14 076**	**13 111**	**8 071**	**35 258**

Source: Experimental Estimates of the Origin of Guests, Hotels, Motels and Guest Houses, Australia, 1994–95 (9501.0).

Bibliography

ABS publications

Accommodation Industry, Australia (8695.0)

Australian National Accounts: Tourism Satellite Accounts, 1997–98 (5249.0)

Directory of Tourism Statistics, 2000 (1130.0)

Framework for Australian Tourism Statistics (9502.0). Available in the Statistical Concepts Library on the ABS Internet site at *http://www.abs.gov.au*

Inbound Tour Operators, Australia, 1995–96 (8690.0)

Origin of Guests, Australia, 1995–96 (9501.0)

Overseas Arrivals and Departures, Australia (3401.0)

Overseas Tourism Marketing Expenditure, Australia, 1995–96 (8691.0)

Tourist Accommodation, Australia (8635.0)

Tourism Indicators, Australia (8634.0)

Other publications

Bureau of Tourism Research

—*International Visitor Survey*

—*National Visitor Survey*

—*Tourism Research Report*

Commonwealth Department of Industry, Science and Resources, *Impact* (a monthly fact sheet on the economic impact of tourism and the latest trends in visitor arrivals).

Internet sites

Australian Tourist Commission, *http://www.atc.net.au*

Bureau of Tourism Research, *http://www.btr.gov.au*

Canberra Tourism and Events Corporation, *http://www.canberratourism.com.au*

Centre for Regional Tourism Research, *http://crtr.crctourism.com.au*

Commonwealth Department of Industry, Science and Resources, *http://www.isr.gov.au*

Cooperative Research Centre for Sustainable Tourism, *http://www.crctourism.com.au*

CSIRO—Tourism Futures, *http://www.dwe.csiro.au/futures/tourism*

Northern Territory Tourist Commission, *http://nttc.com.au*

South Australian Tourist Commission, *http://www.tourism.sa.gov.au*

Tourism Council of Australia, *http://www.tourism.org.au*

Tourism NSW, *http://www.tourism.nsw.gov.au*

Tourism Queensland, *http://www.tourism.qttc.com.au*

Tourism Tasmania, *http://www.tourism.tas.gov.au*

Tourism Victoria, *http://www.tourism.vic.gov.au*

Western Australian Tourism Commission, *http://www.tourism.wa.gov.au*

World Tourism Organization, *http://www.world-tourism.org*

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Introduction

Transport can be described broadly as the movement of goods or people from an origin to a destination. It is one of the most fundamental aspects of an advanced economy. Buildings cannot be constructed without transportation of materials and people, food must be transported from farms to shops, and people must travel to get to and from work, recreation and other facilities. Transport has enormous economic and social impact, generates substantial employment and contributes significantly to Gross Domestic Product, with numerous support industries ranging from automotive manufacturers to travel agencies. There are also social costs of transport—such as road accidents, traffic congestion, fuel emissions, aircraft noise pollution and shipping oil spills. Information about all aspects of transport and its support industries is vital to effective planning by governments and industry.

Four themes are addressed in this chapter:

- transport activity, covering the movement of goods and people;
- safety;
- transport infrastructure, comprising roads, rail transport infrastructure, comprising roads, rail track, ports, etc., transport equipment and skilled persons; and
- transport organisations.

Transport activity

This section provides data relating to the movements of goods and persons. Examples include distance travelled, tonnes of freight carried and numbers of passengers.

General transport activity

Road transport activity

Motor vehicles travelled a total distance of 177,635 million kilometres in the year ended 31 July 1999, an average of 15,800 kilometres per vehicle on the road (table 23.1). Business use, whether laden or unladen, accounted for an estimated 37% of distance travelled, while the journey to and from work accounted for a further 20%. Private use made up the remaining 43%.

Table 23.2 shows the area in which motor vehicles travelled. Only 5% of total distance travelled was interstate, and 54% was within the capital city in which the vehicle was registered.

23.1 BUSINESS AND PRIVATE VEHICLE USE, By Type of Vehicle—Year Ended 31 July 1999(a)

	Business					
Type of vehicle	Laden	Unladen	Total(b)	Total to and from work	Private	Total
	TOTAL KILOMETRES TRAVELLED (million)					
Passenger vehicles	n.a.	n.a.	34 817	32 801	70 267	137 885
Motor cycles	n.a.	n.a.	197	253	553	1 003
Light commercial vehicles	11 688	5 364	17 052	3 225	4 710	24 986
Rigid trucks	4 329	1 855	6 184	97	102	6 382
Articulated trucks	3 888	1 366	5 254	6	*2	5 262
Non-freight carrying trucks	n.a.	n.a.	271	*2	**1	274
Buses	n.a.	n.a.	1 746	19	78	1 843
Total	**19 905**	**8 585**	**65 521**	**36 402**	**75 712**	**177 635**
	AVERAGE KILOMETRES TRAVELLED PER VEHICLE(c) ('000)					
Passenger vehicles	n.a.	n.a.	11.4	7.0	8.6	15.1
Motor cycles	n.a.	n.a.	3.6	3.4	3.0	4.3
Light commercial vehicles	12.9	8.4	17.2	6.2	6.1	16.7
Rigid trucks	15.0	8.0	21.2	4.3	3.5	20.8
Articulated trucks	71.1	28.7	94.5	2.8	*2.2	94.1
Non-freight carrying trucks	n.a.	n.a.	13.7	2.2	**4.0	13.7
Buses	n.a.	n.a.	37.5	6.4	8.7	34.9
Total	**15.9**	**9.4**	**14.6**	**6.8**	**8.3**	**15.8**

(a) Because of changes to methodology, caution should be used when comparing these data with data from the 1995 and earlier surveys presented in previous editions of Year Book Australia. (b) Includes business travel of non-freight carrying vehicles. (c) Calculated as total kilometres travelled divided by the number of vehicles travelling, for each type of vehicle, by purpose of vehicle.

Source: Survey of Motor Vehicle Use, Australia (9208.0).

23.2 AREA OF OPERATION—By Type of Vehicle, Year Ended 31 July 1999(a)

	Within State/Territory of registration				Area of operation	
Type of vehicle	Capital city '000 km	Provincial urban '000 km	Other areas of State or Territory '000 km	Total '000 km	Interstate(b) '000 km	Australia '000 km
TOTAL KILOMETRES TRAVELLED (million)						
Passenger vehicles	79 315	18 573	34 177	132 066	5 819	137 885
Motor cycles	377	162	418	957	*46	1 003
Light commercial vehicles	11 107	3 891	9 013	24 011	975	24 986
Rigid trucks	3 205	911	2 053	6 169	213	6 382
Articulated trucks	1 050	369	2 412	3 831	1 431	5 262
Non-freight carrying types	110	*53	*109	271	**3	274
Buses	862	291	605	1 758	84	1 843
Total	**96 026**	**24 251**	**48 787**	**169 065**	**8 570**	**177 635**
AVERAGE KILOMETRES TRAVELLED PER VEHICLE(c) ('000)						
Passenger vehicles	11.8	7.4	9.9	14.6	5.2	15.1
Motor cycles	3.4	3.1	3.5	4.2	*1.9	4.3
Light commercial vehicles	15.2	9.5	12.5	16.2	5.8	16.7
Rigid trucks	21.9	14.3	14.1	20.3	7.5	20.8
Articulated trucks	32.2	20.7	59.9	69.8	76.3	94.1
Non-freight carrying types	13.8	*11.7	*11.0	13.6	**1.3	13.7
Buses	30.4	22.8	25.4	33.5	18.5	34.9
Total	**12.4**	**7.9**	**10.8**	**15.1**	**6.3**	**15.8**

(a) Because of changes to methodology caution must be taken when comparing these data with data from the 1995 and earlier surveys presented in previous editions of Year Book Australia. (b) Interstate travel relates to distance travelled in States/Territories other than the one in which the vehicle was registered (e.g. distance travelled by a New South Wales registered vehicle in Victoria). It is not classified by capital city/provincial urban/other area (i.e. distance travelled by a New South Wales registered vehicle in Melbourne is shown as interstate travel and not capital city travel). (c) Calculated as total kilometres travelled divided by the number of vehicles travelling, for each type of vehicle, by area of operation.

Source: Survey of Motor Vehicle Use, Australia (9208.0).

23.3 DOMESTIC AIRLINE ACTIVITY, Hours Flown and Departures

	1995	1996	1997	1998	1999
	no.	no.	no.	no.	no.
Domestic airlines					
Hours flown	437 793	454 365	445 567	439 848	441 033
Aircraft departures	252 790	253 606	242 036	239 233	238 655

Source: Department of Transport and Regional Services.

Domestic airline activity

Table 23.3 shows the hours flown and aircraft departures for the major domestic airlines; in 1999 these were Ansett Australia and Qantas Airways Ltd. Aircraft departures declined steadily over the last three years to be almost 6% lower in 1999 than in 1996. In contrast, the number of hours flown increased in 1999, following falls in the previous two years.

In addition to scheduled services of domestic and regional airlines, a wide range of other activities is undertaken by the aviation industry, including business flying, aerial agriculture, charter, training and private flying. Charter operations and training have, in recent years, made up more than 50% of general aviation hours flown. Charter operations involve the use of aircraft in non-scheduled operations for the carriage of passengers and cargo for hire or reward.

Rail transport activity

The Commonwealth and State/Territory Governments' policy to increase competition has resulted in an increase in private rail activity, with a decline in government ownership and management of railways.

New South Wales: The Rail Access Corporation (RAC) manages rail infrastructure and facilitates operator access to the network. The State Government-owned enterprises are:

- Rail Services Australia, which competes for track construction and maintenance contracts in that State and throughout Australia;
- FreightCorp, the State's major rail freight operator; and
- State Rail Authority, which is responsible for country, commuter and urban passenger services.

Private operators also operate rail services.

Victoria: In February 1999 Victoria's rail freight operator V/Line Freight was sold to Freight Australia, owned by US regional rail operator Rail America. In mid-1999 Victoria's rail passenger services were franchised to private operators: UK based National Express Group–V/Line Passenger (under a 10 year franchise agreement), Bayside Trains (15 year agreement) and Swanston Trams (12 year agreement); French based Melbourne Transport Enterprises–Hillside Trains (15 year agreement); and locally based MetroLink, including the major construction company Transfield–Yarra Trams (12 year agreement).

Queensland: The rail systems remain profitable, government-owned business enterprises with responsibility for their entire operations. There are also a number of private operators.

South Australia: In November 1997 the Commonwealth sold the non-urban rail systems. Australia Southern Railroad operates the former SA Freight, and Great Southern Railway operates the long distance passenger trains, namely the Ghan, the Indian Pacific and the Overland. There are also some private operators.

Western Australia: The rail systems are currently profitable, government-owned business enterprises with responsibility for their entire operations, although the Western Australian government has announced its intention to sell Westrail's freight business. In north-west WA, private railways haul iron ore from mine to port on some of the world's longest, heaviest and most efficient trains.

Tasmania: In November 1997 the Commonwealth sold the former Tasrail to Australian Transport Network.

Commonwealth: National Rail Corporation Ltd (NRC), operating rail freight services over main lines between Brisbane and Perth, is jointly owned by the Commonwealth, NSW and Victorian Governments. The three governments have agreed to privatise NRC.

International air transport activity

There was an overall increase in the number of flights into (by 4.4%) and out of (by 4.6%) Australia in 1999 compared with 1998 (table 23.4). The number of Qantas flights, both into and out of the country, fell slightly. In contrast, the number of Ansett flights increased significantly, albeit from a low base; those into Australia rose by 8.0% while flights out of the country rose by 8.4%.

23.4 SCHEDULED INTERNATIONAL AIRLINE TRAFFIC TO AND FROM AUSTRALIA(a) —Year ended December

		Flights(b)(c)
Type of traffic	1998	1999
TRAFFIC TO AUSTRALIA		
Qantas Airways Limited	12 907	12 675
Ansett Australia	1 519	1 640
Other airlines	25 315	27 192
All airlines	**39 741**	**41 507**
TRAFFIC FROM AUSTRALIA		
Qantas Airways Limited	12 957	12 733
Ansett Australia	1 518	1 646
Other airlines	24 747	26 688
All airlines	**39 272**	**41 067**

(a) Australia and Norfolk Island. (b) Includes Qantas flights using aircraft leased from other airlines and vice versa. (c) The difference between to/from numbers arises because some outward flights are operated as non-scheduled, and so are not counted in the above table.

Source: Department of Transport and Regional Services.

Domestic freight activity

The movement of freight from its origin to destination is a major part of the transport task, whether goods are transported intrastate or interstate.

Road freight activity

As can be seen from table 23.5, articulated trucks are responsible for by far the largest percentage of the freight transport task performed by road (78% of total tonne-kilometres of all freight carrying vehicles). From 1 July 2000, the legal maximum limit in vehicle Gross Combination Mass (GCM) (i.e. the weight of the truck and trailer(s) plus their combined carrying capacity) was increased in most States and Territories. This allows trucks and buses to carry larger loads on each trip—for example, a six axle semitrailer will be able to legally carry 45.5 tonnes, an extra three tonnes.

Rail freight activity

Table 23.6 shows the gradual increase in freight carried by private and government operators over the last 10 years. Over this period, freight carried increased by 46.6%. Net tonne kilometres increased slightly more (by 48.8%), indicating that the average distances over which freight was carried have increased.

Sea freight activity

Table 23.7 shows the weight of shipping cargo loaded at Australian ports for discharge at another Australian port. Both interstate and intrastate freight dropped between 1997–98 and 1998–99. Interstate trade accounts for nearly two-thirds of coastal freight (64%), although this percentage has been steadily declining from 1994–95 when 68% of freight moved was interstate.

23.5 TOTAL TONNE-KILOMETRES(a), By Type of Vehicle—Year Ended 31 July 1999(b)

State/Territory of Registration	Light commercial vehicles mill. t-km	Rigid trucks mill. t-km	Articulated trucks mill. t-km	Total mill. t-km
New South Wales	1 531	8 372	22 519	32 422
Victoria	1 250	5 950	25 944	33 145
Queensland	1 072	4 230	21 350	26 651
South Australia	289	1 160	10 690	12 139
Western Australia	539	2 676	12 646	15 862
Tasmania	119	524	1 624	2 267
Northern Territory	60	180	3 638	3 877
Australian Capital Territory	64	175	*709	948
Australia	**4 923**	**23 268**	**99 120**	**127 311**

(a) Total tonne-kilometres are the total tonnes carried multiplied by the distance travelled in kilometres. (b) Because of changes to methodology caution should be used when comparing these data with data from the 1995 and earlier surveys presented in previous editions of Year Book Australia.

Source: Survey of Motor Vehicle Use, Preliminary (9208.0).

23.6 RAIL FREIGHT OPERATIONS

	Tonnes '000	Net tonne kilometres billion
1990	335.7	85.8
1991	346.0	88.3
1992	346.2	89.3
1993	361.2	92.1
1994	379.3	97.8
1995	381.9	99.7
1996	399.4	104.3
1997	470.1	114.4
1998	487.5	125.2
1999	492.0	127.4

Source: Australasian Railway Association Inc.

23.7 AUSTRALIAN COASTAL FREIGHT LOADED—1994–95 to 1998–99

'000 tonnes

Year	Interstate	Intrastate	**Total**
1994–95	33 692	15 498	**49 190**
1995–96	31 982	15 815	**47 798**
1996–97	32 581	16 562	**49 144**
1997–98	34 322	18 200	**52 522**
1998–99	31 934	16 454	**49 388**

Source: Australian port authorities.

23.8 COASTAL CARGO LOADED, By Major Commodity—1994–95 to 1998–99

Year	Major bulk cargo commodities: Iron ore	Bauxite/alumina	Crude oil	Petroleum products (excluding crude oil)	Other cargo	**Total**
			TONNES (million)			
1994–95	8.4	10.2	7.2	6.3	17.1	**49.2**
1995–96	9.0	9.6	7.6	6.5	15.1	**47.8**
1996–97	8.3	10.1	8.3	6.9	15.6	**49.1**
1997–98	8.2	10.3	8.9	7.2	18.0	**52.5**
1998–99	8.6	9.9	6.0	6.9	17.0	**48.4**
			TONNE KILOMETRES (billion)			
1994–95	38.7	22.5	13.2	10.3	24.5	**109.2**
1995–96	40.4	21.1	16.3	9.7	18.6	**106.1**
1996–97	38.1	22.2	18.8	12.9	20.7	**112.7**
1997–98	40.9	22.4	13.5	10.3	19.6	**106.8**
1998–99	40.3	21.4	15.2	10.7	20.9	**108.9**

Source: Australian port authorities.

23.9 DOMESTIC AIR FREIGHT ACTIVITY—1995 to 1999

	Units	1995	1996	1997	1998	1999
Domestic airlines						
Cargo on board(a)	tonnes	169 446	172 761	190 680	192 770	192 326
Cargo tonne kilometres(a)	'000	204 903	207 760	233 659	238 399	245 363
Total tonne kilometres(b)	'000	2 421 190	2 564 988	2 605 795	2 648 072	2 751 214
Revenue weight load factor(c)	%	59.0	57.8	58.2	58.7	59.5
Regional airlines						
Cargo on board(a)	tonnes	2 804	2 782	2 983	3 122	2 710

(a) Includes freight and mail. (b) Includes the weight of passengers and baggage. (c) Total tonne-kilometres travelled as a percentage of total tonne-kilometres available on all flights. It therefore reflects the utilisation of aeroplanes for both cargo and passenger use.

Source: Department of Transport and Regional Services.

The majority of cargo shipped between Australian ports (around 65% in tonnes and 80% in tonne kilometres) comprises major bulk commodities. There was a fall of 8% in tonnes carried between 1997–98 and 1998–99 (table 23.8). An especially large fall in crude oil carried (of 25%) reflected an 18% decrease in Australian crude oil production. In contrast, total tonne kilometres moved rose by 2% over this period, with tonne-kilometres of crude oil increasing by a little under 13%. The increase in tonne-kilometres of crude oil moved largely reflects more oil travelling the greater distance from the new North-West Shelf operations.

Air freight activity

In 1999 there were declines in air cargo on board for both domestic operators (of 0.2%) and regional operators (of 13.2%), following a number of years of growth (table 23.9). For the domestic airlines, cargo tonne-kilometres increased by 2.9%, indicating an increase in the average distance travelled by cargo.

International freight activity

Sea freight activity

There has been a steady rise in the weight of both exports and imports moved by sea over the last five years (table 23.10). The nature of Australia's trade means that the weight of exports far exceeds that of imports. Over this period, the weight of exports increased by 19% and the weight of imports by 26%. Most of the tonnage of exports and imports is shipped by bulk carriers or tankers.

23.10 INTERNATIONAL SEA IMPORTS AND EXPORTS—1994–95 to 1998–99

			million tonnes
Year	Imports	Exports	Total
1994–95	45.9	362.4	408.3
1995–96	47.1	372.9	420.0
1996–97	49.8	404.0	453.8
1997–98	51.7	427.1	478.8
1998–99	56.3	432.1	488.4

Source: Bureau of Transport Economics; ABS Foreign Trade Database.

Air freight activity

There was an increase in both freight and mail flown into and out of Australia in 1999 compared with 1998 (table 23.11). The tonnage of freight coming into Australia (up 10.7%) increased more than the tonnage leaving Australia (up 4.9%). The Australian airlines account for just over 30% of both incoming and outgoing air freight.

Table 23.12 shows the main origin/destination pairs of freight moving into and out of Australia. Despite a fall of 1.5% in 1999, the Auckland/Sydney route carries the most freight. In 1999 there was a considerable increase in freight moved to Singapore from Melbourne (by 46%), from Sydney (by 13%), and from Perth (by 54%).

23.11 SCHEDULED INTERNATIONAL AIRLINE TRAFFIC TO AND FROM AUSTRALIA(a) —Year ended December

	1998		1999	
Type of traffic	Freight tonnes	Mail tonnes	Freight tonnes	Mail tonnes
TRAFFIC TO AUSTRALIA				
Qantas Airways Limited	86 784	4 009	91 215	5 005
Ansett Australia	9 781	427	10 364	637
Other airlines	206 078	9 261	233 328	8 515
All airlines	*302 643*	*13 697*	*334 907*	*14 157*
TRAFFIC FROM AUSTRALIA				
Qantas Airways Limited	95 777	5 495	93 988	8 061
Ansett Australia	8 405	155	10 251	75
Other airlines	225 084	4 090	241 313	3 023
All airlines	*329 265*	*9 740*	*345 551*	*11 159*

(a) Australia and Norfolk Island.

Source: Department of Transport and Regional Services.

23.12 FREIGHT CARRIED, By City Pairs(a)—Year ended December

	1997	1998	1999
	tonnes	tonnes	tonnes
Auckland/Sydney	50 610	54 849	54 046
Singapore/Melbourne	33 910	34 935	51 096
Singapore/Sydney	37 403	38 758	43 689
Los Angeles/Sydney	25 732	26 500	36 061
Auckland/Melbourne	32 849	32 199	34 722
Hong Kong/Sydney	36 945	36 789	34 252
Singapore/Perth	22 784	26 160	27 436
Hong Kong/Melbourne	27 787	23 821	26 031
Kuala Lumpur/Melbourne	8 640	11 711	16 620
Auckland/Brisbane	15 300	16 324	15 616
Other city pairs	354 888	329 862	338 889
All city pairs	**646 847**	**631 908**	**680 458**

(a) The table does not necessarily show the final origin/destination of freight. For example, all freight going to or coming from Europe would require a stopover, generally in Asia.

Source: Department of Transport and Regional Services.

Domestic passenger activity

People travel within Australia for many reasons, including family, business, recreation and travel to and from work, and use all modes of transport—road, rail, sea and air.

Rail passenger activity

The number of passengers carried by private and government rail operators is shown in table 23.13. There was a decline in both urban and non-urban passengers in the early 1990s. However since 1992–93 there have been increases in the number of rail passengers each year. Between 1992–93 and 1998–99 the number of urban passengers increased by 18% and non-urban passengers increased by 42%. Heavy rail has consistantly accounted for about 80% of urban rail passenger operations.

There are no rail passenger services in Tasmania.

Air passenger activity

At 30 June 2000 there were three major domestic carriers—Ansett, Qantas and Impulse. More details on the fleets of these airlines are contained in the *Aircraft fleet* section. Virgin Airlines commenced services in August 2000.

At 31 December 1999, 35 regional operators provided regular public transport air services to about 200 ports in Australia. More than half the regional airline fleet comprises turbine engine and jet aircraft carrying up to about 90 passengers. During 1999, regional operators carried an estimated 5 million passengers.

Both major domestic and the regional airlines increased their number of passengers over recent years (table 23.14). The major domestic airlines have 83% of the Australian domestic market. However, the regional airlines increased their share from 14% in 1995 to 17% in 1999.

23.13 RAIL PASSENGER OPERATIONS(a)—1989–90 to 1998–99

million persons

	Urban				
	Heavy rail	Tram and light rail	Total	Non-urban(a)	**Total(a)**
1989–90	416.5	107.0	523.5	n.a.	**n.a.**
1990–91	416.4	110.0	526.4	8.1	**534.5**
1991–92	409.2	113.7	522.9	7.7	**530.6**
1992–93	395.5	102.5	498.0	7.0	**505.0**
1993–94	401.6	105.6	507.2	8.4	**515.6**
1994–95	419.7	110.5	530.2	8.5	**538.7**
1995–96	440.9	115.5	556.4	9.1	**565.5**
1996–97	455.9	118.3	574.2	9.8	**584.0**
1997–98	457.3	120.5	577.8	9.9	**587.7**
1998–99	462.8	122.5	585.3	9.9	**595.2**

(a) Excludes historical and tourist services.

Source: Australasian Railway Association Inc.

23.14 DOMESTIC AIRLINE ACTIVITY—1995 to 1999

	Units	1995	1996	1997	1998	1999
Domestic airlines						
Revenue passenger departures(a)	no.	22 789 674	23 678 307	23 375 317	23 574 788	24 375 906
Passenger kilometres performed(b)	'000	24 625 411	26 191 426	26 357 069	26 774 140	27 842 795
Seat kilometres available(c)	'000	33 129 881	35 639 503	35 402 870	35 466 723	36 103 356
Regional airlines						
Revenue passenger departures(a)	no.	3 783 244	4 160 984	4 712 143	4 851 113	5 025 000

(a) The unit of measurement is traffic on board (which includes transit traffic). (b) The sum for all flights of the number of passengers on each flight multiplied by the distance travelled. (c) The sum for all flights of the number of seats on a flight multiplied by distance travelled.

Source: Department of Transport and Regional Services.

23.15 REVENUE PASSENGER MOVEMENTS(a) WITH MAJOR DOMESTIC AND REGIONAL AIRLINES AT PRINCIPAL AIRPORTS—1995 to 1999

Airport	1995 no.	1996 no.	1997 no.	1998 no.	1999 no.
Sydney	13 213 332	13 901 702	14 070 134	14 276 173	(b)14 840 000
Melbourne	10 481 179	11 097 264	11 227 713	11 429 141	11 899 000
Brisbane	6 924 345	7 375 444	7 470 083	7 438 368	7 828 879
Adelaide	3 419 694	3 559 829	3 636 073	3 782 303	(b)3 866 000
Perth	2 782 852	3 066 332	3 152 995	3 235 524	3 254 127
Canberra	1 739 064	1 735 758	1 788 064	1 805 223	(b)1 901 000
Hobart	828 986	852 506	831 969	855 176	(b)878 834
Darwin	743 291	821 584	822 583	853 721	877 816
Cairns	1 844 027	1 926 655	1 918 238	1 915 717	2 020 673
Coolangatta	1 998 539	2 043 393	1 918 063	1 888 644	1 936 436
Townsville	654 503	670 254	685 989	703 964	(b)739 522
Launceston	574 762	592 443	558 995	535 944	546 000

(a) The number of passengers on board arriving at or departing from each airport. It includes passengers in transit, who are counted as both arrivals and departures at airports through which they transit. (b) Includes estimates for unreported data.

Source: Department of Transport and Regional Services.

Table 23.15 shows the number of passengers delivered by major domestic and regional airlines at the main airports. All airports recorded increases in 1999 over 1998. The number of passengers arriving at Sydney was almost 15 million (up by 4%). Incoming traffic to Queensland is spread over four main airports, although many passengers going further north transit through Brisbane.

International passenger activity

Air passenger activity

International scheduled services

At 31 December 1999 there were 58 international scheduled airlines operating regular scheduled passenger air services to and from Australia. Cargolux Airlines International, China Airlines and Sri Lankan Airlines commenced services to and from Australia and Flight West Airlines ceased services during the year.

Ansett Australia operated its first international flight in its own right on 11 September 1993. Air New Zealand purchased 50% of Ansett Australia on 1 October 1996 and purchased the remaining 50% on 13 June 2000. Ansett Australia is a member of the Star Global Alliance of airlines.

Qantas operates both international and domestic flights. British Airways purchased 25% of Qantas Airways Limited on 10 March 1993. The company was floated on the Australian Stock Exchange on 22 June 1995. Qantas is a member of the Oneworld Global Alliance of airlines.

The Aircraft fleet section shows details of the Ansett and Qantas international and domestic fleets.

International non-scheduled services

Passenger and freight charter policies in Australia encourage inbound tourism and freight carriage by non-scheduled services, particularly over routes not served by the scheduled carriers. In terms of the passenger charter market, Canada, the United Kingdom and Japan are the most significant countries of origin. There were also significant charter operations to and from East Timor in the last year.

International traffic

Passenger traffic to and from Australia grew by 5.2% in 1999, compared with 1.2% during 1998 (table 23.16). The 1998 growth had been the lowest since 1991 which was affected by the Gulf War. The number of passengers coming to Australia increased by 5.4%, while departures increased by 5.0%. The Australian airlines' share of traffic to Australia fell from 40.4% in 1998 to 38.5% in 1999. Their share of outgoing traffic followed a similar pattern, with a decline from 40.5% to 38.7%.

Table 23.17 shows the number of international passengers arriving and departing from each international airport. Sydney has nearly half the arrivals/departures (49.2% in 1999). This represented a small increase over the percentage of passengers that used Sydney in 1998 (48.7%).

23.16 SCHEDULED INTERNATIONAL AIRLINE TRAFFIC TO AND FROM AUSTRALIA(a) —Year ended December

Type of traffic	1998	Passengers 1999
TRAFFIC TO AUSTRALIA		
Qantas Airways Limited	2 599 464	2 646 876
Ansett Australia	291 464	259 737
Other airlines	4 262 586	4 633 922
All airlines	*7 153 514*	*7 540 535*
TRAFFIC FROM AUSTRALIA		
Qantas Airways Limited	2 585 233	2 622 369
Ansett Australia	286 494	258 187
Other airlines	4 212 928	4 561 670
All airlines	*7 084 655*	*7 442 226*

(a) Australia and Norfolk Island.

Source: Department of Transport and Regional Services.

23.17 PASSENGER TRAFFIC THROUGH AUSTRALIAN INTERNATIONAL AIRPORTS—Year ended December

Airport	1996 no. of passengers	1997 no. of passengers	1998 no. of passengers	1999 no. of passengers
Sydney	6 477 744	6 840 696	6 934 052	7 385 453
Melbourne	2 193 309	2 373 135	2 489 495	2 653 705
Brisbane	2 192 110	2 294 900	2 251 240	2 375 767
Perth	1 292 127	1 399 514	1 434 077	1 474 898
Cairns	719 396	745 110	688 058	660 659
Adelaide	205 863	208 890	223 035	241 014
Darwin	147 888	171 319	177 773	156 058
Coolangatte(a)	463	13 822	14 519	16 923
Norfolk Island	14 797	16 176	15 704	15 073
Port Hedland	1 536	3 209	4 398	2 969
Townsville(b)	. .	240	416	242
Christmas Island(c)	14 513	3 895	2 712	. .
Hobart(c)	5 103	3 689	2 690	. .
Broome(d)	2 338	260	. .	. .
Total	**13 267 187**	**14 074 855**	**14 238 169**	**14 982 761**

(a) International operations commenced in December 1996. (b) International operations ceased in February 1999. (c) International operations ceased in April 1998. (d) International operations ceased in February 1997.

Source: Department of Transport and Regional Services.

Safety

An unwanted side effect of transport activity is accidents, the costs of which include loss of life or injury to persons, and destruction of and damage to equipment and infrastructure.

Road traffic accidents involving fatalities and injuries

Between 1994 and 1999 road fatalities declined in New South Wales (by 10.7%), Queensland (by 25.8%), South Australia (by 5.0%) and Tasmania (by 10.2%), as shown in table 23.18. Overall, the number of road fatalities dropped 8.9% in this period. However, the number of fatalities has been reasonably constant for Australia since 1997 (down only 0.4% in the two years to 1999). In the 6 months to June 2000 there were 896 fatalities—an increase compared to the 876 fatalities in the 6 months to June 1999 and 860 in the 6 months to June 1998.

Fatalities per 100,000 persons and per 10,000 motor vehicles are highest by far in the Northern Territory (25.4 per 100,000 persons and 6.8 per 10,000 vehicles), as shown by table 23.19. Not surprisingly, the Northern Territory also has the highest rates of road traffic accidents involving injury (173 per 100,000 persons and 33 per 10,000 vehicles in 1999), as shown in table 23.20. The Australian Capital Territory had the lowest rates of fatalities per 100,000 persons (6.1) and per 10,000 vehicles (1.1). Victoria was next with 8.1 fatalities per 100,000 persons and 1.2 fatalities per 10,000 vehicles. However, Victoria had 108 accidents involving injury per 100,000 persons—a higher rate than the Australian Capital Territory (56), Tasmania (75), South Australia (82), New South Wales (95) and Queensland (100).

23.18 ROAD TRAFFIC ACCIDENTS INVOLVING FATALITIES, By State/Territory

Year	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	**Aust.**
	no.	no.	no.	no.	no.	no.	no.	no.	**no.**
ACCIDENTS INVOLVING FATALITIES									
1994	557	346	367	145	195	51	36	15	**1 712**
1995	563	371	408	163	194	53	56	14	**1 822**
1996	538	382	338	162	220	53	58	17	**1 768**
1997	528	346	320	123	184	29	66	17	**1 603**
1998	491	348	257	152	202	47	59	20	**1 576**
1999	507	342	269	132	189	47	44	17	**1 547**
2000(a)	283	202	124	77	83	20	22	4	**815**
PERSONS KILLED									
1994	647	378	422	159	211	59	41	17	**1 934**
1995	620	418	456	181	209	57	61	15	**2 017**
1996	581	417	385	181	247	64	72	23	**1 970**
1997	576	377	361	148	197	32	60	17	**1 768**
1998	556	390	279	168	223	48	69	22	**1 755**
1999	578	381	313	151	217	53	49	19	**1 761**
2000(a)	313	213	138	84	97	24	22	5	**896**

(a) For 6 months January to June 2000.

Source: Australian Transport Safety Bureau, Road Fatalities Australia.

23.19 ROAD TRAFFIC FATALITIES, By State/Territory—1999

State/Territory	Persons killed		
	no.	Per 100,000 population(a)	Per 10,000 motor vehicles registered(b)
New South Wales	578	9.0	1.5
Victoria	381	8.1	1.2
Queensland	313	8.9	1.3
South Australia	151	10.1	1.6
Western Australia	217	11.7	1.7
Tasmania	53	11.3	1.5
Northern Territory	49	25.4	6.8
Australian Capital Territory	19	6.1	1.1
Australia	**1 761**	**9.3**	**1.5**

(a) Estimated resident population at 30 June 1999. (b) Number of registered motor vehicles and motor cycles (excluding tractors, plant and equipment) at 31 October 1999.

Source: Road traffic fatalities—Australian Transport Safety Bureau, Road Fatalities Australia, 1999; population data—Estimated Resident Population, Australia, June 1999 (3201.0); registered vehicles—Motor Vehicle Census, Australia, 31 October 1999 (9309.0).

23.20 ROAD TRAFFIC ACCIDENTS INVOLVING CASUALTIES(a), By State/Territory —October 1997 to September 1998

	Persons injured		
State/Territory	no.	Per 100,000 of population(b)	Per 10,000 motor vehicles registered(c)
New South Wales	6 018	95	17
Victoria	5 033	108	16
Queensland	3 447	100	16
South Australia	1 213	82	12
Western Australia	2 375	130	18
Tasmania	352	75	11
Northern Territory	329	173	33
Australian Capital Territory	173	56	9
Austalia	**18 940**	**101**	**16**

(a) Accidents reported to the police or other relevant authority which occurred in public thoroughfares and which resulted in death within thirty days or personal injury to the extent that the injured person was admitted to hospital. (b) Estimated resident population at 30 June 1998. (c) Number of registered motor vehicles (excluding tractors and plant and equipment) at 31 October 1998.

Source: Road traffic accidents—Australian Transport Safety Bureau, Road Injury Australia, September quarter 1998; Population data—Estimated Resident Population, Australia (3201.0); Registered vehicles data—Motor Vehicle Census, Australia, 31 October 1998 (9309.0).

A history of road fatalities in Australia

(This article appeared originally in 1998 as Monograph 23 by the Australian Transport Safety Bureau. It has been updated to include more recent data.)

The war on the roads

Road crashes are a major cause of death and injury in Australia, and incur costs estimated to be in excess of $15b annually.[1] Some 164,190 lives have been lost overall since road crash death records commenced in 1925, almost double the aggregate death toll of Australians killed in the four major wars in which this country has been involved (89,850 deaths). While this is a cause for concern to all Australians, it is worth noting what has been achieved to date in combating the problem.

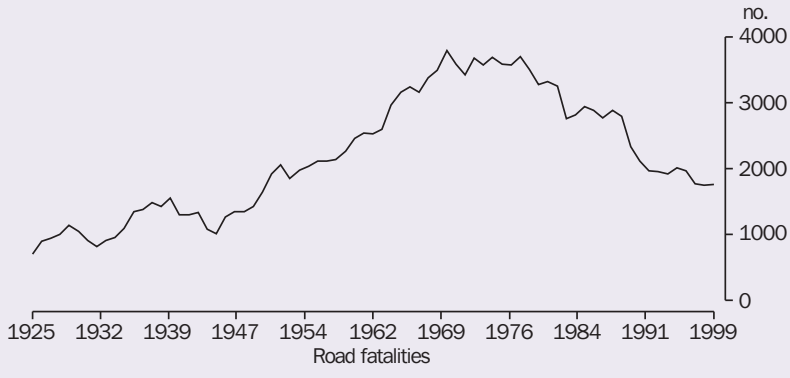
A trend reversed

Between 1925 and 1970 there was a consistent increase in the number of road fatalities, other than in periods during the Great Depression and Second World War. In 1970 there were 3,798 road fatalities, representing 30.4 fatalities per 100,000 persons or 8 per 10,000 registered vehicles. Since then the number of fatalities per year has declined significantly, especially over the 1980s and 1990s (graph 23.21). In 1999 the number of road fatalities had decreased to less than half the 1970 rate (1,761), representing 9.5 per 100,000 persons (graph 23.22) or 1.4 per 10,000 registered vehicles (graph 23.23).

This decline cannot be attributed to a reduction in the distance travelled by vehicles, which has remained fairly steady since 1971, when each vehicle travelled an average of 15,900 km. In 1999 each vehicle travelled an average of 15,800 km.

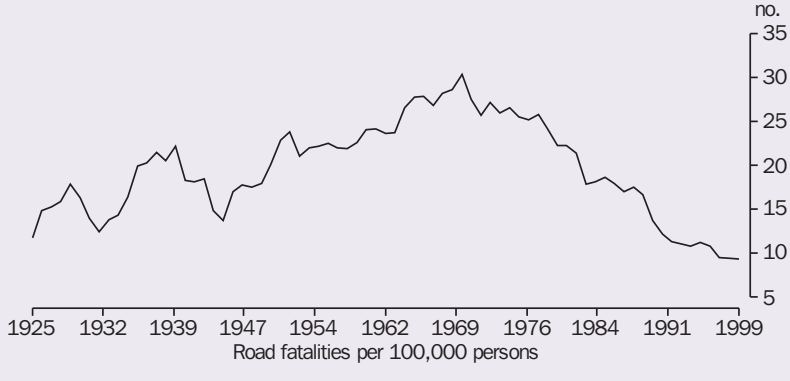
Today there exists a high degree of community awareness about road safety, whereas road safety matters were not a major consideration in the days of an emerging new transport technology.

23.21 NUMBER OF ROAD FATALITIES, AUSTRALIA—1925–1999



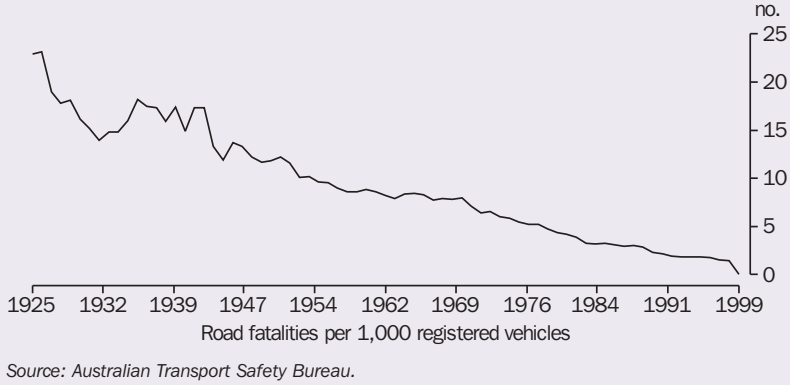
Source: Australian Transport Safety Bureau.

23.22 ROAD FATALITIES PER 100,000 PERSONS, AUSTRALIA—1925–1999



Source: Australian Transport Safety Bureau.

23.23 NUMBER OF ROAD FATALITIES PER 1,000 REGISTERED VEHICLES, AUSTRALIA—1925–1999



Source: Australian Transport Safety Bureau.

Contributions to the turnaround

Major contributions to this turnaround have come from improvements to roads and vehicles, enactment of road safety legislation, intensive public education and enhanced police enforcement technology. The following are some key developments.

Vehicle safety enhancements

The application of Australian Design Rules for Motor Vehicle Safety has been the mechanism for implementing a host of mandatory safety requirements. These include:

- mandatory fitting of seat belts in new passenger vehicles (from 1 January 1970);
- progressive extension of seat belts to other motor vehicles and the use of retractable belts;
- anchorages for child restraints;
- improved vehicle brakes, tyres, lights, indicators and glazing, head restraints and impact resistance;
- increased roll-over strength and occupant protection in buses; and
- the fitting of speed limiters on heavy vehicles.

Legislation

By 1973, legislation had been passed in all Australian States and Territories for compulsory wearing of fitted seat belts in motor vehicles and the wearing of protective helmets by motor cycle riders and their pillion passengers.

Legislation for random breath testing was progressively introduced nationwide, firstly by Victoria (1976), followed by the Northern Territory (1980), South Australia (1981), New South Wales and the ACT (1982), Tasmania (1983) and Queensland and Western Australia (1988). Since its introduction, random breath testing has been intensified and refined to be one of the most extensive programs for mass breath testing of drivers worldwide. Commencing with South Australia in 1973, a number of States and Territories have also legislated for compulsory blood testing on crash participants who attend hospital.

A range of complementary measures has also been put in place, including:

- nationally consistent 0.05 driver blood alcohol limits;
- zero blood alcohol limits for special driver groups;
- a well structured system of penalties; and
- mass public education and media campaigns.

Attitudinal change has seen drink driving become largely unacceptable within the general Australian population.

In 1990, Victoria made wearing of bicycle helmets compulsory, with the other States and Territories following through 1991 and 1992. At that time no other country had compulsory wearing of bicycle helmets.

Improved enforcement technology

Enforcement technology, such as speed cameras, has made a major impact since being introduced in the late 1980s, first in Victoria and later in most other jurisdictions. Other innovations include laser based speed measuring devices and red light cameras.

Improved roads

Australia's roads are today considered to be significantly safer than in the past. The Commonwealth Government's Black Spots programs have encouraged individuals and groups to nominate dangerous sections of road for specific improvement.

Commonwealth funding has seen major upgrading of the National Highway. Other roads have been the target of considerable work by State and local governments in shoulder sealing, use of audible edge-lining and other delineation treatments, removal of roadside hazards and improved speed zoning.

The future

All levels of government in Australia are heavily committed to reducing further the number and severity of road crashes and improving the efficiency of the road network. The turnaround that has been achieved in Australia's road safety performance since 1970 has highlighted the effectiveness of a resolute, coordinated approach by government.

Notwithstanding the progress attained so far, much remains to be achieved. Recent work[2] has suggested that a reduction to 860 annual road fatalities is potentially achievable by the year 2020. The Commonwealth, State and Territory Governments recently agreed to set a target of no more than 1,600 annual road crash deaths by

the year 2005. While no level of crash death or injury is acceptable, this target is intended to focus efforts over the next few years.

Road safety stakeholders have already set down a detailed road safety strategy and implementation plan[3] for the immediate years ahead. This sets out a detailed plan of coordinated policies and legislation supported by enforcement, community involvement and public education activities.

Endnotes

1 Bureau of Transport Economics 2000, *Road Crash Costs in Australia.* Report 102.

2 Vulcan, P. 1997, *Predicting road fatalities for 2001 and beyond*. Paper presented to the Road Safety Research and Enforcement Conference, Hobart, November 1997.

3 *National Road Safety Strategy and Action Plan 1996*, published by the Federal Office of Road Safety on behalf of the National Road Safety Implementation Task Force.

Air accidents and casualties

The number of aircraft accidents and fatalities has declined significantly since 1990 (table 23.24). In 1999 the number of accidents was less than 200 for the only time in the decade. However, the number of fatalities was higher than in 1997. Both the number of accidents and the number of fatalities fell in 1999. There were no ballooning accidents in 1999.

23.24 AIR TRANSPORT(a), Accidents and Fatalities(b)

Year	Accidents no.	Fatalities no.
1990	344	81
1991	323	54
1992	310	61
1993	319	67
1994	268	64
1995	269	51
1996	243	49
1997	254	40
1998	225	54
1999	194	49

(a) Includes airlines, general aviation and sport aviation. Excludes data for ballooning accidents. (b) Includes accidents involving Australia-registered aircraft occurring overseas and accidents involving foreign-registered aircraft occurring in Australia.

Source: Bureau of Air Safety Investigation.

Transport infrastructure

Transport infrastructure comprises three elements, all of which are required to perform the transport task:

- physical infrastructure—roads, rail track, ports, airports and pipelines;
- transport equipment—motor vehicles, trains, ships and aeroplanes; and
- people with the necessary skills—licensed drivers, pilots etc.

This section discusses all three elements.

Physical infrastructure

Australia requires a vast transport network, and the cost of building and maintaining this infrastructure is very high. For example, in 1999 the value of engineering construction was $5,807m on roads, highways and subdivisions; $447m on bridges; $929m on railways; $219m on harbours and $492m on pipelines. Major projects under way in 2000 include a rail link to Darwin, expected to be finished in 2003, upgrade of Darwin's east port, and the strengthening or replacing of many road bridges on major freight routes to allow for heavier freight-carrying vehicles.

Length of the road system

Table 23.25 shows the map lengths of Australian roads. Although every year most States and Territories upgrade some of their roads, most still have more kilometres of roads of gravel, crushed stone or other improved surface than kilometres of bitumen or concrete roads.

Rail network

Table 23.26 shows the diversity of track gauge in Australia, reflecting the historical development of State infrastructure. It also reflects private development, such as the 4,150 route-kilometres of narrow gauge associated with the Queensland sugar industry. Competition reform and government policy to allow open access have resulted in private companies offering freight and passenger services over government-owned track.

23.25 LENGTHS OF ROADS OPEN FOR GENERAL TRAFFIC, By Road Surface and State/Territory —At 30 June 2000

	NSW(a)	Vic.(b)	Qld	SA	WA(c)	Tas.(d)	NT(e)	ACT
Surface of roads	km	km	km	km	km	km	km	km
Bitumen or concrete	89 228	73 701	66 770	27 775	48 118	10 280	6 354	2 497
Gravel, crushed stone or other improved surface	92 424	52 654	50 670	41 300	55 996	(f)12 709	6 630	133
Formed only	(g)	29 843	44 707	18 515	28 959	700	7 473	—
Cleared only	n.a.	(h)	14 709	9 080	13 855	(h)	756	—
Total	**181 652**	**156 198**	**176 856**	**96 670**	**146 928**	**23 689**	**21 212**	**2 630**

(a) Excludes Lord Howe Island, forestry controlled roads or crown roads. (b) Excludes roads coming under the responsibility of the Department of Conservation and Natural Resources. (c) Excludes approximately 25,300 kilometres of forestry roads. (d) Includes an estimate for forestry roads. (e) Excludes roads not managed by the Northern Territory Government. (f) Includes local government roads in Formed only and Cleared only categories. (g) Included in gravel, crushed stone or other improved surface. (h) Included with Formed only.

Source: Derived mainly from Road and Traffic Authorities and local government sources in each State and Territory.

23.26 AUSTRALIAN TRACK NETWORK(a), Route Kilometres Operated—at 30 June 1998 and 1999

Gauge	1998	1999
Narrow		
610mm	4 150	4 150
1067mm	15 063	15 122
Standard 1435mm	16 303	16 381
Broad 1600mm	4 028	4 009
Dual	296	264
Total	**39 840**	**39 930**

(a) Includes tram and light rail.

Source: Australasian Railway Association Inc.

Airports

At 15 March 2000, there were 278 licenced airports in Australia and its external territories. Of these, nine were operating as international airports servicing scheduled international airlines (see table 23.17). The majority of licenced airports are owned and operated by local councils, State government departments and private companies. The remaining airports are owned and operated by the Department of Defence or leased by the Commonwealth to private sector companies or government corporations.

Transport equipment

Registered motor vehicles

The number of motor vehicles has steadily increased in every Motor Vehicle Census conducted by the ABS since 1995. There were 11,934,797 motor vehicles (excluding motor cycles, tractors, plant and equipment, caravans and trailers) registered in Australia at 31 October 1999 (tables 23.27 and 23.28). This represents an increase of 1.7% since 31 October 1998. Each of the mainland States now has motor vehicle fleets of over one million vehicles. About 8 of every 10 vehicles are passenger vehicles.

23.27 NUMBER OF REGISTERED MOTOR VEHICLES—1996 TO 1999(a)

	Passenger vehicles(b)	Light commercial vehicles	Trucks(c)	Buses	**Total (excludes motor cycles)**	Motor cycles
Motor vehicle census years(c)	'000	'000	'000	'000	**'000**	'000
1996	9 021.5	1 601.6	415.4	58.8	**11 097.3**	303.9
1997	9 206.2	1 632.2	418.4	61.1	**11 351.3**	313.1
1998	9 526.7	1 686.4	426.9	64.1	**11 738.0**	328.8
1999	9 719.9	1 721.2	427.8	65.9	**11 934.8**	333.8

(a) As at 31 October in all years shown. (b) Includes campervans. (c) Includes rigid, articulated and non-freight carrying trucks.

Source: Motor Vehicle Census, Australia (9309.0).

23.28 REGISTERED MOTOR VEHICLES—31 October 1999

State/Territory	Passenger vehicles(a) '000	Light commercials '000	Trucks: Rigid '000	Trucks: Articulated '000	Trucks: Non-freight carrying '000	Buses '000	**Total(b) '000**	Motor cycles '000
NSW	2 969.7	482.1	105.9	16.3	3.2	16.6	**3 593.8**	85.6
Vic.	2 652.2	402.0	85.5	18.1	5.7	15.0	**3 178.5**	88.0
Qld	1 746.3	396.3	70.0	12.8	2.9	14.1	**2 242.4**	73.2
SA	843.0	126.0	25.6	5.9	1.9	4.0	**1 006.4**	26.1
WA	1 024.7	212.4	44.6	7.6	2.8	9.9	**1 302.0**	42.8
Tas.	245.7	61.0	9.7	1.5	0.9	2.2	**321.0**	8.6
NT	67.7	24.6	3.3	0.8	0.2	3.0	**99.5**	3.6
ACT	170.7	16.8	2.3	0.2	0.1	1.0	**191.2**	5.9
Aust.	9 719.9	1 721.2	346.8	63.3	17.7	65.9	**11 934.8**	333.8

(a) Includes campervans. (b) Excludes motor cycles, tractors, plant and equipment, caravans and trailers.

Source: Motor Vehicle Census, Australia (9309.0).

The average age of the Australian motor vehicle fleet grew steadily over a long period to reach a peak of 10.7 years in both 1997 and 1998 before falling to 10.6 in 1999 (table 23.29). The average age of passenger vehicles (81% of the vehicle fleet) declined by 0.1 years to 10.3 years as at 31 October 1999, following a similar fall between the 1997 and 1998 Motor Vehicle Censuses.

The number of registered motor vehicles (excluding motor cycles) per 1,000 of population has generally followed the same upward trend as the total number of motor vehicles. At 31 October 1999 there were 647 vehicles per 1,000 population, up marginally from 644 in the previous year (table 23.30).

Registrations of new motor vehicles

Annual registrations of new vehicles processed by motor vehicle registration authorities in all States and Territories are shown in tables 23.31 and 23.32. Table 23.31 shows a fall of 8.6% in the number of new registrations in 1999–2000 compared with 1998–99. This decline was mainly a result of falls in new passenger vehicle registrations. There were increases in new registrations of light commercial vehicles (by 6.4%), rigid trucks (by 2.4%) and buses (by 10.7%) in 1999–2000.

23.29 ESTIMATED AVERAGE AGE OF THE VEHICLE FLEET(a), By State/Territory of Registration—31 October 1999

Type of vehicle	State of registration 1999: NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Aust. 1999	Aust. 1998
Passenger vehicles	9.2	10.8	10.2	11.9	10.5	12.1	8.9	10.1	10.3	10.4
Campervans	17.1	19.2	16.3	18.8	20.2	18.9	18.9	18.4	18.4	18.1
Light commercial vehicles	10.4	12.4	11.0	12.6	11.7	13.1	9.8	10.9	11.4	11.5
Rigid trucks with GVM 3.5 and less than 4.5 tonnes	11.2	14.3	12.6	14.6	13.7	16.7	7.1	11.9	12.7	12.5
Rigid trucks with GVM 4.5 tonnes and over	13.8	16.8	14.3	17.2	16.9	16.8	12.4	11.0	15.4	15.3
Articulated trucks	11.4	11.8	11.3	10.8	13.1	11.0	11.6	7.9	11.6	11.6
Non-freight carrying trucks	14.0	15.3	11.8	13.8	16.8	16.8	11.0	16.6	14.6	14.3
Buses	9.2	10.4	9.8	11.3	8.0	13.7	6.5	8.9	9.5	9.3
Motor cycles	9.2	9.9	10.6	(b)9.7	11.6	10.3	8.4	9.4	10.1	10.2
Total	**9.5**	**11.2**	**10.5**	**12.1**	**11.0**	**12.5**	**9.2**	**10.1**	**10.6**	**10.7**

(a) Excludes plant and equipment, caravans and trailers. (b) Year of manufacture is frequently not reported for South Australian motor cycles.

Source: Motor Vehicle Census, Australia (9309.0).

23.30 MOTOR VEHICLES(a) ON REGISTER PER 1,000 OF POPULATION, By State/Territory—1991 to 1999

	Motor vehicle census years						
State/Territory	1991	1993	1995	1996	1997	1998	1999
NSW	525	529	545	556	563	581	574
Vic.	622	642	637	669	677	682	693
Qld	569	593	614	624	627	645	659
SA	637	638	653	667	671	693	692
WA	653	665	679	694	706	725	723
Tas.	643	661	676	686	686	684	701
NT	507	497	520	529	530	538	535
ACT	556	591	604	613	637	631	635
Aust.	**582**	**595**	**606**	**614**	**630**	**644**	**647**

(a) Excludes motor cycles, tractors, plant and equipment, caravans and trailers.

Source: Motor Vehicle Census, Australia (9309.0).

23.31 REGISTRATIONS OF NEW MOTOR VEHICLES, Australia, By Type of Vehicle—1994–95 to 1999–2000

			Trucks					
	Passenger vehicles(a)	Light commercial vehicles(b)	Rigid	Articulated	Non-freight carrying(c)	Buses	**Total (excludes motor cycles)**	Motor cycles
Year	no.	no.	no.	no.	no.	no.	**no.**	no.
1994–95	528 502	88 840	11 392	4 815	867	4 493	**638 909**	20 505
1995–96	531 778	86 666	9 726	2 909	1 074	4 376	**636 529**	22 345
1996–97	557 962	88 204	9 470	3 145	1 099	3 972	**663 852**	22 842
1997–98	654 697	96 762	11 387	4 006	1 247	3 746	**771 845**	26 765
1998–99	671 513	103 568	13 182	3 973	1 194	3 636	**797 066**	30 070
1999–00	596 357	110 176	13 502	3 296	1 068	4 026	**728 425**	32 579

(a) Formerly described as motor cars and station wagons. From 1 July 1991 includes forward control passenger vehicles of less than 10 seats. (b) Combination of utilities and panel vans. From 1 July 1991 includes cab chassis vehicles of 3.5 tonnes gross vehicle mass or less. (c) Formerly 'Other truck type vehicles'.

Source: New Motor Vehicle Registrations, Australia, Preliminary (9301.0) and unpublished statistics.

23.32 REGISTRATIONS OF NEW MOTOR VEHICLES, By State/Territory—1999–2000

			Trucks					
	Passenger vehicles	Light commercial vehicles(a)	Rigid	Articulated	Non-freight carrying	Buses	**Total (excludes motor cycles)**	Motor cycles
State/Territory	no.	no.	no.	no.	no.	no.	**no.**	no.
NSW	213 586	37 910	4 983	763	227	1 053	**258 522**	9 600
Vic.	164 544	25 233	3 279	1 056	358	1 076	**195 546**	9 613
Qld	97 367	24 253	3 044	821	291	847	**126 623**	6 271
SA	37 377	6 666	683	311	64	183	**45 284**	2 165
WA	54 697	10 401	1 041	210	100	533	**66 982**	3 210
Tas.	11 373	2 800	209	86	24	64	**14 556**	563
NT	5 753	1 692	175	38	3	201	**7 862**	653
ACT	11 660	1 221	88	11	1	69	**13 050**	504
Aust.	596 357	110 176	13 502	3 296	1 068	4 026	**728 425**	32 579

(a) Combination of utilities and panel vans. Includes cab chassis vehicles of 3.5 tonnes gross vehicle mass or less.

Source: Unpublished statistics, New Motor Vehicle Registrations.

Table 23.32 shows new registrations of vehicle types for each State and Territory. Although the number of registrations is fairly consistent with population size, New South Wales did not record the highest number of registrations for every vehicle type. There were more registrations of articulated trucks and non-freight carrying trucks in both Victoria and Queensland. Victoria also recorded more bus and motor cycle registrations than New South Wales.

Rail rolling stock

Table 23.33 shows the number of locomotives, passenger cars and wagons in the Australian rail fleet. A large number of the narrow gauge diesel locomotives are owned by Queensland operators (Queensland Rail and Sugar Cane Railways) and service the Brisbane to Cairns route or the extensive rail network transporting sugar cane. Queensland Rail has the largest fleet of locomotives with 350 narrow gauge diesel and 184 narrow gauge electric. Other operators with large locomotive fleets are Freight Corp (NSW) and Tranz Rail (NZ) which operates in Tasmania.

23.33 AUSTRALIAN RAIL FLEET, Locomotives, Passenger Cars and Wagons—30 June 2000

Location	no.
Locomotives	
Diesel	
Broad gauge	131
Standard gauge(a)	886
Narrow gauge	1 050
Electric	
Standard gauge	60
Narrow gauge	211
XPT standard gauge	19
Steam	17
Total	*2 374*
Passenger cars	
Locomotive hauled	951
Diesel rail cars	
Locomotive hauled	123
Suburban	143
Total	*266*
Electric railcars	
Interurban(b)	313
Suburban	2 603
Total	*2 916*
Tram/Light rail	554
Charter/Heritage	44
Total	*4 731*
Wagons	
Revenue	
Broad gauge	1 860
Standard gauge	21 017
Narrow gauge	73 888
Total	*96 765*
Other	1 573
Total	*98 338*

(a) Includes 60 diesel-electric locomotives. (b) Includes 12 tilt cars.

Source: Australasian Railway Association Inc.

Shipping fleet

There were 8,576 ships registered in Australia at 30 June 2000 (table 23.34). Queensland had the largest fleet (2,714 ships). In all States/Terrritories except South Australia, most ship registrations are classified as recreational. However, South Australia has a larger number of fishing registrations.

The major Australian trading fleet (2,000 Dead Weight Tonnes (DWT) and over) comprised 55 ships at 30 June 1999 (table 23.35). The largest registered coastal ships were the *Iron Whyalla* and the *Iron Spencer* (both 141,475 DWT) which shipped iron ore and coal. The minor trading fleet, consisting of vessels with Gross Tonnage (GRT) of at least 150 tonnes, comprised 21 ships.

Aircraft fleet

At 30 June 2000 there were 11,519 aircraft registered in Australia, including 10,144 aeroplanes and helicopters. Of these the main airlines had 184, with a further 84 registered by their associated regional airlines.

The Ansett group's fleet consisted of 64 aircraft, including 22 Boeing 737-300s, 20 A320-200 Airbuses and 9 Boeing 767-200 jet aircraft. Regional airlines in the Ansett Group are Kendall Airlines, Aeropelican and Skywest Airlines, which together comprised a fleet of 39 aircraft.

Qantas and Qantas Airlink operated a fleet of 117 aircraft including 24 Boeing 737-400s, 22 Boeing 747-400s, 22 Boeing 767-300s, 16 Boeing 737-300s and 14 Bae 146 jet aircraft. Regional airlines in the Qantas Group are Eastern Australia Airlines, Southern Australia Airlines, and Sunshine Airlines. These regionals had a total fleet of 33 aircraft.

Impulse Airlines commenced domestic airline services on 5 June 2000, initially with a fleet of three Boeing 717-200 jet aircraft. The airline also operated 12 Beech 1900 turboprop aircraft on regional airline services.

Virgin Airlines commenced operation in August 2000.

23.34 SHIPS REGISTERED(a) IN AUSTRALIA—30 June 2000

	Nature of registration					
Location	Recreational	Fishing	Government	Demise chartered(b)	Commercial and trading(c)	Total
	no.	no.	no.	no.	no.	no.
New South Wales	1 722	284	4	7	244	2 261
Victoria	637	201	—	2	99	939
Queensland	1 547	753	19	10	385	2 714
South Australia	282	312	1	—	41	636
Western Australia	593	414	—	3	148	1 158
Tasmania	239	214	2	—	55	510
Northern Territory	267	62	1	—	28	358
Australia	**5 287**	**2 240**	**27**	**22**	**1 000**	**8 576**

(a) Australian-owned commercial or trading ships of 24 metres or more in tonnage length. All ships, regardless of tonnage length, must be registered before departing on a voyage from Australia or from a foreign port where there is an Australian diplomatic representative. (b) Demise charter is the charter of a foreign ship operated by an Australian company in Australian waters. These ships are not necessarily engaged in trade or commerce. (c) Relates to ships used for trading and commercial purposes. Some of these ships are less than 24 metres in tonnage length.

Source: Australian Maritime Safety Authority.

23.35 THE AUSTRALIAN TRADING FLEET, Ships 150 Gross Tonnes or More—30 June 1999

Ships	no.	Dead weight tonnage (DWT)(a)	Gross tonnes
Major Australian fleet(b)			
Coastal			
Australian registered	41	1 562 588	1 025 399
Overseas registered	2	102 850	60 684
Total coastal fleet	*43*	*1 665 438*	*1 086 083*
Overseas			
Australian registered	10	673 467	676 311
Overseas registered	2	153 345	90 937
Total overseas fleet	*12*	*826 812*	*767 248*
Total	55	2 492 250	1 853 331
Minor trading ships(c)			
Australian registered	19	11 257	9 963
Overseas registered	3	1 862	1 682
Australian trading fleet	**77**	**2 505 369**	**1 864 976**

(a) The weight that a vessel can carry, including cargo, bunkers, water and stores. (b) 2,000 Dead Weight Tonnes (DWT) and over. (c) Minor trading ships are between 150 Gross Tonnage (GRT) and 2,000 DWT. GRT is the measure of internal capacity of a ship that is available within the hull and enclosed spaces for cargo, stores, passenger and crew.

Source: Department of Transport and Regional Services.

Australia's motor vehicle fleet since the 1920s

Estimates of the size of the Australian vehicle fleet were first published in *Commonwealth Of Australia Yearbook No 16*, for 1923. In 1921 there were approximately 99,270 motor vehicles and 37,580 motor cycles registered. The size of the fleet increased steadily to reach 562,271 motor cars, 258,025 commercial vehicles and 79,237 motor cycles at 30 June 1939. By 30 June 1946 and following the Second World War, registrations of motor cars and motor cycles had fallen to 522,615 and 72,701 vehicles respectively, while commercial vehicle registrations had grown to 333,129.

The motor vehicle census conducted in 1947–48 provided a detailed breakdown of the composition of the Australian vehicle fleet for the first time. The 1947–48 census showed that there were almost one million registered vehicles in Australia at the time, not including motor cycles. The census included details of vehicle type, vehicle make, year of manufacture,

horsepower, and carrying capacity for commercial vehicles. Continued growth since then has seen the fleet expand to almost 12 million vehicles in 1999, excluding motorcycles. This 12-fold increase in just over 50 years compares with a population growth of 2.4 times over the same period.

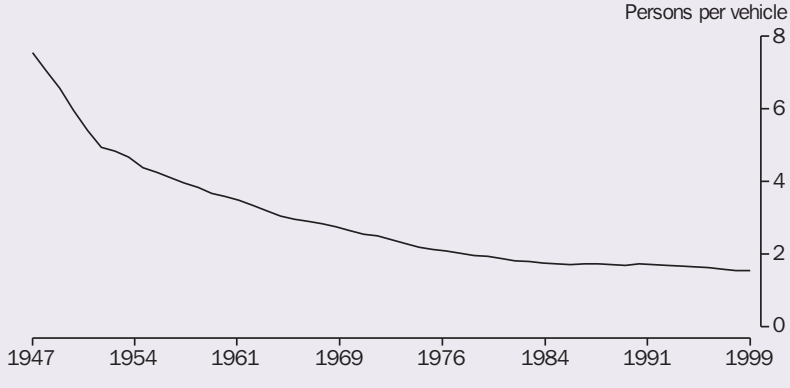
Between 1947–48 and 1999, ownership of a vehicle changed from being relatively unusual to being quite common. In 1947–48 there was an average of only one vehicle per 7.8 persons; by 1999 this average had risen to one vehicle per 1.6 persons (graph 23.36). This increase in the size of the fleet relative to the increase in population mirrored the dramatic increase in the 1920s up to the onset of the Great Depression; the estimated average was one vehicle per 45 persons in 1921, rising to one vehicle per 11 persons in 1930. However, by 1939 the average had only risen further to one vehicle per 7.8 persons.

New South Wales recorded the highest number of registrations in 1947–48 with over a third of the entire vehicle fleet, due primarily to its higher population. Victoria accounted for 29%, Queensland 16%, South Australia 11%, Western Australia 7% and Tasmania 3%. In 1999, New South Wales was still the leading State although its proportion of total vehicle registrations had fallen to 30%. Victoria's and South Australia's shares (27% and 8% respectively) had also fallen since 1947–48, while Tasmania's had remained steady. The significant rises in the proportion of registrations in Queensland (19%), the Australian Capital Territory (2%) and particularly of Western Australia (11%) were a consequence of changing population growth.

The average age of vehicles in the fleet was estimated at 11.3 years in 1947–48, slightly higher than the figure of 10.6 years in 1999. The high average vehicle age in 1947–48 reflected low production rates of vehicles during the war period, and the resulting low rate of new vehicle registrations at the time. In the intervening period, this figure fell to an estimated age of 6.1 years in 1971 with the increasing numbers of new vehicles joining the fleet. It then rose steadily to reach a peak of 10.7 in both 1997 and 1998. Likely factors contributing to this rise were the large increase in the proportion of households with two or more vehicles, the improved reliability of vehicles, enabling them to be kept on the road longer, and the increased cost of replacing vehicles.
In 1947–48, passenger vehicles accounted for 61% of the total vehicle fleet, with light commercial vehicle and trucks together accounting for 35%. By 1999 these figures had changed to 81% and 18%, respectively.

The top five makes of passenger vehicles accounted for 51% and the top 10 for 71% of all registered passenger vehicles in 1947–48. The top five makes were Chevrolet (16%), Ford (16%), Vauxhall (7%), Dodge (6%) and Morris (6%). By 1999 the top five makes together accounted for 75% of total passenger vehicle registrations. The top five makes were Ford with 21% of all passenger vehicle registrations, Holden (20%), Toyota (17%), Mitsubishi (10%)

23.36 PERSONS PER MOTOR VEHICLE—1947 to 1999



Source: Motor Vehicle Censuses, various years.

and Nissan (8%). In contrast, four of the top five makes in 1947–48 (Chevrolet, Vauxhall, Dodge and Morris) accounted for less than half of one per cent of registrations in 1999.

The makeup of the truck fleet is now much less concentrated than in 1947–48, when the top two makes, Ford and Chevrolet, together accounted for over half of all registrations. In 1999, the top five makes, International, Isuzu, Ford, Mitsubishi and Hino, together accounted for about the same proportion. Ford and Chevrolet were also the dominant makes in the light commercial vehicle fleet in 1947–48 with just under half of total registrations. In 1999 Toyota, Ford and Holden dominated this segment with about 68% of registrations.

Only about 5% of all commercial vehicles (with a reported carrying capacity) were capable of carrying loads of 100 hundredweight or more in 1947–48, the equivalent of 5.08 tonnes or more. In contrast, over 55% of rigid trucks registered in 1999 had a gross vehicle mass (weight of the vehicle including a full load) of 8 tonnes and over.

Licenced operators

Drivers' and riders' licences

Table 23.37 shows the number of motor vehicle licences on issue for each State and Territory at 30 June 2000. Between 1999 and 2000 there were increases in the number of licenses in all States and Territories except South Australia, where the total number fell by 5.2%.

Air pilot licences

At 30 June 2000 there were 32,274 holders of a current aeroplane pilot licence, including 17,392 private pilots, 4,525 commercial and senior commercial pilots and 4,628 air transport pilots.

In addition there were 3,491 holders of a current helicopter pilot licence (including student licences), of whom 1,004 were private pilots, 1,991 commercial and senior commercial pilots and 414 air transport pilots. Other licences in force related to 89 commercial balloonists, 365 flight engineers and 18 navigators.

23.37 DRIVERS' AND RIDERS' LICENCES, By State/Territory

Type of licence	NSW(a)	Vic.	Qld	SA	WA(b)	Tas.	NT	ACT
	no.	no.	no.	no.	no.	no.	no.	no.
30 JUNE 1999								
Motor vehicle	4 082 899	3 134 004	n.a.	906 752	n.a.	267 988	84 871	196 743
Motor cycle	383 858	214 663	355 270	153 507	n.a.	148	54	(c)22 688
Combined	(d)381 131	. .	n.a.	. .	n.a.	30 013	21 287	. .
Total	**4 466 757**	**3 348 667**	**(e)2 211 000**	**1 060 259**	**n.a.**	**298 149**	**105 476**	**(c)219 431**
30 JUNE 2000								
Motor vehicle	4 142 951	3 215 197	n.a.	849 892	1 020 518	271 120	94 139	209 502
Motor cycle	391 179	224 984	(d)359 238	154 874	558	198	41	(c)23 305
Combined	(d)388 561	. .	n.a.	. .	2 230 698	31 030	22 414	. .
Total	**4 534 130**	**3 440 181**	**(e)(f)2 256 206**	**1 004 766**	**1 224 174**	**302 348**	**116 594**	**(c)232 729**

(a) Includes learner licences. (b) Data for 1999 are not available for number of licences. The total for classes of licences was 1,852,595 at 30 June 1999. (c) Includes combined licences. (d) Not included in the total. (e) Data are as at 31 May 2000. (f) Includes persons with only motor vehicle classes and persons with motor vehicle and motor cycle classes.

Source: Motor Registry in each State and Territory.

Transport organisations

General

Australian Transport Council

The Australian Transport Council was established on 11 June 1993, subsuming the functions of the Australian Transport Advisory Council.

It comprises Commonwealth, State, Territory and New Zealand Ministers responsible for transport, roads, marine and ports matters. The Papua New Guinea Minister for Civil Aviation, and the Australian Local Government Association are also represented on the Council as observers.

The Council meets biannually; its primary role is to review and coordinate various aspects of transport policy, development and administration. The Council initiates discussion and reports on issues raised by Council members, and provides advice to governments on the coordination and integration of all transport and road policy issues at a national level.

Bureau of Transport Economics (BTE)

The Bureau of Transport Economics (BTE) is a centre for applied economic research in the Commonwealth Department of Transport and Regional Services. It undertakes studies and investigations that contribute to an improved understanding of the factors influencing the efficiency and growth of the transport sector and the development of effective transport policies. The BTE also undertakes consultancy work for a number of external agencies.

Australian Transport Safety Bureau (ATSB)

The Australian Transport Safety Bureau (ATSB) was created as an independent Division-level unit within the Department of Transport and Regional Services on 1 July 1999. It deals with the non-regulatory aspects of air, sea, rail and road safety.

Air and Sea

Using a 'no blame' whole-of-system approach, ATSB investigates accidents, incidents and safety deficiencies, and analyses safety data to prevent repeat occurrences and to minimise the effects of those that do eventuate. As a Commonwealth body the Bureau has legislative authority to investigate cases involving all civilian aircraft and large marine vessels. It works independently of regulators such as the Civil Aviation Safety Authority, Airservices Australia, and the Australian Maritime Safety Authority.

Rail

ATSB's Rail Safety Unit will adopt a similar no-blame systems approach to rail safety investigations on the interstate rail track when Commonwealth legislation has been enacted. It currently investigates, if requested, on behalf of States and is establishing a national rail safety database.

Road

The Bureau's road safety activities include: the federal road safety Black Spots program; road safety research and statistical analysis; the National Road Safety Strategy; and vehicle recall investigations (reflecting the Commonwealth Government's responsibilities under the Trade Practices Act).

The Bureau works closely with the States and Territories, which investigate road accidents.

Road

AUSTROADS

AUSTROADS is the national association of road transport and traffic authorities. It provides strategic direction for the development, management and use of Australia's road system through consultation and discussion with peak industry bodies. The functions of AUSTROADS are coordination of research, and preparation of guides and standards for improvements in, and harmonisation of, practices within an agreed national policy framework. Its membership comprises the six Australian State and two Territory road authorities, the Commonwealth Department of Transport and Regional Services, the Australian Local Government Association and Transit New Zealand.

ARRB Transport Research Ltd

ARRB Transport Research Ltd is a leading provider of value added technology and research services addressing land transport problems. The company's National Strategic Research Program, performed under contract to AUSTROADS, keeps Australia at the leading edge of developments in the road transport industry.

ARRB Transport Research employs over 140 people who form a multidisciplinary pool of scientists, engineers, and specialist technical and support staff for infrastructure design, asset management, construction quality, materials testing, traffic operations, safety analysis, environmental sustainability, and freight issues.

The company has its headquarters in Melbourne, with extensive laboratory and testing facilities, and an office in Perth to service customers in Western Australia and the Indian Ocean Rim.

In addition to addressing Australia's transport problems, ARRB Transport Research has a rapidly growing export business, with products sold in over 60 countries.

National Road Transport Commission (NRTC)

The National Road Transport Commission (NRTC) is a small, independent body which was established in 1991. Its charter is to develop nationally uniform or consistent policies and practices that improve the safety and efficiency of road transport, and reduce its environmental impacts and the costs of administration. The NRTC and its national transport legislation were to have expired in January 1998 but have been extended until 2004.

Transport reforms are developed in close consultation with Commonwealth Government, the State and Territory Governments, the road transport industry, road user groups and other interested persons and organisations, for approval by Australia's Transport Ministers.

Rail

Australasian Railway Association

The Australasian Railway Association was founded in 1994 and provides leadership in promoting a competitive rail industry for the benefit of its members and the wider community. It currently represents 140 members from both the public and private sectors. It is now established as the peak industry body for the rail industry in Australia and New Zealand.

Water

Australian Maritime Safety Authority (AMSA)

AMSA is a government business enterprise established under the *Australian Maritime Safety Authority Act 1990* on 1 January 1991. AMSA is responsible, on behalf of the Commonwealth Government, for the regulation and safety oversight of Australia's shipping fleet and management of Australia's international maritime obligations. AMSA is funded largely through levies on the shipping industry.

Air

Airservices Australia

Airservices Australia, established in July 1995 under the *Air Services Act 1995*, is a Government-owned commercial authority responsible for the management of air traffic control over 11% of the world's surface. Its principal functions are: air traffic control and airspace management; aeronautical information; communications; radio navigation aids; search and rescue alerting; and airport rescue and fire fighting services.

Airservices Australia works with other Government organisations concerned with aviation policy, safety and regulation in Australia, namely the Department of Transport and Regional Services, the Civil Aviation Safety Authority and the Bureau of Air Safety Investigation.

Airservices Australia has a prominent role in the implementation of the global Communications, Navigation and Surveillance/Air Traffic Management (CNS/ATM) system, which uses satellite technology to provide a more efficient air traffic system.

Civil Aviation Safety Authority (CASA)

CASA was established as an independent statutory authority on 6 July 1995. Its primary focus is delivering aviation safety to the Australian public. It does this by: setting aviation standards and rules; licensing pilots and aviation engineers; certifying aircraft and operators; carrying out safety surveillance; enforcing safety standards and rules; providing regulatory oversight of the national airways system, air traffic services and rescue and fire fighting services; and actively assisting the aviation industry to maintain high safety levels through education, training advice and consultation.

CASA reports to the Federal Minister for Transport and Regional Services.

International organisations

Australia is one of the 185 members (as at 31 July 2000) of the International Civil Aviation Organization (ICAO) and is a member of the 33 member governing Council. Australia is also represented on the 15 member Air Navigation Commission which is responsible for drafting international standards and procedures for the safety and efficiency of air navigation. In addition, Australia participates in the South Pacific Forum,

meetings of the Directors-General of Civil Aviation for Asia and the Pacific, and aviation-related work undertaken in APEC.

International agreements

As at 30 June 2000, Australia has air services agreements of full treaty status with 40 countries. Renegotiation of capacity and route rights has occurred under most of these to accommodate traffic growth on international routes to and from Australia. Agreements with 13 countries will be upgraded to treaty status once the draft agreements are incorporated into domestic law. Australia has four air services arrangements of less than treaty status.

These agreements and arrangements enable airlines of Australia and its bilateral partners to operate a network of international air services to and from Australia.

International Air Services Commission (IASC)

The International Air Services Commission (IASC) is an independent statutory authority responsible for the allocation of capacity negotiated under air services arrangements to existing and prospective Australian international carriers.

The Commission was established on 1 July 1992 following the decision to allow Australian airlines other than Qantas to fly internationally. The Government decided that the process of allocating capacity to Australian airlines should be at arms length from the negotiation function.

The IASC works within a legislative and policy framework laid down by the Government. Under the *International Air Services Act 1992*, the IASC objectives are to foster competition, consumer benefits, tourism, trade and the maintenance of competitive Australian airlines.

When considering applications for capacity, the Commission takes into account public benefit criteria outlined in a policy statement issued by the Minister for Transport and Regional Services.

Bibliography

ABS publications

Australian National Accounts: National Income, Expenditure and Product (5204.0).

Motor Vehicle Census, Australia (9309.0).

New Motor Vehicle Registrations, Australia, Preliminary (9301.0).

Survey of Motor Vehicle Use, Australia, Preliminary (9202.0).

Survey of Motor Vehicle Use, Australia (9208.0).

Information Paper: Motor Vehicle Use, Australia (9217.0).

Motor Vehicles In Australia, 1997 (9311.0).

Population Data—Estimated Resident Population, Australia (3201.0).

Other publications

Australian Transport Safety Bureau, *Road Injury Australia*.

Australian Transport Safety Bureau, *Road Fatalities Australia*.

Internet sites

Airservices Australia, *http://www.airservices.gov.au*

ARRB Transport Research Ltd, *http://www.arrb.org.au*

Australian Maritime Safety Authority, *http://www.amsa.gov.au*

Australian Transport Safety Bureau, *http://www.atsb.gov.au*

AUSTROADS, *http://www.austroads.com.au*

Bureau of Transport Economics, *http://www.dotrs.gov.au/bte*

Civil Aviation Safety Authority, *http://www.casa.gov.au*

Commonwealth Department of Transport and Regional Services, *http://www.dotrs.gov.au*

National Road Transport Commission, *http://www.trtc.gov.au*

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Introduction

This chapter begins with an article outlining the history of communications in Australia. It then addresses the performance of the closely related industries involved in communication services and information technology, and canvasses the use of information technology by businesses, governments, farms and households.

History of communications in Australia

(This article was provided by Communications Research Unit, Department of Communications, Information Technology and the Arts.)

Communications before Federation

From the earliest days of European settlement in Australia, communication services have been seen as the almost exclusive responsibility of government. For the first decades of British governance no reliable mail service existed on the new continent. Messages, both between the colonies and internationally, were sent primarily by an ad hoc system of favours and paid messengers. It was not until 1821 that the first regular postal service began, initially operating only within New South Wales. Even then there were no truly reliable postal services within the new colonies until 1832, when Tasmania established the first post office as a Government Department. The other colonies quickly followed and soon Australia's fledgling mail network was entirely run and regulated by government. This began a pattern that was to dominate the communication industry for the next 150 years—almost complete government control of Australia's communications services.

The postal service within the colonies grew quickly, thanks mainly to the gold rush of the 1850s. As people flooded into Australia in search of fortune, sizeable townships built up where previously there had been nothing but the occasional squatter's hut. The sudden increase in population meant a need for more and better communications networks, and post offices began to spring up throughout the country. Soon every major rural centre had a postmaster of its own. These offices became an important part of the social system, providing a link to friends and family often many years distant. They also provided an important link to the authorities of the colonies, becoming the principal symbol of civil governance in the most isolated of areas.

However, in a country as large and isolated as Australia a communication system that relied on horseback could only go so far. When the telegraph first appeared in Europe in 1844, the young country was quick to adopt the new technology. Morse code was brought to Australia in 1853 by Samuel McGowan, and by 1859 telegraph cables linked Melbourne, Adelaide, Sydney and even Tasmania. By the mid-1860s all regional centres in the south east of the country were part of a virtually instantaneous communications network owned, maintained and managed by government. The final and most significant breakthrough was made in 1872, when Sturt's crossing of the Northern Territory enabled the establishment of Australia's first international telecommunications system, a telegraph link to Asia. This in turn linked Australia to the European and American lines, and the great southern land finally ended its isolation from the rest of the world.

Over the next few years Australia's dependence on the new telecommunications industry rapidly grew. The population quickly embraced all new technological developments in what would become the historical norm. In the final years of the nineteenth century Australia sent more telegraphs per capita than any other nation. Telephones quickly followed the telegraph, and in 1882 the first public telephone exchange, based in Sydney, made personal communication available to the average Australian, just six years after Alexander Graham Bell took out his patent.

The years up to WWII—from individual communications to the wireless

Over this period of rapid development the Australian Government had been careful to retain control over the development of the new systems. Adequate communication services

were widely regarded as the right of all Australians regardless of their geographical location, and government control was seen as the only way to ensure equity. With this in mind, section 51(v) of the Australian Constitution of 1901 gave power over all postal, telegraphic, telephonic and 'other like services' to the Federal Government. In 1901 the first Post Master General (PMG) was appointed to oversee communications throughout Australia. Government regulation of communications services at this time remained a relatively simple task—all communication was still made on a primarily individual basis and could be easily limited by infrastructure. The main focus was on modernisation, with developments such as the introduction of automatic telephone exchanges to replace cumbersome manual systems and the establishment of long-line 'trunk call' services to enable efficient personal interstate calls.

However, the introduction of the Marconi wireless radio system to Australia in 1905, just 10 years after its invention and four years after the first trans-Atlantic broadcast, was about to change all this. This marked the beginning of Australia's broadcasting industry, and the first time instant communication to the public at large was possible. The potential for wireless communication in a country as large and scarcely populated as Australia was immediately evident, and by the end of World War I government wireless stations were established along the entire Australian coastline. In 1922 Prime Minister Hughes made the first publicly available radio broadcast from a small hall in Bendigo, and by November 1923 the first radio services were broadcasting out of capital cities.

Private companies were quickly clamouring for a stake in the new wireless market. For the first time, the Government was faced with the problem of how to maintain the service standards central to Australian communications policy and yet allow growth in a new and important commercial industry. Just how could communication with an unlimited potential audience be regulated to maintain equity? After some experimentation with 'sealed' radios fixed to a certain frequency a dual system of public radio stations, funded by licence fees, and private radio stations, funded by advertising, was established. This led to the concept of a national radio service, and the first Australia-wide broadcasting service was established in 1928. In 1932, this service was replaced by the Australian Broadcasting Commission. Postal services kept pace with these developments; overseas airmail was introduced in 1934.

The 1950s, 60s and 70s—a communications explosion

Leading up to and immediately following World War II, the communications industry worldwide entered a period of extreme activity and technological development. Microwave radio, transistors, the first rockets and even early computers began to make an appearance. True to form, Australia was in the forefront of adopting these new developments. The first television broadcast was made from Sydney in 1956, and just six years later television was available in all capital cities except Darwin. The PMG even began to experiment with data services, sending computerised stock exchange and business information over the telephone system as early as 1964.

In the meantime, Australia was also developing its international telecommunications networks, taking advantage of all available technology to improve communications links with the rest of the world. The Overseas Telecommunications Commission (OTC) was established in 1946 to oversee Australia's international telecommunications services and their development towards world standards. It was becoming increasingly clear that traditional ground-based technology was not sufficient to bridge the great distances that separated Australia from the rest of the world. When the first international communications satellite, INTELSAT I, linked North America and Europe in 1965, OTC was already well into negotiations with the United States to launch a similar satellite providing links to the Southern Hemisphere. In 1966 INTELSAT II was launched, providing the first satellite link between Australia and the international telecommunications network. By 1968 the entire Australian telecommunications system was plugged into this network.

By 1975 it was becoming clear that telecommunications, even of the purely domestic variety, had grown into a large and important industry, entirely independent from postal services. INTELSAT II was being used to facilitate communication within Australia as well as overseas, and the PMG's Department was becoming increasingly stretched trying to perform its duties. The Government restructured the Australian communications bodies: OTC

would remain responsible for Australia's international telecommunications; the PMG would handle all postal and delivery services; and a newly established authority, the Australian Telecommunication Commission, would take control of all public telecommunication services. Telecom, Australia's own telecommunications giant, was born.

The 1980s—communications access for all Australians

Australia now had a fully-fledged communications industry, well up to world standards in the areas of international satellite and telephone technology. However, domestic communication services remained erratic. While the capital cities had television, radio and high quality telephone services, many rural communities struggled on without an adequate phoneline. Ironically, it was often easier for a Sydney caller to reach London than outback New South Wales. So in 1960 the PMG made a firm policy commitment—while Australia's international telecommunications industry would continue to be developed, the main focus, for as long as was necessary, would be upon providing modern communication services to all Australians. The policy went into effect and huge development projects were implemented. The crucial step came in 1985, with the launching of Australia's first geostationary communications satellite by AUSSAT, the organisation established in 1981 to oversee Australia's satellite system. By 1987 all areas in Australia had basic telephone services, no matter how remote. Australia had achieved telecommunications maturity, with all Australians linked by a single infrastructure.

And not a moment too soon. Over the next decade information and telecommunications industries worldwide would change rapidly, and the quality of Australia's domestic telecommunication services was to be crucial in the nation's participation in this new economy. This change would be brought about by the proliferation of new technology that made the instantaneous exchange of information as easy as pushing a button. This was, of course, the birth of the Internet.

Advent of the Internet

In theory, an early form of the Internet has been in existence since the early seventies, when the Defence Advanced Research Projects Agency Network (DARPAnet), was set up as an experiment by the United States military. Indeed, Australia has had its own computer information network running between selected Australian universities and research institutions since the late seventies, and the Australian top level domain, .au, has existed since 1984. However, it was not until 1990 that the international computer network began to attract popular attention, with the establishment of the World Wide Web by a server just outside Geneva. This new information forum was instantly linked via satellite to Australia's own fledgling Internet system, Australian Academic and Research Network (AARNet). Australia's first commercial Internet provider, connect.com.au, opened for business in 1992, and Internet addresses became widely available to the Australian public in 1993. Finally, in 1995 control over all interstate and international web links was handed over to the Government by the Australian Vice-Chancellor's Committee, in acknowledgment that the Internet had become an important part of the public Australian communications industry.

The 1990s—opening up the communications market

As Australia entered the final decade of the century, having achieved basic access for all Australians and in view of the growing importance of telecommunications in the international marketplace, the Government changed the focus of its communications policy. The emphasis would now be upon developing Australia's telecommunications system for the future, making it a world leader, not just world class, in industry as well as deliverance. Australia was in an ideal position to embrace and take advantage of the developments taking place internationally with the rise of the Internet—its infrastructure was new, complete and of world standard.

As telecommunications developed into an increasingly lucrative commodity, a growing international trend had emerged towards industry competition and, as part of this competition, towards privatisation. Traditionally, the telecommunications providers of all the major developed nations had been highly regulated government-owned monopolies. Since the early seventies this regulation had been gradually reduced in many nations to encourage marketplace development. Many telecommunications institutions had been fully or partially sold off by their governments. Over this period the

possibility of deregulation and privatisation had frequently been discussed within Australia. However concerns, particularly the need to maintain an adequate and equitable standard of services for all Australians regardless of locality, had always prevented the topic from proceeding to a policy level.

With these developments in the world telecommunications market new concerns began to arise within Australia—concerns that Australia would be unable to remain competitive in the new economy unless it changed the structure of its communications industry. Market growth was necessary, and it was the opinion of an increasing number that the introduction of competition was the best way to achieve this. Yet this would require sweeping changes to the established industry, changes that carried with them a great deal of risk. If competition was introduced too quickly, and without due care, there was a genuine possibility that new entrants would flounder, causing the entire Australian telecommunications industry to become dangerously destabilised. Caution was warranted.

Mindful of this, in 1991 the Government passed a new Telecommunications Act. The Act introduced changes to the Australian telecommunications industry designed, all things going well, to eventually lead to the opening of the market to full-scale competition. As part of these changes Telecom and OTC were merged to form a single government player, the Australian and Overseas Telecommunications Corporation, renamed Telstra in 1993. In addition, after a long bidding process for a second telecommunications licence, a single private player, Optus, was allowed to enter the Australian telecommunications marketplace for national long distance and international telephone calls. Certain measures were set in place to enable Optus to gain a foothold beside the incumbent giant, including guaranteed access to Telecom's existing infrastructure on reasonable terms. All other players would be prevented from entering the general telephone market until 1997, at which time a thorough review of the effect of competition on the market would be completed. This began the Telecom/Optus duopoly that would dominate the Australian telecommunications industry for the rest of the decade.

Over the next few years further steps towards open competition were made. Optus began using its own infrastructure from 1993. On the recommendation of Austel, the independent industry regulator introduced in 1990, Vodafone was permitted to enter the mobile telephony market with an exclusively digital licence in 1992. This added a third player to the emerging mobile industry, as Telecom had been providing mobile services since 1987 and Optus had been allowed to buy AUSSAT's assets and begin mobile telephony as part of the general duopoly deal of 1991. It also laid the ground work for the compulsory conversion to digital technology currently taking place across the industry—Vodafone agreed to accept the exclusively digital licence on the sole proviso that the analogue mobile system being used at the time would eventually be phased out, placing it on equal footing with the major players.

All of these gradual changes had one principal aim: to test the waters of competition in the Australian telecommunications industry in a carefully monitored and relatively stable environment. The 1991 Act declared that if a review pronounced the experiment a success full-scale competition would be introduced by 1997. As 1997 rolled round the review was completed, giving a positive, if slightly tentative, verdict. Optus had suffered some difficult periods struggling against the marketplace dominance of Telstra, but was now performing strongly. Telecommunications had become the fastest growing industry in Australia.

On 1 July 1997, the industry was opened up to full competition. All limitations on the number of licensed players were removed and anti-competitive conduct was prohibited. Telecommunications regulation was aligned with general competition law, with the Australian Competition and Consumer Commission overseeing competition policy regulation across all sectors. The Australian Communications Authority still provided some technical regulation, but the main emphasis was on encouraging industry self-regulation. The Australian Communications Industry Forum was established as an industry body to facilitate and manage this regulation, including the development of codes of practice and technical standards. To allay concerns regarding the maintenance of service standards, legislative safety nets were introduced, ensuring that the Universal Service Obligations that had always applied to Telstra would now also apply to the new telecommunications providers. These obligations aim to guarantee the rights of end users and ensure that the lucrative urban market is not developed at the expense of the rural market.

The final, and most controversial, move towards an open market in telecommunications came with the partial privatisation of Telstra in September 1997. The initial sale, which placed 16.6% of Telstra's shares on the open stock exchange, was the outcome of many years of debate and negotiation. It followed the trend towards partial sale of public telecommunications providers that had been taking place internationally for the last decade. At the time the decision was highly controversial, and the effect upon service and competition is still debated today. However, as a business move alone, the sale proved highly successful, with Telstra now ranking as the most valuable telecommunications company of its size internationally. The sale was also a financial success for the Government, and a further 33.3% of the company was sold off in 1999, bringing the privately owned portion of Telstra to 49.9%.

Looking back—and forward

This gradual move towards open competition in telecommunications can be seen as merely part of a general restructuring that has been taking place across the Australian communications industry for decades. Media ownership legislation, particularly regarding cross-media ownership, has been constantly debated and amended since 1986. The laws governing foreign investment in the Australian media and communications industries have been loosened. New markets have emerged, with varying success. E-commerce has become the wave of the future, with 13% of small and medium businesses already participating in this new forum and a further 36% expecting to move online within the next year. The introduction of pay television with the launching of Australis Television in 1995, however, has been far less successful. For the first time a prominent new service has failed to be immediately embraced by the Australian population. Five years down the track Australis has gone into receivership and all of the major players that have entered the market since, including both Telstra and Optus (now Cable and Wireless Optus), have yet to show a profit. However, even in the world of pay television all is not dark; despite poor economic turnover, the rate of subscription takeup is actually quite high compared to international historical standards.

For the moment, the communications industry in Australia continues to grow at an increasing rate. Since its complete deregulation in 1997 over 30 players have entered the telecommunications market. Australia has one of the highest levels of mobile telephone ownership in the world, and is second in Internet takeup rate only to the United States. And growth does not look like stopping. Australia is still rapidly embracing new technology, with mobile telephones going exclusively digital this year and digital television to be introduced next year. Controversy still continues—the debate over the form the new digital television system will take has been running for years. However, this is inevitable if growth is to continue. Australia has developed into a world leader in communications industries and will continue to develop as the new century progresses.

The communication services industries

The communication services industries encompass telecommunication services, and postal and courier services. These industries comprise the Communication Services Division of the *Australian and New Zealand Standard Industrial Classification (ANZSIC).*

The telecommunication services industry is made up of businesses mainly providing telecommunication services to the public by wire, cable or radio. The primary activities of the industry include cable and communication channel services, network communication services, operation of radio relay stations, satellite communication services, telecommunications, telephone services, teleprinter and telex services, and operation of television relay stations.

The industry excludes businesses which manufacture telecommunications equipment, businesses engaged in cable laying and transmission line construction, and those providing secretarial services (e.g. personalised telephone answering services or message delivery services). Also, the ABS classifies the provision of radio and television services (as distinct from the operation of radio and television relay stations) as part of the Cultural and Recreational Services Division of the ANZSIC. Information on radio and television broadcasting, including the role of the National Transmission Agency, the Australian

Broadcasting Corporation, the Special Broadcasting Service and commercial radio and television services, is included in *Chapter 12, Culture and recreation*.

Table 24.1 shows key measures of industry structure and performance for the Communication Services Division as a whole, compiled from the ABS's annual Economic Activity Survey. As can be seen from the table, by some measures the communication services sector overall has been one of the fastest growing in Australia. For example, sales grew from $17b in 1993–94 to over $29b in 1998–99. Other measures have fluctuated over the years though most indicators for 1998–99 were positive:

- growth in the number of businesses continued to be strong, with increases of 16% in 1997–98 and 10% in 1998–99;
- employment reached a peak in 1995–96, declined in the following two years, but has had a small 1% increase in 1998–99;
- gross operating surplus increased by 57% in 1997–98 but declined by 16% in 1998–99;
- pre-tax profit, after recovering in 1997–98, had a further 35% increase in 1998–99;
- net worth grew by 14% in 1998–99, following a 5% rise in 1997–98;
- capital spending has fluctuated over the years, but increased by 20% in 1998–99; and
- the gross product of the sector (the former measure of unduplicated output and of an industry sector's contribution to Gross Domestic Product) grew by 12% in 1994–95, by only 2% in 1995–96 but by 16% in 1996–97. For 1997–98 and following years the measure of unduplicated output has changed somewhat in line with international standards (see footnote (a) to table 24.1). The new measure, industry value added, still measures an industry's contribution to GDP. Industry value added for the communication services industries was a strong $19.2b in 1997–98 but fell by 14% to $16.5b in 1998–99.

24.1 COMMUNICATION SERVICES INDUSTRIES, Structure and Performance

	Unit	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99
Industry structure							
Businesses at 30 June	no.	1 400	1 955	2 362	3 048	3 539	3 886
Employment at 30 June	'000	117	127	137	125	117	118
Income statement							
Sale of goods and services	$m	17 463	19 883	21 623	23 698	24 813	29 273
Less cost of sales	$m	6 447	7 583	9 264	11 141	9 998	13 381
Trading profit	*$m*	*11 016*	*12 300*	*12 359*	*12 557*	*14 815*	*15 892*
Plus interest	$m	99	154	179	171	140	154
Plus other operating income	$m	167	252	624	77	n.p.	n.p.
Less labour costs	$m	5 529	6 451	6 273	6 606	6 120	5 526
Less depreciation	$m	2 348	2 572	2 791	3 026	3 090	3 483
Less other operating expenses	$m	172	200	142	443	n.p.	379
Earnings before interest and tax	*$m*	*3 233*	*3 483*	*3 956*	*2 731*	*n.p.*	*n.p.*
Less interest expenses	$m	762	615	723	742	n.p.	n.p.
Operating profit before tax	*$m*	*2 471*	*2 868*	*3 233*	*1 989*	*4 388*	*5 911*
Total assets	$m	26 713	32 094	34 371	37 965	38 814	41 938
Total liabilities	$m	13 457	17 814	17 729	23 715	22 816	24 808
Net worth	*$m*	*13 256*	*14 280*	*16 642*	*14 251*	*14 998*	*17 130*
Capital expenditure	$m	3 328	4 488	6 217	5 365	5 362	6 421
Gross operating surplus	$m	5 676	6 153	6 614	8 352	13 082	11 011
Industry gross product(a)	$m	11 205	12 605	12 887	14 957	. .	. .
Industry value added(a)	$m	. .	. .	. .	. .	19 203	16 537

(a) Starting with estimates for 1997–98, under the new international standard, the 1993 edition of the System of National Accounts (SNA93), the contribution to GDP by industries is measured by 'industry value added' (IVA). Estimates for IVA measure the value added by an industry to the intermediate inputs used by that industry. Previously the corresponding contribution to GDP was measured by 'industry gross product' (IGP). Further information on the changes to international standards can be found in the Information Paper: Implementation of Revised International Standards in the Australian National Accounts (5251.0).

Source: Business Operations and Industry Performance, Australia, Preliminary, 1998–99 (8142.0).

The information and communications technologies sector

The information and communications technologies (ICT) sector is that part of the economy which produces information and telecommunications goods and services. As such it overlaps with part of the Communication Services Division discussed above, but encompasses other industries as well. The ICT sector in Australia includes telecommunication services (see above), computer services, and selected manufacturing and wholesale trade industries.

Table 24.2 provides statistics for a selection of industries considered to be the predominant contributors to the production and distribution of ICT goods and services. The table is based on ABS surveys conducted for 1995–96 and 1998–99.

The Australian ICT sector has undergone significant change over the three years to 1998–99. Total income for the sector was approaching $63b in 1998–99, an increase of 28.0% over 1995–96. The ICT industries contributing to this outcome were telecommunication services with an increase in income of 39.2% since 1995–96 (for more detail see table 24.4), wholesale trade with a rise of 31.3%, computer services with a rise of 29.5% and manufacturing with a fall of 30.6%.

At June 1999, Australia's ICT sector consisted of 18,072 ICT businesses, an increase of 33.5% (or 4,537 businesses) since June 1996. This increase was mainly due to an increase of computer consultancy businesses. There were 199,341 persons working in ICT businesses at June 1999, a 2.1% decrease from 1996. However, employment increased in computer services by 35.2% and in wholesale trade by 0.8%, offset by decreases in manufacturing of 39.0% and telecommunication services of 18.8%.

Revenue from the domestic production of ICT goods and services in 1998–99 was nearly $40b, 27.9% higher than in 1995–96. Telecommunication services (rise of 39.9%) and packaged software and computer services (rise of 32.2%) recorded large increases. However, production of manufactured ICT goods decreased by 24.0% or $1.2b over the three year period. The decline in domestic production of manufactured ICT goods was offset by a 20.8% or $1.9b increase in imports of these products.

24.2 INDUSTRIES IN THE ICT SECTOR, Income and Employment

	Total income			Employment		
	1995–96	1998–99	Percentage change	1995–96	1998–99	Percentage change
Industry	$m	$m	%	no.	no.	%
Manufacturing						
Computer and business machines	1 934.5	1 146.4	–40.7	5 755	2 461	–57.2
Telecommunication, broadcasting and transceiving equipment	1 659.7	1 507.7	–9.2	7 335	5 125	–30.1
Electronic equipment n.e.c.	99.1	344.8	247.9	836	1 959	134.3
Electric cable and wire	1 072.5	307.3	–71.3	3 369	997	–70.4
Total	*4 765.8*	*3 306.2*	*–30.6*	*17 295*	*10 542*	*–39.0*
Wholesale trade						
Computers	12 254.9	15 748.4	28.5	26 599	27 212	2.3
Business machines and electrical and electronic equipment n.e.c.	5 070.9	7 004.0	38.1	13 030	12 725	–2.3
Total	*17 325.8*	*22 752.4*	*31.3*	*39 629*	*39 936*	*0.8*
Telecommunication services	18 733.7	26 083.0	39.2	91 701	74 467	–18.8
Computer services						
Data processing	924.7	n.p.	n.p.	5 291	7 174	35.6
Information storage and retrieval	180.0	99.8	–44.6	994	908	–8.7
Computer maintenance	902.7	n.p.	n.p.	5 032	2 519	–49.9
Computer consultancy	6 080.4	8 680.4	42.8	43 711	63 794	45.9
Total	*8 087.8*	*10 474.0*	*29.5*	*55 028*	*74 395*	*35.2*
Total	**48 913.1**	**62 615.5**	**28.0**	**203 653**	**199 341**	**–2.1**

Source: Information Technology, Australia (8126.0).

24.3 ICT GOODS AND SERVICES, Domestic Production and Imports

	Domestic production			Imports		
	1995–96	1998–99	Percentage change	1995–96	1998–99	Percentage change
Industry	$m	$m	%	no.	no.	%
Computer/telecommunications equipment, etc.	4 805.1	3 649.7	–24.0	8 904.3	10 756.9	20.8
Packaged software and computer services	8 582.6	11 342.3	32.2	744.6	1 310.1	75.9
Telecommunication services	17 773.0	24 871.5	39.9	1 060.0	1 467.0	38.4
Total	**31 160.6**	**39 863.5**	**27.9**	**10 708.9**	**13 534.0**	**26.4**

Source: Information Technology, Australia (8126.0).

Telecommunication services within Australia

The telecommunications environment in Australia

On 1 July 1997, the Australian Communications Authority (ACA) was formed by the merger of the Australian Telecommunications Authority and the Spectrum Management Agency. The ACA, along with the Australian Competition and Consumer Commission (ACCC), is responsible for administering the telecommunications industry and the radiocommunications community under legislation passed in March 1997. This allows Australia to take advantage of the social and economic opportunities presented by technological developments in the communication services industry as well as providing an environment of competition in the telecommunication services industry, reinforcing consumer protection arrangements and reforming technical regulation in the communication services industry.

Role of the Australian Communications Authority

The ACA is responsible for regulating telecommunications and radiocommunications, including promoting industry self-regulation and managing the radiofrequency spectrum. The ACA also has significant consumer protection responsibilities. The ACA was established under the *Australian Communications Authority Act 1997*, and exercises powers under the *Telecommunications Act 1997*, the *Radiocommunications Act 1992*, and other related legislation.

The ACA licenses telecommunications carriers, ensures compliance with carrier licence conditions and service provider rules, and monitors service performance and quality. The ACA also administers legislative provisions relating to powers and immunities of carriers in the construction of telecommunications facilities, and protection of consumers through safeguards and service guarantees. The Universal Service Obligation (USO) is administered by the ACA to ensure reasonable and equitable access across Australia to standard telecommunication services. Under the USO, Telstra is obliged to ensure that standard telephone services and pay phones are reasonably accessible to all people in Australia on an equitable basis, wherever they reside or carry on business. The ACA also manages the National Numbering Plan and information programs on key issues affecting consumers.

Industry self-regulation is encouraged through the development of voluntary industry codes of practice and technical standards, and the Australian Communications Industry Forum (ACIF) was established by the communication services industry to support this process. The aim of self-regulation is to encourage industry to respond to customer needs without first having to overcome excessive regulatory restrictions. When a code fails or proves inadequate, the ACA is empowered to intervene and enforce a code or develop a mandatory standard. In this environment of industry self-regulation, the Customer Service Guarantee (CSG) and the Universal Service Obligation (USO) provide for consumer protection. Under the CSG, telephone subscribers are legally entitled to claim compensation from carriage service providers (CSPs) who fail to keep appointments, provide service connections, repair faults and provide certain other services, within set timeframes.

Access to the radiofrequency spectrum is facilitated by the ACA through licensing, managing interference and ensuring industry compliance with mandatory standards and conditions. Spectrum auctions are used in areas of spectrum scarcity and high market demand as a means of allocating spectrum fairly and efficiently. The ACA also advises on the use of

telecommunications and the radiofrequency spectrum and investigates interference complaints.

The ACA monitors compliance with technical standards for communications equipment and cabling, including the new standard for electromagnetic radiation, and for electromagnetic compatibility of electrical and electronic equipment. The ACA is also responsible for standards protecting the integrity of communications networks and the interoperability of the standard telephone service.

The ACA represents Australia's communications interests internationally through its membership of the International Telecommunication Union, the Asia-Pacific Telecommunity and other appropriate bodies.

Role of the Australian Competition and Consumer Commission in telecommunications

The ACCC was formed in November 1995 by the merger of the Trade Practices Commission and the Prices Surveillance Authority. It administers the *Trade Practices Act 1974* and the *Prices Surveillance Act 1983* and has additional responsibilities under other legislation. The ACCC's telecommunications group has prime responsibility for administering the Commission's functions for competition and economic regulation of telecommunications which include:

- administering telecommunications-specific competitive safeguards, which enables the Commission to deal with anti-competitive conduct by carriers and carriage service providers as well as allowing it to issue tariff filing directions and record-keeping rules to assist with its telecommunications powers and functions;
- administering the telecommunications-specific regime for facilitating access to the networks of carriers. This includes declaring services for access, approving access codes, approving access undertakings, arbitrating disputes for declared services and registering access agreements; and
- administering other legislative provisions in the Telecommunications Act and other related legislation, including in relation to price control of Telstra's retail services, international conduct rules, number portability, electronic addressing, interconnection standards and arbitration of disputes about access to network information, access to facilities, operator services, directory assistance services, provision of number portability, preselection, emergency call services and carriage services for use by the Defence forces.

Telecommunication services industry

Major changes have been occurring in the telecommunication services industry as a result of the 1997 legislative changes, particularly the deregulation of the telecommunications market and the introduction of open competition. The *Telecommunications Act 1997* allows any person to provide a range of telecommunication services, provided they comply with the provisions of the Act. Providers may use telecommunications capacity acquired from a licensed carrier or, in defined circumstances, from non-carrier infrastructure, to supply a range of local or national telecommunication services to consumer and commercial markets. Service providers typically purchase network capacity from carriers at discounted rates. In theory this allows them to provide either similar services at competitive prices or a variety of value-added services. These services include basic telephony services, mobile phone services, data and value-added services, Internet services and other telecommunication services.

The number of licensed telecommunication carriers operating in Australia has increased from 3 at June 1997, to 21 at June 1998, to 29 at June 1999 and to 45 at June 2000. At September 2000 there were 51 licensed telecommunication carriers. At June 1999, there were around 850 service providers, over 520 of these being Internet service providers. This was a substantial increase since June 1997, when there were just over 400 service providers, just over 300 of these being Internet service providers. These numbers exclude businesses for which telecommunication service provision was a minor part of their business operation.

Table 24.4 shows summary indicators of the performance of the telecommunication services industry from surveys conducted in 1995–96, 1996–97 and 1998–99. The strong growth in this industry is demonstrated by the growth in total income by 24.6% or $5.2b over the three years to 1998–99, to reach a little over $26b.

24.4 TELECOMMUNICATION SERVICES INDUSTRY, Summary Indicators

Indicator	Units	1995–96	1996–97	1998–99
Businesses at 30 June	no.	410	411	869
Employment at 30 June(a)	no.	91 701	79 654	74 467
Income from ICT services	$m	17 937.5	19 761.9	25 071.4
Total income	$m	18 733.7	20 927.2	26 083.0
Total expenses	$m	15 933.6	19 458.2	20 601.5
Operating profit before tax	$m	2 781.5	1 472.8	5 549.2

(a) Employment data exclude some staff not predominantly engaged in the telecommunication services industry.

Source: Telecommunication Services, Australia (8145.0).

Postal communications

Australian Postal Corporation

The Australian Postal Corporation (trading as Australia Post) is a government business enterprise owned by the Commonwealth of Australia. It operates under the *Australian Postal Corporation Act 1989*. Australia Post is independent of Government funding, achieves a substantial profit from its activities, and pays a full range of taxes and charges. In 1998–99, Australia Post paid $310m in taxes and government charges ($295m in 1997–98).

Australia Post offers letter and parcel delivery services within Australia and internationally. It also provides a range of related services including electronic bulk mail handling, advertising mail, bill payment, money order and banking services, express delivery services and philatelic products and services.

Australia Post's legal obligations require it to:

- provide Australians with a universal letter service;
- carry standard letters within Australia at a uniform price;
- ensure that the letter service meets the social, industrial and commercial needs of the community;
- perform its functions according to sound business practice; and
- perform its functions consistent with the Commonwealth's general policies.

Financial and other operating statistics for Australia Post are shown in tables 24.5, 24.6 and 24.7.

24.5 AUSTRALIAN POSTAL CORPORATION, Consolidated Financial Statement

	1995–96	1996–97	1997–98	1998–99
	$ MILLION			
Revenue	2 915.8	3 123.6	3 300.3	3 448.7
Expenditure	2 576.3	2 787.0	2 923.9	3 074.4
Operating profit before abnormals and tax	368.0	353.1	335.2	373.0
Dividends	142.6	219.9	215.1	148.7
Total taxes and government charges(a)	305.9	307.6	294.6	309.5
Cost of Universal Service Obligation(b)	72.0	67.0	71.0	70.0
Total assets(c)	2 382.0	2 588.6	2 735.8	2 853.5
	PER CENT			
Return on assets(d)	16.6	15.1	13.4	14.6

(a) Includes sales tax and customs duty, payroll tax, local government taxes and charges, federal excise duty, and fringe benefits tax. (b) The Universal Service Obligation ensures that all Australians have reasonable access to the letter service; this includes the delivery of standard letters by ordinary post at a uniform price even when the delivery cost is higher. (c) At 30 June of the financial years shown. (d) Operating profit before net interest and income tax divided by average total assets.

Source: Australian Postal Corporation.

24.6 AUSTRALIAN POSTAL CORPORATION, Mail Delivery Network and Post Outlets

	1995–96	1996–97	1997–98	1998–99
	no.	no.	no.	no.
Households receiving mail	7 131 522	7 387 216	7 348 319	7 668 143
Businesses receiving mail	789 100	822 949	822 412	838 009
Total delivery points	**7 920 622**	**8 210 165**	**8 170 731**	**8 506 152**
Corporate outlets and licensed post offices	3 957	3 934	3 922	3 903

Source: Australian Postal Corporation.

24.7 AUSTRALIAN POSTAL CORPORATION, Total Postal Articles Handled

	1994–95	1995–96	1996–97	1997–98	1998–99
	million	million	million	million	million
Posted in Australia for delivery in Australia	3 529.9	3 733.7	3 888.1	4 046.1	4 188.0
Posted in Australia for delivery overseas	146.4	159.1	157.3	165.1	168.6
Posted overseas for delivery in Australia	151.4	154.6	160.3	160.8	164.2
Total articles through mail network	**3 827.7**	**4 047.4**	**4 205.7**	**4 372.0**	**4 520.8**

Source: Australian Postal Corporation.

Use of information technology

Business use of information technology (IT)

At the end of June 1998, 63% of all employing businesses in Australia used personal computers (PCs). The corresponding figure for the end of June 1994 was 49%. Of the businesses with PCs at the end of June 1998, almost half had Internet access (29% of all businesses) and about a third had local area networks (LANs) and/or wide area computer networks (WANs) (20% of all businesses).

There were three PCs for every ten persons employed. The ratio of PCs to PC users was higher, with eight PCs for every ten users. Employees providing in-house or external information technology and telecommunication (IT&T) services accounted for 2% of total employment. On average, every in-house IT&T employee supported 22 PC users.

Of the businesses without PCs at the end of June 1998, 11% (24,000 businesses) intended to acquire them within the next 12 months, while 19% of businesses without Internet access (83,000) intended to acquire access within the 12 months to June 1999. If reported intentions were realised, by the end of June 1999, 43% of businesses would have had Internet access. Of businesses without an Internet site/home page at the end of June 1998, 16% (88,000 businesses) intended to establish one by the end of June 1999.

IT use by industry

PC use was proportionately highest in mining, and property and business services (each 78%) (table 24.8). While overall PC use in communication services was 73%, the telecommunication services component reported 100% use. PC use was lowest in the personal and other services industry (42%) and the accommodation, cafes and restaurants industry (45%). The proportion of businesses using LANs or WANs was consistently higher in industries with a high incidence of PC use. Access to the Internet, email and/or Web browsers was highest in industries with the highest proportion of PC use.

24.8 SELECTED IT&T USE, By Industry—June 1998

	Businesses at end June 1998			
	Personal computers	LAN/WAN	Internet access	Email access
Industry	%	%	%	%
Mining	78	38	46	45
Manufacturing	69	21	31	29
Electricity, gas and water supply	n.a.	n.a.	n.a.	n.a.
Construction	54	7	17	16
Wholesale trade	74	30	38	38
Retail trade	54	17	17	17
Accommodation, cafes and restaurants	45	8	14	12
Transport and storage	54	15	20	19
Communication services(a)	73	*17	45	45
Finance and insurance	74	27	39	37
Property and business services	78	30	44	43
Health and community services	69	20	33	32
Cultural and recreational services	64	18	33	33
Personal and other services	42	12	20	20
Total	**63**	**20**	**29**	**28**

(a) Includes telecommunication services, and postal and courier services.

Source: Business Use of Information Technology, Australia, 1997–98 (8129.0).

IT use by size of business

The proportion of businesses using PCs increased with the size of the business. At the end of June 1998 all businesses with 100 or more employees used PCs, and 86% of businesses were connected to a LAN or WAN (table 24.9). In contrast, only 55% of businesses employing 1–4 persons used PCs, with a fifth of these businesses connected to a computer network (11% of all businesses of this size). Larger businesses were more likely to have Internet and email access. Of businesses employing 100 or more persons, 87% had Internet access. This compares with 24% of businesses employing 1–4 persons, 32% of businesses employing 5–19 persons and 56% of businesses employing 20–99 persons.

Government use of information technology

At the end of June 1998, almost all government entities used PCs (97%) (table 24.10). An estimated 73% of all government organisations had access to the Internet and 37% had an Internet site/home page. Rates of Internet use and Internet presence were considerably higher for the larger Commonwealth and State entities. While 89% of Commonwealth entities and 77% of State entities employing 20 or more persons reported an Internet presence, the proportion for local government was 28%.

Of government organisations without Internet access at 30 June 1998, 57% intended to obtain it within the next 12 months. Of those organisations without an Internet site/home page, 52% intended to establish one by 30 June 1999.

24.9 SELECTED IT&T USE, By Employment Size of Business—June 1998

	Employment size				
	1–4 persons	5–19 persons	20–99 persons	100 or more persons	Total
Employing businesses with	%	%	%	%	%
Personal computers	55	75	91	100	63
LAN/WAN	11	32	50	86	20
Internet access	24	32	56	87	29
Email access	23	31	54	85	28

Source: Business Use of Information Technology, Australia, 1997–98 (8129.0).

24.10 SELECTED IT&T USE, By Government—June 1998

	Government entities at end June 1998					
Level of government	Personal computers %	LAN/ WAN %	Internet access %	Email access %	Restricted Internet access %	Web site/ home page %
Commonwealth departments and agencies	100	99	100	99	22	89
State/Territory departments and agencies						
1–19 persons	100	62	62	62	**6	*31
20 or more persons	100	99	97	96	35	77
Total	*100*	*86*	*85*	*85*	*26*	*61*
Local government	100	84	77	76	17	28
Other government entities	94	46	60	60	10	21
Total	**97**	**69**	**73**	**73**	**16**	**37**

Source: Government Use of Information Technology, Australia, 1997–98 (8119.0).

Farm use of information technology

The ABS's Agricultural Commodity Survey is an annual collection which surveys farms with an estimated value of agricultural operations (EVAO) of $5,000 or more. The 1997–98 and 1998–99 surveys included questions on access to computers and the Internet. They showed that 49% of farms had a computer at March 1999, a significant growth from March 1998 when 40% of farms had a computer (table 24.11). The Northern Territory had the highest proportion of farms with computers at March 1999 (65%) while Queensland had the lowest (45%).

Nearly 18% of farms were connected to the Internet at March 1999. This compares with only 11% a year earlier. The Northern Territory had the highest proportion of farms with Internet access (31%) at March 1999 and Queensland the lowest (16%).

Large farming operations were more likely to use a computer or the Internet than smaller farms. For instance, 69% of farms with an EVAO of $250,000 or more used a computer and 26% had Internet access at March 1999.

Household use of information technology

At May 2000, 54% of households (3.8 million) had a computer, an 18% increase over May 1999. About one-third (33%) of households (2.3 million) had Internet access, a 53% increase over May 1999 (graph 24.12). The graph also shows estimates for households with a home computer and those with Internet access at May 2001 based on the reported intentions of those households without either at May 2000. On that basis a little over 60% of households are expected to have a home computer and almost 50% are expected to have Internet access.

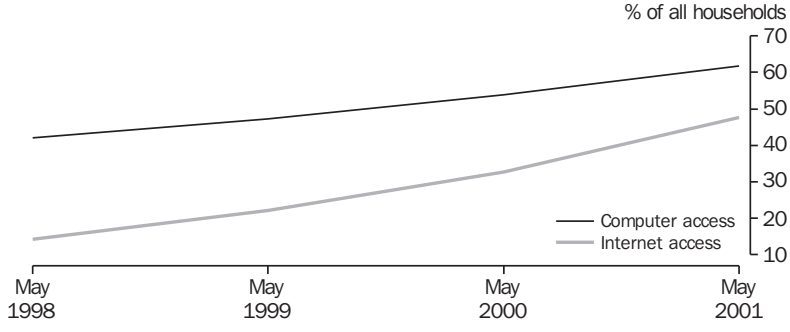
24.11 FARM COMPUTER AND INTERNET ACCESS(a), By State/Territory

	NSW %	Vic. %	Qld %	SA %	WA %	Tas. %	NT %	ACT %	Aust. %
March 1999									
Farms with a computer	49.0	48.5	44.7	52.7	58.9	48.7	65.0	63.8	49.3
Farms with Internet access	18.7	16.6	15.6	19.1	18.1	21.7	30.7	26.1	17.6
March 1998									
Farms with a computer	39.8	36.9	36.5	43.1	49.0	35.9	52.0	55.1	39.5
Farms with Internet access	11.8	9.9	9.9	12.0	10.2	12.3	21.5	19.9	10.8

(a) Estimates are sourced from the Agricultural Commodity Survey, reference periods March 1998 and March 1999.

Source: Use of Information Technology on Farms, Australia, 1998–99 (8150.0).

24.12 HOUSEHOLD COMPUTER AND INTERNET ACCESS—May 1998 to May 2000 and Projected to May 2001



Source: Use of the Internet by Householders, Australia, May 2000 (8147.0).

Regional differences

Table 24.13 shows the distribution by State/Territory for 1999. These statistics are an average of the results from the four surveys conducted during 1999. The ACT had by far the highest penetration rate for both computers and the Internet (68% and 35% respectively). Tasmania had the lowest for both (41% and 18% respectively).

At May 2000, slightly more households in capital cities had a computer (56%) than households in other areas of Australia (51%) (table 24.14). The proportion of households with Internet access is increasing rapidly in both the capital cities and in other areas of Australia. By May 2000, 37% of households in capital cities had home Internet access, an increase of 12 percentage points over May 1999. Of households in other areas of Australia, 26% had access to the Internet at home by May 2000, an increase of 9 percentage points over May 1999.

Characteristics of households with home Internet access

Households with children and those on higher incomes ($50,000 or more) were more likely to have access to computers and the Internet at home (table 24.15).

24.13 HOUSEHOLD COMPUTER AND INTERNET ACCESS(a), By State/Territory(b)—1999

	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT
	%	%	%	%	%	%	%	%
Households with a home computer	47	51	45	46	51	41	54	68
Households with Internet access	22	23	21	20	23	18	29	35

(a) Proportions are of all households. (b) State/Territory data are not available on a quarterly basis. These estimates average the results from quarterly household surveys undertaken during 1999.

Source: Household Use of Information Technology, Australia, 1999 (8146.0).

24.14 HOUSEHOLD COMPUTER AND INTERNET ACCESS(a), By Capital City/Rest of Australia

	Computer access			Internet access		
	May 1998	May 1999	May 2000	May 1998	May 1999	May 2000
	%	%	%	%	%	%
Capital cities	45	52	56	18	25	37
Rest of Australia	37	39	51	8	17	26
Australia	**42**	**47**	**54**	**14**	**22**	**33**

(a) Proportions are of all households in each region.

Source: Use of the Internet by Householders, Australia, May 2000 (8147.0).

24.15 HOUSEHOLD COMPUTER AND INTERNET ACCESS, By Household Type(a) and Income(a)

	Computer access			Internet access		
	May 1998	May 1999	May 2000	May 1998	May 1999	May 2000
Household type	%	%	%	%	%	%
Households						
With children under 18	61	66	75	19	30	46
Without children under 18	31	36	42	11	17	25
Household income						
Under $50,000	27	30	37	6	10	18
$50,000 or more	68	70	75	28	39	51

(a) Proportions are of all households in each category.

Source: Use of the Internet by Householders, Australia, May 2000 (8147.0).

Characteristics of adult Internet users

An estimated 6.4 million adults in Australia (46% of all adults) accessed the Internet from any site (home, work or other site) at some time over the 12 months to May 2000 (table 24.16). The comparable figure for the 12 months to May 1999 was 5.5 million adults (41% of adults). In the 12 months to May 2000:

- 77% of 18–24 year olds accessed the Internet from any site, compared to 60% of 25–39 year olds, 45% of 40–54 year olds and 16% of adults aged 55 years and over;
- 51% of adult males and 41% of adult females accessed the Internet from any site;
- 59% of employed adults accessed the Internet from any site, compared to 23% of adults who were not employed; and
- 49% of adults in capital cities accessed the Internet from any site, compared to 40% of adults who resided in other areas.

Internet purchasing

About 6% of Australian adults (802,000) used the Internet to purchase or order goods or services for their own private use in the 12 months to May 2000. By comparison, in the 12 months to May 1999 an estimated 5% of Australian adults (650,000) purchased or ordered goods or services via the Internet.

In the 12 months to May 2000, adults made Internet purchases/orders for the following main items:

- books or magazines (by 36% of adult Internet shoppers);
- computer software (by 18%);
- music (by 18%);
- computer hardware (by 14%); and
- food and groceries (by 13%).

During this period, 81% of adult Internet shoppers paid for all or part of their purchases/orders on-line. The total amount of the purchases/orders made by each adult was $500 or less in over 70% of cases. Of adults making purchases/orders:

- 35% spent up to $100;
- 36% spent between $101 and $500;
- 17% spent between $501 and $1,000; and
- 11% spent more than $1,000.

Adults working from home

At May 2000, about 6% of employed adults reported that they had an agreement with their employer to work from home on an ongoing basis. To enable them to work from home, over a third (38%) of these adults had use of a portable PC. Almost a third (32%) of adults working from home were able to access their employer's computer system from home via a modem, with a similar proportion (31%) using floppy disks or CDs containing work-related information.

Adults making selected electronic transactions

In the 12 months to May 2000, only 8% of adults used the Internet to access government services. In the three months to May 2000, the same proportion (8% of adults) used the Internet to pay bills or transfer funds. In contrast, in the three months to May 2000, a little over half of all adults (51%) used the telephone to pay bills or transfer funds, two-thirds (67%) used EFTPOS and nearly three-quarters (74%) used ATMs.

24.16 ADULTS ACCESSING THE INTERNET(a)(b), Main Characteristics—May 2000

	Site of Internet access(c)			
	Home	Work	Other sites	Any site
Characteristic	%	%	%	%
Age (years)				
18–24	38	20	63	77
25–39	34	30	29	60
40–54	33	26	13	45
55 or over	12	6	4	16
Sex				
Males	33	24	25	51
Females	24	19	20	41
Employment status				
Employed	35	32	27	59
Not employed	15	. .	15	23
Region				
Capital cities	31	24	23	49
Rest of Australia	22	16	21	40
Total	**28**	**21**	**23**	**46**

(a) Proportions are of all persons in each category. (b) Internet access occurred during the preceding 12 months. (c) Persons can nominate more than one site if applicable.

Source: Use of the Internet by Householders, Australia, May 2000 (8147.0).

Bibliography

ABS publications

Business Operations and Industry Performance, Australia, Preliminary, 1998–99 (8142.0).

Business Use of Information Technology, Australia, 1997–98 (8129.0).

Computing Services Industry, Australia 1998–99 (8669.0).

Household Use of Information Technology, Australia, 1999 (8146.0).

Information Technology, Australia, 1998–99 (8126.0).

Government Use of Information Technology, Australia, 1997–98 (8119.0).

Telecommunication Services, Australia, 1996–97 (8145.0).

Use of Information Technology on Farms, Australia, 1998–99 (8150.0).

Use of the Internet by Householders, Australia, May 2000 (8147.0).

Other publications

Australia Post, *Annual Report 1998–99*.

Internet sites

Australian Communications Authority, *http://www.aca.gov.au*

Australian Competition and Consumer Commission, *http://www.accc.gov.au*

Commonwealth Department of Communications, Information Technology and the Arts (DOCITA), *http://www.dcita.gov.au*

Communications Research Unit (DOCITA), *http://www.dcita.gov.au/cru*

Australian Information Industries Association, *http://www.aiia.com.au*

National Office for the Information Economy, *http://www.noie.gov.au*

25 Science and innovation

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Introduction

The application of science and technological innovation to industrial processes influences the strength and competitiveness of industry by providing a basis for technological change and encouraging economic growth and development.

Australia has a range of statistics relating to science and innovation, many of which are compiled by the ABS. The key indicators relate to Australia's research and development (R&D) effort and the extent to which businesses innovate. Australia's statistics in this field are based on international standards, particularly the *Frascati Manual* developed by the Organisation for Economic Co-operation and Development (OECD), which is the basic international source of methodology for collecting and using R&D statistics.

A number of other indicators, notably patents and bibliometrics, are compiled by the Department of Industry, Science and Resources and are reported in the Commonwealth Government's *Science and Technology Statement*. These indicators have not been included in this chapter.

Expenditure and human resources devoted to R&D

The OECD defines R&D to comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of people, culture and society, and the use of this stock of knowledge to devise new applications.

Statistics on the amount of expenditure and human resources devoted to R&D in the business sector are collected annually. Comparable statistics on the higher education, government and private non-profit sectors are collected biennially. Tables 25.1 and 25.2 summarise the latest statistics available.

25.1 EXPENDITURE ON R&D, By Sector

	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99
	$m	$m	$m	$m	$m	$m
Business	3 119.2	3 508.3	4 365.8	4 246.9	4 202.8	3 991.7
Government						
Commonwealth	n.a.	1 193.3	n.a.	1 264.2	n.a.	1 192.6
State	n.a.	782.8	n.a.	812.7	n.a.	879.0
Total	n.a.	*1 976.0*	n.a.	*2 076.9*	*n.a.*	*2 071.6*
Higher education(a)	n.a.	1 829.6	2 039.1	2 307.6	n.a.	2 602.7
Private non-profit	n.a.	152.7	n.a.	173.4	n.a.	183.9
Total	**n.a.**	**7 466.6**	**n.a.**	**8 804.8**	**n.a.**	**8 850.0**

(a) Data for the calendar year ending within the financial year shown.

25.2 HUMAN RESOURCES DEVOTED TO R&D, By Sector

	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99
	'000 person years	'000 person years	'000 person years	'000 person years	'000 person years	'000 person years
Business	23.7	25.8	27.2	26.5	24.5	24.2
Government						
Commonwealth	n.a.	10.7	n.a.	10.3	n.a.	9.4
State	n.a.	8.6	n.a.	9.0	n.a.	9.5
Total	n.a.	*19.3*	n.a.	*19.4*	*n.a.*	*18.9*
Higher education(a)	n.a.	40.1	n.a.	42.7	n.a.	45.5
Private non-profit	n.a.	1.7	n.a.	2.2	n.a.	2.1
Total	**n.a.**	**87.0**	**n.a.**	**90.8**	**n.a.**	**90.7**

(a) Data for the calendar year ending within the financial year shown.

Expenditure on R&D—how does Australia compare internationally?

The most commonly used indicator for comparison purposes is the ratio of expenditure on R&D to Gross Domestic Product (GDP). As table 25.3 shows, in 1998–99 Australia spent 1.49% of its GDP on R&D, ranking it below Japan (3.06%), Finland (2.90%), the United States (2.74%), Korea (2.52%), Germany (2.29%), France (2.18%), Iceland (2.01%), Denmark (1.92%), the United Kingdom (1.83%) and Canada (1.64%).

In terms of business enterprise R&D, Australia's ratio of R&D expenditure to GDP (0.67%) is again below the ratios for the industrialised countries referred to earlier, and is also below the rate for the Czech Republic.

For government sector R&D as a percentage of GDP, Australia ranks higher. A ratio to GDP of 0.35% places it fifth in the group of OECD member countries for which data are available, behind only Iceland (0.75%), Korea (0.44%), France (0.43%) and Finland (0.37%). Government sector R&D as a percentage of GDP is much higher for Australia than for the United States and Canada.

For the higher education sector, Australia also ranks highly. With a ratio to GDP of 0.44%, Australia ranks behind only Finland (0.57%), Iceland (0.50%) and Japan (0.45%) among OECD countries.

Sources of funds for expenditure on R&D

In 1998–99, the business sector funded 45% of all Australian R&D. This compares with 33% recorded in 1988–89. The Commonwealth Government funded 40% of R&D in 1998–99 (down from 49% in 1988–89) and the State Governments funded 8% (down from 15% in 1988–89).

In 1998–99, 92% of funding for R&D carried out by businesses came from the business sector. It has remained at about this level for the preceding decade. Commonwealth government organisations provided 3% of funding for business R&D expenditure in 1998–99.

About 83% of Commonwealth government sector R&D was funded by Commonwealth government organisations in 1998–99. The Commonwealth government proportion of self-funding has dropped from 94% ten years ago, with the business sector and the private non-profit sector making up most of the remainder, each contributing 6% in 1998–99.

About 69% of State government R&D was funded by State government organisations in 1998–99. This is significantly lower than a decade earlier, when the proportion was 81%. The private non-profit sector funded 15% of the State government R&D in 1998–99, an increase from 4% a decade earlier.

25.3 EXPENDITURE ON R&D AS A PERCENTAGE OF GDP, OECD Countries—1998–99

	Business	Government	Higher education	Total(a)
Country	%	%	%	%
Japan	2.18	0.28	0.45	3.06
Finland	1.95	0.37	0.57	2.90
United States	2.04	0.22	0.39	2.74
Korea	1.77	0.44	0.28	2.52
Germany	1.55	0.33	0.40	2.29
France	1.35	0.43	0.37	2.18
Iceland	0.73	0.75	0.50	2.01
Denmark	1.20	0.29	0.41	1.92
United Kingdom	1.21	0.24	0.36	1.83
Canada	1.01	0.21	0.39	1.64
Australia	**0.67**	**0.35**	**0.44**	**1.49**
Czech Republic	0.81	0.32	0.12	1.26
Italy	0.55	0.22	0.26	1.02
Spain	0.47	0.15	0.28	0.90
Poland	0.30	0.22	0.20	0.73
Hungary	0.26	0.21	0.17	0.68

(a) Includes private non-profit.

Source: Main Science and Technology Indicators 2000–1, OECD, Paris, 2000.

About 87% of higher education R&D funding in 1998–99 came from the Commonwealth Government (compared with 89% in 1988–89). Business enterprises provided 5% of the funding in 1998–99, up from 3% a decade earlier.

Commonwealth government organisations funded 29% of the R&D of the private non-profit sector in 1998–99, while the contribution by State Governments was 11%.

Tables 25.4 and 25.5 show the data for 1988–89 and 1998–99 respectively.

Business sector

Business expenditure on R&D in Australia in 1998–99 (table 25.6) fell for the third consecutive year. Expenditure fell by 5% in 1998–99 compared to 1997–98, and human resources devoted to R&D fell by 1%.

The decrease in R&D expenditure between 1997–98 and 1998–99 was attributable to the Mining and Manufacturing industries. The Mining industry recorded a 10% decrease in expenditure in 1998–99, while the Manufacturing industry recorded a fall of 7%. Other industries, in total, remained the same.

25.4 EXPENDITURE ON R&D, Sector by Source of Funds—1988–89

	Commonwealth Government		State Government		Businesses		Private non-profit and other Australian(a)		Overseas		Total
Sector	$m	% of total	$m	% of total	$m	% of total	$m	% of total	$m	% of total	$m
Business	62.0	3.4	4.4	0.2	1 687.1	93.8	4.2	0.2	40.7	2.3	1 798.3
Government											
Commonwealth	816.9	93.9	3.9	0.4	40.6	4.7	2.7	0.3	5.6	0.6	869.6
State	44.6	9.2	391.7	81.1	23.8	4.9	21.3	4.4	1.3	0.3	482.7
Total	*861.5*	*63.7*	*395.6*	*29.3*	*64.4*	*4.8*	*23.9*	*1.8*	6.9	*0.5*	*1 352.3*
Higher education(b)	951.3	88.7	16.6	1.5	27.6	2.6	70.2	6.5	7.2	0.7	1 072.9
Private non-profit	19.8	37.1	5.9	11.1	4.4	8.3	21.0	39.4	2.2	4.1	53.3
Total	**2 756.0**	**49.0**	**818.1**	**14.5**	**1 847.9**	**32.8**	**143.3**	**2.5**	**63.8**	**1.1**	**5 629.2**

(a) Includes funds provided via government levies. (b) Data for calendar year 1988.

Source: Research and Experimental Development, All Sector Summary, Australia (8112.0).

25.5 EXPENDITURE ON R&D, Sector by Source of Funds—1998–99

	Commonwealth Government		State Government		Businesses		Private non-profit and other Australian(a)		Overseas		Total
Sector	$m	% of total	$m	% of total	$m	% of total	$m	% of total	$m	% of total	$m
Business	114.0	2.9	8.9	0.2	3 690.0	92.4	46.7	1.2	132.1	3.3	3 991.7
Government											
Commonwealth	993.6	83.3	24.8	2.1	71.4	6.0	76.7	6.4	26.1	2.2	1 192.6
State	77.1	8.8	610.0	69.4	58.3	6.6	128.8	14.7	4.8	0.5	879.0
Total	*1 070.7*	*51.7*	*634.9*	*30.6*	*129.7*	*6.3*	*205.4*	*9.9*	*30.9*	*1.5*	*2 071.6*
Higher education(b)	2 266.0	87.1	68.8	2.6	135.8	5.2	90.9	3.5	41.2	1.6	2 602.7
Private non-profit	47.4	28.6	22.9	10.6	27.3	17.4	73.2	39.6	13.1	3.8	183.9
Total	**3 498.2**	**39.5**	**735.4**	**8.3**	**3 982.8**	**45.0**	**416.2**	**4.7**	**217.4**	**2.5**	**8 850.0**

(a) Includes funds provided via government levies. (b) Data for calendar year 1998.

Source: Research and Experimental Development, All Sector Summary, Australia (8112.0).

25.6 BUSINESSES, R&D Resources by Industry of Business

	Businesses			Expenditure on R&D			Effort on R&D		
	1996–97	1997–98	1998–99	1996–97	1997–98	1998–99	1996–97	1997–98	1998–99
Industry of business	no.	no.	no.	$m	$m	$m	'000 person years	'000 person years	'000 person years
Mining (including services to mining)	108	105	101	562	534	478	1.1	0.9	1.0
Manufacturing									
Food, beverage and tobacco	170	147	145	231	180	206	1.3	1.0	1.1
Textile, clothing, footwear and leather	66	55	54	21	22	19	0.2	0.2	0.2
Wood and paper product	40	37	31	191	117	89	0.3	0.3	0.2
Printing, publishing and recorded media	39	39	40	17	19	26	0.2	0.2	0.2
Petroleum, coal, chemical and associated product	343	309	306	309	314	340	2.4	2.3	2.2
Non-metallic mineral product	77	61	58	66	72	54	0.5	0.5	0.4
Metal product	205	179	171	361	331	269	1.6	1.3	1.1
Motor vehicle and part and other transport equipment	127	122	123	401	436	372	2.7	2.7	2.7
Photographic and scientific equipment	100	95	94	91	93	102	0.9	0.9	0.9
Electronic and electrical equipment and appliance	360	327	324	362	398	378	2.9	2.8	2.8
Industrial machinery and equipment	283	245	223	144	124	110	1.3	1.2	1.0
Other manufacturing	78	73	75	46	36	18	0.2	0.2	0.2
Total manufacturing	*1 888*	*1 689*	*1 644*	*2 240*	*2 142*	*1 983*	*14.4*	*13.5*	*13.1*
Other industries									
Wholesale and retail trade	365	341	304	342	325	345	2.7	2.5	2.4
Finance and insurance	46	39	30	96	85	44	1.1	0.4	0.4
Property and business services	742	757	772	650	665	631	5.3	5.1	5.3
Scientific research	94	97	147	147	164	179	1.0	1.1	1.3
Other n.e.c.	179	178	179	210	289	331	1.0	0.9	0.9
Total other industries	*1 426*	*1 412*	*1 432*	*1 445*	*1 527*	*1 531*	*11.1*	*10.1*	*10.1*
Total all industries	**3 422**	**3 206**	**3 177**	**4 247**	**4 203**	**3 992**	**26.5**	**24.5**	**24.2**

Source: Research and Experimental Development, Business Enterprises, Australia (8104.0).

In terms of fields of research (table 25.7), almost all business sector R&D expenditure took place in the Natural sciences, technologies and engineering. Of total R&D expenditure, 13% was in Computer software, 11% in Communications technologies, 11% in Mining and mineral processing, 10% in Manufacturing and process technologies and engineering, and 10% in Mechanical and industrial engineering.

A slightly different pattern applied to human resources devoted to R&D, with 20% in Computer software, 12% in Mechanical and industrial engineering, 11% in Manufacturing and process technologies and engineering, and 9% in Other general engineering.

25.7 BUSINESSES, R&D Resources by Field of Research—1998–99

	Type of expenditure				
Field of research	Capital expenditure $m	Labour costs $m	Other current expenditure $m	Total $m	Human resources '000 person years
Natural sciences, technologies and engineering					
Mathematical sciences	1.1	5.0	3.6	9.7	0.1
Physical sciences	2.0	18.2	10.6	30.8	0.3
Chemical sciences	8.7	49.3	44.3	102.3	0.8
Earth sciences	11.5	45.1	87.0	143.6	0.5
Information systems and technologies	22.2	103.6	80.1	205.8	1.4
Computer software	32.4	336.2	166.5	535.2	4.9
Communications technologies	25.6	110.5	302.0	438.1	1.7
Other information, computers and communication technologies	14.2	91.5	97.2	202.9	1.3
Manufacturing and process technologies and engineering	39.2	162.7	214.8	416.7	2.6
Industrial biotechnology and food sciences	32.7	52.5	53.7	138.8	0.8
Material sciences and technologies	14.4	56.7	90.3	161.5	0.8
Other applied sciences and technologies	8.7	28.8	25.0	62.6	0.5
Mechanical and industrial engineering	31.4	175.6	203.8	410.8	2.9
Mining and mineral processing	143.8	55.4	225.1	424.3	0.8
Other general engineering	40.5	132.2	122.6	295.2	2.3
Biological sciences	4.5	34.8	47.5	86.8	0.6
Agricultural sciences	8.1	44.7	56.7	109.4	0.7
Medical and health sciences	25.1	83.9	102.2	211.2	1.3
Total natural sciences, technologies and engineering	*466.1*	*1 586.7*	*1 933.0*	*3 985.7*	*24.1*
Social sciences and humanities					
Social sciences	n.p.	3.9	n.p.	5.2	0.1
Humanities	n.p.	0.5	n.p.	0.8	—
Total social sciences and humanities	*0.6*	*4.4*	*1.0*	*6.0*	*0.1*
Total	**466.7**	**1 591.0**	**1 934.0**	**3 991.7**	**24.2**

Source: Research and Experimental Development, Business Enterprises, Australia (8104.0).

In terms of socioeconomic objectives (table 25.8), most business sector R&D expenditure ($3,519m or 88%) was directed towards Economic development. Of this, $1,785m (51%) was directed towards Manufacturing. About 4% was directed towards Society, 3% towards Defence, 3% towards Environment and 2% to Advancement of knowledge.

A similar pattern applied to human resources devoted to R&D, with 87% directed towards Economic development, 5% directed towards Society, 4% towards Defence, 2% towards Environment and 2% to Advancement of knowledge.

25.8 BUSINESSES, R&D Resources by Socioeconomic Objective—1998–99

	Type of expenditure				
	Capital expenditure	Labour costs	Other current expenditure	Total	Human resources
Socioeconomic objective	$m	$m	$m	$m	'000 person years
Defence	6.3	62.7	65.1	134.1	0.9
Economic development					
Plant—production and primary products	6.6	21.7	15.5	43.7	0.4
Animal—production and primary products	3.0	11.1	19.7	33.8	0.2
Mineral resources (excl. energy)	104.9	68.0	202.4	375.3	0.9
Energy resources	13.3	41.4	98.8	153.5	0.5
Energy supply	18.6	34.6	31.4	84.6	0.6
Manufacturing	208.4	733.7	842.6	1 784.7	11.6
Construction	3.7	21.7	23.8	49.3	0.4
Transport	11.5	36.2	37.6	85.3	0.7
Information and communication services	42.3	378.7	398.1	819.1	5.3
Commercial services	9.1	43.5	35.5	88.1	0.6
Economic framework	0.1	1.5	0.3	2.0	—
Total economic development	*421.5*	*1 392.1*	*1 705.7*	*3 519.3*	*21.1*
Society					
Health	11.2	56.4	66.7	134.3	0.9
Education and training	0.2	2.4	1.3	3.9	0.1
Social development and community services	0.2	16.4	4.0	20.6	0.3
Total society	*11.6*	*75.2*	*72.0*	*158.8*	*1.2*
Environment					
Environmental knowledge	3.5	5.2	7.5	16.2	0.1
Environmental aspects of economic development	7.1	14.3	26.9	48.3	0.3
Environmental management and other aspects	7.2	15.8	19.8	42.8	0.2
Total environment	*17.8*	*35.4*	*54.2*	*107.3*	*0.6*
Advancement of knowledge	9.5	25.7	37.0	72.2	0.5
Total	**466.7**	**1 591.0**	**1 934.0**	**3 991.7**	**24.2**

Source: Research and Experimental Development, Business Enterprises, Australia (8104.0).

Government sector

Expenditure on R&D carried out by government organisations in Australia in 1998–99 was estimated to be $2,072m, a marginal decrease on expenditure in 1996–97 (table 25.1).

As shown in table 25.9, the fields of research in which most government R&D expenditure took place were: Agricultural sciences ($664m, or 32%), Biological sciences ($255m, or 12%), Earth sciences ($207m, or 10%), Medical and health sciences ($189m, or 9%) and Applied sciences and technologies ($188m, or 9%).

A slightly different pattern applied to human resources devoted to R&D, with Agricultural sciences accounting for 32%, Medical and health sciences 15%, Biological sciences 12%, Applied sciences and technologies 8%, Earth sciences 7% and General engineering 7%.

In terms of socioeconomic objectives (table 25.10), most government sector R&D expenditure ($1,139m or 55%) was directed towards Economic development. Of this, $353m (31%) was directed towards Plant production and primary products, $237m (21%) towards Animal production and primary products and $237m (21%) towards Manufacturing. About 21% was directed towards Environment, 11% towards Society, 10% towards Defence, and 3% to Advancement of knowledge.

A slightly different pattern applied to human resources devoted to R&D, with 51% directed towards Economic development, 18% towards Environment, 18% towards Society, 10% towards Defence, and 3% to Advancement of knowledge.

25.9 GOVERNMENT ORGANISATIONS, R&D Resources by Field of Research—1998–99

	Type of expenditure					
Field of research	Land and buildings $m	Other capital expenditure $m	Labour costs $m	Other current expenditure $m	Total $m	Human resources '000 person years
Natural sciences, technologies and engineering						
Mathematical sciences	0.4	0.8	12.4	6.7	20.3	0.2
Physical sciences	1.9	6.3	49.5	31.2	88.8	0.8
Chemical sciences	2.0	7.2	48.1	30.0	87.3	0.7
Earth sciences	5.2	8.8	90.2	103.2	207.4	1.4
Information, computers and communication sciences	2.5	9.7	66.7	38.2	117.1	1.0
Applied sciences and technologies	4.0	14.8	103.9	65.3	188.0	1.6
General engineering	7.2	13.4	101.9	58.0	180.5	1.4
Biological sciences	8.5	10.7	125.6	110.5	255.2	2.2
Agricultural sciences	19.4	21.9	321.7	300.8	663.8	6.2
Medical and health sciences	5.7	7.6	108.9	66.8	189.0	2.8
Total natural sciences, technologies and engineering	*56.8*	*101.1*	*1 028.9*	*810.5*	*1 997.3*	*18.1*
Social sciences and humanities						
Social sciences	0.8	1.6	45.4	23.8	71.6	0.8
Humanities	0.1	0.1	1.4	1.2	2.7	—
Total social sciences and humanities	*0.8*	*1.7*	*46.8*	*25.0*	*74.3*	*0.8*
Total	**57.6**	**102.8**	**1 075.8**	**835.4**	**2 071.6**	**18.9**

Source: Research and Experimental Development, Government and Private Non-profit Organisations, Australia (8109.0).

25.10 GOVERNMENT ORGANISATIONS, R&D Resources by Socioeconomic Objective—1998–99

	Type of expenditure					
	Land and buildings	Other capital expenditure	Labour costs	Other current expenditure	Total	Human resources
Socioeconomic objective	$m	$m	$m	$m	$m	'000 person years
Defence	0.1	18.5	126.9	59.5	205.1	1.9
Economic development						
Plant—production and primary products	10.0	11.9	167.1	163.8	352.8	3.2
Animal—production and primary products	8.8	8.4	114.3	105.9	237.4	2.2
Mineral resources (excl. energy)	1.5	3.7	29.1	25.1	59.4	0.4
Energy resources	0.9	2.7	23.1	32.6	59.3	0.3
Energy supply	0.5	1.8	8.8	4.9	16.0	0.1
Manufacturing	9.0	13.5	125.0	89.2	236.7	1.9
Construction	0.9	3.2	21.9	12.5	38.4	0.3
Transport	3.3	0.2	10.8	4.4	18.6	0.1
Information and communication services	2.4	3.4	36.9	26.3	69.1	0.5
Commercial services	0.3	1.5	6.3	5.0	13.1	0.1
Economic framework	0.6	1.5	22.5	13.9	38.6	0.4
Total economic development	*38.2*	*51.8*	*565.7*	*483.8*	*1 139.4*	*9.6*
Society						
Health	4.6	9.4	112.8	70.5	197.2	2.9
Education and training	0.2	0.2	6.1	1.8	8.3	0.1
Social development and community services	0.2	1.0	21.2	9.9	32.2	0.4
Total society	*5.0*	*10.6*	*140.0*	*82.2*	*237.8*	*3.4*
Environment						
Environmental knowledge	8.2	13.7	141.4	128.2	291.6	2.2
Environmental aspects of economic development	3.2	3.3	30.8	21.1	58.3	0.5
Environmental management and other aspects	1.3	2.7	38.5	36.4	78.9	0.7
Total environment	*12.7*	*19.7*	*210.7*	*185.6*	*428.7*	*3.4*
Advancement of knowledge						
Natural sciences, technologies and engineering	1.4	2.1	31.1	23.3	57.9	0.6
Social sciences and humanities	0.2	0.1	1.5	1.1	2.8	—
Total advancement of knowledge	*1.6*	*2.2*	*32.5*	*24.3*	*60.7*	*0.7*
Total	**57.6**	**102.8**	**1 075.8**	**835.4**	**2 071.6**	**18.9**

Source: Research and Experimental Development, Government and Private Non-profit Organisations, Australia (8109.0).

Higher education sector

Estimated expenditure on R&D carried out in Australia by the higher education sector in 1998 was $2,603m, an increase of 13% over expenditure in 1996, and 28% over expenditure in 1995 (table 25.1).

Table 25.11 shows that the fields of research in which most higher education R&D expenditure took place in 1998 were Medical and health sciences ($592m, or 23% of total expenditure), Social sciences ($507m, or 19%), Biological sciences ($312m, or 12%) and the Humanities ($198m, or 8%). Direct labour costs accounted for 47% of total R&D expenditure.

A slightly different pattern applied to human resources devoted to R&D, with 24% on the Social sciences, 19% on Medical and health sciences, 12% on the Humanities and 11% on Biological sciences.

25.11 HIGHER EDUCATION ORGANISATIONS, R&D Resources by Field of Research—1998

	Type of expenditure						
Field of research	Land and buildings $m	Other capital expenditure $m	Direct labour costs $m	Scholarships $m	Other current expenditure $m	Total $m	Human resources '000 person years
Natural sciences, technologies and engineering							
Mathematical sciences	0.2	2.3	31.9	3.0	25.6	63.1	1.0
Physical sciences	1.8	10.3	46.3	3.9	44.2	106.5	1.4
Chemical sciences	1.7	12.2	50.2	8.6	48.3	121.0	1.9
Earth sciences	1.2	8.6	50.1	6.2	46.9	113.0	1.9
Information, computers and communication technologies	1.3	10.8	65.7	8.5	52.9	139.2	2.3
Applied sciences and technologies	1.3	10.5	42.2	7.5	37.3	98.8	1.7
General engineering	2.8	14.7	80.8	12.9	71.0	182.3	2.8
Biological sciences	5.5	22.6	135.6	16.6	131.6	311.8	4.9
Agricultural sciences	1.5	8.4	70.5	10.8	79.5	170.7	2.7
Medical and health sciences	6.1	27.6	277.7	23.4	257.6	592.4	8.5
Total natural sciences, technologies and engineering	*23.4*	*128.1*	*851.0*	*101.2*	*795.0*	*1 898.7*	*29.0*
Social sciences and humanities							
Social sciences	8.2	13.1	265.7	22.0	197.5	506.5	10.9
Humanities	3.2	4.3	102.5	15.9	71.6	197.5	5.6
Total social sciences and humanities	*11.4*	*17.4*	*368.2*	*37.9*	*269.1*	*704.0*	*16.5*
Total	**34.8**	**145.5**	**1 219.3**	**139.1**	**1 064.1**	**2 602.7**	**45.5**

Source: Research and Experimental Development, Higher Education Organisations, Australia (8111.0).

In terms of socioeconomic objectives (table 25.12), most higher education R&D expenditure ($1,094m or 42%) was directed towards Advancement of knowledge. About 27% was directed towards Society, 23% towards Economic development, and 7% towards Environment. The major subdivision within Society was Health with 19% of total R&D expenditure.

A similar pattern applied to human resources devoted to R&D, with 45% directed towards Advancement of knowledge, 26% towards Society, 22% towards Economic development, and 7% to Environment.

25.12 HIGHER EDUCATION ORGANISATIONS, R&D Resources by Socioeconomic Objective—1998

	Type of expenditure						
Socioeconomic objective	Land and buildings $m	Other capital expenditure $m	Direct labour costs $m	Scholarships $m	Other current expenditure $m	Total $m	Human resources '000 person years
Defence	—	0.3	2.7	0.2	2.5	5.8	0.1
Economic development							
Plant—production and primary products	0.9	4.6	38.2	5.2	45.3	94.2	1.4
Animal—production and primary products	0.5	2.6	27.1	4.1	30.4	64.7	1.0
Mineral resources (excl. energy)	0.3	2.2	13.2	2.0	16.1	33.7	0.4
Energy resources	0.1	1.5	6.8	1.0	6.9	16.3	0.3
Energy supply	—	1.3	10.4	1.5	8.8	22.0	0.3
Manufacturing	1.8	11.6	49.4	8.4	45.8	117.0	1.8
Construction	1.3	2.3	19.9	2.6	13.6	39.7	0.7
Transport	0.2	1.3	7.0	1.0	5.6	15.1	0.3
Information and communication services	0.7	3.3	32.2	3.4	25.0	64.6	1.1
Commercial services	0.7	0.6	14.8	1.2	10.3	27.6	0.4
Economic framework	1.4	2.9	57.3	4.9	42.7	109.2	2.2
Total defence	*7.9*	*34.2*	*276.2*	*35.2*	*250.5*	*604.0*	*10.0*
Society							
Health	4.9	18.6	243.7	20.3	219.3	506.7	7.3
Education and training	1.5	2.9	58.2	4.2	41.4	108.3	2.6
Social development and community services	1.8	2.5	48.0	3.1	40.0	95.3	1.8
Total society	*8.2*	*24.0*	*349.9*	*27.6*	*300.6*	*710.2*	*11.8*
Environment							
Environmental knowledge	2.1	6.9	53.9	6.0	51.1	119.9	2.1
Environmental aspects of economic development	0.5	1.5	16.1	2.3	13.9	34.2	0.6
Environmental management and other aspects	0.5	1.4	15.5	1.9	15.1	34.4	0.6
Total environment	*3.1*	*9.8*	*85.5*	*10.1*	*80.1*	*188.5*	*3.3*
Advancement of knowledge							
Natural sciences, technologies and engineering	10.7	69.0	338.1	43.1	312.2	773.1	11.9
Social sciences and humanities	5.0	8.1	166.9	22.9	118.2	321.0	8.5
Total advancement of knowledge	*15.6*	*77.1*	*505.0*	*66.0*	*430.4*	*1 094.1*	*20.4*
Total	**34.8**	**145.5**	**1 219.3**	**139.1**	**1 064.1**	**2 602.7**	**45.5**

Source: Research and Experimental Development, Higher Education Organisations, Australia (8111.0).

Private non-profit sector

Expenditure on R&D carried out by private non-profit organisations in 1998–99 ($184m) increased by 6% (table 25.1) over 1996–97 expenditure.

Medical and health sciences comprised the major field of research for R&D expenditure in the private non-profit sector, accounting for $126m (68%) of the sector's total R&D expenditure in 1998–99. Labour costs continued to be the main component of R&D expenditure (50%) (table 25.13).

Medical and health sciences also comprised the leading field of research in terms of human resource use.

In the private non-profit sector, Health was the main socioeconomic objective (table 25.14), accounting for 85% or $156m of total R&D expenditure. Education and training accounted for $13m (7%), while $8m (4%) was directed towards Advancement of knowledge.

A similar pattern applied to human resources devoted to R&D, with 87% directed towards Health, 5% towards Education and training, and 4% towards Advancement of knowledge.

25.13 PRIVATE NON-PROFIT ORGANISATIONS, R&D Resources by Field of Research—1998–99

	Type of expenditure					
	Land and buildings	Other capital expenditure	Labour costs	Other current expenditure	Total	Human resources
Field of research	$m	$m	$m	$m	$m	person years
Natural sciences, technologies and engineering						
Mathematical sciences	—	—	—	—	—	—
Physical sciences	—	—	0.6	0.3	1.0	12
Chemical sciences	—	0.1	0.7	0.4	1.2	14
Earth sciences	—	—	—	—	—	1
Information, computers and communication technologies	—	—	0.4	0.1	0.5	4
Applied sciences and technologies	—	—	0.1	—	0.1	2
General engineering	—	—	0.2	—	0.2	3
Biological sciences	0.7	3.1	21.4	15.9	41.2	482
Agricultural sciences	—	—	0.3	0.2	0.5	5
Medical and health sciences	2.6	11.3	63.5	48.6	125.9	1 455
Total natural sciences, technologies and engineering	*3.4*	*14.6*	*87.1*	*65.6*	*170.7*	*1 978*
Social sciences and humanities						
Social sciences	0.1	0.2	5.0	7.8	13.1	89
Humanities	—	—	0.1	—	0.1	1
Total social sciences and humanities	*0.1*	*0.2*	*5.1*	*7.8*	*13.2*	*90*
Total	**3.5**	**14.8**	**92.2**	**73.5**	**183.9**	**2 068**

Source: Research and Experimental Development, Government and Private Non-profit Organisations, Australia (8109.0).

25.14 PRIVATE NON-PROFIT ORGANISATIONS, R&D Resources by Socioeconomic Objective—1998–99

	Type of expenditure					
Socioeconomic objective	Land and buildings $m	Other capital expenditure $m	Labour costs $m	Other current expenditure $m	Total $m	Human resources person years
Defence	—	—	—	—	—	—
Economic development	0.3	0.5	1.4	1.5	3.7	26
Society						
Health	2.9	13.4	79.5	59.8	155.6	1 809
Education and training	0.2	0.4	5.0	7.3	12.9	95
Social development and community services	—	—	0.9	1.0	1.9	17
Total society	*3.1*	*13.8*	*85.4*	*68.1*	*170.4*	*1 921*
Environment	—	—	1.4	0.7	2.2	34
Advancement of knowledge	0.1	0.4	4.0	3.2	7.6	88
Total	**3.5**	**14.8**	**92.2**	**73.5**	**183.9**	**2 068**

Source: Research and Experimental Development, Government and Private Non-profit Organisations, Australia (8109.0).

Innovation statistics

Innovation is a measure of the extent to which science and technology are used within businesses to create new products or to implement new processes for the provision of goods and services. Innovation surveys provide a wider measure of the innovation process than R&D surveys.

The ABS has conducted two surveys of innovation, the first in respect of 1993–94 and a second, more comprehensive survey, in respect of 1996–97. These surveys were based on the concepts and standard questions developed jointly by the OECD and Eurostat (the statistical office for the European community). While the main ABS innovation surveys obtained data from manufacturing businesses, exploratory surveys have also been conducted for the mining, agriculture, construction and telecommunications industries.

The statistics which follow present some of the main findings from the ABS innovation surveys of manufacturing businesses only. The data include the proportion of businesses which innovate, the reasons why businesses innovate and the costs involved. The data are presented by business size, where small businesses are defined as those having fewer than 20 employees, medium sized businesses as those having 20 to 199 employees, and large businesses as those having 200 or more employees. The survey results relate only to businesses with employees.

As can be seen in table 25.15, just over a quarter of all manufacturing businesses were identified as undertaking technological innovation in 1996–97. The rate of technological innovation had a strong relationship with size of business. Large businesses were over three times more likely to undertake technological innovation than small businesses.

Of businesses which undertook technological innovation, over half undertook both product and process innovation (i.e. they introduced new, or significantly technologically changed products and used new, or significantly technologically changed processes to produce their products). Only 3% of businesses introduced new processes without introducing new products. Over 8% of businesses introduced new products without using new processes.

25.15 MANUFACTURING BUSINESSES, Proportion Undertaking Technological Innovation by Business Size—1996–97

	Technological innovation			
Business size	Product only %	Process only %	Product and process %	Total %
Small	7.7	2.6	11.3	21.6
Medium	11.3	5.9	37.7	55.0
Large	10.4	5.8	64.0	80.2
All	**8.1**	**3.0**	**14.8**	**26.0**

Source: Innovation in Manufacturing, Australia (8116.0).

25.16 OBJECTIVES OF UNDERTAKING TECHNOLOGICAL INNOVATION—1996–97

	Importance of the objective		
	Not applicable	Not important	Important
Objective	%	%	%
Reducing costs	4.1	3.9	92.0
Maximising profits	*4.4	*3.7	91.9
Improving productivity	6.2	4.7	89.2
Responsiveness to customers	6.0	6.3	87.7
Improving quality/speed of service	6.9	5.5	87.6
Increasing market share	7.3	8.1	84.6
Being at industry forefront	11.7	8.3	79.9
Expanding product range	10.7	10.3	79.1
Improving staff safety/working conditions	11.2	10.1	78.7
Establishing a new market	10.8	11.5	77.7
Being environmentally aware	16.0	14.4	69.6
Meeting Government standards/regulations	13.4	17.2	69.5
Seeking/expanding export opportunities	31.8	17.7	50.6

Source: Innovation in Manufacturing, Australia (8116.0).

In 1996–97, the rate of technological innovation was lower than in 1993–94, when almost one-third of manufacturing businesses undertook technological innovation. This decline was largely due to the drop in the rate of small businesses undertaking technological innovation from 28% in 1993–94 to 22% in 1996–97.

Even though only just over a quarter of manufacturing businesses undertook technological innovation, because of the higher proportion of larger businesses, innovative businesses in total contributed about two-thirds of the total employment and three-quarters of the total turnover of all manufacturing businesses.

Almost two-thirds of large businesses had staff dedicated to innovation work, while less than one-quarter of small businesses had staff dedicated to this work. Large businesses were almost three times more likely than small businesses to take staff off-line to undertake innovation work.

Objectives of undertaking technological innovation

As table 25.16 shows, most businesses (around 90%) undertaking technological innovation rated 'reducing costs', 'maximising profits' and 'improving productivity' as important objectives of undertaking technological innovation. Most of the objectives listed in the table were considered important by a large majority of businesses.

Costs of undertaking innovation

The total amount spent by manufacturing businesses on technological innovation during 1996–97 was estimated at $3.9b. About half of this was spent on research and development ($2.0b). A further $1.1b was spent on tooling-up, industrial engineering and start up.

On average, businesses with expenditure on innovation activities spent $296,100 on innovation, or $6,300 per employee. As would be expected, expenditure on innovation increased with size of business; expenditure ranged from an average of $61,000 for small businesses to $4.1m for large businesses. The average innovation expenditure per employee showed the reverse trend, ranging from $8,900 for small businesses to $5,600 for large businesses. Similarly, the ratio of innovation expenditure to the total turnover of the business fell as size of business increased. In the case of small businesses undertaking innovation expenditure, 7% of their total turnover on average was spent on innovative activities, while large businesses spent only 2% of their total turnover on such activities (table 25.17).

25.17 COSTS OF UNDERTAKING TECHNOLOGICAL INNOVATION(a)—1996–97

	Turnover per employee	Innovation costs per employee	Innovation costs as a proportion of turnover
Business size	$'000	$'000	%
Small	132	9	7
Medium	185	7	4
Large	266	6	2
All	**238**	**6**	**3**

(a) Restricted to businesses with innovation expenditure.

Source: Innovation in Manufacturing, Australia (8116.0).

Official organisations and administration

There are many organisations in Australia concerned in some way with the development of science and innovation.

The Commonwealth Government's commitment to science and innovation is reflected in the functions of the Department of Industry, Science and Resources. The Department is concerned with the development and maintenance of Australia's scientific and innovative capability.

A number of other Commonwealth Government organisations either support or carry out science and innovation related activities. State Governments are also involved in science and innovation through State government departments, science and technology councils and other organisations. Non-government organisations participating in scientific and innovative activities include higher education institutions, professional and learned bodies, private organisations and industry groups.

Department of Industry, Science and Resources

The Department of Industry, Science and Resources is responsible for the majority of federally supported science and technology related industry development programs. The Department includes the Innovation and Science Division, the Australian Geological Survey Organisation, IP Australia and the Office of AusIndustry, including the Industry Research and Development Board (IRDB) programs. The Innovation and Science Division, comprising the Science and Technology Policy Branch, the International Science and Technology Policy Branch, the Innovation Policy Branch and the Science and Technology Advisory Team, is responsible for science and technology strategy, policy, analysis and awareness. It is responsible, inter alia, for the preparation of the annual *Science and Technology Budget Statement*.

The Department, through AusIndustry, administers the Tax Concession for Research and Development scheme, the Strategic Assistance for Research and Development (START) Program and the Cooperative Research Centres Program. The scientific and technological bodies of the portfolio include the Commonwealth Scientific and Industrial Research Organisation (CSIRO), the Australian Nuclear Science and Technology Organisation and the Australian Institute of Marine Science.

R&D Tax Concession Program

The tax concession for R&D, which commenced from July 1985, is the focus of one of the major programs in the Commonwealth Government's package of measures to encourage R&D in Australia.

The concession allows companies incorporated in Australia, public trading trusts and partnerships of eligible companies, to deduct up to 125% of eligible expenditure on R&D activities when lodging their corporate tax returns.

Expenditure eligible under the scheme includes: salaries, wages and other overhead costs which are directly related to the company's Australian R&D activities; contract expenditure; and capital expenditure on R&D plant and equipment (over three years). Expenditure on acquiring, or acquiring the right to use, technology for the purposes of the company's own R&D activities is 100% deductible.

The R&D projects must also satisfy a requirement for adequate Australian content. In addition the results of the R&D must be exploited on normal commercial terms and to the benefit of Australia.

To attract the tax concession deduction, annual eligible R&D expenditure must exceed $20,000. Where R&D is contracted to either an approved Registered Research Agency or a Cooperative Research Centre this expenditure threshold is waived.

Strategic Assistance for Research and Development Program

The R&D START Program replaced the R&D Syndication Program. It encompasses and builds upon other R&D support measures to provide a flexible package of assistance to industry for research, development and commercialisation.

The Program complements the R&D Tax Concession Program.

R&D START meets the need for a program capable of funding larger projects, with more flexible funding arrangements, and aims to:

- provide a new competitive R&D scheme to replace the R&D Syndication Program;
- provide a mix of support measures based on large grants, loans and interest rate subsidies; and
- develop new market-based support measures in further consultation with industry.

There are three rounds of grants each year (every four months) to provide a timely response to companies in areas of rapidly developing technologies and markets.

The Industry Research and Development Board has flexibility to vary the combination of support to take account of variations in spillovers, closeness to market, nature of the technology and capacity to attract private finance. The basic elements are grants, loans (which will normally be at commercial rates but may have repayment deferred), and interest subsidies to lenders who participate in financing the projects.

Commonwealth Scientific and Industrial Research Organisation (CSIRO)

The CSIRO was established as an independent statutory authority by the *Science and Industry Research Act 1949*, which has been amended on a number of occasions since then. Its primary role is as an applications-oriented research organisation in support of major industry sectors and selected areas of community interest, with a strong commitment to the effective transfer of its results to users.

Briefly, the CSIRO's primary statutory functions are to:

- carry out scientific research for the benefit of Australian industry, the community, national objectives, national or international responsibilities, or for any other purpose determined by the Minister; and
- encourage or facilitate the application or utilisation of the results of such research.

Other functions include dissemination and publication of scientific information, international liaison in scientific matters, and provision of services and facilities.

The CSIRO's work is planned and prioritised on a sectoral basis and conducted through core business units—CSIRO Divisions. External advice on research priorities is channelled through Sector Advisory Committees. Each sector represents an industry group, market, or natural resource of national significance. There are 22 sectors covering research in five broad groupings:

- *Agribusiness*—field crops; food processing; forestry, wood and paper industries; horticulture; meat, dairy and aquaculture; wool and textiles.
- *Environment and Natural Resources*—biodiversity; climate and atmosphere; land and water; marine.
- *Information Technology, Infrastructure and Services*—information technology and telecommunications; built environment; measurement standards; radio astronomy; services.
- *Manufacturing*—chemicals and plastics; integrated manufactured products; pharmaceuticals and human health.
- *Minerals and Energy*—coal and energy; mineral exploration and mining; mineral processing and metal production; petroleum.

Bibliography

ABS publications

Innovation in Manufacturing, Australia (8116.0).

Research and Experimental Development, All Sector Summary, Australia (8112.0).

Research and Experimental Development, Businesses, Australia (8104.0).

Research and Experimental Development, Government and Private Non-profit Organisations, Australia (8109.0).

Research and Experimental Development, Higher Education Organisations, Australia (8111.0).

Other publications

OECD, *Main Science and Technology Indicators, 2000–1*, Paris, 2000.

Additional information

Additional information on topics presented in this chapter may be found in the annual reports of the organisations mentioned, particularly the Department of Industry, Science and Resources and the CSIRO, and in the annual Science and Technology Statements. Further statistical information on higher education is obtainable from the Department of Education, Training and Youth Affairs.

The then Department of Industry, Science and Tourism's *Australian Business Innovation, 1996* uses science and technology indicators to give a good overview and analysis of science and technology information in Australia. It presents information on business innovation, an R&D related view of trade in manufacturing, diffusion of advanced manufacturing technologies, patents, business sector R&D and bibliometrics.

Additional information on some technology related issues, particularly on the use of information technology, may be found in *Chapter 24, Communications and information technology*.

Internet sites

Australian Bureau of Statistics, *http://www.abs.gov.au*

—A *Science and Innovation* theme page may be found under the category *Themes*.

Commonwealth Scientific and Industrial Research Organisation, *http://www.csiro.au*

Department of Industry, Science and Resources, *http://www.isr.gov.au*

—The Science and Technology Budget Statement 2000–2001 may be found at *http://www.isr.gov.au/science/analysis/budget2000/index.html*

Organisation for Economic Co-operation and Development, *http://www.oecd.org*

—A summary of the *Frascati Manual*, the basic international source of methodology for collecting and using research and development statistics, can be found at *http://www.oecd.org/dsti/sti/stat-ana/prod*

The pace of change in science and innovation

Dr Keith Boardman

Dr Keith Boardman AO FRS FAA FTSE is a former Chairman and Chief Executive of the Commonwealth Scientific and Industrial Research Organisation. Prior to becoming a Member of the Executive of the CSIRO in 1977, Dr Boardman had a distinguished career as a Chief Research Scientist in the Division of Plant Industry of CSIRO, where his research involved unravelling the mechanisms of photosynthesis in green plants and investigating the adaptation of plants to their light environment.

Introduction

Science and innovation are now accepted as key elements for the economic advancement, competitiveness and the wellbeing of nations, although the linkages between scientific investigation, technological innovation, national wealth and social wellbeing are complex and involve many interacting elements. Over the 20th century increasing resources were devoted to research and development and to technological innovation in the developed countries, leading to increased mechanisation and capital investment and producing great changes in the use of labour and improvements in the standard of living. The pace of change in innovation, with potential to impact on most facets of our lives, is not showing any signs of diminishing as we enter the 21st century.

Major scientific discoveries of the 20th century were the splitting of the atom in 1932 at Cambridge University, the invention of the transistor at the Bell Laboratories in the USA in 1947, the isolation of penicillin and the discovery of its antibiotic potency in the UK, the elucidation of the structure of DNA at Cambridge University in 1953 followed by the unravelling of the genetic code of all living organisms. The 20th century saw a diminution in the time span between a major scientific discovery and its exploitation for the benefit or disbenefit of mankind. The transistor could be considered to have had the greatest impact on our lives with the revolution of communication, including the development of the personal computer, the Internet, world wide web and electronic mail.

Over the century science in Australia has grown at a pace comparable to that of the industrialised nations, but gains in productivity and improvements in industrial competitiveness have relied mainly on the import of technology with adaptation to meet Australia's particular needs. Universities of international standard have provided skilled graduates needed by industry and the community as well as performing research that underpins innovation and allows access to international advances in science and technology.

This article contrasts the situation for science and innovation at the time of Federation and now, and identifies events during the century that have most influenced science and innovation in Australia. It outlines some significant Australian discoveries and discusses issues for science and innovation in Australia in the 21st century. The article does not cover medical science and innovations in medicine.

Science and innovation at the time of Federation

At the time of Federation, Australia's wealth was derived from the export of commodities from the agricultural and pastoral industries and products of the mineral industry. Wool and gold were the leading exports and Australia enjoyed a very high income per capita. The doubling of the area of land under cultivation in the two decades before Federation was greatly assisted by the mechanisation of farming. For instance, the cost and time of vegetation clearance in the Mallee regions of Victoria and South Australia were reduced considerably by the invention of the scrub roller, and the cultivation of partially cleared land was facilitated by the

stump-jump plough. The invention of the stripper-harvester independently by James Morrow and Hugh Victor McKay in the mid 1880s allowed the stripping and winnowing operations of wheat to be combined in one operation. The import and development of refrigeration in the late 19th century meant that Australia was able to sell meat and dairy products to the British market and other countries. Innovations in metallurgy in the 1890s greatly assisted the extraction of gold from the complex sulphur-telluride ores of Coolgardie and Kalgoorlie. The Schools of Mines at Ballarat, founded in 1871, Bendigo (1873) and Adelaide (1889) provided trained personnel for the mining operations and mineral processing. The Kalgoorlie School of Mines was founded in 1902 and is still in operation in 2001.

The last decade of the 19th century experienced severe economic recession worldwide. Many banks and other businesses in Australia failed and the prices paid for agricultural produce showed large decreases. The coming of Federation in 1901 generated a climate of optimism. Duties charged on goods transported between the States were eliminated, stimulating trade between the States, and the Commonwealth assumed responsibility for several areas including customs and excise, defence, external affairs, posts and telegraphs and quarantine.

Departments of Agriculture had been established in all States by the time of Federation. The role of a Department of Agriculture included regulation as well as investigation and advisory functions. Much of the effort of Departments of Agriculture was concerned with the control of pests and diseases of livestock and crops.

Proposals to establish a Federal Department of Agriculture or a Federal Bureau of Agriculture were advanced soon after Federation. It was argued that many diseases and pests affecting stock and plants are found in several States and that scientific research could more profitably be controlled by a central authority. A bill was introduced in Federal Parliament in 1909 to establish an Australian Bureau of Agriculture, but it was withdrawn later in the year without a vote being taken. In 1910, the Government invited a group of noted Scottish agriculturists to visit Australia and assess agricultural developments and opportunities. Their report praised the work done by the States but pointed to a considerable amount of overlap and the need for cooperation and coordination. The visiting agriculturists saw many of the problems as being common to the whole of Australia or to a greater part of it. Allowing each State to attempt to find the solution for each agricultural problem by itself was not the most economical method.

In 1913, a Bill, exactly the same as the one of 1909 for a Bureau of Agriculture, was introduced into the House of Representatives by the Prime Minister, Joseph Cook. Speakers opposing the Bill argued that the proposed Bureau would overlap or duplicate the work done by the State Departments of Agriculture. The Bill passed the lower House, but it lapsed without consideration by the Senate when Parliament was prorogued.

The Australian climate and native vegetation were suited to the production of high class wool, but the decade after Federation saw a more extensive use of land with an expansion of wheat and meat production. Extension of cropping to some regions such as the Mallee produced poor crops and led to soil degradation. Drought and diseases like rust had significant effects on yields of the commonly grown varieties of wheat. Painstaking work by William Farrer at his small farm near Canberra produced new varieties of wheat that were resistant to drought and rust and gave spectacular increases in yields. Farrer had a fruitful collaboration with a chemist in the New South Wales Department of Agriculture, F. B. Guthrie, who had developed a laboratory with milling techniques to assess wheat quality from a small quantity of grain. The best of Farrer's varieties was named Federation in 1901, and by the 1919–20 season Federation accounted for 80% of the wheat harvested in Australia.

In 1900, the Bureau of Sugar Experiment Stations was established by the Queensland Government to improve the cultivation of sugar cane and control the diseases of cane. New cane varieties were developed with improved sugar yields and increased disease resistance. The Bureau of Sugar Experiment Stations has now operated for a century, and from its initial work on cultivation it expanded its research to cover all aspects of sugar production and processing. The contributions of the Bureau's research to the success and high standing of the Australian sugar industry are acknowledged internationally.

Manufacturing industry grew steadily in the first decade of the century, due in large measure to the increasing demand for machinery for agriculture, food processing and refrigeration. The Harvester works of H. V. McKay at Sunshine, a suburb of Melbourne, was the largest factory in Australia at the time.

For several decades after their foundation in the mid-19th century the Universities of Sydney and Melbourne were teaching institutions with very little advanced research. Towards the end of the century there was a determined effort by several of the newly appointed professors in science areas to improve both the teaching of science and the standard of research, and to attract honours graduates into their research programs. By the time of Federation several professors had established small but excellent research groups and received recognition by their peers in Europe and North America. Among the professors of distinction were David Orme Masson (chemistry), W. Baldwin Spencer (biology), Thomas R. Lyle (physics), Charles Martin (physiology) and J.W. Gregory (geology) at Melbourne University, and T. Edgeworth David (geology), William Haswell (biology), Archibald Liversidge (chemistry and mineralogy), and Richard Threlfall (physics) at Sydney University. William Bragg was investigating radioactive substances at Adelaide University with a small but talented group of students. The University of Tasmania was founded in 1890, but Queensland and Western Australia did not inaugurate their universities until 1909 and 1911. Astronomical observatories were an important part of science in Australia with observatories in Sydney, Melbourne and Adelaide from the 1850s and Perth from 1896. The Melbourne Observatory had the world's largest telescope, a 48-inch reflector, but after the turn of the century the observatories went into a slow decline.

The research in the universities of Sydney and Melbourne was mostly in areas that reflected trends in Europe, although there were some excellent fundamental studies on Australian marsupials and monotremes. Australian researchers were at a considerable disadvantage because of the isolation from the great centres of learning in Europe and North America. They lacked the opportunities to participate in the international scientific meetings where new discoveries and innovative experimental techniques were discussed, and to establish dialogue with the leading scientists in their field of investigation. Scientific journals took several months to reach Australia and there were similar delays in transmitting Australian scientific papers for publication in European and American journals. Several academics, including William Bragg, who had established their research credentials in Australia, left for the greener scientific pastures in Britain. William Bragg, together with his son Lawrence Bragg, won the Nobel Prize in Physics in 1915 for their pioneering work at Cambridge University on X-ray crystallography.

Council for Scientific and Industrial Research

The outbreak of war in 1914 made Australia realise how dependent the country was on the import of manufactured goods from Europe. Even Great Britain was in trouble, being dependent on Germany for supplies of chemicals and many manufactured goods. There was an expansion of manufacturing in Australia, including the construction of a steel works at Newcastle by BHP that went into production early in 1915. Construction of ships by the Government and steel products by other manufacturers was carried out near the BHP steel works. Prior to the war aspirin was imported from the German firm Bayer. George Nicholas, a chemist in Melbourne, synthesised an impure form of aspirin in 1914. With the help of Harry Shmith a pure product was produced that was packaged in tablet form and sold under the name ASPRO. The Commonwealth Serum Laboratories (CSL) were established in 1916 by the Government to produce much needed vaccines. CSL was retained after the war and it gradually expanded into a large Government-owned pharmaceutical enterprise. It was privatised in 1994 to become a very successful corporation.

In both Great Britain and Australia there was a greater realisation by government of the links between scientific research and industrial and economic strength. Considerable discussion took place in both countries on a role for government in promoting scientific research. In 1915, the Government of Great Britain established the Department of Scientific and Industrial Research. The Commonwealth Government, with strong support from the Prime Minister, W. M. Hughes, proposed the establishment of a National Laboratory of Scientific

Research, but the universities were concerned about the likely impact of a Commonwealth funded National Laboratory on university research and teaching. The Government convened a conference in January 1916 involving university and business representatives as well as Commonwealth and State Governments to discuss the proposal. The outcome of the conference was the appointment by the Commonwealth Government of an advisory group with representatives from university, business and government to propose a plan for the operation of an Institute of Science and Industry.

The Institute was finally launched in 1921, unfortunately a time of economic recession. Funds provided to the Institute by the Commonwealth Government were inadequate for the proposed research activities and the Institute failed to develop. In 1925 the Prime Minister, S. M. Bruce, saw the need to reorganise the Institute. He convened yet another conference and also invited the Head of the Department of Scientific and Industrial Research in Great Britain, Sir Frank Heath, to visit Australia and advise on the reorganisation. The governance of the Institute and its relation to the Public Service were prime issues. The report of the conference contained an important and perceptive recommendation that the Institute should be exempt from the provisions of the Commonwealth Public Service Act. It was argued that the mechanisms of the Public Service were inconsistent with the kind of work that should be done at the Institute, and that there was a direct analogy between the Institute and a University. The report recommended that the Institute should be run by an Executive Committee of three full-time Directors, all with scientific qualifications and experience, but that in their selection due regard should be paid to administrative and executive ability. The Government was not in favour of full-time Directors, at least initially. Heath supported the concept of an Executive Committee and suggested that it consist of an engineer, a chemist and a biologist. In his report Heath insisted on the need for cooperation between the Institute and the States. He also emphasised the need to improve the training of research workers and recommended that the Institute of Science and Industry be involved with post-graduate scientific training.

The Government accepted most of the recommendations of the conference and Sir Frank Heath, including a role for the Institute in scientific training. An amending Act establishing a Council for Scientific and Industrial Research (CSIR) as a Statutory Corporation was passed by Parliament without opposition, and it received Royal Assent on 21 June 1926. An Executive Committee of G. A. Julius, a consulting engineer from Sydney, A. C. D. Rivett, Professor of Chemistry at Melbourne University and W. J. Newbigin, also an engineer from Sydney, was appointed part-time by the Government to run CSIR between full meetings of the Council. The Council consisted of the Executive Committee with Julius as Chairman, the chairman of each of the State Advisory Committees and two coopted members. The aim of the Government, as expressed in the Prime Minister's second reading speech, was for CSIR to cooperate with existing State agencies and enlist the aid of the pure scientists in the universities. Some professors expected the Council to provide research grants to the universities, but Sir David Orme Masson thought that the CSIR should have its own staff and laboratories.

Rivett was a strong advocate of scientific autonomy in the conduct of scientific investigations. He held the view that the Executive Committee should decide from the best available advice what problems should be tackled by the CSIR and then find the best scientists to take charge of the investigations. This strategy was agreed by the Executive Committee and was the basic philosophy that guided the CSIR and its successor CSIRO to become a great research organisation. Rivett was appointed full-time Chief Executive Officer in November 1926 and A. E. V. Richardson, Director of the Waite Agricultural Research Institute in Adelaide, was appointed part-time to the Executive Committee on the death of Newbigin in 1927.

The Executive Committee decided that the research of CSIR should be concentrated in a limited number of areas of national importance. Australia's wealth was still derived from the export of products from the rural and mining industries. There was scope to significantly improve the productivity of rural production, which was adversely affected by many pests and diseases, nutrient deficient soils and climate variations that led often to severe drought. Irrigation schemes in Victoria and New South Wales were

causing problems with rising salt. The Executive Committee believed that several of the problems affecting rural production could be overcome or at least ameliorated by scientific investigation and application of up-to-date scientific knowledge. European practices were often ineffective for improving productivity in many regions of Australia.

The research of CSIR in the first decade was devoted almost entirely to the rural industries. An exception was financial support, with the Post Office and the Defence Department, for a Radio Research Board that would award grants mainly to university scientists for research on radio transmission. The priority areas of research for CSIR agreed by the Council were animal pests and diseases, plant pests and diseases, forests products, food (especially cold storage) and liquid fuels. The proposed investigations on liquid fuels from coal and shale were not started, but animal nutrition and soils were added. Some of the State Departments of Agriculture showed hostility to CSIR, but an agreement was reached which preserved the role of the States: investigations of a more or less fundamental character and which were national in scope should be conducted by CSIR, while problems of a more or less local character and which involve the applications of existing knowledge should be undertaken by the State Departments of Agriculture. It was agreed that research on wheat and sugar would remain with the States.

CSIR decided that it needed to establish its own laboratories to perform its role, but it saw advantages in close cooperation with the universities. Of the six divisions established by CSIR in 1928–30 three were located on the grounds of universities. The laboratory for the Division of Animal Health (named the McMaster Laboratory) was erected at Sydney University with the support of a generous gift of £20,000 from a grazier, F. D. McMaster. The Animal Nutrition Division was located at the University of Adelaide and the Soils Division at the site of the Waite Agricultural Research Institute. Laboratories for the Divisions of Economic Botany and Economic Entomology were erected at a site in Canberra, but Forests Products research was located in Melbourne rather than near the Forestry School in Canberra. CSIR was successful in appointing well-qualified and experienced researchers to lead the divisions, but the severe economic depression of 1929 and the early 1930s resulted in cuts in CSIR appropriation and a severe curtailment in the build-up of staff.

Relations between CSIR and the universities were excellent in the pre-war period.

CSIR established a studentship scheme for overseas research training. The studentships, which were funded from a trust fund provided by the Government, were highly sought by graduates. The scheme was small but it was later expanded and many future leaders of science in Australia were studentship holders.

A significant discovery of CSIR in the years between its establishment and the war was the cure for ‘coast disease‘ of sheep and cattle. Coast disease was prevalent along the coast from Cape Otway in Victoria to the west of South Australia. Sheep grazed on pastures in the zone lost their appetite and their wool became steely. If the animals were not moved they became anaemic and died. A similar disease, Denmark disease, was observed in cattle in Western Australia where it was under study by the Western Department of Agriculture. Dick Thomas, a chemist with a background in geology, recognised that the areas in South Australia had calcareous soils that he believed would be short of heavy metal trace elements. Experiments with penned sheep at the Animal Nutrition Division of CSIR showed that the disease could be cured by supplementing a coast diet with cobalt nitrate. Further experiments in Western Australia confirmed that the addition of cobalt cured Denmark disease. Unfortunately, the addition of cobalt to fertilisers applied to the pastures did not work, but CSIR research was successful in developing a cobalt pellet that was administered to animals and resulted in the slow release of cobalt in the stomach of sheep and cattle. A decade later investigations in the United States and Britain showed that vitamin B12, which is essential for animals but not plants, contains cobalt.

A successful treatment for bovine pleuropneumonia and its eradication in New South Wales was another achievement for CSIR research in the period before the war. The scientists at the Division of Animal Health isolated a less virulent strain of the bovine pleuropneumonia and developed a method for its mass production for use as a vaccine. A reliable diagnostic test for bovine

pleuropneumonia was also developed for use in the successful eradication program.

CSIR entomologists were involved in the successful program to control prickly pear by the Prickly Pear Board that had been formed by the Commonwealth and the Governments of Queensland and New South Wales. The first successful release of the biological control agent *Cactoblastus cactorum* coincided with the creation of CSIR.

An increasing role for manufacturing industry in Australia's economic performance, standard of living and employment opportunities was becoming apparent in the mid 1930s. The Acts under which CSIR operated enabled it to carry out scientific researches for the benefit of primary or secondary industries but, as indicated earlier in this article, the research in the first decade of the existence of CSIR was almost entirely for primary industry. The first involvement of CSIR in research for secondary industry arose from the establishment of the Commonwealth Aircraft Corporation for aircraft manufacture and the decision to form an aeronautics research laboratory. The outbreak of war hastened the construction of the Aeronautics Research Laboratory that played an important technological role in the design and manufacture of aircraft in Australia.

By the mid 1930s it became very clear that the provision of adequate reference standards in Australia was necessary for quality mass production in the expanding manufacturing sector. CSIR received approval to establish a National Standards Laboratory (NSL) along the lines of the National Physical Laboratory in England and the Bureau of Standards in the United States. NSL, which was located at the University of Sydney, was not completed until September 1940. During the war, NSL was heavily involved in the manufacture of precision gauges, with routine calibration, refractive measurements of optical glass for munitions and improving existing manufacturing processes. It had not been intended that NSL would be involved in routine testing, but the demands of wartime production meant a delay for its main role as a research laboratory in establishing and improving standards.

The manufacturing industry in Australia in the 1930s was fragmented, and production was directed to a small local market. It was protected by tariffs and most of the technology was imported. Only the large firms were in a position to perform significant applied research and technological development. Small firms often needed information or assistance to solve problems on the production line. CSIR conceded that an information service would be more suited to their needs than the sort of applied or basic research appropriate for CSIR. Rivett was convinced that applied research for a competitive secondary industry must include a component of basic research, but he doubted whether industry in Australia would have the need for such research. However, Rivett saw a role for research in the physical sciences in improving the utilisation of Australia's mineral and agricultural resources. A Division of Industrial Chemistry was established in March 1940 with preference for research in the following areas: mineral chemistry, alloys, ceramics and cement, and the processing of wool, hides, leather and dairy products. Ian Wark, who had extensive industrial as well as academic research experience, was appointed to lead the division. He had achieved considerable international acclaim for his work on the flotation process for mineral purification.

The contribution of science and technology to the 1939–45 war effort

Science and technology made a vital contribution to the war effort, especially in the production of munitions, aircraft and other defence equipment, but it had an important role in many areas including radio communication, meteorology, the synthesis, isolation and manufacture of drugs and vitamins, the formulation and testing of insect repellents, the proofing of textiles and equipment for tropical conditions, and the composition and processing of army food. Scientists and technical staff in industrial laboratories, as well as in the CSIR, the Munitions Supply Laboratories and other State and Commonwealth Departments, transferred to war-related projects. University academics played leadership roles in several projects and many new graduates were obliged to join industrial or laboratory work. The war led to a growth in Australian industry and a considerable increase in its technological sophistication. The staff in CSIR increased almost four-fold between

1940 and 1945, with the percentage of staff in secondary industry divisions increasing from 5.6 to 23.1%. Basic research and longer term projects in both the universities and CSIR were severely curtailed.

The story of Australia's involvement with Britain in the development of radar systems has been told many times. The work in Australia was carried out secretly at the newly formed CSIR Division of Radiophysics that was accommodated in an extension to the National Physics Laboratory at Sydney University. Another vital wartime project was the manufacture and precision grinding of optical glass for gun sights and binoculars. It involved the cooperation of Australian Consolidated Industries, the Universities of Melbourne and Tasmania, the Mt Stromlo Observatory and the Munitions Supply Laboratories. The CSIR set up a Lubricants and Bearings Section at Melbourne University to take advantage of a visit in 1939 of an expatriate Australian, F. P. Bowden, who was lecturer in physical chemistry at Cambridge University. Bowden had established a considerable reputation for his research on the physics of friction and lubrication, and it was considered that his expertise would be extremely valuable for the production of munitions and aircraft. The expertise provided by Bowden and his team proved to be critical to aircraft production and important for the testing of munitions and weapons.

The synthesis and production of drugs and antibiotics received high priority during the war. Scientists at Sydney and Adelaide Universities and at Monsanto were successful in the synthesis and scale-up production of sulpha drugs, and the Commonwealth Serum laboratories developed the fermentation facilities needed for the large scale production of penicillin and streptomycin. The production of morphine from opium poppy and hyoscine and hyoscyamine from *Duboisia* was a cooperative effort of scientists and technologists from the pharmaceutical firm Felton Grimwade and Duerdin and CSIR. Academics at the University of Melbourne had the difficult task of devising a satisfactory method for the proofing of clothing and equipment for the tropics against microbiological attack.

The post-war era

The 1939–45 war demonstrated probably for the first time the enormous value of effectively harnessing science and innovation on a national scale and the crucial role of advanced technology for a successful war outcome. After the war the industrial nations turned their attention to harnessing science for peaceful purposes and the benefit of mankind. In the USA the National Science Foundation was established as an independent Federal Government agency with the charter to strengthen research in the universities by the award of competitive grants to academics. In the 50 years since the establishment of the National Science Foundation the USA has dominated the world in outputs of basic research and its flow through to innovation by industry.

During the war years in Australia there was an increase in the technological sophistication of Australian industry and a considerable growth in a range of scientific skills. As indicated earlier, CSIR expanded into new areas in the physical sciences and there was growth of the defence laboratories and the telecommunication laboratories of the Australian Post Office. In contrast, basic research in the universities was curtailed during the war, so that in 1946 CSIR was in a position to dominate Australian science. The war made Australia realise that it needed a much larger basic research effort of international standard and more innovative secondary industries if it was to keep up with developments in other countries.

Discussions had already taken place during the war on a proposal to establish a post-graduate research university funded by the Commonwealth Government. The proposal became a reality in 1946 with the establishment of the Australian National University (ANU) in Canberra. Initially, there were four research schools with a high degree of autonomy for each school. The foundation schools were the Research School of Physical Sciences, the Research School of Medical Research named The John Curtain School of Medical Research, the Research School of Social Sciences and the Research School of Pacific Studies. Freedom from undergraduate teaching, generous funding (by Australian university standards) for the building of research teams, and very generous study leave provisions for academics, were the incentives used to persuade leading academics to come to the ANU. Mark Oliphant, eminent nuclear physicist at Birmingham University, accepted the university's invitation to be Director of the Research School of Physical Sciences, but efforts to entice Sir Howard Florey as Director of the John Curtain School of Medical

Research failed after he had shown interest. The ANU was successful in recruiting to professorial and other positions in the Schools several leading researchers who were to achieve outstanding international reputations. The most notable was John Eccles who shared the Nobel Prize for Physiology or Medicine in 1963.

The Research School of Chemistry and Research School of Biological Sciences were added in 1967, and the Research School of Earth Sciences was formed from the Research School of Physical Sciences in 1973. Professors Arthur Birch and David Craig, very distinguished expatriate chemists, returned from the U.K to head the Research School of Chemistry. A Research School of Information Sciences and Engineering was created in 1994. The Mount Stromlo Observatory, which had its beginning as the Commonwealth Solar Observatory in 1924, was transferred to the ANU in 1955, the year in which a new 74-inch telescope was commissioned.

The ANU established an observatory at Siding Spring in Northern New South Wales in the mid 1960s and was successful in having the joint 150-inch Anglo-Australian telescope located there in 1975. The Mount Stromlo and Siding Spring Observatories were part of the Research School of Physical Sciences until 1986 when they became autonomous. They are now the Research School of Astronomy and Astrophysics.

In the post-war period there was a large increase in undergraduate numbers in the State universities and more post-graduate students after the introduction of the PhD degree. The Commonwealth provided scholarships and some financial assistance to the State universities but funds for research were meagre. The CSIR provided some grants for research projects, but it was not until 1966 that the Commonwealth founded the Australian Research Grants Committee and provided the funding for competitive research grants to university academics.

The Bureau of Mineral Resources, Geology and Geophysics was founded in 1946 as a division of the Department of National Development, with H. Raggatt as Director and with the primary functions to research exploration techniques and survey the continent at a broad scale for prospective areas for minerals and oil. The broad surveys of the Bureau were of considerable value to exploration companies in their choice of prospective areas for investigation. The Australian Atomic Energy Commission was created in 1953 to assist in the mining and treatment of uranium deposits and develop practical uses of atomic energy. A laboratory and nuclear reactor were built at Lucas Heights near Sydney for research and the production of short-lived radioactive isotopes for medicine and other uses.

CSIR emerged from the war years stronger and more diversified, and with an enhanced reputation. The contributions of its scientists to the war effort were widely recognised, and in the post-war years the Commonwealth Government provided increases in appropriation funding to CSIR in successive budgets. CSIR also was the major beneficiary in the allocation of substantial research funds from the Wool Research Trust Account. There was a compulsory levy on wool growers for research and publicity, and the Government paid a matching amount to the Wool Research Trust Account for the conduct of scientific research. In addition, a separate Wool Industry Fund was established from the profit on the sale of surplus wool bought by the Government during the war. This fund was reserved for equipment and the construction of laboratories for wool research.

Before the war there was an arrangement with the Wool Industries Research Association at Leeds in England, that wool production research would be done in Australia and research on wool processing research in England. In 1945 CSIR decided to expand its wool research to include basic investigations into the chemical and physical properties of wool and wool processing. There was concern with the competition from synthetic fibres, where the manufacturing process had advantages over wool processing. The Executive Committee had intended to form a single new Division to conduct the research, but failed to attract a suitable person to head the Division. Instead it established three separate laboratories, a protein chemistry laboratory in Melbourne to investigate the properties of wool keratin, a wool physics laboratory in Sydney to study the physical properties of wool fibres and fabrics, and a wool textile laboratory at Geelong for wool processing.

After the war there was also a significant expansion of wool related production research in several of the existing primary industry divisions. A new Division of Animal

Production was also established at Prospect. CSIR also formed new sections for research in meteorological physics, building materials and coal, and the increases in appropriation funding also enabled the rapid expansion of existing Divisions.

Rivett strongly felt that all CSIR Divisions should have an appropriate balance between longer-term basic research and the more applied research. The basic research was essential to underpin the applied programs and ensure that CSIR scientists remained in touch with relevant overseas developments in their field. The 1950s saw a revitalisation of the Division of Plant Industry in Canberra under a new chief, O. H. Frankel. There was an expansion in basic research in areas of plant genetics, physiology, biochemistry, ecology, microbiology and soil physics. The Division achieved international recognition as one of the world's leading plant research laboratories for its significant advances in several areas of plant biology. A section of the Division under the leadership of J. Griffith Davies was established in Brisbane to introduce new pastures to the tropical regions. It later became the Division of Tropical Crops and Pastures. A land research and regional survey section under C. S. Christian was established to survey the northern part of Australia for agricultural development. It became the Division of Land Research. The Division of Industrial Chemistry was split into six separate divisions. Eventually, the large number of divisions in CSIRO led to problems for the coordination and management of the research and the allocation of resources.

At the end of the war, the Division of Radiophysics had a large team of scientists that had acquired considerable expertise with advanced microwave technology from the wartime work on radar. The Division was keen to apply the new radar techniques to peacetime activities such as radio propagation, navigation and the study of weather and climate. Among the programs selected was a new area of radioastronomy. The Division attracted other young scientists and the radioastronomy group, under the inspired leadership of J. L. Pawsey, pioneered the development of radioastronomy. Several of the scientists received considerable international recognition, including election to Fellowship of The Royal Society for the discovery of radio stars and research on the radio emissions of the sun, which transformed the perception of the solar corona. The giant 64 metre radio telescope, which was commissioned at Parkes in 1961, proved to be a very successful research instrument and was the tool for pioneering studies on the Magellanic Clouds.

The Cold War period in the late 1940s created problems for CSIR, due mainly to its involvement with defence related research work in the Aeronautics Division. Rivett was strongly in favour of freedom in the search for and exchange of knowledge and opposed to secrecy. The Australian Government was keen to demonstrate to the United States and the UK that it could protect classified information. CSIR also came under attack from opposition politicians for its failure to introduce adequate security arrangements for sensitive defence related research, including the lack of security screening of staff. There were moves to place CSIR under bureaucratic control within a Government Department. The Chifley Government resisted these but decided to change the management of CSIR. Under the new *Science and Industry Research Act of 1949*, CSIR became the Commonwealth Scientific and Industrial Research Organisation (CSIRO), and responsibility for the management was transferred from a Council to an Executive of five members with three full-time and two part-time. The Chairman was one of the full-time members.

In the 1950s several industrial companies in Australia established large new research laboratories, including ICI Australia, Monsanto, BHP, CSR, Australian Paper Manufacturers, Australian Consolidated Industries and Repco. It augured well for an increase in private sector research in Australia which was low by comparison with the industrial nations of Europe.

The Australian Academy of Science, modelled on the Royal Society of Great Britain, was founded under Royal Charter in 1954 to promote the natural sciences in Australia and recognise outstanding contributions to the advancement of knowledge by scientists resident in Australia.

In 1950 the budgets of the universities for research totalled only £350,000 compared to the CSIRO budget of £2.35 m. The contrast between CSIRO, with its quality staff and good conditions, and the universities, with high teaching loads and poor facilities and equipment for research, was very noticeable

and resented by the universities. After considerable lobbying by the universities as well as by the Chairman of CSIRO, Sir Ian Clunies Ross, the Prime Minister, R. G. Menzies, established a Committee of Inquiry into the universities in 1957. It was chaired by Sir Keith Murray, Chairman of the Universities Grants Commission in the UK. The report of the Committee recommended a large increase in funding for the universities and the establishment of an Australian Universities Commission. The Government supported the recommendations, but it meant the beginning of Commonwealth control of the universities.

The 1960s and 1970s

Public sector support for research continued to increase. There was a large increase in the number of universities during the 1960s and 1970s to meet the demand for undergraduate places, and by 1980 there were 19 universities. Resources for research and postgraduate training were part of the block grants to universities. University research of international standard was boosted by the establishment of the Australian Research Grants Committee in 1965. The ARGC was run along the lines of the National Science Foundation in the United States, with the award of competitively peer-assessed grants to individual academics for equipment, supplies and research assistance. The world prominence of the Great Barrier Reef prompted the Commonwealth Government to establish the Australian Institute of Marine Science as a statutory authority for research on the Great Barrier Reef and marine systems in tropical Australia.

Research related to rural production and processing still dominated the research portfolio of CSIRO. In the mid-1970s, there was increasing concern about land degradation and the longer implications of land management practices. The CSIRO responded by shifting the emphasis of the work of the Division of Land Research in Canberra, and diverting some resources from rural production to form a Division of Land Resource Management in Western Australia.

By the mid-1970s, CSIRO was a large and diverse organisation with a staff of 7,000 and 37 Divisions and 5 Units at locations in all States, the Northern Territory and the ACT. It was managed by an Executive of five full-time members, all with scientific qualifications, and four part-time members. Some critics thought that CSIRO was too large to manage effectively and should be split into at least two organisations. The counter arguments were that a single organisation has more flexibility in moving resources between research areas and is in a better position to form interdisciplinary and multidisciplinary teams. In 1976 the Government decided on an independent inquiry into CSIRO by a small committee chaired by Professor Arthur Birch. The report of the inquiry recommended that CSIRO remain a single organisation. It considered that the existing role of CSIRO in conducting longer-term research in support of primary, secondary and tertiary industry and in areas of community interest such as the environment and conservation was appropriate. During the conduct of the inquiry the committee was made well aware of the gap between CSIRO and manufacturing industry and the reasons for it. The report made a number of recommendations to improve the relationship with manufacturing industry that included the dissemination of CSIRO information. To improve the management of CSIRO the committee of inquiry recommended that the Divisions should be grouped into not more than six institutes, each headed by a Director. The Government accepted all the recommendations of the committee.

The Australian Science and Technology Council (ASTEC) was established in 1978 to advise the Government on matters relating to the conduct and application of science and technology. It was composed of leading academics and industrialists, but for some unknown reason leading scientists from CSIRO and other government agencies were excluded. Matters investigated by ASTEC either were selected by itself or referred by the Government. ASTEC reports were tabled in Parliament, but their influence on the decisions of Government varied considerably.

Applied scientists and technologists in Australia were disappointed that so few of their number were being elected to the Australian Academy of Science. In 1976 an applied science academy was inaugurated as the Australian Academy of Technological Sciences. Engineering was added to the name in 1987.

Science and innovation in the 1980s

The quarter century before 1980 saw a very large increase in public funded research in Australia, but the R & D performance of the private sector was disappointing. Secondary industry was protected by tariffs, much of the technology for manufacturing was imported and the Australian currency was fixed. The optimism after the war that successful outcomes of research in CSIRO and the universities would flow to the private sector and be developed for the nation's benefit was not realised. This led to a shift in government thinking and a number of initiatives were introduced to stimulate the level of R&D in existing industry and encourage new ventures. These included the 150% tax deduction for R&D and the Grants for Industrial R&D (GIRD). The latter were of particular value for companies which were not yet profitable and therefore unable to benefit from the tax concession. The R&D tax concession was reduced to 125% in 1996 and the GIRD scheme was replaced by an R&D Start Program. Innovation in Australia suffered from a shortage of venture capital for R&D and start-up companies. Initiatives from the Government to stimulate the flow of venture capital from the private sector for R&D were by way of tax advantages for Management Investment Companies and Syndicated R&D. Both schemes were abandoned after several years, but an Innovation Investment Fund was set up by the Government in 1997 to assist small, technology-based companies. Most State Governments provided infrastructure for science and technology parks, for technology incubation centres and for promoting the commercialisation of research.

Budgetary constraints in the 1980s meant that CSIRO needed to operate for the first time in thirty years under zero or slightly negative growth. New areas or directions of research, which often required different skills, were supported at the expense of existing activities. Towards the end of the 1980s CSIRO initiated a study to improve the methodology of priority setting. Priority setting by CSIRO now includes the assessment of the attractiveness of programs in terms of potential benefits to Australia and the ability to capture the benefits, and the feasibility in terms of R&D potential and the availability of the R&D expertise. In order to improve the interaction of CSIRO with commercial and other customers the Government decided that CSIRO should obtain a greater proportion of its funds from sources other than by direct parliamentary appropriation. The organisation was required to work to a target of 30% of funds from non-appropriation sources. The Australian Institute of Marine Science and the Australian Nuclear Science and Technology Organisation also were given targets for funds from non-appropriation sources.

The 1980s saw a more pluralistic approach to Commonwealth government funding of research, with Departments such as Environment providing substantial funds for contract research to universities and research agencies in areas of priority to the Department. The funding of rural R&D was reorganised by the Commonwealth Government in 1989 through a number of rural industries R&D corporations and councils. Each corporation or council is funded through a statutory levy on output at the farm gate and matched by the Government up to 0.5% of the gross value of production. The corporations and councils support R&D by contracting out to universities, CSIRO, State government departments and agencies, and others.

In 1989 the Prime Minister created the position of Chief Scientist to be located within the Department of Prime Minister and Cabinet, and a Prime Minister's Science Council with himself as Chair and with Ministers from portfolios with a significant science component. The Council included the Chief Executive of CSIRO, the Chairs of ASTEC and the Australian Research Council and representatives from business. The Chief Scientist was the Executive Officer of the Council and responsible for the agenda papers and follow-up of decisions and matters discussed by Council. The main purpose of the Council, which held its first meeting in 1989, was as an information forum for the Prime Minister and the other Ministers and to involve them in discussion of emerging science topics. It was replaced in 1997 by a new Prime Minister's Science, Engineering and Innovation Council and the abolition of ASTEC.

A revolutionary change in arrangements for higher education occurred in 1989 when the Government supported the proposal by the Minister of Employment, Education and Training, John Dawkins, to abolish the binary

system of universities and colleges of advanced education and replace it with fewer institutions in a unified national system. The colleges were not funded for research, so that the formation of 38 universities in the unified system required a substantial increase in funding for research and research training. There was some increase in resources for research infrastructure in the new universities, but not a commensurate increase in funding for the Australian Research Grants Committee. There was concern that the quality of basic research in the universities could suffer through a dilution of effort.

Focus on research collaboration in the 1990s

By the 1990s it was realised that there was scope to strengthen Australian science and innovation by building larger research groups of critical mass through improved collaboration between the universities, CSIRO and other government research agencies and industry. In 1990 the Government launched the Cooperative Research Centre Scheme with the aims to build centres of research concentration, to capture the benefits of research, and to improve postgraduate research training through the active involvement of researchers from outside the higher education system. There was a requirement that a centre must include at least one higher education institution. Commonwealth funding provided under the CRC program was limited to 50% of the cost of establishing and operating a centre.

The first selection round was held in 1990 when 20 CRCs were established with Commonwealth funding for 5–7 years. There are now 63 centres covering areas of manufacturing technology, information and communication technology, mining and energy, environment, and medical science and technology. As well as universities, participation in the CRC program includes CSIRO and other Commonwealth research agencies, State government departments and agencies, companies and Rural R&D corporations. Some CRCs are incorporated bodies, but the majority are unincorporated. Commonwealth funding under the CRC program is about 30% of the overall resources. Each CRC has a governing Board with an independent Chair.

Reviews of the CRC program conducted in 1995 and 1999 were very supportive. The program is fulfilling its objectives of strengthening the links between research organisations and bridging the gap between public researchers and companies or other users of the research. It has played a major role in changing the research culture within Australia to include an appreciation in the universities of the importance of research outcomes and their commercialisation or utilisation for economic benefit or public good. Postgraduate students have benefited from interaction with supervisors from outside their universities.

The changes outlined above in the organisation and orientation of science, the improved interaction between public sector research and the private sector, the initiatives of Government to stimulate industrial R&D, and the radical reshaping of the tertiary education system, illustrate the very significant changes which have occurred in Australian Science and Technology over the last two decades. These have been in response to an increasing realisation of the need for Australia to develop a more diverse and internationally competitive economy and the crucial importance of science and innovation to its achievement.

Significant Australian inventions

Some of the earlier Australian inventions have been mentioned already: the development of disease resistant wheat varieties at the turn of the century by William Farrer, the flotation of minerals, cobalt as the cure for coast disease of sheep and cattle, improved diagnostic tests and a vaccine for cattle pleuropneumonia, and the control of prickly pear. These discoveries were directed at Australian problems, although minerals flotation is widely used for mineral ore treatment around the world.

Another significant invention in the 1920s was the development by G. K. Williams at Port Pirie of the first continuous refining process for lead. The control of rabbit populations by the introduction of myxomatosis in 1950 had a major impact on wool and meat production.

Basic research at the chemical physics laboratory of CSIRO by Alan Walsh led to the development of atomic absorption spectroscopy in 1953 as a revolutionary and

sensitive method for chemical analysis. Atomic absorption spectrometers are used around the world in hospitals, factories and laboratories to measure traces of metallic elements in an enormous range of substances as diverse as soil, blood, minerals, wine, and plant and animal tissues. The development of the spectrometer was a commercial success, with design and manufacture in Australia for export and eventually licence for manufacture overseas. Another Australian instrument invention was the flame ionisation detector for the sensitive detection of volatile substances by gas liquid chromatography. It was invented by Ian McWilliam at the central research laboratory of ICI in Melbourne.

CSIRO discoveries greatly assisted the wool industry to survive in the face of intense competition from synthetic fibres. The most significant was a spinning technique named Sirospun which enabled the production of a fine wool worsted yarn in a single stage, at a cost saving of 40% over conventional processes.

Examples of significant high technology inventions which were successfully commercialised are the heart pacemaker and defibrillator developed by Telectronics in conjunction with research aid from CSIRO, and the bionic ear, an implantable hearing prosthesis conceived by Graeme Clark of the University of Melbourne and developed in collaboration with Cochlear. Telectronics and Cochlear were subsidiaries of Nucleus Limited, founded in 1965 by Paul Trainor to develop, manufacture and market innovative medical technology. The bionic ear has captured most of the world market for such a device, and the pacemaker has substantial overseas markets.

A new smelting technology, Sirosmelt, that cuts energy costs and increases metal recovery, was devised and tested by CSIRO and further developed by Mount Isa Mines as Isasmelt.

Among other novel Australian inventions are the plastic banknote with a novel inbuilt security device, the result of collaboration between the CSIRO and the Reserve Bank, and the membrane filtration technology of Memtec.

Australia has made a large contribution to the advancement of knowledge proportional to its population. Australian science over all fields produced 2.7% of world science papers in the five years to 1997, but it has particular strengths and excellence in the geosciences, plant and animal sciences, agricultural sciences, ecology and environmental sciences. For example, over this period Australia produced just over 5% of world papers in the geosciences and just under 5% in plant and animal sciences. Although Australia produced only a little under 2% of world papers in materials sciences and just over 2% of those in engineering, the Australian papers had above average rates of citation by world researchers in the areas (DISR 2000, pp. 55–59).

Issues for the 21st century

Increased globalisation of trade and the further lowering of tariff barriers will mean greater competition for Australian industry, but it would also provide opportunities to expand exports of goods and services. Science and innovation will be a crucial element in enhancing the competitiveness of Australian industry and improving the nation's economic and social prosperity. Science and innovation also have an important role to play in overcoming environmental problems, such as land degradation, marine and water pollution, retention of biodiversity and the mitigation of greenhouse gas emissions.

In spite of the efforts of the last decade to broaden the base of the economy, Australia is well below advanced industrial countries in the production of high technology goods and services, that constitute the fastest growing area of world trade. Australia with its small population cannot hope to mount an internationally competitive science and innovation effort in too many areas, and urgent attention needs to be paid to selecting priority areas for the concentration of resources. Governments in Australia have avoided the 'picking of winners' and have preferred to leave the selection of priorities to the market. Modern biotechnology based on cell biology and the identification, isolation, manipulation and transfer of genes is predicted to be a dominant and far reaching technology of the 21st century. The biological science base is relatively strong in Australia and it provides a springboard for the creation of new industry. There are already a few small firms in the biotechnology area which have been spun off from public sector research. A major impediment to growth of new enterprises in

high technology areas, particularly biotechnology, has been the shortage of venture capital for such enterprises. Investors often require a credible market plan and good commercial management skills in the company before they are willing to take the risk of a substantial investment. Strategic alliances with foreign companies would seem to be an attractive and viable option for high technology companies to access the global market. It is very likely that there will be many instances in the biotechnology area where the development of a product and its global marketing can only be achieved in this way. It is important that an Australian enterprise has a strong patent position for its products in order to strengthen its negotiations with a prospective partner.

Several elements of the Australian innovation system need to be strengthened if Australia is to compete successfully in the global market in the trade of high technology goods and services, as well as improving export earnings from the mining and rural industries. Important issues for the innovation system are the education system, the research base, international networks, business R&D, capital markets and tax structures. The last two will not be discussed in this article.

There are concerns that interest in science has declined among school students, and fewer students are choosing science and engineering as a career. The main reason for the poor image of science and engineering is the lack of attractive career opportunities, particularly in the private sector. An improved skill base in science and technology will be crucial to increasing Australia's share of world trade in high technology goods and services, but it is a chicken and egg situation. Without the career opportunities the best students will not be attracted to tertiary studies in science and engineering, but without a pool of experienced researchers and a competitive skill base international companies will not be attracted to establishing more of their operations including R&D activities in Australia.

It is imperative that Australia maintains a strong science research base in the universities, CSIRO and the other Government research agencies. The internationally accepted measure of the quality of the basic research of a country is the number and impact of papers published in peer-reviewed international journals. An article in the American journal Science Watch in 1993 showed a decline in the impact of Australian scientific publications as measured by the decrease in their citation in the papers of other scientists. This study was confirmed by the work of Bourke and Butler, and by a report by the Bureau of Industry Economics that also examined possible reasons for the decline factors without being able to come to a clear-cut conclusion. A study by the Australian Academy of Science concluded that the likeliest cause of the declining impact was a weakening of the networks connecting Australia's younger researchers with their colleagues overseas. The Academy of Science published a follow-up report that examined the various mechanisms by which international scientific networks are established and maintained. The report called for the establishment of a national overseas postdoctoral scheme to significantly increase the opportunities for early career researchers to gain research experience overseas. It recommended that the fellowships be tenable in both public and private sector laboratories.

Another matter of concern for the science base is the low success rate of high quality applications by university researchers for grants from the Australian Research Council because of the limited resources available to the Council. The science base in CSIRO has declined over the past decade with the increase in funding from industry and other external sources and the diversion of resources to support the short-term projects.

The main issue for innovation in Australia in the 21st century is the low level of business expenditure on R&D (BERD) (table 25.1 of the Year Book's *Chapter 25, Science and Innovation* shows expenditure on R&D by sector, including BERD, from 1993–94 to 1998–99). After the introduction of the 150% tax concession BERD showed a steady increase, with an annual growth rate of 17.6% between 1984–85 and 1995–96. Since 1995–96 BERD has fallen from 0.86% of GDP to 0.67% in 1998–99 at a time when the private sector in many other countries in the OECD and the Asian region is increasing R&D (see table 25.3 of the chapter for expenditure on R&D as a percentage of GDP in OECD countries for 1998–99). The reduction in the R&D tax concession in 1996 from 150% to 125% may have contributed to the fall in BERD, but others factors, such as the generally poor international competitiveness of Australian secondary

industry and the small size of the local market, may also have contributed to the lack of greater investment by the private sector in R&D.

The pace of change in science and technology is showing no signs of diminishing, and Australia has no choice but to improve its innovation system and broaden the base of its economy. Australia can no longer rely on its natural resources and the competitiveness of the rural and mining industries to maintain a high standard of living. Australia must become more competitive in the supply of high-technology goods and services and gain a fair share of the expanding world markets for them. The ideas emanating from the Innovation Summit held in Melbourne in February 2000 and the follow-up studies will provide the basis for a report to government on ways to improve innovation in Australia.

References

Australian Academy of Science 1999, *International Networks and the Competitiveness of Australia's Science and Technology*, Australian Academy of Science, Canberra.

Australian Academy of Technological Sciences and Engineering 1988, *Technology in Australia 1788–1988*, Australian Academy of Technological Sciences and Engineering, Melbourne.

Blainey, Geoffrey 1957, *A Centenary History of The University of Melbourne*, Melbourne University Press.

Branagan, David and Holland, Graham (eds) 1985, *Ever Reaping Something New—A Science Centenary*, University of Sydney.

Bourke, Paul and Butler, Linda 1993, *A Crisis for Australian Science?*, Performance Indicators Project, Monograph Series No. 1, Australian National University, Canberra.

British Council 1996, *Australia: a Science Profile*, The British Council.

Bureau of Industry Economics 1996, *Australian Science—Performance from Published Papers*, Australian Government Publishing Service, Canberra.

Currie, George and Graham, John 1966, *The Origins of CSIRO*, Commonwealth Scientific and Industrial Research Organisation, Melbourne.

Department of Industry, Science and Resources 2000, *Australian Science and Technology at a Glance 2000*, AGPS, Canberra.

Foster, S.G. and Varghese, Margaret M., *The Making of the Australian National University*, Allen & Unwin, Sydney.

Home, R. W. (ed.) 1988, *Australian Science in the Making*, Cambridge University Press, Cambridge.

Schedvin, C. B., *Shaping Science and Industry*, Allen & Unwin, Sydney.

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Introduction

The financial system in Australia can be thought of as having three overlapping components. The first component consists of financial enterprises (such as banks) and regulatory authorities, the Reserve Bank and the Australian Prudential Regulation Authority. The second consists of financial markets (for example, the bond market) and their participants (issuers such as governments, and investors such as superannuation funds). The third is the payments system—that is, the cash, cheque and electronic means by which payments are effected—and its participants (for example, banks). The interaction of these components enables funds for investment or consumption to be made available from savings in other parts of the national or international economy.

This chapter provides a summary of the structure and activities of the three financial system components as they function currently. However, the financial system can, and does, change its structure and activities as a result of regulatory or deregulatory processes. The chapter concludes with a short article outlining the main elements of the Australian financial system in 1901, comparing it where possible with the main features of the system today.

Regulation

From 1 July 1998 a new financial regulatory framework came into effect, in response to the recommendations of the Financial System Inquiry (the Wallis Committee). Under the new structure a single prudential supervisor, the Australian Prudential Regulation Authority (APRA) was established to take responsibility for the supervision of banks, life and general insurance companies and superannuation funds. The Australian Securities and Investments Commission (ASIC) assumed responsibility for market integrity and consumer protection across the financial system. The Reserve Bank retained responsibility for monetary policy and the maintenance of financial stability, including stability of the payments system.

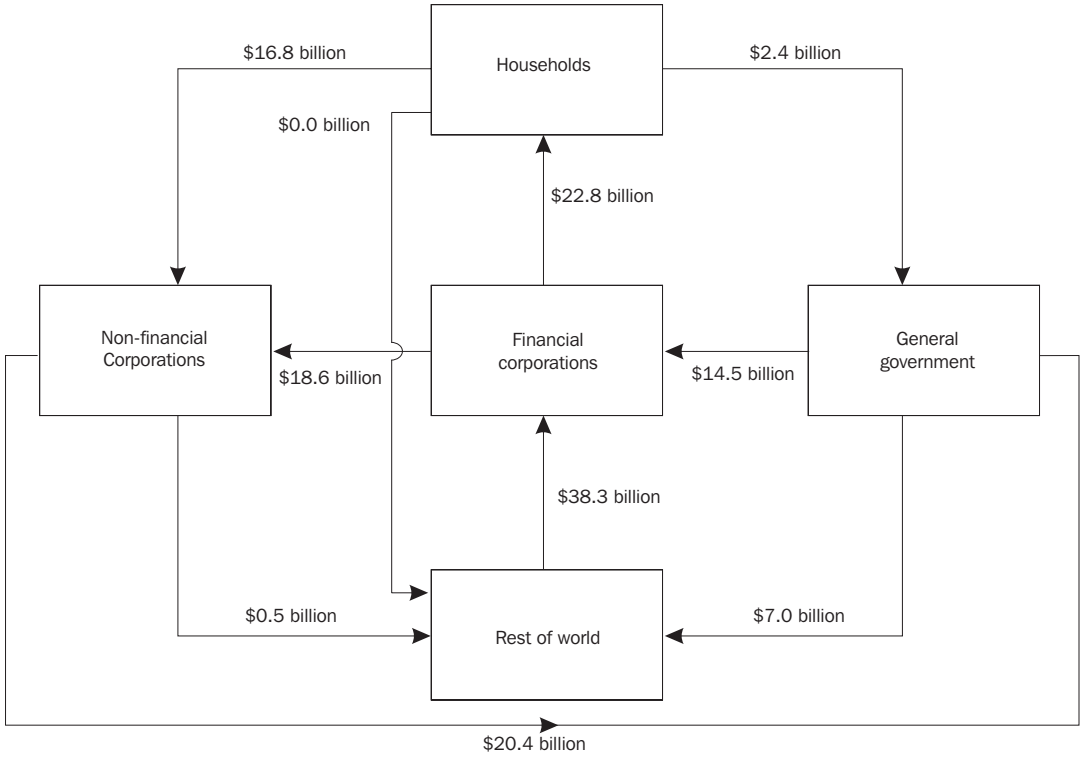
From 1 July 1999 building societies and credit unions have been supervised by APRA. From 1 July 1999 APRA has supervised benefit funds of friendly societies under the *Life Insurance Act 1995*, while health benefit funds of friendly societies are regulated by the Private Health Insurance Administration Council under the *National Health Act 1959*. Prior to 1 July 1999 building societies, credit unions and friendly societies were regulated under State legislation.

On 1 July 2000 APRA transferred regulation of self-managed superannuation funds to the Australian Taxation Office.

Inter-sectoral financial flows

Diagram 26.1 provides an overview of the flows of capital through the financial system and summarises the end result of applying the current statistical framework. It illustrates the net financial flows between sectors during the year 1999–2000. The arrows show the net flow from lenders to borrowers. For example, there is a $22.8b net flow from financial corporations to the household sector. There is also an $18.6b net flow from financial corporations to non-financial corporations. This is mainly attributable to increased loans by financial intermediaries and increased share purchases by financial institutions such as life offices.

26.1 INTER-SECTORAL FINANCIAL FLOWS DURING THE YEAR 1999–2000



Note: The arrows show the direction of net financial flows from lending sectors to borrowing sectors. The number relating to each arrow indicates the value of that net flow during the period. Other claims are omitted from the diagram. For this reason, inter-sectoral borrowing does not equal inter-sectoral lending.

Source: Australian National Accounts: Financial Accounts (5232.0).

Financial enterprises

Financial enterprises are institutions which engage in acquiring financial assets and incurring liabilities, for example, by taking deposits, borrowing and lending, providing superannuation, supplying all types of insurance cover, leasing, and investing in financial assets.

For national accounting purposes, financial enterprises are grouped into Depository corporations, Life insurance corporations, Pension funds, Other insurance corporations, Central borrowing authorities and Financial intermediaries not elsewhere classified.

Depository corporations are those which are included in the Reserve Bank of Australia's broad money measure (see *Money supply measures* later in the chapter). The Reserve Bank itself is a depository corporation; authorised depository institutions are those supervised by APRA and include banks, building societies and credit unions; non-supervised depository corporations registered under the Financial Corporations Act include merchant banks, pastoral finance companies, finance companies and general financiers; finally cash management trusts are also included in depository corporations.

Life insurance corporations cover the statutory and shareholders' funds of life insurance

companies, similar business undertaken by friendly societies and long-service-leave boards.

Pension funds cover separately constituted superannuation funds.

Other insurance corporations cover health, export and general insurance companies.

Central borrowing authorities are corporations set up by State and Territory Governments to provide liability and asset management services for those governments.

Financial intermediaries n.e.c. cover common funds, mortgage, fixed interest and equity unit trusts, issuers of asset-backed securities, economic development corporations and cooperative housing societies.

Table 26.2 shows the relative size of these groups of financial enterprises in terms of their financial assets. This table has been compiled on a consolidated basis, i.e. financial claims between institutions in the same grouping have been eliminated. The total is also consolidated, i.e. financial claims between the groupings have been eliminated. For this reason, and because there are a number of less significant adjustments made for national accounting purposes, the statistics in the summary table will differ from those presented later in this chapter and published elsewhere.

Banks

Between 1940 and 1959, central banking business was the responsibility of the Commonwealth Bank. The *Reserve Bank Act 1959* established the Reserve Bank of Australia as the central bank, and from 1959 to 1998 the Reserve Bank was responsible for the supervision of commercial banks. From 1 July 1998, the Australian Prudential Regulation Authority (APRA) assumed responsibility for bank supervision while the Reserve Bank retains responsibility for monetary policy and the maintenance of financial stability, including stability of the payments system.

Banks are the largest deposit-taking and financial institutions in Australia. At the end of June 2000 there were 55 banks operating in Australia. All are authorised to operate by the *Banking Act 1959*. Four major banks: the Australia and New Zealand Banking Group, National Australia Bank, Westpac Banking Corporation and the Commonwealth Bank of Australia, account for over half the total assets of all banks. These four banks provide widespread banking services and an extensive retail branch network throughout Australia. The remaining banks provide similar banking services through limited branch networks often located in particular regions. As at 30 June 2000, banks operated: 5,003 branches of which 2,838 were in metropolitan areas and 2,165 elsewhere; and 5,043 agencies of which 2,091 were in metropolitan areas and 2,952 elsewhere. Banking services were also provided at 2,724 giroPost locations (at 30 June 1999) and 10,818 Automatic Teller Machines (ATM) throughout Australia (at 30 June 2000).

The liabilities and financial assets of the Reserve Bank are set out in table 26.3. The liabilities and financial assets of the banks operating in Australia are shown in table 26.4.

26.2 FINANCIAL INSTITUTIONS, Financial Assets

	Depository corporations								
At 30 June	Reserve Bank	Banks	Other	Life insurance corporations	Pension funds	Other insurance corporations	Central borrowing authorities	Financial intermediaries n.e.c.	**Consolidated financial sector total**
	$b	$b	$b	$b	$b	$b	$b	$b	**$b**
1996	35.6	474.1	145.0	123.8	208.5	45.9	100.2	98.1	**919.6**
1997	49.1	528.2	154.9	140.1	256.6	51.7	92.0	122.4	**1 029.0**
1998	45.1	581.5	170.6	157.5	297.3	60.7	95.5	165.3	**1 144.2**
1999	44.6	647.6	172.6	172.2	344.6	62.2	96.0	158.2	**1 223.2**
2000	51.1	731.3	180.3	184.1	405.4	68.1	89.7	199.0	**1 389.4**

Source: Australian National Accounts: Financial Accounts (5232.0).

26.3 RESERVE BANK OF AUSTRALIA, Financial Assets and Liabilities

	Amounts outstanding at 30 June		
	1998	1999	2000
	$m	$m	$m
FINANCIAL ASSETS			
Monetary gold and SDRs	1 261	1 101	1 374
Currency and deposits	12 044	8 559	9 970
One name paper	4 074	2 769	1 199
Bonds	26 361	30 719	36 916
Loans and placements	1 282	1 343	1 521
Other accounts receivable	125	129	125
Total financial assets(a)	**45 147**	**44 620**	**51 105**
LIABILITIES			
Currency and deposits	32 659	33 763	31 019
Unlisted shares and other equity(b)	12 554	10 913	10 447
Other accounts payable	1 504	3 460	4 230
Total liabilities	**46 717**	**48 136**	**45 969**

(a) Excludes non-financial assets (e.g. fixed assets, property, inventories, etc.). (b) Estimates based on net asset values.

Source: Australian National Accounts: Financial Accounts (5232.0).

26.4 BANKS(a), Financial Assets and Liabilities

	Amounts outstanding at 30 June		
	1998	1999	2000
	$m	$m	$m
FINANCIAL ASSETS			
Currency and deposits	30 379	29 876	26 311
Acceptance of bills of exchange	65 618	69 740	75 829
One name paper	7 262	9 432	11 474
Bonds	15 903	20 931	20 725
Derivatives	15 136	15 584	17 682
Loans and placements	399 647	446 667	501 154
Equities	28 541	31 436	44 397
Prepayments of premiums and reserves	1 309	1 353	1 471
Other accounts receivable	17 747	22 550	32 302
Total financial assets(b)	**581 542**	**647 569**	**731 345**
LIABILITIES			
Currency and deposits	319 100	337 537	359 697
Acceptance of bills of exchange	51513	53726	54660
One name paper	69 585	88 356	100 361
Bonds	57 651	60 171	74 416
Derivatives	13 764	15 567	18 465
Loans and placements	13 140	20 532	34 897
Equity	96 407	105 396	130 861
Other accounts payable	22 207	34 582	42 209
Total liabilities	**643 367**	**715 867**	**815 566**

(a) Does not include the Reserve Bank of Australia. (b) Excludes non-financial assets (e.g. fixed assets, property, inventories, etc.).

Source: Australian National Accounts: Financial Accounts (5232.0).

26.5 OTHER DEPOSITORY CORPORATIONS, Total Assets

	Amounts outstanding at 30 June		
	1998	1999	2000
	$m	$m	$m
Permanent building societies	11 801	12 697	12 395
Credit cooperatives	18 205	19 881	19 172
Money market corporations	67 636	60 860	63 703
Pastoral finance companies	3 545	4 039	5 922
Finance companies	43 729	47 173	44 272
General financiers	16 704	18 289	20 632
Cash management trusts	18 676	21 531	23 804
Total	**180 296**	**184 470**	**189 900**

Source: Australian Financial Institutions Commission; APRA; Reserve Bank of Australia; ABS: Managed Funds, Australia (5655.0).

Other depository corporations

In addition to banks, financial institutions such as building societies, credit unions and merchant banks play an important part in the Australian financial system. In the Australian Financial Accounts, Other depository institutions are defined as those with liabilities included in the Reserve Bank's definition of *broad money*. Non-bank institutions included in broad money are Other authorised depository institutions (building societies and credit cooperatives), corporations registered under the *Financial Corporations Act 1974* in categories D (money market corporations), E (pastoral finance companies), F (finance companies) and G (general financiers), and cash management trusts.

Table 26.5 shows the total assets of each category of non-bank deposit-taking institution.

There are seven categories of other depository corporations.

Permanent building societies are usually organised as financial cooperatives. They are authorised to accept money on deposit. They provide finance principally in the form of housing loans to their members.

Credit cooperatives—also known as credit unions—are similar to building societies. As their name implies, they are organised as financial cooperatives which borrow from and provide finance to their members. Credit cooperatives mainly lend for purposes other than housing.

Supervision of building societies and credit cooperatives was transferred to APRA on 1 July 1999, and from 1 July 2000 these institutions are no longer subject to the *Financial Corporations Act 1974.*

Money market corporations are similar to wholesale banks and for this reason they are often referred to as merchant or investment banks. They have substantial short-term borrowings which they use to fund business loans and investments in debt securities. They are registered as category D financial corporations under the *Financial Corporations Act 1974*.

Pastoral finance companies incur liabilities to lend to rural producers. They are category E financial corporations. Finance companies (category F financial corporations) borrow mainly on financial markets, for example by issuing debentures. They lend these funds to both businesses and persons. Their lending to businesses is sometimes called commercial lending and covers, for example, financial leasing of vehicle fleets. Their lending to persons is often in the form of instalment credit to finance retail sales by others. In contrast with finance companies, general financiers (category G financial corporations) are funded by their parent or another member of their company group. Typically they lend to corporate customers which buy products produced by member companies of their group. For example, a general financier within a motor vehicle manufacturing group will lend to the group's dealers to finance their inventory of vehicles.

Cash management trusts are investment funds which are open to the public. They invest the pooled monies of their unit holders mainly in money-market securities such as bills of exchange. As with other public unit trusts their operations are governed by a trust deed and their units are redeemable by the trustee on demand or within a short time. They are not subject to supervision by APRA or registered under the *Financial Corporations Act 1974*.

Life insurance corporations

Life insurance corporations offer termination insurance and investment policies. Termination insurance includes the payment of a sum of money on the death of the insured or on the insured receiving a permanent disability. Investment products include annuities and superannuation plans. The life insurance industry in Australia consists of 44 direct insurers and six reinsurers. As with the banking industry, the life insurance industry is dominated by a few very large companies holding a majority of the industry's assets.

Life insurance companies are supervised by the Australian Prudential Regulation Authority under the *Life Insurance Act 1995*.

The operations of life insurance corporations can be split effectively into two parts. The statutory funds contain policy owner monies that are invested according to policy owner expectations. Total assets in statutory funds of Australian life insurers are shown in table 26.6. The shareholders' funds must be held separately and distinct from the statutory funds and, as its name suggests, money in this account can be invested to the benefit of the shareholders.

Pension funds

Pension funds have been established to provide retirement benefits for their members. Members make contributions during their employment and receive the benefits of this form of saving in retirement. In order to receive concessional taxation treatment, a pension fund must elect to be regulated under the *Superannuation Industry (Supervision) Act 1993* (SIS Act). These funds are supervised by either the Australian Prudential Regulation Authority (APRA) or the Australian Taxation Office (ATO). Public sector funds, being funds sponsored by a government employer or government controlled business enterprise, are exempt from direct APRA supervision.

The largest number of pension funds comprise self-managed superannuation funds (also known as 'do it yourself' funds). From 1 July 2000 the Australian Taxation Office assumed responsibility for regulating self-managed superannuation funds (SMSFs).

SMSFs are superannuation funds:

- that have less than five members; and
- all members are trustees; and
- all trustees are members; and
- no member of the fund is an employee of another member of the fund, unless they are related; and
- no trustee receives remuneration for their services as a trustee.

26.6 LIFE INSURANCE CORPORATIONS, Financial Assets and Liabilities

	June 1998	June 1999	June 2000
	$m	$m	$m
FINANCIAL ASSETS			
Currency and deposits	11 490	11 421	10 719
Bills of exchange	6 468	5 998	3 834
One name paper	11 685	16 663	13 060
Bonds	41 792	45 750	44 963
Loans and placements	11 136	9 631	11 067
Equities	70 189	76 408	95 096
Other accounts receivable	4 779	6 281	5 327
Total financial assets	**157 539**	**172 152**	**184 075**
LIABILITIES			
Loans and placements	1 190	3 141	3 514
Listed and unlisted equity	34 690	35 386	42 003
Net equity in reserves	70 669	69 139	62 672
Net equity of pension funds	76 040	90 245	107 634
Other accounts payable	4 560	5 330	4 326
Total liabilities	**187 149**	**203 283**	**220 149**

Source: Managed Funds, Australia (5655.0).

Corporate funds are funds sponsored by a single non-government employer, or group of employers. Industry funds generally have closed memberships restricted to the employees of a particular industry and are established under an agreement between the parties to an industrial award. Public sector funds are those funds sponsored by a public sector employer. Retail funds are pooled superannuation products sold through an intermediary to the general public. Funds with less than five members but which do not qualify as SMSFs are known as small APRA funds (SAFs).

26.7 PENSION FUNDS(a), Number of Funds —1 July 2000

Type of fund	Total
Corporate	2 550
Industry	75
Public sector	48
Retail	180
Small APRA funds	(a)26 000
Self managed superannuation funds	(a)180 000
Total	**(a)209 000**

(a) Approximate number.

Source: ATO and APRA.

In addition to separately constituted funds, the SIS Act also provides for special accounts operated by financial institutions earmarked for superannuation contributions, known as Retirement Savings Accounts (RSA), that also qualify for concessional taxation under the supervision of APRA. The liabilities represented by these accounts are liabilities of the institutions concerned and are included with the relevant institution in this chapter (for example RSAs operated by banks are included in bank deposits in table 26.4), but are also footnoted in table 26.8 for completeness.

The assets of pension funds are shown in table 26.8 and include unfunded pension claims by pension funds on the Commonwealth Government where these have been formally recognised in accounting systems. The assets in the table do not include any provision for the pension liabilities of Australian governments to public sector employees in respect of unfunded retirement benefits. At 30 June 2000 the ABS estimate for these outstanding liabilities was $129.2b.

26.8 PENSION FUNDS(a), Financial Assets

	June 1998	June 1999	June 2000
	$m	$m	$m
Currency and deposits	22 387	27 817	30 107
Bills of exchange	5 226	7 180	6 966
One name paper	7 914	12 634	11 148
Bonds	29 685	30 579	32 714
Loans and placements	9 843	12 750	15 175
Equities	137 692	153 161	190 055
Unfunded superannuation claims	4 818	6 093	7 064
Net equity of pension funds in life office reserves	76 040	90 245	107 634
Other accounts receivable	3 662	4 167	4 554
Total	**297 267**	**344 626**	**405 417**

(a) RSAs were valued at $214.6m at 30 June 2000.

Source: Managed Funds, Australia (5655.0).

26.9 OTHER INSURANCE CORPORATIONS, Financial Assets and Liabilities

	June 1998	June 1999	June 2000
	$m	$m	$m
FINANCIAL ASSETS			
Currency and deposits	4 625	5 733	5 013
Bills of exchange	1 785	2 207	2 881
One name paper	2 754	2 630	2 248
Bonds	16 589	14 961	15 471
Loans and placements	6 587	7 674	9 036
Equities	20 903	21 958	25 715
Other accounts receivable	7 616	7 137	7 815
Total financial assets	**60 859**	**62 300**	**68 179**
LIABILITIES			
Bonds on issue	118	430	597
Loans and placements	1 139	1 766	1 151
Listed shares and other equity	7 032	5 672	3 995
Unlisted shares and other equity	12 068	12 826	13 910
Prepayment of premiums	43 647	45 120	49 041
Other accounts receivable	9 675	9 730	11 229
Total liabilities	**73 679**	**75 544**	**79 923**

Source: Australian National Accounts, Financial Accounts (5232.0); APRA; PHIAC.

Other insurance corporations

This sector includes all corporations that provide insurance other than life insurance. Included are general, fire, accident, employer liability, household, health and consumer credit insurers.

Private health insurers are regulated by the Private Health Insurance Administration Council (PHIAC) under the *National Health Act 1959*. At 30 June 1999 there were 44 private health insurers, including health benefit funds of friendly societies. Other private insurers are supervised by APRA under the *Insurance Act 1973*. At 30 June 1999 there were 162 insurers supervised by APRA. In addition, there were nine public sector insurers at 30 June 2000.

Central borrowing authorities

Central borrowing authorities are institutions established by each State and Territory Government primarily to provide finance for public corporations and quasi-corporations, and other units owned or controlled by those governments, and to arrange investment of the units' surplus funds. The central borrowing authorities borrow funds, mainly by issuing securities, and on-lend them to their public sector clientele. However, they also engage in other financial intermediation activity for investment purposes, and may engage in the financial management activities of the parent government.

Table 26.10 shows the total assets and liabilities held by the central borrowing authorities for the most recent three years.

26.10 CENTRAL BORROWING AUTHORITIES, Financial Assets and Liabilities

	Amounts outstanding at 30 June		
	1998	1999	2000
	$m	$m	$m
FINANCIAL ASSETS			
Currency and deposits	2 124	2 898	1 379
Holdings of bills of exchange	5 193	7 682	6 239
One name paper	6 450	6 118	4 817
Bonds	1 870	2 779	3 209
Derivatives	1 641	1 856	2 201
Loans and placements	77 124	73 674	70 808
Other acounts receivable	1 055	1 025	1 056
Total financial assets(a)	**95 457**	**96 032**	**89 709**
LIABILITIES			
Drawings of bills of exchange	134	105	100
One name paper	5 583	7 726	6 529
Bonds	75 542	73 269	68 411
Derivatives	1 804	1 857	2 108
Loans and placements	6 403	8 701	7 264
Equity	211	209	30
Other accounts payable	3 388	1 827	1 531
Total liabilities	**93 065**	**93 694**	**85 973**

(a) Excludes non-financial assets (e.g. fixed assets, property, inventories, etc.).

Source: Australian National Accounts: Financial Accounts (5232.0).

Financial intermediaries not elsewhere classified (n.e.c.)

This subsector comprises all institutions that meet the definition of a financial enterprise and have not been included elsewhere. It includes:

- economic development corporations owned by governments;
- cash, mortgage, equity and fixed interest common funds;
- mortgage, fixed interest, balanced and equity public unit trusts;
- wholesale trusts;
- securitisers;
- investment companies;
- cooperative housing societies;
- corporations registered in category J of the *Financial Corporations Act 1974*; and
- housing finance schemes established by State Governments to assist first home buyers.

In addition to enterprises which engage directly in intermediation, the subsector also includes enterprises which undertake activity closely associated with intermediation such as:

- fund managers;
- insurance brokers; and
- arrangers of hedging instruments such as swaps, options and futures.

Table 26.11 shows the financial assets of selected groups of financial intermediaries n.e.c.

Economic development corporations are owned by governments. As their name implies, these bodies are expected to finance infrastructure developments mainly in their home State or Territory.

Common funds are set up by trustee companies and are governed by State Trustee Acts. They allow the trustee companies to combine depositors' funds and other funds held in trust in an investment pool. They are categorised according to the main types of assets in the pool, for example, cash funds or equity funds.

26.11 FINANCIAL INTERMEDIARIES N.E.C., Financial Assets

	Amounts outstanding at 30 June		
	1998	1999	2000
	$m	$m	$m
Public unit trusts(a)	54 005	68 100	81 101
Equity unit trusts	34 540	42 842	52 003
Other unit trusts	19 465	25 258	29 098
Common funds	6 890	7 592	8 099
Securitisers	33 185	45 447	63 978
Cooperative housing societies	1 170	n.y.a.	n.y.a.
Other(b)	70 043	n.y.a.	n.y.a.
Total	**165 294**	**158 249**	**199 030**

(a) Excludes property and trading trusts. (b) Includes investment companies, Category J financial institutions, economic development corporations, fund managers, insurance brokers, hedging instrument arrangers, wholesale trusts, and State government housing schemes.

Source: Australian National Accounts: Financial Accounts (5232.0); Managed Funds, Australia (5655.0); Annual Statistics on Financial Institutions (5661.0.40.001).

Public unit trusts are investment funds open to the Australian public. Their operations are governed by a trust deed which is administered by a management company. Under the *Managed Investments Act 1997*, the management company has become the single responsible entity for both investment strategy and custodial arrangements; the latter previously had been the responsibility of a trustee. These trusts allow their unit holders to dispose of their units relatively quickly. They may sell them back to the manager if the trust is unlisted, or sell them on the Australian Stock Exchange if the trust is listed. Public unit trusts are categorised according to the main types of assets in the pool; for example, property or equity. Only those which invest primarily in financial assets—mortgages, fixed interest, futures or equity securities—are included here.

Wholesale trusts are investment funds that are only open to institutional investors—life insurance corporations, superannuation funds, retail trusts, corporate clients, high net worth individuals—due to high entry levels (e.g. $500,000 or above). They may issue a prospectus, but more commonly issue an information memorandum. Only those which invest in financial assets are included here.

Securitisers issue debt securities which are backed by specific assets. The most common assets bought by securitisation trusts/companies are residential mortgages. These mortgages are originated by financial institutions such as banks and building societies or specialist mortgage managers. Other assets can also be used to back these securities, such as credit card receivables and financial leases. Securitisers generally pool the assets and use the income on them to pay interest to the holders of the asset-backed securities.

Investment companies are similar to equity trusts in that they invest in the shares of other companies. However, investors in investment companies hold share assets, not unit assets.

Cooperative housing societies are similar to permanent building societies. In the past they were wound up after a set period, but now they too are continuing bodies. They raise money through loans from members (rather than deposits) and provide finance to members in the form of housing loans. Over recent years many cooperative housing societies have originated mortgages on behalf of securitisers.

Corporations registered in Category J of the *Financial Corporations Act 1974* are classified to this sector because their liabilities are not included in the Reserve Bank's definition of broad money.

Fund managers, insurance brokers and arrangers of hedging instruments are classified as financial auxiliaries as they engage primarily in activities closely related to financial intermediation, but they themselves do not perform an intermediation role. Auxiliaries primarily act as agents for their clients (usually other financial entities) on a fee for service basis, and as such the financial asset remains on the balance sheet of the client, not the auxiliary. However, a small portion of the activities of auxiliaries is brought to account on their own balance sheet, and these amounts are included in table 26.11.

Financial markets

Financial markets are used by participants to either raise funds (for example, by issuing securities) or invest savings (by buying securities and other financial assets). The major markets in the Australian financial system include the share market, bond market and money market. Descriptions and tables indicating prices and activity in various financial markets are provided in this section.

A significant influence in financial markets is the participation of institutional investors controlling large pools of investment funds. These pools are accumulated by collective investment institutions and are often managed on a fee-for-service basis by investment managers. A summary of the activities of these institutions is also provided.

Credit market

Credit may be defined broadly as funds provided to those seeking to borrow. However, analytically useful measures of credit usually exclude borrowings by financial enterprises because their main role is as an intermediary, i.e. they borrow in order to lend. Also, lending and borrowing between enterprises which have a special relationship, such as between companies in the same group or between government agencies, are often excluded from credit measures because transactions between these bodies frequently are of a non-market nature. Similarly, some types of financial instrument, such as trade debts, are not considered to be part of an organised market. All of these types of transactions are omitted from table 26.12, which presents a summary of the demand for credit in Australia by the non-financial sectors. It includes raisings by the issue of both debt and equity securities.

Table 26.13 shows indicative interest rates for bank borrowing and lending. Another view of activity in the credit market is provided later in this chapter under *Lending by financial institutions*.

26.12 DEMAND FOR CREDIT(a)

	Net transactions during year		
	1997–98	1998–99	1999–00
	$m	$m	$m
Funds (including equity) raised on conventional credit markets by			
Private non-financial corporations	54 763	50 795	58 998
National public non-financial corporations	12 259	354	18 312
State and local public non-financial corporations	–1 250	–446	366
National general government	–14 649	–8 973	–12 614
State and local general government	–123	–3 149	–3 357
Households	41 759	42 763	59 239
Total	**92 759**	**81 344**	**120 944**

(a) Positive numbers indicate an increase in raisings. Negative numbers indicate repayment or redemption.

Source: Australian National Accounts: Financial Accounts (5232.0).

26.13 BANK RETAIL DEPOSIT AND LENDING RATES

	June 1998	June 1999	June 2000
	% p.a.	% p.a.	% p.a.
Bank deposit rates			
Six month fixed deposit	4.15	3.70	4.80
Cash management accounts(a)	3.15	2.90	3.65
Bank lending rates			
Housing loans—variable	6.70	6.50	7.80
Small business loans—variable	7.70	7.45	8.85
Credit cards	15.30	15.30	16.25

(a) Accounts from $20,000 to less than $100,000.

Source: Reserve Bank of Australia Bulletin.

Stock market

The Australian stock market provides a mechanism for trading equities (shares), units in trusts, options, and some fixed-interest securities through a network of computers with buyers and sellers located anywhere in the country.

It is operated nationally by Australian Stock Exchange Limited (ASX), which is responsible for the day-to-day running and surveillance of stock market trading. Trading is electronic, conducted using the Stock Exchange Automated Trading System.

ASX classifies listed companies according to their major activity and produces indexes based on these classifications. Table 26.14 summarises the performance of the major indexes over the last three financial years.

26.14 AUSTRALIAN STOCK MARKET INDEXES(a)

	1997–98	1998–99	1999–00
All ordinaries			
Index(b)	2 668.4	2 968.9	3 257.6
High	2 881.4	3 145.2	3 274.1
Low	2 219.2	2 458.2	2 779.7
All industrials			
Index(b)	4 689.0	5 188.1	5 696.7
High	4 964.5	5 583.6	5 823.0
Low	3 401.2	4 271.2	4 786.3
All resources			
Index(b)	1 037.4	1 209.8	1 323.2
High	1 245.8	1 267.2	1 470.6
Low	994.1	902.4	1 122.2

(a) Base 31 December 1979 = 500. (b) Share prices on joint trading floors; average of daily figures for June.

Source: 'Shares' magazine (BRW Media); Reuters data service.

Table 26.15 shows the market value of Australian shares and units in trusts on issue—both listed and unlisted. It shows the amount on issue by sector of issuer and sector of holder of equities and units.

26.15 THE EQUITY MARKET(a)

	Amounts on issue at 30 June					
	June 1998		June 1999		June 2000	
	$m		$m		$m	
	Listed	Unlisted	Listed	Unlisted	Listed	Unlisted
Total equities and units in trusts	**549 888**	**475 391**	**634 618**	**508 469**	**742 329**	**567 793**
ISSUED BY						
National public non-financial corporations	70 857	10 254	111 387	9 955	87 237	9 017
State and local non-financial corporations	—	104 111	—	105 698	—	103 544
Private corporate trading enterprises(b)	308 931	114 317	368 076	127 230	455 630	142 733
Central Bank(c)	—	12 554	—	10 913	—	10 446
Banks(b)	99 140	4 470	107 675	5 119	134 179	6 034
Other depository corporations	179	15 619	211	16 082	243	16 654
Life insurance corporations(b)	26 299	9 588	27 103	8 836	32 509	10 172
Central borrowing authorities	—	211	—	209	—	30
Other insurance corporations	7 032	12 068	5 672	12 826	3 995	13 910
Financial intermediaries	37 450	45 313	14 494	58 971	28 536	77 688
Rest of world	—	146 886	—	152 630	—	177 561
HELD BY						
National public non-financial corporations	—	758	—	815	—	1 733
State and local public non-financial corporations	7	61	—	69	13	70
Private non-financial corporations	10 699	88 316	13 628	82 267	16 759	85 580
Banks	7 203	28 540	7 408	31 435	17 681	36 076
Other depository corporations	—	5 642	—	6 189	—	5 976
Life insurance corporations	34 994	36 386	37 783	39 179	47 618	48 160
Other insurance corporations	4 627	16 276	4 355	17 603	4 578	21 137
Pension funds	84 761	52 919	86 726	66 426	102 756	87 289
Financial intermediaries	61 466	23 390	43 919	32 005	68 995	40 669
National general government	53 122	21 861	74 258	20 093	49 991	19 725
State and local general government	2 546	105 503	—	107 520	—	105 432
Households	100 701	45 486	134 230	59 483	168 596	68 062
Rest of world	189 762	50 248	232 311	45 382	265 342	47 880

(a) Includes units in trusts. (b) These estimated market values are considered to be of poor quality. They should be used cautiously. (c) Net asset values.

Source: Australian National Accounts: Financial Accounts (5232.0).

Money market

Liquidity management by Australian corporations, financial institutions and governments is conducted through an informally arranged market for deposits, loans and placements and by issuance, purchase and sale of short-term debt securities. Rates in the market at end June of the last three financial years are shown in table 26.16.

Money market securities have an original term to maturity of less than one year, often 30, 90 or 180 days. They are issued by borrowers at a discount to face value and carry no income payment other than the repayment of face value at maturity. To enhance liquidity, money market securities conform to standardised attributes concerning risk and discount rates. Because of the standardisation, the securities of different issuers are often combined in the one parcel of securities for trading purposes. There are two types of securities: bills of exchange and one name paper (promissory notes, treasury notes, commercial paper and bank certificates of deposits), both of which are covered by the *Bills of Exchange Act 1909*. The risk of default of a bill of exchange is reduced by an acceptor or endorser adding their name to the security for a fee. Most bills of exchange traded in the market are bank-accepted bills. Promissory notes are issued by institutions whose credit worthiness is equal to or better than banks; they are not accepted by a bank and unlike bills of exchange they are not endorsed by the parties which sell them in the market. The Commonwealth Government issues treasury notes, State Governments and large corporations issue commercial paper and banks issue negotiable certificates of deposit. Table 26.17 shows the amount on issue by sector of issuer and sector of holder of the various types of money market securities.

26.16 SHORT-TERM MONEY MARKET RATES

	June 1998	June 1999	June 2000
	% p.a.	% p.a.	% p.a.
11am call	5.07	4.80	6.01
Bank-accepted bills—90 days	5.32	4.93	6.23

Source: Reserve Bank of Australia Bulletin.

26.17 SHORT-TERM DEBT SECURITIES

	Amounts outstanding at 30 June		
	1998	1999	2000
	$m	$m	$m
ISSUED BY			
Private non-financial corporations	70 757	75 580	76 830
National public non-financial corporations	3 980	3 861	3 647
State and local public non-financial corporations	380	299	265
Banks	72 962	96 061	109 718
Other depository corporations	31 977	29 277	28 677
Central borrowing authorities	6 290	8 536	7 256
Financial intermediaries n.e.c.	12 186	19 771	26 666
National general government	10 294	7 714	5 815
Households	2 470	2 905	2 921
Rest of World	1 546	2 262	1 995
Total	**212 842**	**246 268**	**263 792**
HELD BY			
Private non-financial corporations	13 335	24 733	35 151
National public non-financial corporations	656	763	371
State and local public non-financial corporations	422	178	61
Central bank	4 074	2 769	1 199
Banks	24 745	33 155	42 010
Other depository corporations	22 573	22 718	24 143
Life insurance corporations	18 153	22 661	16 903
Pension funds	13 140	19 814	18 114
Other insurance corporations	4 526	4 848	5 139
Central borrowing authorities	12 216	14 505	11 683
Financial intermediaries n.e.c.	33 544	30 854	34 184
State and local general government	247	107	206
Households	4 986	6 374	9 371
Rest of world	60 226	62 792	65 268
Total	**212 843**	**246 271**	**263 803**

Source: Australian National Accounts: Financial Accounts (5232.0).

26.18 BOND MARKET, Market Yields

	June 1998	June 1999	June 2000
	% p.a.	% p.a.	% p.a.
Treasury bonds			
3 years	5.25	5.63	5.97
5 years	5.38	5.90	6.05
10 years	5.58	6.27	6.16
New South Wales T-corp bonds			
3 years	5.40	5.89	6.29
5 years	5.58	6.24	6.42
10 years	5.86	6.61	6.60
Finance company debentures			
2 years	5.30	5.10	6.30
3 years	5.35	5.45	6.40

Source: Reserve Bank of Australia Bulletin.

Bond market

Bonds are issued with original terms to maturity of one or more years. Usually the investors are paid a set periodic interest, called a coupon, for the life of the bond and receive their initial investment back at maturity. Some bonds have variable interest rates, some have principal repayments indexed, and there are small amounts of zero-coupon or deep discount securities which are issued at a discount to face value. Governments, trading enterprises and financial institutions issue bonds to finance long-term requirements. For these entities, the bond market generally provides a cheaper source of funds than borrowing from banks and other financial institutions. Table 26.18 shows the market yields at end June of the last three financial years for a range of bonds.

The main issuers of bonds are the Commonwealth Government and State Governments, the latter through their central borrowing authorities. Issues by Commonwealth, State and local public trading enterprises may be guaranteed by their respective governments. This provides the bond issue with a higher credit rating, meaning that the market will purchase the bonds at a lower yield. Corporate bonds are issued only by very large private trading and financial enterprises. The amounts outstanding on bonds at end June of the last three financial years are shown in table 26.19.

Foreign exchange market

The foreign exchange market is the means whereby currencies of different countries can be bought and sold. In October 1983, the Commonwealth Government decided to float the Australian dollar, allowing its value to be determined by market forces with few exchange controls and little Reserve Bank intervention. Prior to 1983, the Australian dollar was pegged to a basket of currencies which were weighted according to their trading significance to Australia. Table 26.20 shows the value of the Australian dollar against major currencies at end June of the last three financial years.

Currencies are traded for many reasons: because of exporting or importing requirements, investing or borrowing overseas, arbitraging (i.e. taking advantage of short-term discrepancies in rates) or speculating on possible exchange rate movements with a view to making a profit. Table 26.21 shows daily averages of foreign exchange turnover against all currencies.

26.19 BONDS, Amounts Outstanding

	Amounts outstanding at 30 June		
	1998	1999	2000
	$m	$m	$m
ISSUED BY			
Private non-financial corporations			
Issued in Australia	10 137	12 127	18 626
Issued offshore	21 924	23 442	22 116
National public non-financial corporations			
Issued in Australia	3 174	3 774	4 188
Issued offshore	3 654	2 989	5 182
State and local public non-financial corporations			
Issued in Australia	92	—	—
Issued offshore	—	—	—
Banks			
Issued in Australia	26 886	29 783	31 154
Issued offshore	44 529	45 955	61 728
Other depository corporations			
Issued in Australia	21 535	22 708	24 097
Issued offshore	15 042	10 655	14 353
Other insurance corporations			
Issued in Australia	172	112	116
Issued offshore	500	318	481
Life insurance corporations			
Issued offshore	—	42	—
Central borrowing authorities			
Issued in Australia	52 978	52 609	52 474
Issued offshore	30 323	28 032	23 115
Financial intermediaries n.e.c.			
Issued in Australia	18 498	20 029	24 390
Issued offshore	10 849	11 392	20 951
National general government			
Issued in Australia	95 546	87 208	77 679
Issued offshore	2 478	1 704	1 517
State and local general government			
Issued in Australia	244	244	424
Issued offshore	—	—	—
Rest of the world			
Issued in Australia	11 624	11 954	13 669
Issued offshore	25 168	31 518	33 881
Total	**395 353**	**396 595**	**430 141**
HELD BY			
Private non-financial corporations	5 082	4 979	5 318
National public non-financial corporations	406	153	26
State and local public non-financial corporations	671	332	196
Central bank	26 361	30 719	36 916
Banks	31 039	36 515	38 407
Other depository corporations	13 129	11 533	14 684
Life insurance corporations	41 792	45 750	44 963
Pension funds	29 685	30 579	32 714
Other insurance corporations	16 598	14 972	15 482
Central borrowing authorities	9 466	10 150	10 480
Financial intermediaries n.e.c.	19 961	16 516	13 981
State and local general government	28	82	154
National general government	820	928	1 101
Households	13 887	13 713	12 100
Rest of world	186 428	179 674	203 619
Total	**395 353**	**396 595**	**430 141**

Source: Australian National Accounts: Financial Accounts (5232.0).

26.20 VALUE OF AUSTRALIAN DOLLAR(a), Against Major Currencies

	At 30 June		
	1998	1999	2000
United States dollar	0.6020	0.6547	0.5887
United Kingdom pound	0.3643	0.4094	0.3895
German deutschmark	1.0781	1.2336	1.2242
Japanese yen	84.45	78.97	63.39
Euro	. .	0.63	0.63

(a) Rate given is the midpoint between the buying and selling rates.

Source: Average of Daily Exchange Rates (5654.0).

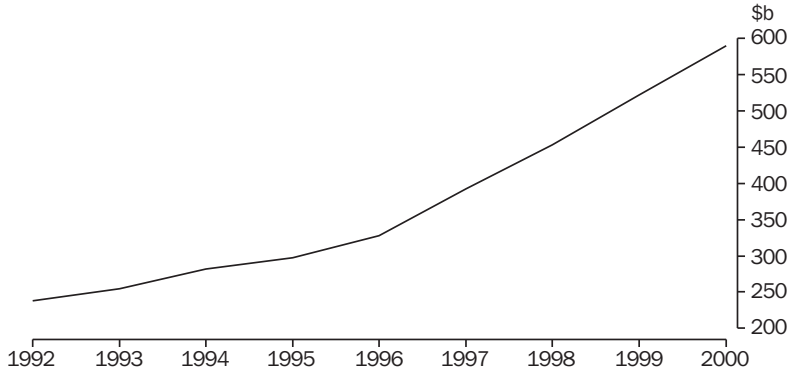
26.21 FOREIGN EXCHANGE TURNOVER AGAINST ALL CURRENCIES, Daily Averages(a)

	1997–98	1998–99	1999–00
	$m	$m	$m
Transactions by foreign exchange dealers(b)			
Outright spot(c)	28 659	32 540	22 751
Outright forward(d)	3 689	4 432	3 828
Swaps	36 452	37 903	36 620
Options	2 112	2 485	2 517
Total	**70 911**	**77 360**	**65 715**

(a) Figures given are the average daily turnover for the financial year. (b) Australian banks and non-bank financial intermediaries authorised to deal in foreign exchange. (c) An outright spot transaction is one for receipt or delivery within two business days. (d) An outright forward transaction is one for receipt or delivery in more than two business days.

Source: Reserve Bank of Australia Bulletin.

26.22 MANAGED FUNDS, Consolidated Assets—At June



Source: Managed Funds, Australia (5655.0).

Managed funds

The term *managed funds* is used loosely in the financial community to embrace two broad types of institutions. The first are collective investment institutions (such as life insurance companies) which buy assets on their own account. The second are investment or fund managers which act as investment agents for the collective investment institutions as well as others with substantial funds to invest. Investment managers have relatively small balance sheets because most of the assets they acquire are purchased on behalf of clients. The significant growth in managed funds (graph 26.22) has been a major development in the financial sector over the last decade.

Collective investment institutions

As the name implies, collective investment institutions pool the funds of many small investors and use them to buy a particular type or mix of assets. The asset profile can be structured to satisfy individual investor requirements regarding, for example, the degree of risk, the mix of capital growth and income, and the degree of asset diversification. Collective investment institutions comprise the following:

- life insurance corporations;
- pension and approved deposit funds;
- public unit trusts;
- friendly societies;

- common funds; and
- cash management trusts.

Funds of a speculative nature that do not offer redemption facilities—for example, agricultural and film trusts—are excluded.

To derive the total assets of collective investment institutions in Australia on a consolidated basis, it is necessary to eliminate the cross investment between the various types of institution. For example, investments by superannuation funds in public unit trusts are excluded from the assets of superannuation funds in a consolidated presentation.

Although statistics for each of these institutions were presented earlier in this chapter, the accompanying tables summarise their consolidated position (i.e. after the cross investment between the institutions has been eliminated). Table 26.23 shows their assets by type of institution and table 26.24 shows assets by type of investment.

26.23 ASSETS OF MANAGED FUNDS, By Type of Collective Investment Institution —30 June 2000

Type of institution	Total $m	Cross invested $m	Consolidated $m
Life insurance corporations(a)	187 528	17 516	170 012
Pension funds	318 438	46 739	271 699
Public unit trusts	124 036	13 055	110 981
Friendly societies	6 163	268	5 895
Common funds	8 219	188	8 031
Cash management trusts	23 804	. .	23 804
Total	**668 188**	**77 766**	**590 422**

(a) Investments by pension funds which are held and administered by life insurance offices are included under life insurance offices.

Source: Managed Funds, Australia (5655.0).

26.24 MANAGED FUNDS, Consolidated Assets

Type of investment	30 June 1998 $m	30 June 1999 $m	30 June 2000 $m
Deposits, loans and placements	58 244	65 752	72 040
Short-term debt securities	54 089	67 179	61 253
Long-term debt securities	66 039	70 391	75 329
Equities and units in trusts	130 548	149 072	183 287
Land and buildings	48 466	57 539	65 109
Overseas assets	78 632	91 958	112 187
Other assets	17 048	20 523	21 218
Total	**453 066**	**522 414**	**590 422**

Source: Managed Funds, Australia (5655.0).

Investment managers

A further development within the managed funds industry is the emergence of specialist investment managers. They are employed on a fee-for-service basis to manage and invest in approved assets on their clients' behalf. They usually act for the smaller collective investment institutions such as public unit trusts. They are not accessible to the small investor. Investment managers provide a sophisticated level of service, matching assets and liabilities. They act in the main as the managers of pooled funds, but also manage clients' investments on an individual portfolio basis.

A considerable proportion of the assets of collective investment institutions, particularly the statutory funds of life insurance corporations and assets of pension funds, is channelled through investment managers. At 30 June 2000, $440b (66% of the unconsolidated assets of collective investment institutions) were channelled through investment managers. Table 26.25 shows the total unconsolidated assets of each type of collective investment institution and the amount of these assets invested through investment managers.

Investment managers also accept money from investors other than collective investment institutions. At 30 June 2000, investment managers invested $109b on behalf of government bodies, general insurers and other clients, including overseas clients.

26.25 ASSETS OF MANAGED FUNDS, Invested through Investment Managers—30 June 2000

Type of fund	Unconsolidated assets of managed funds $m	Assets invested with investment managers $m
Statutory funds of life insurance corporations(a)	187 528	140 381
Pension and approved deposit funds	318 438	185 452
Public unit trusts	124 036	82 033
Friendly societies	6 163	4 326
Common funds	8 219	5 519
Cash management trusts	23 804	22 112
Total	**668 188**	**439 823**

(a) Includes both superannuation and ordinary business.

Source: Managed Funds, Australia (5655.0).

Lending by financial institutions

The lending activities of financial institutions are grouped for statistical purposes into four major types of lending—housing, personal, commercial and leasing. Information regarding housing finance is presented in *Chapter 8, Housing*. Table 26.26 shows the size of commitments by financial institutions for the four types of lending. It should be noted that, although commitments are firm offers of finance made by institutions that have been accepted by borrowers, not all commitments are taken up by borrowers.

26.26 FINANCIAL INSTITUTIONS, Lending Commitments

	1997–98	1998–99	1999–00
Type of lending activity	$m	$m	$m
Housing finance	54 661	61 501	74 930
Personal finance	42 921	45 905	51 877
Commercial finance	172 489	172 056	169 691
Lease finance	8 982	9 515	7 860
Total	**279 053**	**288 977**	**304 358**

Source: Lending Finance, Australia (5671.0).

Lease finance

The statistics in tables 26.27 and 26.28 measure lease finance commitments made by significant lenders (banks, money market corporations, finance companies, general financiers, etc.) to trading and financial enterprises, non-profit organisations, governments, public authorities and individuals.

26.27 LEASE FINANCE COMMITMENTS, By Type of Lessor

	1997–98	1998–99	1999–00
Type of lessor	$m	$m	$m
All banks	2 995	3 683	3 147
Finance companies	3 741	3 756	2 550
General financiers	1 817	1 690	1 443
Other(a)	428	386	718
Total	**8 982**	**9 515**	**7 860**

(a) Includes money market corporations.

Source: Lending Finance, Australia (5671.0).

26.28 LEASE FINANCE COMMITMENTS, By Type of Goods Leased

	1997–98	1998–99	1999–00
Type of good	$m	$m	$m
Motor vehicles and other transport equipment	5 122	5 276	3 611
Construction and earth moving equipment	410	387	320
Agricultural machinery and equipment	534	586	328
Automatic data processing equipment and office machinery	1 591	1 625	1 985
Shop and office furniture, fittings and equipment	278	332	455
Other goods	1 046	1 309	1 162
Total	**8 982**	**9 515**	**7 860**

Source: Lending Finance, Australia (5671.0).

Personal finance

Tables 26.29 and 26.30 present statistics of commitments made by significant lenders (banks, credit cooperatives, finance companies, etc.) to lend to individuals for their own personal (non-business) use. The revolving credit commitments provided in table 26.30 include commitments for overdrafts, credit cards and other personal revolving lines of credit.

26.29 PERSONAL FINANCE COMMITMENTS, By Type of Lender(a)

	1997–98	1998–99	1999–00
Type of lender	$m	$m	$m
All banks	31 477	33 825	39 957
Finance companies	3 339	3 275	3 165
Credit cooperatives	6 654	7 267	6 908
Other lenders(b)	1 449	1 538	1 846
Total	**42 921**	**45 905**	**51 877**

(a) Includes both fixed loan facilities and new and increased lending commitments under revolving credit facilities.
(b) Includes permanent building societies, general financiers and retailers.

Source: Lending Finance, Australia (5671.0).

26.30 PERSONAL FINANCE COMMITMENTS, By Type of Facility

Type of facility	1997–98 $m	1998–99 $m	1999–00 $m
Fixed loan commitments	22 280	21 124	22 251
Revolving credit commitments			
New and increased credit limits	20 640	24 781	29 626
Cancellations and reductions in credit limits	7 153	7 435	9 084
Credit limits at 30 June			
Total	64 279	80 013	101 531
Used	28 124	34 683	46 039

Source: Lending Finance, Australia (5671.0).

Commercial finance

The statistics in tables 26.31 and 26.32 measure commitments, made by significant lenders (banks, finance companies, money market corporations, etc.) to lend to government, private and public enterprises, non-profit organisations and individuals for investment and business purposes.

26.31 COMMERCIAL FINANCE COMMITMENTS(a), By Type of Lender

Type of lender	1997–98 $m	1998–99 $m	1999–00 $m
All banks	132 653	142 776	143 545
Finance companies	23 966	16 468	12 035
Money market corporations	5 985	4 505	4 476
Other lenders(b)	9 885	8 307	9 635
Total	**172 489**	**172 056**	**169 691**

(a) Includes both fixed loan facilities and new and increased lending commitments under revolving credit facilities. (b) Includes permanent building societies, general financiers and pastoral finance companies.

Source: Lending Finance, Australia (5671.0).

26.32 FIXED COMMERCIAL FINANCE COMMITMENTS, By Purpose

Purpose	1997–98 $m	1998–99 $m	1999–00 $m
Construction	10 961	8 025	9 285
Purchase of real property(a)	29 600	28 116	36 035
Purchase of plant and equipment	7 705	7 624	8 553
Refinancing	12 081	11 385	9 169
Other purposes	30 973	35 971	32 216
Total	**91 221**	**91 120**	**95 258**

(a) Purchase of real property includes those finance commitments to individuals for the purchase of dwellings for rental or resale.

Source: Lending Finance, Australia (5671.0).

Money and the payments system

The payments system supports trade and commerce in a market economy. Notes and coin are one means of payment. Liquid balances held at financial institutions are also available potentially for transactions needs, under cheque and other forms of transfer facilities, and thus add to the money supply.

From 1 July 1998 a new financial regulatory framework came into effect, in response to the recommendations of the Financial System Inquiry (the Wallis Committee). Under these arrangements the Reserve Bank has stronger regulatory powers in the payments system in accordance with the *Payments Systems (Regulations) Act 1998*, to be exercised by a Payments System Board within the Bank.

Money

Australia has a decimal system of currency, the unit being the dollar, which is divided into 100 cents. Australian notes are issued in the denominations of $5, $10, $20, $50 and $100 and coins in the denominations of 5c, 10c, 20c, 50c, $1 and $2. $1 and $2 notes were replaced by coins in 1984 and 1988 respectively, and 1c and 2c coins ceased to be issued from 1 February 1992. Table 26.33 shows the value of notes on issue at the last Wednesday of June in the last three financial years. Table 26.34 shows the value of coin on issue at the same time points.

26.33 VALUE OF AUSTRALIAN NOTES ON ISSUE

	Last Wednesday in June		
	1998	1999	2000
	$m	$m	$m
$1	19	—	—
$2	47	46	46
$5	361	379	397
$10	617	639	646
$20	1 804	1 850	1 917
$50	9 523	10 356	11 188
$100	9 280	10 282	11 240
Total	**21 651**	**23 552**	**25 434**
	%	%	%
Increase	7.9	8.8	8.0

Source: Reserve Bank of Australia.

26.34 VALUE OF AUSTRALIAN DECIMAL COIN ON ISSUE

	Last Wednesday in June		
	1998	1999	2000
	$m	$m	$m
1c	23	22	22
2c	30	30	29
5c	112	117	123
10c	102	107	114
20c	148	154	162
50c	215	224	234
$1	365	381	396
$2	518	552	589
Total	**1 511**	**1 588**	**1 669**
	%	%	%
Increase	3.8	5.1	5.0

Source: Reserve Bank of Australia.

Money supply measures

The money supply, as measured and published by the Reserve Bank, refers to the amount of cash held by the public plus deposits with specified financial institutions. The measures range from the narrowest category, money base, through to the widest category, broad money, with other measures in between. The measures mainly used are as follows.

- *Money base*, which comprises holdings of notes and coin by the private sector, deposits of banks with the Reserve Bank, and other Reserve Bank liabilities to the private sector.
- *M3*, which is defined as currency plus bank deposits of the private non-bank sector.
- *Broad money*, which is defined as M3 plus borrowings from the private sector by non-bank financial intermediaries (including cash management trusts) less their holdings of currency and bank deposits.

The money supply under each of these measures at end June of the last three years is shown in table 26.35.

26.35 MONEY SUPPLY MEASURES

	June 1998	June 1999	June 2000
	$m	$m	$m
Money base	31 424	31 752	28 083
M3	340 891	375 835	406 500
Broad money	405 770	451 524	479 716
	%	%	%
Percentage change(a)	5.9	11.3	6.2

(a) Of broad money, over level at end of preceding June.

Source: Reserve Bank of Australia.

Payments system

Following recommendations by the Financial System (Wallis) Inquiry, the Payments System Board was established within the Reserve Bank on 1 July 1998. The Payments System Board has responsibility for determining the Reserve Bank's payments system policy, under the powers set out in the *Payments Systems (Regulation) Act 1998*. The payments system has components for settling large amounts, and components for settling retail amounts.

The High Value Clearing System (HVCS) was implemented in August 1997. The HVCS allows all holders of Reserve Bank exchange settlement accounts to settle large value payments through a system designed to process a high volume of transactions. On 1 March 1999 the Payments System Board announced easing of restrictions on eligibility for holding exchange settlement accounts. APRA-supervised institutions and some institutions not supervised by APRA potentially now have access.

Initially, the settlement of payments was on a net deferred basis, where settlement of interbank obligations was not completed until 9 a.m. on the day following the sending of payment instructions. This was changed to a real-time gross settlement (RTGS) basis on 22 June 1998. This new settlement basis, where payments are settled immediately, contributes substantially to the reduction of settlement risk and systemic risk in the Australian payments system.

Additionally, the Board has declared the Reserve Bank Information and Transfer System (RITS) and the Austraclear System (FINTRACS) to be approved RTGS systems.

About 80% of the value exchanged in the payments system is cleared via the HCVS.

Table 26.36 shows the number of points of access to the payments system. Branches are access points staffed by employees of financial institutions. Agencies are staffed by other than employees of financial institutions such as postmasters or storekeepers, and exclude school agencies and giroPost agencies. giroPost provides a limited range of services at Australia Post offices on behalf of participating financial institutions. At 30 June 1999, eight banks, two building societies and 30 credit unions participated in the giroPost scheme. Electronic points of access include ATM and electronic funds transfer at point of sale (EFTPOS) terminals.

Smaller (retail) non-cash payments are effected by various means, as shown in graph 26.37.

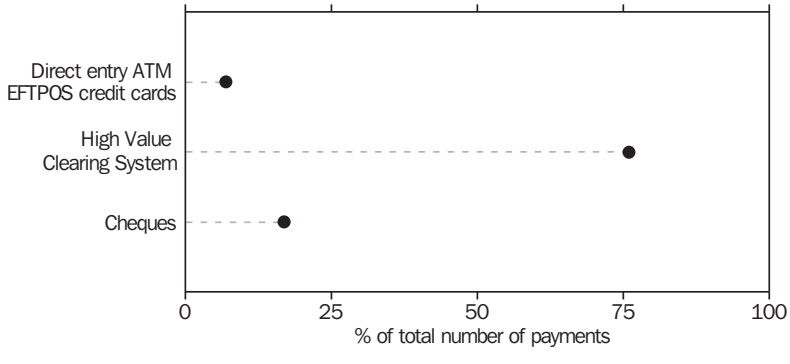
26.36 POINTS OF ACCESS TO THE AUSTRALIAN PAYMENTS SYSTEM

	June 1998	June 1999	June 2000
	no.	no.	no.
Branches			
Banks	5 615	5 358	(a)5 003
Building societies and credit unions	1 317	1 358	(a)1 208
Agencies			
Banks	6 337	6 528	(a)5 043
Building societies and credit unions	1 652	1 417	(a)887
giroPost	2 720	2 724	n.y.a.
ATM	8 814	9 387	10 818
EFTPOS terminals	218 330	265 391	320 372

(a) Numbers are preliminary and subject to revision.

Source: Australian Payments Clearing Association, 2000 Annual Report; APRA.

26.37 MAIN TYPES OF NON-CASH PAYMENTS, Proportions of Total Number of Payments—May 2000

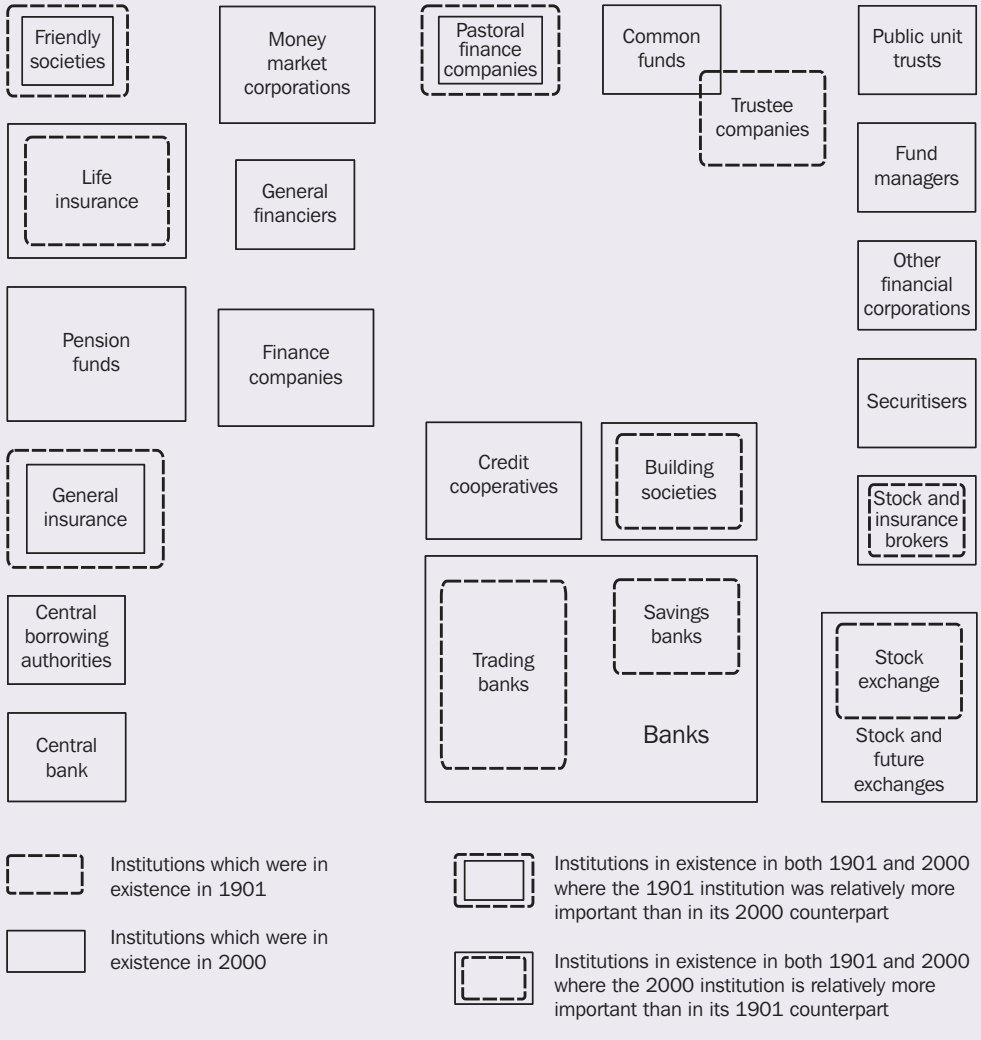


Source: Australian Payments Clearing Association, May 2000.

1901 in retrospect

The current financial system can clearly trace its foundations and connections to the structures and activities of the financial system existing in 1901. The three components of the financial system: financial enterprises, financial markets and payments system, operate along much the same lines as they did in 1901. However, the financial system has undergone considerable growth, with increased diversification and specialisation within institutions, markets, products and services, and with higher levels of activity, to facilitate and/or profit from structural and economic changes. Diagram 26.38 shows the relative structures of the financial sector in 1901 and 2000.

26.38 AUSTRALIAN FINANCIAL SECTOR, Comparison of Structures—1901 and 2000



Regulation framework

One of the clearest differences distinguishing the financial system in 1901 from that in 2001 is the degrees of regulation and monitoring that impact on the environment in which financial enterprises operate. In 1901 there was no centralised legislation or institution with prudential authority over banks or other financial institution/activity despite the failure of a number of banks during the 1890s. Nor was there any Australian institution which performed the functions of a central bank. There were a range of different State laws relating to banks, friendly societies and life assurance organisations.

Statistical framework

The national accounting framework, which defines and structures our current presentation of information on the financial system, did not exist in 1901, nor did accounting treatments such as consolidation within financial sector and subsectors, and standards such as consistent balance dates for reporting. The absence of these standards makes the application of the current framework to the limited data for 1901 difficult. Nevertheless, there were sufficient statistical data collected to provide a reasonable quantification of the financial system a hundred years ago.

The (State) Banking Acts specified that quarterly statements of assets and liabilities and capital resources were to be provided. With the exception of NSW, State legislation governing life assurance companies required annual statements showing total business, and transactions within their own State. In NSW, life assurance companies were regulated under either the Companies or Friendly Societies Act, or were incorporated by special Act.

Financial enterprises

In 1901 enterprises such as banks, pastoral companies and building societies offered deposit and lending facilities for housing and business, while life offices and friendly societies insured against loss of life, health and property. Trustee companies managed property in the event of death until inheritance was settled. A number of types of institution that exist now had no counterpart in 1901. There was no central bank or prudential regulator until the 1930s. Merchant banks and futures exchanges did not start operating and separately constituted pension funds were not set up until the 1950s. Highly specialised vehicles such as public unit trusts, cash management trusts and wholesale investment managers had to await an environment and population that would take advantage of the facilities they offered.

Trading banks (i.e. banks which offered cheque accounts and/or issued their own currency in the form of bank notes) were the largest group of financial institutions in Australia in 1901. There were 22 banks operating in Australasia (i.e. including New Zealand). The four largest banks at the time accounted for half the total assets of all banks (£84m). In 1901 these trading banks operated 1,560 branches, although only two banks did business in all States and New Zealand. Trading banks' assets were estimated at £122m and were composed of cash reserves of £19m in coin and £1m in bullion, landed and other property £6m, notes and bills of other banks £1m, balances due from other banks £1m, all other debts due to the banks £94m (including £1m in 'London Funds', Government and municipal securities of £2m and 'adjusted external cash' of £5m). London Funds were liquid assets and played a similar role to deposits with the Reserve Bank in later years, and 'adjusted external cash' took into account banks' holdings of their own bank notes. Trading bank liabilities were estimated at £96m, consisting of notes in circulation of £3m, bills in circulation not bearing interest £0.5m, deposits of £92m (not bearing interest £38m, bearing interest £54m), and balances due to other banks £0.4m. Generally banks held assets to the value of around half their liabilities at call in coin and bullion.

Savings banks' liabilities consisted predominantly of their deposits, estimated at £33m, from 964,553 depositors. Assets consisted of a cash reserve of £0.4m, deposits at State Treasuries £8m, advances £5m, local and semi-government securities £1m, Commonwealth and State government securities £21m. These institutions were supervised closely by State Governments to ensure public confidence; the volume of depositing and withdrawal reflected the role these institutions played in day to day requirements of the general population and small business in a system where cash was the main means of effecting payments. The State government savings banks and those with trustees or commissioners nominated by the State Government had relationships with the post offices that allowed depositors access to

their accounts. There were a few banks that allowed depositors to withdraw funds from States other than their own and even by telegraph, an early example of electronic funds transfer.

There were numerous land, building, investment, trading and commercial companies which received money on deposit and transacted business as done by banks of issue. Many of these types of institutions had folded during the 1890s. By 1901 there were still 37 building societies operating in Australia, with total assets £4m, and deposits of approximately £3m.

Although merchant banks have been operating in Europe since the sixteenth century, these institutions did not appear in Australia until the 1950s. However, pastoral finance companies were quite important to the provision of finance to rural areas. There were five principal companies which made £20–25m in rural advances, financed by the issue of £23m in debentures and around £10m in shareholders' funds.

Life assurance companies and societies played a role in 1901 very similar to their present incarnation as life insurance corporations, offering term and whole life cover and annuities—essentially converting long term savings into long term investments. There were 18 companies doing ordinary and/or industrial life insurance business. Their liabilities consisted mainly of their assurance funds. Only three of the 18 companies were partly proprietary, with paid up capital approximately £33m. Their assets consisted of loans on mortgages and policies £22m, and around £11m in holdings of government and municipal securities, freehold property, and cash on deposit.

Friendly societies provided health and death cover, and other long term savings. There were approximately 137 societies, with 3,008 branches (or lodges), and total funds of around £3m.

Other insurance companies mostly transacted marine and fire insurance, along with some guarantee and other business. Total liabilities for other insurance business were around £4m, mostly due to shareholders and policyholders. Investments made by other insurance companies consisted of: loans on mortgage £1m; government securities, debentures and shares £1m; land and other property £1m; and fixed deposits £1m. The balance of assets consisted of cash in bank, on hand and bills receivable £0.2m, and sundry debtors £0.3m.

Finally, there were 14 trustees, executors and agency companies, with £1m liabilities due to paid up capital and reserve funds. Their assets consisted of deposits with government £0.2m; other public securities and fixed deposits £0.1m; loans on mortgages £0.2m; property owned £0.2m; and other assets £0.1m. These companies did not receive deposits and made advances on very rare occasions. They were, however, responsible for £31m in assets at credit of estates.

Quantitative comparisons of financial data over the century since Federation are problematic: the economy, legislative framework and statistical frameworks are very different. Nonetheless, table 26.39 provides some indication of relative size and structure of financial corporations.

In this table institutions have been classified according to the standard institutional subsectors of 2000. As a result, the role of friendly societies in 1901 may be misrepresented. In both 1901 and 2000 friendly societies offered both health insurance and 'death' benefits to members, but the proportions for 1901 are not known.

There are some differences between the three data sources consulted for 1901 data, and some choices have been made. The 1901 data are tabulated in many cases from annual returns with accounting periods which were not always the year ended June. The 1901 data in pounds have been converted to dollars. In the absence of specific price indexes for financial sector products, the growth in retail prices of some 47 times between 1901 and 2000 (see table 28.5 of *Chapter 28, Prices*) may provide a broad order of magnitude for revaluation to 2000 prices.

Because of the large differences in economic and legal structures between the financial system in 1901 and 2000, comparisons are difficult. By scaling the 1901 and 2000 data such that the bank data are the same relative size, the relative change in importance of the other institutions can be seen by comparison with banks. In particular pension funds, other insurance, central borrowing authorities, and financial institutions n.e.c., are the significant new players (graph 26.40).

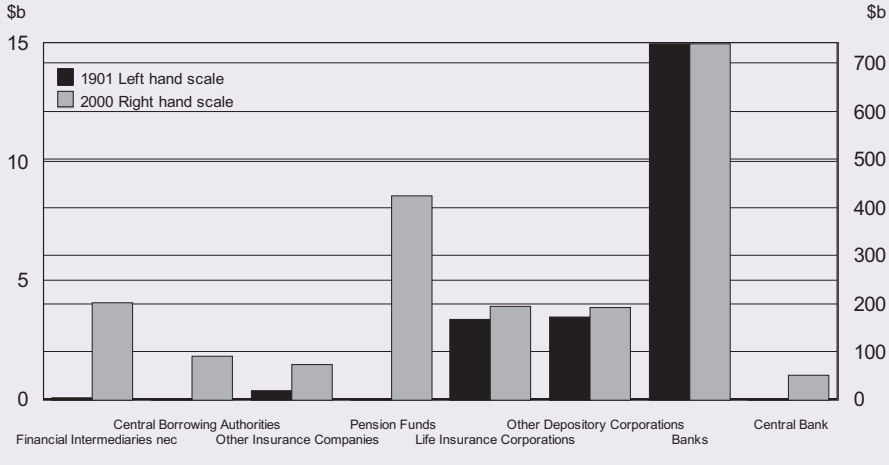
26.39 FINANCIAL INSTITUTIONS, Total Assets by Institutional Sector—1901 and 2000

Type of institution	1901 £m	1901 $b (2000 prices)(a)	1901 %	2000 $b	2000 %
Central Bank	. .	. .	. .	51.4	3
Banks					
Trading	121.6	11.6	52	740.2	38
Saving	35.2	3.4	15	. .	. .
Total(b)	*156.8*	*15.0*	*67*	*740.2*	*38*
Other depository corporations					
Building societies	4.0	0.4	2	12.9	1
Credit cooperatives	. .	. .	. .	19.7	1
Money market corporations	. .	. .	. .	65.1	3
Pastoral finance companies	32.5	3.1	14	5.9	—
Finance companies	. .	. .	. .	44.3	2
General financiers	. .	. .	. .	26.4	1
Cash management trusts	. .	. .	. .	24.7	1
Total(b)	*36.5*	*3.5*	*16*	*191.8*	*10*
Life insurance corporations					
Life insurance companies	32.5	3.1	14	188.6	10
Friendly societies	2.9	0.3	1	6.2	—
Total(b)	*35.4*	*3.4*	*15*	*194.8*	*10*
Pension funds	. .	. .	. .	422.9	21
Other insurance companies	3.9	0.4	2	74.0	4
Central borrowing authorities	. .	. .	. .	89.8	5
Financial intermediaries n.e.c.	0.7	0.1	—	202.5	10
Total(b)	**233.3**	**22.3**	**100**	**1 967.4**	**100**

(a) Pounds converted to dollars by multipying by two (2) and by CPI changes. (b) Aggregates are summations, not consolidations.

Source: Various reports and publications.

26.40 RELATIVE SIZE OF THE FINANCIAL SYSTEM, Australia—1901 and 2000



Source: Various ABS publications and other sources.

Financial markets

There is only a small range of data available for financial markets in 1901, reflecting the reliance on intermediated finance at that time. There are some data for government debt securities on issue, share prices and interest rates.

Most debt security issuance during the early 1900s was by the State Governments. The Commonwealth Government did not issue debt until 1911. Government debt securities outstanding issued overseas were £185m at June 1901 which was 58% of the estimated stock of total foreign investment in Australia of £320m (see the article *An account of investment in and by the six colonies* in *Chapter 30, International accounts and trade*). At 2000 prices the equivalent values would be $18b and $31b. In comparison, at 30 June 2000 general government debt securities held by non-residents were $29.3b, of which only $1.5b were issued overseas. Foreign holdings of general government debt securities accounted for only 4% of total stock of foreign investment in Australia at that date of $677b. Table 26.42 illustrates the development of domestic markets for government securities. Note that debt securities issued by State central borrowing authorities are not included in general government.

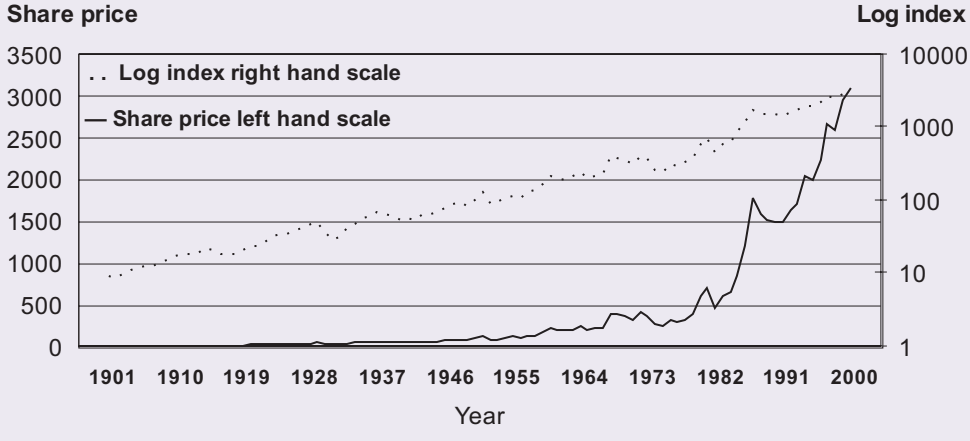
The stock exchange was well established by 1901, with exchanges set up in Sydney, Melbourne, Hobart, Brisbane, Adelaide and Perth. The Australian Stock Exchange has compiled a share price index which spans the period 1901 to 2000 (graph 26.41).

This log scale graph shows a remarkably constant rate of growth, with share prices increasing tenfold approximately every 45 years.

Although futures exchanges were well established in America and Europe, insuring against price fluctuations on primary products such as wheat, butter and eggs, there is no sign of any such activity in Australia in 1901.

Table 26.43 shows a range of prices pertaining in financial markets in 1901 and 2000.

26.41 SHARE PRICE INDEX, Average for Month Ended June—1901 to 2000



Source: Australian Stock Exchange.

26.42 GOVERNMENT DEBT SECURITIES OUTSTANDING—1901 and 2000

	1901 £m	1901 $b (2000 prices)(a)	1901 %	2000 $b	2000 %
By domicile					
Overseas	185	17.6	86	1.5	2
Australia	31	2.9	14	82.8	98
Total	*215*	*20.5*	*100*	*84.3*	*100*
By original term to maturity					
Less than 1 year	8	0.8	4	5.8	67
1 year or more	207	19.8	96	78.5	93
Total	*215*	*20.5*	*100*	*84.3*	*100*

(a) Pounds converted to dollars by multipying by two (2) and by CPI changes.

Source: Various ABS publications and other sources.

Implied bank lending margins were of the order of 3.5 percentage points in 1901 and 4.0 percentage points in 2000. With inflation of about 1.4% per year in 1999, real interest rates were close to nominal rates; for example the real interest rate for small business borrowing was about 7.5%. In 1901 inflation was running at about 9% (see table 28.5 in the section *Long-term price series* in *Chapter 28, Prices*), and real interest rates were probably negative. The $A has depreciated against both US dollar and GB pound, and the GB pound has also depreciated against the US Dollar.

Money and the payments system

In the early days of the colonies, transactions were made using rum, wheat, tobacco and other items as well as money—which included Spanish dollars as well as English pounds and other currencies. There were also Commissariat store receipts and promissory notes issued by private individuals. The nature of these instruments, their reliability, and their accessibility to the public led to the Bank of NSW being allowed to issue notes; it was followed, eventually, by other private trading banks.

At the time of Federation, an Australian currency did not exist, although the debate about the introduction of a decimal system of currency was already occurring. Coinage was minted by the British Government (quite a profitable sideline) and notes were issued by individual banks, except in Queensland where Treasury notes were issued into circulation by the State Government. However, these bank notes, and Treasury notes, were not legal in any State other than the State in which they were issued.

The modern measures of the volume of money in 1901 and 2000 are shown in table 26.44.

Measures of the volume or supply of money are defined as follows:

- *M1*, which was defined as currency in circulation plus current account deposits at banks;
- *M2*, which added in the fixed deposits at trading banks; and
- *M3*, which included all other deposits at banks.

26.43 PRICES IN FINANCIAL MARKETS—1901 and 2000

	1901	2000
Interest rates		
Deposits % p.a.		
Saving bank/cash management	2.88	3.65
Trading bank/fixed 6 month	3.00	4.80
Overdrafts/small business % p.a.	6.50	8.85
Government bonds/5 year bonds p.a.	3.34	6.05
Share prices (index value)	9.18	3115.9
Exchange rates $A=		
GB Pound	0.4937	0.4094
US Dollar	2.4127	0.6547

Source: Various ABS publications and other sources.

26.44 VOLUME OF MONEY, Measures—1901 and 2000

	1901	1901	2000
	£m	$b (2000 prices)(a)	$b
Notes issued			
Reserve Bank	. .	. .	25.4
Queensland Treasury	0.7	0.1	. .
Banks(a)	3.3	0.3	. .
Total	*4.0*	*0.4*	*25.4*
Coins on issue and bullion	28.7	2.7	1.7
Total currency	*32.7*	*3.1*	*27.1*
Currency outside banking system	10.5	1.0	24.6
Current account deposits at bank	36.3	3.5	103.1
M1	*46.8*	*4.5*	*127.7*
Fixed deposits at trading banks	46.8	4.5	. .
M2	*93.5*	*8.9*	. .
Deposits at savings banks	32.0	3.1	. .
Other deposits with banks	. .	. .	278.7
M3	*125.5*	*12.0*	*406.4*

(a) Net of holding of own notes.

Source: various reports and publications.

In 1901 there was no supervision of the payments system as exists now by the Australian Payments Council. By 1907 there were two clearing houses operating: the Sydney Banks' Exchange Settlement and the Melbourne Clearing House; at these two institutions settlements were effected daily between banks doing business in NSW and Victoria. Settlement would have included both notes issued by other banks as well as cheques drawn on current accounts.

Bibliography

ABS publications and data services

Australian National Accounts: Financial Accounts (5232.0).

Average of Daily Exchange Rates (5654.0).

Cash Management Trusts, Australia (5635.0.40.001).

Finance, Australia (5611.0)

Housing Finance for Owner Occupation, Australia (5609.0).

Lending Finance (5671.0).

Managed Funds, Australia (5655.0).

Monthly Statistics for Corporations Registered under the Financial Corporations Act (5647.0).

Other publications and data services

Australian Payments Clearing Association, *Annual Report, 2000*.

Australian Stock Exchange, *Monthly Index Analysis, June 2000*.

BRW Media, *Shares magazine*

Coghlan, T.A. 1904, *A Statistical Account of Australia and New Zealand 1903–4*, Sydney: Govt. Printer.

Commonwealth Bureau of Census and Statistics 1908, *Official Year Book of the Commonwealth of Australia, 1901–1907*, Government Printer, Melbourne.

Private Health Insurance Administration Council, *Annual Report 1998–99, Annual Statistics on Financial Institutions 1998–99*.

Reserve Bank of Australia, *The Reserve Bank of Australia Bulletin*, various issues.

Vamplew, Wray (ed.) 1987, *Australians: Historical Statistics*, Fairfax, Syme & Weldon Associates, Sydney.

Internet sites

Australian Prudential Regulation Authority (APRA), *http://www.apra.gov.au*

Australian Stock Exchange (ASX), *http://www.asx.com.au*

Reserve Bank of Australia, *http://www.rba.gov.au*

27 Government finance

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Introduction

The main functions of government are the provision of non-market services, the regulation of economic and social conditions, and the redistribution of income between sections of the community. These activities are primarily financed by taxation and are carried out by entities in the general government sector. In addition to this core activity, governments can also own or control enterprises that sell goods or services to the public and which operate largely on a commercial (or market) basis (public non-financial corporations) or engage in financial intermediation (public financial corporations).

The Australian system of Government Finance Statistics (GFS), which is used to derive the statistics presented in this chapter, is designed to provide statistical information on public sector entities in Australia classified in a uniform and systematic way. GFS enable policy makers and users to analyse the financial operations and financial position of the public sector at either the level of a specific government, institutional sector or set of transactions. The GFS system is based on international standards set out in the *System of National Accounts 1993* (SNA93) and the draft accrual version of the International Monetary Fund's *A Manual of Government Finance Statistics*.

The public sector comprises general government entities and public financial and public non-financial corporations. These entities are described in the next section. This is followed by an outline of the roles of the different levels of government.

Until recently, GFS comprised only cash-based statistics for general government. Accrual-based data have always been compiled for public corporations. The most recent GFS publication containing accrual-based GFS, *Government Finance Statistics 1998–99* (5512.0), was released in 12 July 2000.

An article on accrual-based GFS sets the scene for accrual-based statistics for the total public and general government sectors for 1998–99 for:

- all governments combined;
- the State Governments; and
- the local governments.

The remainder of the chapter deals with taxation revenue. It presents, for the general government sector, the amount of tax collected in 1998–99 by level of government and type of tax. This is followed by an article on taxation during the first 100 years of Federation.

Public sector

The public sector comprises all organisations owned or controlled by any of the four levels of government within the Australian political system:

- Commonwealth;
- State;
- local; and
- multi-jurisdictional.

The public sector can be divided into the institutional sectors described below, based on the characteristics of the organisations it comprises. These sectors are as follows:

- *General government*. The principal function of general government entities is to provide non-market goods and services (e.g. roads, hospitals, libraries) primarily financed by taxes, to regulate and influence economic activity, to maintain law and order, and to redistribute income by means of transfer payments.

  This institutional sector covers the departments of the Commonwealth Government, State Governments and local government municipalities. It also includes agencies and government authorities under departmental administration which are engaged in the provision of public administration, defence, law enforcement, welfare, public education, and health. Also included are non-departmental bodies which independently perform the government functions of regulation (e.g. Nurses Registration Boards and the Maritime Safety Authority), provision of non-market services (e.g. the Australian Broadcasting Corporation), and redistribution of income (e.g. the Aboriginal and Torres Strait Islander Commission). Some of these bodies may be corporations, but they are still considered part of the general government sector if they perform general government functions. Universities are also considered part of the general government sector.

  Unincorporated government enterprises which provide goods and services to their governments and to the public at prices that are not economically significant (such as cafeterias for government employees, and

municipal swimming pools) are also included in this sector. In addition, government quasi-corporations which sell their output exclusively to other government units, while not in open competition with other producers, are classified as general government units.

- *Public non-financial corporations*. The main function of public non-financial corporations is to provide goods and services which are predominantly market, non-regulatory and non-financial in nature, and financed through sales to consumers of these goods and services.

  Enterprises in the public non-financial corporations sector differ from those in the general government sector in that all or most of their production costs are recovered from consumers, rather than being financed from the general taxation revenue of government. Some enterprises, however, do receive subsidies to make up for shortfalls incurred as a result of government policy, for example in the provision of 'community service obligations' at concessional rates.

  Public non-financial corporations vary in their degree of 'commercialism', from those which are quite heavily reliant on parent governments for subsidies, such as rail and bus transport undertakings, to those which are net contributors to government revenue. Governments may exercise control over public non-financial corporations by either owning more than 50% of the voting stock or otherwise controlling more than half the shareholders' voting power, or through legislation, decree or regulation which empowers the government to determine corporate policy or to appoint the directors. Examples of public non-financial corporations are: Telstra, Australia Post, State Rail and local bus and transport operations.

- *Public financial corporations*. These are government owned or controlled enterprises which engage in financial intermediation (i.e. trade in financial assets and liabilities), such as central borrowing authorities, government banks and insurance offices, or home lending schemes. The inclusion of public financial corporations (PFCs) in Government Finance Statistics makes GFS consistent in scope with the Australian accounting standard for whole of government reporting, *Australian Accounting Standard AAS31, Financial Reporting by Governments*.

Levels of government

The statistics in this chapter are presented by level of government, i.e. Commonwealth, State, local and multi-jurisdictional.

Commonwealth Government

The Commonwealth Government has exclusive responsibility under the Constitution for the administration of a wide range of functions including defence, foreign affairs and trade, and immigration. A distinctive feature of the Australian federal system is that the Commonwealth Government levies and collects all income tax, from individuals as well as from enterprises. It also collects a significant portion of other taxes, including taxes on the provision of goods and services. The Commonwealth distributes part of this revenue to other levels of government, principally the States and Territories.

State Governments

State and Territory Governments (referred to as 'State' Governments in this chapter) perform the full range of government functions, other than those the Constitution deems the exclusive domain of the Commonwealth. The functions mainly administered by State Governments include public order, health, education, administration, transport and maintenance of infrastructure. The revenue base of State Governments is narrower than that of the Commonwealth and consists of taxes on property, on employers' payrolls, and on provision and use of goods and services. This revenue base is supplemented by grants from the Commonwealth.

Local governments

Local government authorities govern areas typically described as cities, towns, shires, boroughs, municipalities and district councils. Although the range of functions undertaken by local governments varies between the different jurisdictions, their powers and responsibilities are generally similar and cover such matters as:

- the construction and maintenance of roads, streets and bridges;
- water, sewerage and drainage systems;
- health and sanitary services;
- the regulation of building standards; and
- the administration of regulations relating to items such as slaughtering, weights and measures, and registration of dogs.

Local governments also provide transport facilities, hospitals, charitable institutions, recreation grounds, parks, swimming pools, libraries, museums and other business undertakings.

Local governments' own-source revenue is derived mainly from property taxes. They also rely on grants from the Commonwealth and their parent State Governments. The Australian Capital Territory has no separate local government.

Multi-jurisdictional

Universities are classified to a 'multi-jurisdictional' category, because of the combined role of the Commonwealth and State Governments in their financing and control. No other units are currently classified as multi-jurisdictional.

Accrual-based Government Finance Statistics

The Australian system for producing GFS was changed during 1999–2000 because of the adoption of accrual accounting by governments and the revision of international statistical standards. As a result, a new conceptual framework was introduced, in the form of an integrated statement of stocks and flows, in place of the old cash-based framework. This new framework allows a more comprehensive assessment of the economic impact of government activity and the sustainability of fiscal policy. It also provides an improved basis for monitoring efficiency in the allocation and use of government resources.

The new framework is divided into a number of separate statements (Operating Statement, Statement of Stocks and Flows, Balance Sheet, and Cash Flow Statement), each of which focuses on analytical aggregates or balances of particular interest to users of GFS.

The following statements are presented in this chapter for the total public and general government sectors for all Australian governments combined, and for the State and local government levels:

- the Operating Statement;
- the Cash Flow Statement; and
- the Balance Sheet.

The remainder of this article discusses the accrual-based analytical measures highlighted in these statements, the classifications used in the compilation of GFS and the main differences between the former cash-based and the new accrual-based GFS.

Analytical measures

The accrual GFS analytical balances are set out below.

Net Operating Balance (NOB)

The GFS NOB is calculated as transactions in GFS revenues less transactions in GFS expenses. It measures (in accrual terms) the full cost of providing government services, including unfunded superannuation and non-cash items such as depreciation. The NOB is not affected by revaluations of existing assets, by acquisition or disposal of assets or by assets recognised in the Balance Sheet for the first time. This measure is conceptually equivalent to the concept of 'Net savings plus capital transfers' in the Australian System of National Accounts (ASNA).

When a government's NOB is positive, it indicates that surplus funds have been generated from current operations and these have resulted in an increase in that government's Net Worth. These surplus funds may be used to acquire assets and/or decrease liabilities. When a NOB is negative, it indicates that a shortfall has occurred on current operations and it has been necessary to incur liabilities and/or liquidate assets, but it does not necessarily indicate that a government is a net borrower. It can therefore be said that a government's NOB, which is in an overall positive balance over a number of periods, such as an economic cycle, is indicative of the on-going sustainability of that government's

operations. However, it should not be necessarily taken as an indicator of sustainability or otherwise of a government's future operations.

GFS Net Lending(+)/Borrowing(–) (NLB)

GFS NLB is calculated as the NOB less net acquisition of non-financial assets (gross fixed capital formation less depreciation plus change in inventories plus other transactions in non-financial assets). It measures in accrual terms the gap between government savings plus net capital transfers and investment in non-financial assets. The GFS NLB is conceptually equivalent to the ASNA concept of 'Net lending/borrowing'. As such, it measures the contribution of the sector to the balance on current and capital accounts in the balance of payments.

When NLB is positive, a government is placing financial resources at the disposal of other sectors in the domestic economy or overseas (i.e. it is lending). When NLB is negative, a government is utilising the financial resources of other sectors in the domestic economy or overseas (i.e. it is borrowing). In this way NLB can be viewed as a macro- or global indicator of the financial impact of government operations on the rest of the economy.

GFS Net Worth (NW)

GFS NW is defined as assets less liabilities less shares and other contributed capital. For the general government (GG) sector, NW is simply assets less liabilities, as other institutional units do not hold shares or other equity capital in this sector.

For listed public corporations, NW is assets less liabilities less shares and other contributed capital. The shares for listed corporations are recorded at the closing values prevailing in the stock market at the reference date. These corporations therefore have a NW measure determined through the valuation implicit in the stock market mechanism.

A similar stock market valuation basis does not exist for unlisted corporations. The shares and other contributed capital for such corporations are therefore set equal to the value of assets less liabilities. This means that their NW is zero. However, in the balance sheet of the owner (i.e. the GG sector) the value of shares and other contributed capital of such entities (i.e. the difference between their assets and liabilities) is shown as an asset and therefore reflected in the NW of the owner.

The NW at two points in time can be differenced to obtain the change in NW, which is attributable to transaction flows (i.e. the NOB) and other flows (i.e. revaluations and other changes in the volume of assets).

The NW is an economic measure of wealth. It reflects the contribution of governments to the wealth of Australia.

GFS Surplus(+)/Deficit(–)

The Surplus(+)/Deficit(–) is a cash-based measure and is calculated as:

Net cash flows from operating activities	
plus	Net cash flows from investments in non-financial assets
less	Distributions paid
less	Acquisitions of assets acquired under finance leases and similar arrangements
equals	Surplus(+)/Deficit(–)

The Surplus(+)/Deficit(–) measure described here is conceptually the same as the Deficit(+)/Surplus(–) used in the former cash-based GFS system; in practice, however, the Surplus(+)/Deficit(–) in the accrual-based GFS system has been derived using different methodologies which result in a break in the time series across the two systems. The Surplus(+)/Deficit(–) is the cash-based equivalent of the GFS Net Lending/Borrowing described above.

The Surplus(+)/Deficit(–) is a broad indicator of a sector's cash flow requirements. When this measure is positive (i.e. a surplus), it reflects the extent to which cash is available to government to either increase its financial assets or decrease its liabilities (assuming no revaluations and other changes occur). When this measure is negative (i.e. a deficit), it is a measure of the extent to which government requires cash, by running down its financial assets, or by drawing on the cash reserves of the domestic economy, or by borrowing from overseas.

Government Finance Statistics classifications

The adoption of the new GFS conceptual framework also required changes to the main classifications used in the compilation of GFS. These changes are outlined below:

- *Economic Type Framework*. This is the main classification of stocks and flows. It is structured as an input classification, unlike the previous output-oriented classification which focused on outlays, revenues and financing transactions. The new classification resembles a set of financial accounting statements with additional sections to cater for the reconciliation of accounting net operating results with cash flows from operating activities, and the capture of items such as acquisitions of assets under finance leases, intra-unit transfers, and revaluations and other changes in the volume of assets.
- *Taxes Classification*. The new Taxes Classification is similar to the previous Taxes, Fees and Fines Classification except that the fees and fines group has been removed (as recommended by SNA93) and reclassified as user charges (in the case of fees) and as other current revenue (in the case of fines). A category for the goods and services tax (GST) has also been added.
- *Source/Destination Classification*. The previous Source/Destination Classification has been expanded to include categories for resident private sector institutional units (private non-financial and financial corporations, households, non-profit institutions serving households) and non-resident institutional units.
- *Institutional Sector Classification*. The previous Institutional Sector Classification has been expanded to incorporate public sector financial corporations.
- *Type of Assets Classification*. This new classification replaces the former Fixed Asset Classification. The Type of Assets Classification incorporates the SNA93 distinction between produced (tangible and intangible) and non-produced (tangible and intangible) assets.
- *Government Purpose Classification*. The Government Purpose Classification remains unchanged.

Relationship of GFS measures to other information

The ABS publishes in *Government Finance Statistics* (5512.0) reconciliations between GFS, ASNA and AAS31 measures to both explain the differences between them to users and maintain user confidence in the data produced by each system. GFS and ASNA are aimed at macroeconomic analysis, while AAS31—which is the accounting standard used by governments—is aimed at producing general purpose financial statements on a similar basis to those of private sector entities in order to provide an overview of government performance, financial position, and financing and investing activities.

Main differences between cash-based and accrual-based Government Finance Statistics

Table 27.1 summarises the main differences between cash-based and accrual-based GFS for each component of the public sector.

27.1 MAIN DIFFERENCES BETWEEN CASH-BASED AND ACCRUAL-BASED GFS

Cash-based GFS	Accrual-based GFS	Main differences
	GENERAL GOVERNMENT	
Outlays and revenues compiled on a cash basis	Revenues and expenses compiled on an accrual basis	Change in accounting basis from cash to accrual
Deficit(+)/Surplus(–) compiled on a cash basis	Surplus(+)/Deficit(–) compiled on a cash basis from the cash flow statement	Change in sign convention
Partial balance sheet (selected financial assets and liabilities)	Full balance sheet	Change to full balance sheet (includes non-financial assets)
	PUBLIC NON-FINANCIAL CORPORATIONS	
Outlays and revenues compiled on an accrual basis	Revenues and expenses compiled on an accrual basis	No change in the accounting basis of revenues and expenses
Deficit(+)/Surplus(–) compiled on an approximate cash basis	Surplus(+)/Deficit(–) compiled on a cash basis from the cash flow statement	Change from an approximate cash basis to a cash basis. Change in sign convention
Partial balance sheet (selected financial assets and liabilities)	Full balance sheet	Change to full balance sheet (includes non-financial assets)
	PUBLIC FINANCIAL CORPORATIONS	
Outlays and revenues compiled on an accrual basis	Revenues and expenses compiled on an accrual basis	No change in the accounting basis of revenues and expenses
Deficit(+)/Surplus(–) compiled on an approximate cash basis	Surplus(+)/Deficit(–) compiled on a cash basis from the cash flow statement	Change from an approximate cash basis to a cash basis. Change in sign convention
Partial balance sheet (selected financial assets and liabilities)	Full balance sheet	Change to full balance sheet (includes non-financial assets)

Total public sector, all Australian governments combined

This section sets out the Operating Statement, Cash Flow Statement and Balance Sheet for the total public sector for all Australian governments combined.

Operating Statement

As table 27.2 shows, in 1998–99 the GFS Net Operating Balance (NOB) for the total public sector was $8,687m and GFS Net Borrowing was $324m.

Cash Flow Statement

Table 27.3 shows a deficit for the total public sector of $3,369m in 1998–99.

27.2 ALL AUSTRALIAN GOVERNMENTS, Total Public Sector, Operating Statement—1998–99

	Commonwealth	Multi-jurisdictional(a)	State	Local	All Australian governments(b)
	$m	$m	$m	$m	$m
GFS Revenue	176 563	8 725	119 721	14 961	277 103
less					
GFS Expenses	*171 586*	*8 380*	*116 688*	*13 703*	*268 416*
equals					
Net Operating Balance	***4 977***	***345***	***3 033***	***1 258***	***8 687***
less					
Net acquisition of non-financial assets	*3 722*	*183*	*4 394*	*725*	*9 011*
equals					
GFS Net Lending(+)/Borrowing(–)	**1 255**	**161**	**–1 360**	**533**	**–324**

(a) The multi-jurisdictional sector currently contains only universities. (b) The sums of individual levels of government may not agree with totals for all Australian governments due to transfers between levels of government.

Source: Government Finance Statistics, Australia, 1998–99 (5512.0)

27.3 ALL AUSTRALIAN GOVERNMENTS, Total Public Sector, Cash Flow Statement—1998–99

	Commonwealth	Multi-jurisdictional(a)	State	Local	All Australian governments(b)
	$m	$m	$m	$m	$m
CASH FLOW STATEMENT					
Cash receipts from operating activities	176 105	8 733	118 524	14 520	275 206
Cash payments for operating activities	–164 626	–7 565	–111 334	–10 794	–252 921
Net cash flows from operating activities	*11 479*	*1 168*	*7 189*	*3 726*	*22 286*
Net cash flows from investments in non-financial assets	–7 969	–755	–12 780	–3 418	–24 918
Net cash flows from investments in financial assets for policy purposes	7 685	3	8 378	6	14 513
Net cash flows from investments in financial assets for liquidity purposes	–1 825	–168	–1391	–58	–2 206
Net cash flows from financing activities	–9 592	–149	209	88	–7 850
Net Increase(+)/Decrease(–) in Cash Held	**–223**	**99**	**1 606**	**345**	**1 825**
SURPLUS(+)/DEFICIT(–)					
Surplus(+)/Deficit(–)	**2 910**	**413**	**–5 717**	**298**	**–3 369**

(a) The multi-jurisdictional sector currently contains only universities. (b) The sums of individual levels of government may not agree with totals for all Australian governments due to transfers between levels of government.
Note: Negative figures denote outflows.

Source: Government Finance Statistics, Australia, 1998–99 (5512.0)

Balance Sheet

Table 27.4 provides Balance Sheet results for 1998–99. The consolidated GFS Net Worth (NW) for the total public sector was $276,201m.

27.4 ALL AUSTRALIAN GOVERNMENTS, Total Public Sector, Balance Sheet—30 June 1999

	Commonwealth	Multi-jurisdictional(a)	State	Local	All Australian governments(b)
	$m	$m	$m	$m	$m
Assets					
Financial assets	107 052	7 170	90 008	7 314	195 392
Non-financial assets	89 267	15 739	332 600	131 970	569 574
Total	*196 319*	*22 908*	*422 608*	*139 283*	*764 966*
Liabilities	260 187	5 301	192 014	9 201	450 635
Shares and other contributed capital	38 226	. .	—	—	38 130
GFS Net Worth	**–102 094**	**17 608**	**230 593**	**130 082**	**276 201**
Net debt(c)	67 510	–3 957	26 106	227	89 873

(a) The multi-jurisdictional sector currently contains only universities. (b) The sums of individual levels of government may not agree with totals for all Australian governments due to transfers between levels of government. (c) Equals deposits held, advances received, Reserve Bank notes on issue and borrowing less cash and deposits, advances paid, and investments, loans and placements.

Source: Government Finance Statistics, Australia, 1998–99 (5512.0)

General government, all Australian governments combined

This section sets out the Operating Statement, Cash Flow Statement and Balance Sheet for the general government sector for all Australian governments combined.

Operating Statement

Table 27.5 provides an Operating Statement for the general government sector for 1998–99.

For 1998–99 the GFS Net Operating Balance for the general government sector for all Australian governments combined was $9,711m. The two largest components of this figure were the NOBs for the Commonwealth and State Governments, $5,022m and $4,162m respectively.

GFS Net Lending for the general government sector for all Australian governments combined was $5,270m for 1998–99. The Commonwealth Government and the State Governments contributed $3,629m and $2,012m respectively to this aggregate.

Cash Flow Statement

Table 27.6 provides a Cash Flow Statement for 1998–99 for the general government sector for all Australian governments combined.

The cash surplus for all Australian governments for 1998–99 was $991m, the result of a Commonwealth surplus of $3,889m partly offset by a deficit of $2,465m for State Governments. Local governments and universities generated small surpluses.

27.5 ALL AUSTRALIAN GOVERNMENTS, General Government, Operating Statement—1998–99

	Commonwealth	Multi-jurisdictional(a)	State	Local	All Australian governments(b)
	$m	$m	$m	$m	$m
GFS Revenue					
Taxation revenue	139 797	—	35 399	6 301	181 282
Current grants and subsidies	—	4 397	31 843	1 909	276
Sales of goods and services	3 504	3 495	8 648	4 293	19 114
Interest from public non-financial corporations	93	. .	. .	. .	93
Interest from public financial corporations	—	. .	. .	. .	—
Interest from other	642	. .	. .	. .	193
Interest income n.e.c.	. .	261	2 336	348	2 939
Dividend income	5 126	. .	. .	. .	. .
Other	3 044	572	12 872	2 105	20 754
Total	*152 206*	*8 725*	*91 097*	*14 956*	*224 649*
less					
GFS Expenses					
Gross operating expenses					
Depreciation	2 308	580	4 363	2 894	10 144
Employee expenses	14 942	4 772	(c)37 217	3 867	(c)60 663
Other operating expenses	24 214	2 693	22 878	6 344	55 792
Total	*41 465*	*8 045*	*64 458*	*13 105*	*126 599*
Nominal superannuation interest expenses	2 407	—	(c)2 448	—	(c)4 855
Other interest expenses	8 014	20	3 373	400	11 478
Other property expenses	—	—	4	—	4
Current transfers					
Grant expenses to State Governments	31 120	. .	. .	. .	. .
Grant expenses to the private sector	5 398	. .	. .	. .	5 398
Grant expenses to universities	4 237	. .	. .	. .	. .
Grant expenses to local governments	226	. .	. .	. .	. .
Grant expenses n.e.c.	. .	12	8 544	21	7 048
Subsidy expenses to public corporations	322	. .	. .	. .	322
Subsidy expenses to other	2 157	. .	. .	. .	2 157
Subsidy expenses n.e.c.	. .	6	4 083	—	4 063
Other current transfers	49 020	294	1 061	110	50 029
Capital transfers					
Grant expenses to public non-financial corporations	—	. .	. .	. .	. .
Grant expenses to public financial corporations	—	. .	. .	. .	. .
Grant expenses to other levels of government	2 338	. .	. .	. .	. .
Grants to local governments	. .	. .	533	. .	. .
Grant expenses n.e.c.	. .	—	. .	52	2 367
Other capital transfers	479	4	2 432	11	618
Total	*147 184*	*8 380*	*86 935*	*13 699*	*214 938*
equals					
GFS Net Operating Balance	**5 022**	**345**	**4 162**	**1 257**	**9 711**
less					
Net acquisition of non-financial assets					
Gross fixed capital formation	3 286	736	6 366	3 593	13 968
less Depreciation	2 308	580	4 363	2 894	10 144
plus Change in inventories	473	1	30	–4	500
plus Other transactions in non-financial assets	–58	26	118	32	118
Total	*1 393*	*183*	*2 151*	*728*	*4 442*
equals					
GFS Net Lending(+)/Borrowing(–)	**3 629**	**161**	**2 012**	**530**	**5 270**

(a) The multi-jurisdictional sector currently contains only universities. (b) The sums of individual levels of government may not agree with totals for all Australian governments due to transfers between levels of government. (c) Nominal superannuation interest expenses of the Australian Capital Territory are included in employee expenses.

Source: Government Finance Statistics, Australia, 1998–99 (5512.0).

27.6 ALL AUSTRALIAN GOVERNMENTS, General Government, Cash Flow Statement—1998–99

	Commonwealth	Multi-jurisdictional(a)	State	Local	All Australian governments(b)
	$m	$m	$m	$m	$m
CASH FLOW STATEMENT					
Cash receipts from operating activities					
Taxes received	138 150	—	35 449	6 230	179 770
Receipts from sales of goods and services	4 005	2 557	8 451	4 382	18 547
Grants and subsidies received	. .	4 542	34 081	2 490	682
Interest received from public non-financial corporations	93	—	309	—	402
Interest received from public financial corporations	—	14	458	76	548
Interest from other	557	238	1 522	267	1 957
Other receipts	7 666	1 382	10 599	1 068	20 621
Total	*150 472*	*8 733*	*90 868*	*14 514*	*222 526*
Cash payments for operating activities					
Payments for goods and services	–24 024	–6 392	–66 569	–9 859	–106 176
Grants and subsidies paid to State Governments	–33 411	. .	. .	. .	. .
Grants and subsidies paid to the private sector	–6 451	. .	. .	. .	–6 451
Grants and subsidies paid to universities	–4 270	. .	. .	. .	. .
Grants and subsidies paid to local governments	–240	. .	. .	. .	. .
Grants and subsidies paid to public corporations	–323	. .	. .	. .	–323
Grants and subsidies paid n.e.c.	. .	—	–15 391	–24	–13 582
Interest paid	–8 047	–21	–3673	–399	–11 783
Other payments	–66 589	–1 152	–1 234	–516	–69 355
Total	*–143 355*	*–7 565*	*–86 868*	*–10 798*	*–207 669*
Net cash flows from operating activities	*7 117*	*1 168*	*4 001*	*3 717*	*14 857*
Net cash flows from investments in non-financial assets					
Sales of non-financial assets	1 351	53	1 637	706	3 747
Purchases of new non-financial assets	–4 579	–808	–8 030	–4 116	–17 527
Purchases of secondhand non-financial assets	—	—	–2	–3	–4
Total	*–3 228*	*–755*	*–6 394*	*–3 413*	*–13 784*
Net cash flows from investments in financial assets for policy purposes	7 027	3	5 415	6	10 902
Net cash flows from investments in financial assets for liquidity purposes	–447	–168	154	–58	–549
Net cash flows from financing activities					
Advances received (net)	—	—	–1 095	9	200
Borrowing (net)	–11 752	31	–561	33	–12 230
Deposits received (net)	122	6	40	–4	154
Other financing (net)	2 573	–186	–206	57	3 659
Total	*–9 058*	*–149*	*–1 821*	*94*	*–8 216*
Net Increase(+)/Decrease(–) in Cash Held	**1 411**	**99**	**1 354**	**346**	**3 209**
SURPLUS(+)/DEFICIT(–)					
Net cash flows from operating activities and net cash flows from investments in non-financial assets	3 889	413	–2 394	304	1 072
Acquisitions of assets under finance leases and similar arrangements	—	—	–71	–11	–82
Surplus(+)/Deficit(–)	**3 889**	**413**	**–2 465**	**293**	**991**

(a) The multi-jurisdictional sector currently contains only universities. (b) The sums of individual levels of government may not agree with totals for all Australian governments due to transfers between levels of government.
Note: Negative figures denote outflows.

Source: Government Finance Statistics, Australia, 1998–99 (5512.0).

27.7 ALL AUSTRALIAN GOVERNMENTS, General Government, Balance Sheet—30 June 1999

	Commonwealth	Multi-jurisdictional(a)	State	Local	All Australian governments(b)
	$m	$m	$m	$m	$m
Assets					
Financial Assets					
Cash and deposits	1 875	617	5 746	1 803	10 039
Advances paid	16 065	12	5 720	7	15 315
Investments, loans and placements	8 178	3 713	19 151	4 122	35 134
Other non-equity assets	5 706	2 446	7 786	1 299	15 463
Equity	100 643	382	111 651	280	212 956
Total	*132 468*	*7 170*	*150 054*	*7 512*	*288 908*
Non-financial assets					
Land and fixed assets	51 905	15 718	184 040	130 735	382 399
Other non-financial assets	1 615	20	2 194	967	4 796
Total	*53 520*	*15 739*	*186 234*	*131 702*	*387 195*
Total	*185 988*	*22 908*	*336 289*	*139 214*	*676 103*
Liabilities					
Deposits held	559	50	1 254	217	2 078
Advances received	—	70	5 715	44	. .
Borrowing	96 129	265	37 413	5 855	138 973
Unfunded superannuation liability and other employee entitlements	74 710	3 671	49 469	1 381	129 231
Other provisions	4 340	143	362	98	4 943
Other non-equity liabilities	11 302	1 102	11 481	1 543	23 653
Total	*187 041*	*5 301*	*105 694*	*9 138*	*298 878*
GFS Net Worth	**–1 053**	**17 608**	**230 594**	**130 076**	**377 225**
Net debt(c)	70 570	–3 957	13 765	184	80 562

(a) The multi-jurisdictional sector currently contains only universities. (b) The sums of individual levels of government may not agree with totals for all Australian governments due to transfers between levels of government. (c) Equals deposits held, advances received and borrowing, less cash and deposits, advances paid and investments, loans and placements.

Source: Government Finance Statistics, Australia, 1998–99 (5512.0)

Balance Sheet

Table 27.7 provides the Balance Sheet as at 30 June 1999 for the general government sector.

The consolidated GFS Net Worth as at 30 June 1999 for the general government sector for all Australian governments combined was $377,225m. The major contributor to this result was land and fixed assets.

Total public sector, State Governments

This section sets out the Operating Statement, Cash Flow Statement and Balance Sheet for the total public sector for all State Governments.

Operating Statement

Table 27.8 summarises the net operating results for the total public sector for all State Governments for 1998–99.

Cash Flow Statement

Table 27.9 summarises the cash operating results for 1998–99 for the total public sector for all State Governments.

Balance Sheet

Table 27.10 summarises the Balance Sheet results as at 30 June 1999 for the total public sector for all State Governments.

27.8 STATE GOVERNMENTS, Total Public Sector, Operating Statement—1998–99

	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Total(a)
	$m	$m	$m	$m	$m	$m	$m	$m	$m
GFS Revenue	37 955	27 173	22 726	10 441	14 438	3 247	2 368	1 902	119 721
less									
GFS Expenses	36 822	25 740	21 892	10 548	13 948	3 263	2 619	2 043	116 688
equals									
Net Operating Balance	***1 133***	**1 433**	**833**	**–108**	**490**	**–16**	**–252**	**–141**	**3 033**
less									
Net acquisition of non-financial assets	*1 264*	1 087	2 034	–125	361	13	–117	–65	4 394
equals									
GFS Net Lending(+)/Borrowing(–)	***–132***	**346**	**–1201**	**17**	**129**	**–29**	**–135**	**–75**	**–1 360**

(a) The sums of all individual State jurisdictions may not agree with total State figures, due to transfers between jurisdictions.

Source: Government Finance Statistics, Australia, 1998–99 (5512.0)

27.9 STATE GOVERNMENTS, Total Public Sector, Cash Flow Statement—1998–99

	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Total(a)
	$m	$m	$m	$m	$m	$m	$m	$m	$m
CASH FLOW STATEMENT									
Cash receipts from operating activities	37 684	26 426	22 577	10 218	14 089	3 211	2 367	1 892	118 524
Cash payments for operating activities	–36 227	–26 772	–19 290	–9 379	–12 740	–2 917	–2 377	–1 702	–111 334
Net cash flows from operating activities	*1 457*	*–346*	*3 287*	*839*	*1 348*	*294*	*–10*	*190*	*7 189*
Net cash flows from investments in non-financial assets	–3 690	–2 441	–4 311	–594	–1 302	–255	–69	–129	–12 780
Net cash flows from investments in financial assets for policy purposes	–22	7 011	837	—	14	30	84	35	8 378
Net cash flows from investments in financial assets for liquidity purposes	–345	–554	102	344	–308	–213	6	–39	–1 391
Net cash flows from financing activities	2 704	–3 854	628	–535	962	323	—	–47	209
Net Increase(+)/Decrease(–) in Cash Held	**104**	**–184**	**543**	**54**	**714**	**179**	**12**	**10**	**1 606**
SURPLUS(+)/DEFICIT(–)									
Surplus(+)/Deficit(–)	**–2 231**	**–2 787**	**–1 080**	**245**	**–10**	**39**	**–82**	**53**	**–5 717**

(a) The sums of individual State jurisdictions may not agree with total State figures, due to transfers between jurisdictions.
Note: Negative figures denote outflows.

Source: Government Finance Statistics, Australia, 1998–99 (5512.0)

27.10 STATE GOVERNMENTS, Total Public Sector, Balance Sheet—30 June 1999

	NSW	Vic.	Qld.	SA	WA	Tas.	NT	ACT	Total(a)
	$m	$m	$m	$m	$m	$m	$m	$m	$m
Assets									
Financial assets	13 808	21 679	32 346	9 549	8 722	2 449	1 188	1 007	90 008
Non-financial assets	119 036	56 980	64 880	22 931	43 511	10 764	6 227	8 252	332 600
Total	*132 844*	*78 659*	*97 227*	*32 480*	*52 232*	*13 213*	*7 415*	9 258	*442 608*
Liabilities	54 362	42 362	39 123	21 864	20 746	8 058	3 791	2 414	192 014
GFS Net Worth	**78 482**	**36 296**	**58 103**	**10 616**	**31 486**	**5 155**	**3 624**	**6 845**	**230 593**
Net debt(b)	21 290	–3 745	–5 963	5 973	4 663	2 694	1 075	121	26 106

(a) The sums of individual State jurisdictions may not agree with total State figures, due to transfers between jurisdictions.
(b) Equals deposits held, advances received and borrowing, less cash and deposits, advances paid and investments, loans and placements.

Source: Government Finance Statistics, Australia, 1998–99 (5512.0).

General government, State Governments

This section sets out the Operating Statement, Cash Flow Statement and Balance Sheet for the general government sector for all State Governments.

Operating Statement

Table 27.11 summarises the net operating results for the general government sector for all State Governments for 1998–99.

Cash Flow Statement

Table 27.12 summarises the cash operating results for 1998–99 for the general government sector for all State Governments.

Balance Sheet

Table 27.13 summarises the Balance Sheet results as at 30 June 1999 for the general government sector for all State Governments.

27.11 STATE GOVERNMENTS, General Government, Operating Statement—1998–99

	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Total(a)
	$m	$m	$m	$m	$m	$m	$m	$m	$m
GFS Revenue									
Taxation revenue	14 145	9 190	4 732	2 435	3 270	662	339	626	35 399
Current grants and subsidies	9 383	7 021	6 256	2 939	3 300	1 110	1 261	573	31 843
Sales of goods and services	2 658	2 066	1 757	758	924	246	80	198	8 648
Interest income	419	200	1 371	143	107	44	19	56	2 336
Other	3 481	4 039	2 372	949	1 384	267	202	179	12 872
Total	*30 085*	*22 516*	*16 488*	*7 223*	*8 984*	*2 329*	*1 900*	*1 632*	*91 097*
less									
GFS Expenses									
Gross operating expenses									
Depreciation	1 108	804	1 353	331	420	73	149	126	4 363
Employee expenses	12 378	7 764	7 224	3 190	3 968	1 037	829	(b)827	(b)37 217
Other operating expenses	8 167	5 654	3 423	1 796	2 325	626	512	480	22 878
Total	*21 652*	*14 222*	*12 000*	*5 317*	*6 713*	*1 736*	*1 491*	*1 434*	*64 458*
Nominal superannuation interest expenses	553	580	643	277	276	65	54	. .	(b)2 448
Other interest expenses	1 331	666	154	639	224	186	115	58	3 373
Other property expenses	—	—	—	4	—	—	—	—	4
Current transfers									
Grant expenses	2 592	1 723	1 971	679	1 038	176	211	194	8 544
Subsidy expenses	1 248	759	942	515	491	91	27	9	4 083
Other current transfers	447	194	197	12	124	17	8	61	1 061
Capital transfers									
Grants to local governments	209	16	170	3	131	—	3	—	533
Other capital transfers	918	779	268	58	123	53	224	8	2 432
Total	*28 952*	*18 940*	*16 345*	*7 504*	*9 120*	*2 324*	*2 133*	*1 764*	*86 935*
equals									
GFS Net Operating Balance	**1 134**	**3 577**	**143**	**–281**	**–136**	**5**	**–233**	**–132**	**4 162**
less									
Net acquisition of non-financial assets									
Gross fixed capital formation	2 095	868	2 029	373	657	96	137	111	6 366
less Depreciation	1 108	804	1 353	331	420	73	149	126	4 363
plus Change in inventories	12	5	3	–2	12	—	—	—	30
plus Other transactions in non-financial assets	–119	300	44	–26	–73	3	–11	—	118
Total	*881*	*369*	*723*	*15*	*176*	*25*	*–23*	*–15*	*2 151*
equals									
GFS Net Lending(+)/Borrowing(–)	**253**	**3 208**	**–580**	**–296**	**–312**	**–20**	**–210**	**–117**	**2 012**

(a) The sums of all individual State jurisdictions may not agree with total State figures, due to transfers between jurisdictions.
(b) Nominal superannuation interest expenses of the Australian Capital Territory are included in employee expenses.

Source: Government Finance Statistics, Australia, 1998–99 (5512.0).

27.12 STATE GOVERNMENTS, General Government, Cash Flow Statement—1998–99

	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Total(a)
	$m	$m	$m	$m	$m	$m	$m	$m	$m
CASH FLOW STATEMENT									
Cash receipts from operating activities									
Taxes received	14 218	9 234	4 780	2 433	3 159	654	335	636	35 449
Receipts from sales of goods and services	2 647	2 028	1 545	782	944	245	114	191	8 451
Grants and subsidies received	10 314	7 447	6 660	3 053	3 489	1 194	1 331	593	34 081
Other receipts	2 654	3 481	3 769	905	1 574	228	105	192	12 888
Total	*29 833*	*22 190*	*16 754*	*7 173*	*9 166*	*2 322*	*1 884*	*1 612*	*90 868*
Cash payments for operating activities									
Payments for goods and services	–23 794	–17 124	–10 197	–5 065	–6 337	–1 674	–1 354	–1 093	–66 569
Grants and subsidies paid	–5 023	–3 005	–3 300	–1 187	–1 885	–320	–444	–268	–15 391
Interest paid	–1 423	–694	–346	–627	–232	–186	–115	–51	–3 673
Other payments	–294	–368	–195	–157	–125	–14	–13	–68	–1 234
Total	*–30 534*	*–21 191*	*–14 038*	*–7 036*	*–8 579*	*–2 194*	*–1 926*	*–1 480*	*–86 868*
Net cash flows from operating activities	*–701*	*999*	*2 716*	*137*	*587*	*128*	*–42*	*132*	*4 001*
Net cash flows from investments in non-financial assets									
Sales of non-financial assets	506	210	682	49	121	31	36	2	1 637
Purchases of new non-financial assets	–2 481	–1 393	–2 733	–388	–669	–129	–134	–104	–8 030
Purchases of secondhand non-financial assets	—	—	—	—	—	—	–2	—	–2
Total	*–1 975*	*–1 182*	*–2 050*	*–339*	*–548*	*–98*	*–100*	*–102*	*–6 394*
Net cash flows from investments in financial assets for policy purposes	–2	4 343	657	87	134	97	103	–3	5 415
Net cash flows from investments in financial assets for liquidity purposes	–169	387	–24	–3	–8	1	—	–31	154
Net cash flows from financing activities									
Advances received (net)	–76	–958	–19	–17	–9	–14	1	–2	–1 095
Borrowing (net)	2 756	–3 634	–83	404	25	–72	–20	64	–561
Deposits received (net)	5	–32	–119	183	—	—	4	—	40
Other financing (net)	–1	–113	—	–21	–60	94	3	–65	–206
Total	*2 684*	*–4 736*	*–221*	*549*	*–44*	*8*	*–13*	*–4*	*–1 821*
Net Increase(+)/Decrease(–) in Cash Held	**–163**	**–190**	**1 078**	**432**	**121**	**136**	**–51**	**–8**	**1 354**
SURPLUS(+)/DEFICIT(–)									
Net cash flows from operating activities and net cash flows from investments in non-financial assets	–2 676	–183	666	–202	39	29	–141	30	–2 394
Acquisitions of assets under finance leases and similar arrangements	—	—	—	—	–59	—	–3	–9	–71
Surplus(+)/Deficit(–)	**–2 676**	**–183**	**666**	**–202**	**–19**	**29**	**–144**	**21**	**–2 465**

(a) The sums of all individual State jurisdictions may not agree with total State figures, due to transfers between jurisdictions.

Source: Government Finance Statistics, Australia, 1998–99 (5512.0).

27.13 STATE GOVERNMENTS, General Government, Balance Sheet—30 June 1999

	NSW	Vic.	Qld.	SA	WA	Tas.	NT	ACT	Total(a)
	$m	$m	$m	$m	$m	$m	$m	$m	$m
Assets									
Financial Assets									
Cash and deposits	961	622	1 170	1 884	154	420	210	323	5 746
Advances paid	1 653	494	321	1 260	1 054	489	35	414	5 720
Investments, loans and placements	3 658	1 270	12 688	56	1 287	15	294	84	19 151
Other non-equity assets	3 354	766	2 452	409	650	17	28	116	7 786
Equity	41 407	22 809	13 388	11 655	14 672	3 706	1 323	2 692	111 651
Total	*51 033*	*25 962*	*30 019*	*15 264*	*17 818*	*4 648*	*1 890*	*3 629*	*150 054*
Non-financial assets									
Land and fixed assets	64 066	31 790	42 412	8 674	22 679	4 723	4 391	5 304	184 040
Other non-financial assets	672	696	198	56	273	11	32	257	2 194
Total	*64 738*	*32 486*	*42 610*	*8 730*	*22 952*	*4 734*	*4 423*	*5 561*	*186 234*
Total	*115 771*	*58 448*	*72 629*	*23 994*	*40 770*	*9 382*	*6 312*	*9 189*	*336 289*
Liabilities									
Deposits held	41	188	—	522	278	29	177	17	1 254
Advances received	2 270	41	9	1 107	899	614	437	340	5 715
Borrowing	16 761	6 966	3 104	6 351	1 736	1 548	747	401	37 413
Unfunded superannuation liability and other employee entitlements	11 323	13 645	9 532	4 521	5 852	1 894	1 265	1 436	49 469
Other provisions	61	103	190	—	—	—	2	5	362
Other non-equity liabilities	6 847	1 207	1 690	877	518	142	61	145	11 481
Total	*37 303*	*22 152*	*14 526*	*13 378*	*9 284*	*4 227*	*2 689*	*2 344*	*105 694*
GFS Net Worth	**78 469**	**36 297**	**58 103**	**10 616**	**31 486**	**5 155**	**3 624**	**6 845**	**230 594**
Net debt(b)	12 799	4 809	–11 066	4 780	417	1 266	822	–63	13 765

(a) The sums of all individual State jurisdictions may not agree with total State figures, due to transfers between jurisdictions.
(b) Equals deposits held, advances received and borrowing, less cash and deposits, advances paid and investments, loans and placements.

Source: Government Finance Statistics, Australia, 1998–99 (5512.0).

Total public sector, local governments

This section sets out the Operating Statement, Cash Flow Statement and Balance Sheet for the total public sector for local governments.

Operating Statement

Table 27.14 summarises the net operating results for the total public sector for local governments for 1998–99.

Cash Flow Statement

Table 27.15 summarises the cash operating results for 1998–99 for the total public sector for local governments.

Balance Sheet

Table 27.16 summarises the Balance Sheet results as at 30 June 1999 for the total public sector for local governments.

27.14 LOCAL GOVERNMENTS, Total Public Sector, Operating Statement—1998–99

	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT(a)	Total(b)
	$m	$m	$m	$m	$m	$m	$m	$m	$m
GFS Revenue									
Taxation revenue	2 601	1 330	1 120	482	582	149	36	. .	6 301
Sales of goods and services	1 138	651	1 775	174	334	177	48	. .	4 299
Current grants and subsidies	534	549	332	113	233	63	87	. .	1 912
Interest income	164	48	69	25	30	8	3	. .	348
Other	836	330	594	56	211	28	48	. .	2 102
Total	*5 274*	*2 908*	*3 890*	*851*	*1 391*	*425*	*222*	. .	*14 961*
less									
GFS Expenses									
Gross operating expenses									
Depreciation	1 147	573	464	210	349	121	38	. .	2 901
Employee expenses	1 800	612	1 062	273	—	124	—	. .	3 870
Other operating expenses	1 684	1 792	1 273	350	905	154	176	. .	6 335
Total	*4 631*	*2 976*	*2 800*	*833*	*1 254*	*399*	*214*	. .	*13 106*
Property expenses									
Other interest expenses	115	47	175	36	13	15	2	. .	402
Current transfers									
Grant expenses	—	—	—	9	11	1	—	. .	21
Tax expenses	5	—	—	—	5	1	—	. .	12
Other current transfers	64	—	10	10	6	9	—	. .	99
Capital transfers									
Grant expenses	52	—	—	—	—	—	—	. .	52
Other capital transfers	—	—	11	—	—	—	—	. .	11
Total	*4 867*	*3 023*	*2 996*	*888*	*1 290*	*424*	*216*	. .	*13 703*
equals									
GFS Net Operating Balance	**407**	**–115**	**895**	**–37**	**101**	**1**	**6**	**. .**	**1 258**
less									
Net acquisition of non-financial assets									
Gross fixed capital formation	1 259	517	1 193	181	337	99	12	. .	3 598
less Depreciation	1 147	573	464	210	349	121	38	. .	2 901
plus Change in inventories	—	—	—	—	–4	—	—	. .	–4
plus Other transactions in non-financial assets	15	–22	—	—	—	7	32	. .	32
Total	128	–78	729	–29	–16	–15	7	. .	725
equals									
GFS Net Lending(+)/Borrowing(–)	**279**	**–36**	**165**	**–8**	**117**	**16**	**–1**	**. .**	**533**

(a) The ACT has no separate local government. (b) The sums of all individual State jurisdictions may not agree with total State figures, due to transfers between jurisdictions.

Source: Government Finance Statistics, Australia, 1998–99 (5512.0).

27.15 LOCAL GOVERNMENTS, Total Public Sector, Cash Flow Statement—1998–99

	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT(a)	Total(b)
	$m	$m	$m	$m	$m	$m	$m	$m	$m
CASH FLOW STATEMENT									
Cash receipts from operating activities									
Taxes received	2 526	1 330	1 120	483	582	153	36	. .	6 230
Receipts from sales of goods and services	1 094	653	1 775	180	403	183	95	. .	4 383
Grants and subsidies received	806	670	463	142	251	75	86	. .	2 493
Other receipts	631	255	451	26	33	14	3	. .	1 414
Total	*5 057*	*2 908*	*3 809*	*831*	*1 269*	*425*	*220*	. .	*14 520*
Cash payments for operating activities									
Payments for goods and services	–3 541	–2 403	–2 386	–620	–428	–295	–174	. .	–9 846
Grants and subsidies paid	—	–1	—	–9	–12	–1	—	. .	–24
Interest paid	–118	–47	–175	–31	–13	–16	–2	. .	–402
Other payments	—	—	—	–21	–489	–12	—	. .	–522
Total	*–3 659*	*–2 452*	*–2 561*	*–681*	*–941*	*–325*	*–175*	. .	*–10 794*
Net cash flows from operating activities	*1 398*	*457*	*1 249*	*150*	*328*	*100*	*45*	. .	*3 726*
Net cash flows from investments in non-financial assets									
Sales of non-financial assets	366	112	92	41	80	13	4	. .	706
Purchases of new non-financial assets	–1 452	–606	–1 295	–198	–415	–107	–48	. .	–4 121
Purchases of secondhand non-financial assets	—	—	—	–1	–2	—	—	. .	–3
Total	*–1 086*	*–494*	*–1204*	*–158*	*–337*	*–95*	*–45*	. .	*–3 418*
Net cash flows from investments in financial assets for policy purposes	6	—	—	–1	—	1	—	. .	6
Net cash flows from investments in financial assets for liquidity purposes	–45	—	–20	21	–7	–6	—	. .	–58
Net cash flows from financing activities									
Advances received (net)	2	–21	—	29	—	–7	—	. .	3
Borrowing (net)	–16	94	–88	–41	86	–1	2	. .	35
Deposits received (net)	—	—	—	—	–4	—	—	. .	–4
Other financing (net)	—	–35	88	9	–8	5	–3	. .	56
Total	*–15*	*37*	—	*–3*	*74*	*–4*	*–1*	. .	*88*
Net Increase(+)/Decrease(–) in Cash Held	**258**	**—**	**24**	**8**	**58**	**–4**	**—**	. .	**345**
SURPLUS(+)/DEFICIT(–)									
Net cash flows from operating activities and net cash flows from investments in non-financial assets	312	–37	45	–8	–9	5	1	. .	309
Acquisitions of assets under finance leases and similar arrangements	–6	—	—	–1	—	–3	—	. .	–11
Surplus(+)/Deficit(–)	**306**	**–37**	**45**	**–9**	**–9**	**2**	**1**	. .	**298**

(a) The ACT has no separate local government. (b) The sums of all individual State jurisdictions may not agree with total State figures, due to transfers between jurisdictions.
Note: Negative figures denote outflows.

Source: Government Finance Statistics, Australia, 1998–99 (5512.0).

27.16 LOCAL GOVERNMENTS, Total Public Sector, Balance Sheet—30 June 1999

	NSW	Vic.	Qld.	SA	WA	Tas.	NT	ACT(a)	Total(b)
	$m	$m	$m	$m	$m	$m	$m	$m	$m
Assets									
Financial Assets									
Cash and deposits	334	423	758	12	192	60	32	..	1 811
Advances paid	—	4	—	—	—	4	—	..	7
Investments, loans and placements	2 756	524	257	90	409	79	7	..	4 122
Other non-equity assets	465	324	237	110	117	45	8	..	1 306
Equity	—	56	—	11	—	—	—	..	67
Total	*3 555*	*1 332*	*1 252*	*222*	*718*	*187*	*47*	..	*7 314*
Non-financial assets									
Land and fixed assets	63 097	22 339	24 775	7 119	9 760	3 751	161	..	131 003
Other non-financial assets	958	—	—	—	8	1	—	..	967
Total	*64 055*	*22 339*	*24 775*	*7 119*	*9 768*	*3 752*	*161*	..	*131 970*
Total	*67 610*	*23 671*	*26 028*	*7 342*	*10 486*	*3 939*	*208*	..	*139 283*
Liabilities									
Deposits held	—	50	—	132	29	3	3	..	217
Advances received	28	8	—	9	—	1	—	..	47
Borrowing	1 500	630	3 154	189	204	209	18	..	5 904
Unfunded superannuation liability and other employee entitlements	642	287	283	66	74	34	—	..	1 386
Other provisions	67	—	—	12	7	1	11	..	99
Other non-equity liabilities	544	289	483	65	132	33	4	..	1 550
Total	*2 781*	*1 264*	*3 920*	*473*	*446*	*282*	*36*	..	*9 201*
GFS Net Worth	**64 829**	**22 407**	**22 108**	**6 868**	**10 040**	**3 658**	**172**	..	**130 082**
Net debt(c)	–1 561	–263	2 138	228	–368	71	–18	..	227

(a) The ACT has no separate local government. (b) The sums of all individual State jurisdictions may not agree with total State figures, due to transfers between jurisdictions. (c) Equals deposits held, advances received and borrowing, less cash and deposits, advances paid and investments, loans and placements.

Source: Government Finance Statistics, Australia, 1998–99 (5512.0)

Taxation revenue

Table 27.17 shows, for the general government sector, the amount of taxation revenue collected in Australia during 1998–99 by level of government and by type of tax. Total taxation revenue collected in Australia during the period was $181,282m and comprised 81% of total revenue. Commonwealth government taxation revenue was $139,797m and accounted for 77% of total taxation revenue. Total State and local government taxation revenue was $41,699m, 23% of total taxation revenue. The largest component of taxation revenue for the Commonwealth Government was income taxes; for State and local governments the largest component was property taxes.

27.17 TAXATION REVENUE, General Government, All Levels of Government—1998–99

Type of tax	Commonwealth $m	State and local $m	All Australian governments $m
Taxes on income			
Income taxes levied on individuals	75 657	—	75 657
Income taxes levied on enterprises	25 677	—	25 677
Income taxes levied on non-residents	1 079	—	1 079
Total	*102 413*	—	*102 413*
Employers' payroll taxes(a)			
General taxes (payroll tax)	—	8 507	8 394
Other employers' labour force taxes	3 245	—	3 145
Total	*3 245*	*8 507*	*11 539*
Taxes on property			
Taxes on immovable property(a)	—	8 631	8 631
Taxes on financial and capital transactions	5	8 357	8 362
Total	*5*	*16 988*	*16 993*
Taxes on provision of goods and services			
General taxes (sales tax)	15 215	—	15 215
Excise and levies			
Crude oil and liquid petroleum gas (LPG)	11 160	—	11 160
Other excises	2 680	—	2 680
Agricultural production taxes	791	—	791
Levies on statutory corporations	—	50	50
Total	*14 631*	*50*	*14 681*
Taxes on international trade	3 747	—	3 747
Taxes on gambling	3	4 136	4 139
Taxes on insurance	—	2 012	2 012
Total	*33 596*	*6 198*	*39 794*
Taxes on use of goods and performance of activities			
Motor vehicle taxes	20	3 908	3 928
Franchise taxes	—	5 688	5 688
Other	519	411	930
Total	*539*	*10 007*	*10 546*
Total taxes	**139 797**	**41 699**	**181 282**

(a) The sum of individual levels of government may not agree with totals for all levels of government, due to intergovernmental taxes.

Source: Taxation Revenue, Australia (5506.0).

Taxation during the first 100 years of Federation

Taxation policy from Federation to the year 2000

Before Federation, the sources of most tax revenues for Australian colonial governments were customs duties and excises. Other taxes were also generally imposed, such as stamp duties, stock taxes, taxes on the property of deceased persons and taxes on land. When revenue from these taxes fell short of what was needed to fund expenditure programs, governments chose to levy income taxes at different times from the 1880s. All States had established income taxation by 1907.

At Federation in 1901, the Australian Constitution granted the Commonwealth a monopoly of customs duties and excises and the power to levy other taxes concurrently with the States. Individual States attempted to impose sales taxes from time to time (e.g. in 1926, 1938 and 1949), but these were ruled to be excises by the High Court. Sales taxes were first imposed by the Commonwealth in 1930 to offset falls in customs revenues.

A Commonwealth land tax was introduced during 1910, aimed at financing a national old age pension which had been promised at Federation.

Commonwealth income taxes were first imposed during 1915 to make up for the fall in revenues from customs duties and excises which resulted from the disruption to world trade brought about by World War I. This income tax was designed by the Australian Statistician of the time (Sir George Knibbs). In 1942, a Commonwealth special committee on uniform taxation recommended that Commonwealth income tax take priority over any State income tax and that any State retiring from income tax collection be paid a grant in compensation for lost revenue. A further recommendation was that the scheme operate for the duration of World War II plus one year thereafter. The Commonwealth legislated to bring the recommendations of the special committee into effect. One condition in the Commonwealth legislation was that any State which did not vacate the income tax field for the duration of the war period would not receive a share of Commonwealth income tax revenues.

The States rejected this tax plan, and four States challenged the validity of the Commonwealth legislation in the High Court. The High Court ruled that the Commonwealth income tax legislation was valid, essentially giving the Commonwealth constitutional priority in taxation. A further outcome of the High Court challenge was that the Commonwealth was no longer bound to limit the duration of the uniform income tax scheme, and later decided to continue with it indefinitely. The States were not precluded from superimposing their own income taxes on top of the Commonwealth tax, but if a State did so its Commonwealth tax reimbursement payment would cease. Commonwealth income tax rates were set at a level which made it difficult for the States to raise an amount equal to Commonwealth tax reimbursements. For these reasons the States retired from the field of income taxation.

Commonwealth and State government death and gift duties were abolished by the early 1980s. Commonwealth land taxes were abolished in 1952, while State and Territory land taxes have remained in force as a source of finance for the provision of local government services, along with municipal rates. Since the discontinuation of State income taxes, gambling levies, stamp duties, payroll taxes and motor vehicle taxes have been the main taxes for the States and Territories.

The major part of the financing of State budgets since Federation has come from Commonwealth grants. The source of these grants lies in each State's and Territory's share of Commonwealth taxation revenue (mainly income taxation up until the introduction of the goods and services tax (GST) in July 2000) as determined by Commonwealth–State financial agreements.

State and Territory Governments levied business franchise fees from 1958 until 1997 when the High Court ruled that those on tobacco were constitutionally invalid. By extension, all other State and Territory business franchise fees were also constitutionally invalid. The Commonwealth then legislated for and collected replacement excise taxes on a uniform basis and returned this revenue to the States and Territories after allowing for administration costs, to ensure that these governments were compensated for the loss of business franchise revenues (the 'safety net' tax arrangements). This arrangement continued up until June 2000.

Under the terms of the June 1999 Intergovernmental Agreement on Principles for the Reform of Commonwealth-State Financial Relations (IGA), the Commonwealth imposed a goods and services tax (GST), from 1 July 2000, with all GST revenue to be passed to the States and Territories. Commonwealth GST revenue grants replace the old financial assistance grants made by the Commonwealth to the States and Territories. Each government's share of GST revenue is based on its population share adjusted by a relativity factor reflecting per capita financial needs. The IGA required the Commonwealth to permanently cease its wholesale sales tax (in addition to safety net taxes) from July 2000 State and Territory Governments were required to permanently cease bed taxes, financial institutions duties, and stamp duties on marketable securities, from July 2000 and to adjust their gambling taxes to take account of the impact of the GST on gambling operators. State debit taxes will cease on 1 July 2005 and the need to continue a number of State stamp duties on financial instruments and leases will be reviewed in 2005. The Commonwealth retains income tax revenues for its own purposes.

Taxation and total government revenues

The major functions of government are the provision of mainly non-market goods and services to the community and individual households and the redistribution of incomes and wealth through transfers between sectors in the economy. Expenditures incurred in relation to these functions are generally financed out of taxation revenues.

Table 27.18 compares taxation revenues to total revenue for Commonwealth, State and Territory and local government. It shows the importance of taxation as a source of Australian government revenues. Taxation forms the majority of revenues for the Commonwealth Government and, up until the 1970s, local governments. Because State taxes are not as broad-based as Commonwealth taxes and local government taxes, the proportion of State revenue from taxes is lower. Commonwealth grants financed from Commonwealth taxation revenues have provided the main source of State revenues since Federation. Similarly, State grants have provided a major source of local government revenues. Commonwealth and State taxation revenues as a proportion of total revenues have increased over the period 1901–02 to 1998–99, while movements in local taxation revenues have been within a narrow but generally falling band.

Taxation revenue per head

Table 27.19 shows total Commonwealth, State and local government taxation revenues per head of population for the period 1901–02 to 1998–99. In current price terms, taxation revenue per head of population has increased markedly over the period (particularly since the 1970s). As expected (given the different taxes imposed by the different levels of government), Commonwealth taxes per head are much greater than the State equivalent, which is in turn greater than that for local government. The table also shows GDP per head, and total taxation revenue per head as a percentage of GDP per head. Total taxation per head as a proportion of gross domestic product per head has increased fivefold over the period.

27.18 TAXATION AND TOTAL GOVERNMENT REVENUES(a)

	Taxation revenues			Total government revenues			Taxation revenues as a percentage of total government revenues		
	C'wlth	States	Local	C'wlth	States	Local	C'wlth	States	Local
	$m	$m	$m	$m	$m	$m	%	%	%
1901–02	18	5	5	23	56	8	78.9	9.6	55.6
1908–09	22	7	7	29	69	10	75.3	10.1	68.8
1918–19	66	24	13	89	116	21	73.6	20.6	65.5
1928–29	113	65	31	160	240	59	70.4	27.0	51.6
1938–39	148	101	28	190	267	49	77.8	37.9	56.7
1948–49	982	180	50	1 109	466	82	88.5	38.6	60.6
1958–59	2 267	276	158	2 592	1 359	261	87.4	20.3	60.4
1968–69	5 486	738	351	6 044	3 114	681	90.8	23.7	51.6
1978–79	23 395	4 746	1 215	26 281	17 516	2 558	89.0	27.1	47.5
1988–89	83 324	17 271	3 423	94 064	57 322	8 633	88.6	30.1	39.7
1998–99	137 799	34 120	6 301	176 563	119 721	14 961	78.0	28.5	42.1

(a) Some adjustments to previously published data have been made to maintain a consistent definitional coverage of taxation and total government revenues. Taxation revenue figures prior to 1998–99 have been adjusted to exclude fees and fines, and total government revenue figures prior to 1998–99 have been adjusted to include general government sales of goods and services. Data up to 1988–89 are on a cash basis and for 1998–99 they are on an accrual basis, resulting in a break in series for which no adjustments have been possible.

27.19 TAXATION REVENUE AND GDP PER HEAD

	Taxation revenue per head(a)					
	C'wlth	States	Local	Total	GDP per head(b)	Total taxation revenue per head as a percentage of GDP per head
	$	$	$	$	$	%
1901–02	4.65	1.41	1.19	7.25	114.57	6.32
1908–09	5.07	1.64	1.53	8.24	132.52	6.22
1918–19	13.07	4.76	2.53	20.35	215.98	9.42
1928–29	17.77	10.26	4.75	32.78	265.99	12.32
1938–39	21.38	14.62	3.97	39.98	259.96	15.38
1948–49	125.87	23.14	6.16	155.17	558.08	27.80
1958–59	227.74	27.87	15.52	271.14	1 274.03	21.28
1968–69	450.72	60.64	28.86	540.22	2 476.32	21.82
1978–79	1 611.7	326.93	83.70	2 022.33	7 769.79	26.03
1988–89	4 955.51	1 027.15	203.58	6 186.24	20 930.43	29.56
1998–99	7 305.64	1 808.93	334.06	9 448.63	31 361.79	30.13

(a) Taxation revenue data to 1988–89 are on a cash basis, and for 1998–99 they are on an accrual basis, resulting in a break in series. (b) GDP data up to and including 1948–49 are from the historical series published in Australian National Accounts: National Income, Expenditure and Product, 1995–96 (5204.0). GDP data after 1948–49 are from Australian System of National Accounts (5204.0).

Composition of taxation revenue

This section describes the composition of taxation revenues for the Commonwealth, State and local governments over the period 1901–02 to 1998–99.

Commonwealth Government

As table 27.20 shows, Commonwealth income taxes have been the largest part of Commonwealth taxation revenues since World War II. As noted earlier, the Commonwealth income tax was introduced to make up the shortfall in customs duties at the time of World War I. This is the reason that the proportion of income taxes for 1918–19 is higher than in the inter-war period. Customs revenues have fallen as a proportion of taxation revenues since Federation, and most notably in the post-World War II period. Excises have also generally fallen over the period 1901–02 to 1998–99, but more gradually than customs duties. Sales taxes have remained at about the same proportion in revenue since their introduction.

27.20 COMPOSITION OF COMMONWEALTH TAXATION REVENUE(a)

	Income taxes	Payroll taxes	Land taxes	Estate taxes	Sales taxes	Excises	Customs duties	Other taxes	Total
	%	%	%	%	%	%	%	%	%
1901–02	. .	. .	. .	. .	. .	13.8	86.2	. .	100.0
1908–09	. .	. .	. .	. .	. .	20.4	79.6	. .	100.0
1918–19	35.2	. .	6.4	2.8	. .	17.7	35.3	2.5	100.0
1928–29	17.4	. .	5.3	3.7	. .	20.5	52.4	0.6	100.0
1938–39	16.0	. .	2.0	2.6	12.6	22.2	42.1	2.4	100.0
1948–49	55.5	4.2	0.6	1.0	8.0	12.8	12.9	5.1	100.0
1958–59	53.7	4.4	. .	1.2	12.7	20.8	6.3	0.9	100.0
1968–69	62.4	4.0	. .	1.1	9.0	16.5	6.3	0.7	100.0
1978–79	68.1	0.2	. .	0.4	7.6	17.1	6.2	0.5	100.0
1988–89	70.1	1.3	. .	. .	11.3	11.1	4.6	1.6	100.0
1998–99	74.2	2.4	. .	. .	11.0	8.9	2.7	1.0	100.0

(a) Data up to 1988–89 are on a cash basis and for 1998–99 they are on an accrual basis, resulting in a break in series.

State Governments

State income taxes formed a large part of State taxation revenue up until World War II, when the Commonwealth assumed responsibility for income taxes (table 27.21). Land taxes, estate duties, stamp duties and motor vehicle taxes have also been major sources of State taxation revenues, although in aggregate the share of these taxes has fallen over time. This fall has been offset by payroll, gambling and other taxes. The significant increase in other taxes since the late 1970s is due to increases in franchise taxes, taxes on the transactions of financial institutions and taxes on insurance.

Local governments

Municipal rates have been the sole source of local government taxation revenues since Federation.

27.21 COMPOSITION OF STATE TAXATION REVENUE(a)

	Income taxes	Payroll taxes	Land taxes	Estate taxes	Stamp duties	Gambling taxes	Motor vehicle taxes	Other taxes	Total
	%	%	%	%	%	%	%	%	%
1901–02	27.8	. .	21.9	29.8	20.8	n.a.	n.a.	. .	100.0
1908–09	32.3	. .	10.0	26.0	22.1	n.a.	n.a.	9.7	100.0
1918–19	51.2	. .	9.9	15.2	15.8	n.a.	n.a.	8.1	100.0
1928–29	49.2	. .	5.8	12.0	12.3	3.3	13.0	4.3	100.0
1938–39	59.0	. .	2.8	9.9	6.9	3.5	13.8	4.1	100.0
1948–49	0.7	. .	3.5	27.7	18.8	12.9	28.2	8.2	100.0
1958–59	. .	. .	11.2	19.7	20.5	8.6	30.4	9.5	100.0
1968–69	. .	. .	9.5	17.1	26.2	13.6	28.0	5.5	100.0
1978–79	. .	37.2	5.8	4.3	16.9	10.1	16.3	9.4	100.0
1988–89	. .	27.0	5.5	. .	29.4	9.0	12.3	16.7	100.0
1998–99	. .	23.2	5.4	. .	17.6	12.4	11.3	30.5	100.0

(a) Data up to 1988–89 are on a cash basis and for 1998–99 they are on an accrual basis, resulting in a break in series.

Data sources and references

ABS publications

Australian National Accounts: National Income, Expenditure and Product, 1995–96 (5204.0)

Government Finance Statistics, Australia, 1984 to 1999 (5512.0).

Government Financial Estimates, Australia, 1984 to 1999 (5501.0).

Taxation Revenue, Australia, 1984 to 1999 (5512.0).

Year Book Australia, (1301.0) various issues.

Other publications

Smith, Julie P. 1993, *Taxing Popularity: The Story of Taxation in Australia*, Federalism Research Centre, ANU, Canberra.

Coghlan T.A. 1902, *A Statistical Account of the Seven Colonies of Australasia, 1901–02*, Commonwealth and New South Wales Governments, Sydney.

Bibliography

ABS publications

Australian System of National Accounts (5204.0).

Government Finance Statistics, Australia: Concepts, Sources and Methods (5514.0).

Government Finance Statistics, Australia (5512.0).

Government Financial Estimates, Australia (5501.0).

Information Paper: Accruals-based Government Finance Statistics (5517.0), also available in the Statistical Concepts Library on the ABS Internet site at *http://www.abs.gov.au*

Public Sector Financial Assets and Liabilities, Australia (5513.0).

Taxation Revenue, Australia (5506.0).

Other publications

Australian Accounting Research Foundation, 1998 *Australian Accounting Standard AAS31, Financial Reporting by Governments*, Caulfield, Victoria.

Australian Taxation Office, *Taxation Statistics* (see below).

Commission of the Economic Communities, International Monetary Fund, Organisation for Economic Co-operation Development, United Nations and World Bank 1993, *System of National Accounts*, New York.

International Monetary Fund, *A Manual of Government Finance Statistics*, Washington.

Internet sites

Australian Accounting Research Foundation, *http://www.aarf.asn.au*

Australian Taxation Office, *http://www.ato.gov.au*

—*Taxation Statistics 1996–97* and *Taxation Statistics 1997–98* can be accessed by selecting the 'About the ATO' link, then the 'Catalogue of Corporate Publications' link.

Commonwealth Department of Finance and Administration, *http://www.dofa.gov.au*

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Introduction

Prices are a key factor in the operation of an economy. Price indexes, which provide summary measures of the movements in various categories of prices, are used extensively to analyse and monitor price behaviour, and to adjust government payments such as pensions.

This chapter provides an outline of the major price indexes, their history, and their underlying concepts and methodology. More detailed information is contained in the source publications referred to throughout the chapter and in the Bibliography.

Consumer Price Index (CPI)

The description of the CPI commonly adopted by users is in terms of its perceived uses; hence the frequent references to the CPI as a measure of inflation, a measure of changes in purchasing power, or a measure of changes in the cost of living. In practice, the CPI is a measure of changes, over time, in prices of a constant basket of goods and services acquired by metropolitan households in Australia. As such, the CPI has been designed as a general measure of price inflation for the household sector in Australia.

The simplest way of thinking about the CPI is to imagine a basket of goods and services of the kind acquired by Australian households. As prices vary, the total price of this basket will also vary. The CPI is simply a measure of the changes in the price of this basket as the prices of items in it change.

The price of the CPI basket in the base period is assigned a value of 100.0 and the prices in other periods are expressed as percentages of the price in the base period. For example, if the price of the basket had increased by 35% since the base year, then the index would read 135.0. Similarly, if the price had fallen by 5% since the base year, the index would stand at 95.0.

For practical reasons, the CPI basket cannot include every item bought by households, but it does include all the important kinds of items. It is not necessary to include every item that people buy since many related items are subject to similar price changes. The idea is to select representative items so that the index reflects price changes for a much wider range of goods and services than is actually priced.

The total basket is divided into the following eleven major commodity groups: food; alcohol and tobacco, clothing and footwear; housing; household furnishings, supplies and services; health; transportation; communication; recreation; education and miscellaneous. These groups are divided in turn into 34 subgroups, and the subgroups into 89 expenditure classes. These numbers apply to CPIs calculated and published from the September quarter 2000 onwards. For more information see *A Guide to the Consumer Price Index* (6440.0).

In addition to the aggregate All groups index, indexes are also compiled and published for each of the groups, subgroups and expenditure classes for each State capital city, Darwin and Canberra. National indexes are constructed as the weighted average of the indexes compiled for each of the eight capital cities.

The CPI is the latest of a number of retail price indexes which have been constructed for various purposes by the ABS. The history of retail price indexes in Australia is published in *Year Book Australia 1995*.

Index population

The CPI measures price changes relating to the spending pattern of metropolitan private households. This group is termed the CPI population group. 'Metropolitan' is defined as the State capital cities, together with Darwin and Canberra.

This population group differs from that applying to CPIs calculated and published prior to the September quarter 1998. For more information see the article *Outcomes of the 13th Series Australian Consumer Price Index Review* in *Year Book Australia 1999*.

Conceptual basis

The CPI is a quarterly measure of the change in average price levels. It provides a method of comparing the average price level for a quarter with the average price level of the reference base year or changes in the average price level from one quarter to any other quarter.

In measuring price changes, the CPI aims to measure only pure price changes (i.e. it is concerned with isolating and measuring only that element of price change which is not brought about by any change to either the quantity or the quality of the goods or services concerned). In other words it aims to measure, each quarter, the change in the cost of acquiring an identical basket

of goods and services. This involves evaluating changes in the quality of goods and services included in the index and removing the effects of such changes from the prices used to construct the index.

The CPI is also a measure of changes in the prices actually paid by consumers for the goods and services they buy. It is not concerned with nominal, recommended or list prices (unless they are the prices consumers actually pay).

The CPI basket includes goods and services ranging from steak to motor cars and from dental fillings to restaurant meals. The items are chosen not only because they represent the spending habits of the CPI population group, but also because the items are those for which the prices can be associated with identifiable and specific commodities and services. While government taxes and charges which are associated with the use of specific goods and services (such as excise and customs duty, goods and services taxes, local government rates, etc.) are included, income taxes and the income-related Medicare levy are excluded because they cannot be clearly associated with the purchase or use of a specific quantity of any good or service.

Items are not excluded from the CPI basket on the basis of moral or social judgements. For example, some people may regard the use of tobacco and alcohol as socially undesirable, but these commodities are included in the CPI basket because they are significant items of household expenditure and their prices can be accurately measured. However, to assist in understanding the effect that major item groups have on the CPI, the ABS publishes a range of supplementary indexes which exclude, in turn, each of the eleven major commodity groups. These supplementary indexes can also be used in their own right for evaluating price changes or for indexation purposes.

Periodic reviews of the CPI

Like any other long-standing and important statistical series, the CPI is reviewed from time to time to ensure that it continues to be relevant to current conditions. Over time, household spending habits change, as does the range of available goods and services. The CPI needs to be updated to take account of these changes. These reviews also provide an opportunity to reassess the scope and coverage of the index and other methodological issues.

Since its inception in its current form in 1960, reviews of the CPI have usually been carried out at about five-yearly intervals. Following each review, which involves revising the list of items and their weights, the new series are linked to the old to form continuous series. This linking is carried out in such a way that the resulting continuous series reflects only price changes and not differences in the prices of the old and new baskets.

The current (14th series) CPI reflects expenditure patterns derived mainly from the 1998–99 Household Expenditure Survey and has a reference base of 1989–90. It was introduced in the September quarter 2000.

In addition to revising weights to reflect new expenditure patterns, the 14th Series CPI introduced a new utility-based commodity classification to better address possible consumer substitution between commodities in response to relative price changes arising from The New Tax System. For more information see *Information Paper: Price Indexes and The New Tax System* (6425.0) and *Information Paper: Introduction of the 14th Series Australian Consumer Price Index* (6456.0).

Weighting pattern

The composition of the CPI basket is based on the pattern of household expenditure in the 'weighting base period', which is 1998–99 for the 14th series CPI. Measures of expenditure are obtained primarily from the ABS's Household Expenditure Survey (HES). The HES data, modified for known instances of under-reporting (the most notable being for alcohol and tobacco), are then used to derive a weight for each of the 89 expenditure classes. The weights for the 14th series groups and subgroups as at June quarter 2000 prices are shown in table 28.1.

28.1 CONSUMER PRICE INDEX, Weighted Average of Capital Cities(a)(b)

Groups and subgroups	Weight in CPI basket
Food	
Dairy and related products	1.51
Bread and cereal products	2.20
Meat and seafoods	2.62
Fruit and vegetables	2.30
Non-alcholic drinks and snack food	2.48
Meals out and take away foods	4.93
Other food	1.69
Total	*17.72*
Alcohol and tobacco	
Alcoholic drinks	5.14
Tobacco	2.27
Total	*7.41*
Clothing and footwear	
Men's clothing	0.98
Women's clothing	1.80
Children's and infants' clothing	0.47
Footwear	0.83
Clothing accessories, supplies and services	1.10
Total	*5.19*
Housing	
Rents	5.60
Utilities	3.23
Other housing	10.91
Total	*19.75*
Household furnishings, supplies and services	
Furniture and furnishings	3.58
Household appliances, utensils and tools	1.98
Household supplies	1.91
Household services	0.62
Total	*8.09*
Health	
Health services	3.55
Pharmaceuticals	1.14
Total	*4.69*
Transportation	
Private motoring	14.40
Urban transport fares	0.85
Total	*15.25*
Communication	
Communication	2.88
Total	*2.88*
Recreation	
Audio, visual and computing	2.70
Books, newspapers and magazines	1.08
Sport and other recreation	4.16
Holiday travel and accommodation	4.35
Total	*12.29*

...continued

28.1 CONSUMER PRICE INDEX, Weighted Average of Capital Cities(a)(b)—*continued*

Groups and subgroups	Weight in CPI basket
Education	
Education	2.69
Total	*2.69*
Miscellaneous	
Insurance services	1.46
Personal care	2.14
Childcare	0.44
Total	*4.04*
Total All groups	**100.00**

(a) Percentages may not add due to rounding. (b) Weights shown are those applicable from the September quarter 1998 onwards.

Source: Information Paper: Introduction of the 14th Series Australian Consumer Price Index (6456.0).

Price collection

Since the CPI is designed to measure the impact of changing prices on metropolitan private households, information about prices is collected in the kinds of retail outlets or other places where these households normally purchase goods and services. Prices are collected from many sources, including supermarkets, department stores, footwear stores, restaurants, motor vehicle dealers and service stations, dental surgeries, hotels and clubs, schools, hairdressers, telephone carriers, travel agents and airlines, bus operators, electricians and plumbers. Items like rail fares, electricity, gas and water and sewerage charges, and property rates and charges are collected from the authorities concerned. Information on rents is obtained from property management companies and from government housing commissions. In total, around 100,000 separate price quotations are collected each quarter.

The collection of prices in each capital city is carried out by trained ABS field staff.

The prices used in the CPI are those that any member of the public would have to pay to purchase the specified good or service, including any goods and service taxes, excises and customs duty. Sale prices, discount prices and 'specials' are reflected in the CPI so long as the items concerned are of normal quality (that is, not damaged or shop-soiled), and are offered for sale in reasonable quantities. To ensure that the price movements reflect the buying experience of the bulk of the metropolitan population, the brands and the varieties of the items which are priced are generally those which sell in greatest volume.

Price movements by city

Table 28.2 presents All groups index numbers for each of the eight capital cities and for the weighted average of the eight capital cities, together with percentage changes.

The capital city indexes measure price movements over time in each city individually. They do not measure differences in price levels between cities. For example, the index for Adelaide in 1999–2000 of 126.3, compared with the corresponding index for Sydney of 125.4, does not mean that prices in Adelaide are higher than those in Sydney. It simply means that, since the base period (1989–90), prices in Adelaide have increased by a greater percentage than those in Sydney (26.3% compared with 25.4%).

Price movements by broad commodity group

Table 28.3 presents, for the weighted average of the eight capital cities, index numbers for each of the eleven major commodity groups of the 14th Series CPI and for the All groups, together with percentage changes.

28.2 CONSUMER PRICE INDEX, All Groups Index Numbers(a)(b)

Year	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Canberra	Darwin	**Weighted average of eight capital cities**
					INDEX NO.(c)				
1993–94	109.2	111.1	110.6	113.4	108.5	111.7	111.4	111.5	**110.4**
1994–95	113.0	114.1	114.7	116.9	112.3	115.2	115.1	114.7	**113.9**
1995–96	118.7	118.4	119.1	121.2	116.7	119.6	120.3	119.5	**118.7**
1996–97	120.4	119.9	121.0	122.3	118.3	121.4	121.2	121.6	**120.3**
1997–98	120.5	119.8	121.6	121.6	118.0	121.3	120.4	121.3	**120.3**
1998–99	122.5	120.9	122.9	123.2	120.1	122.5	121.5	122.4	**121.8**
1999–00	125.4	124.1	125.0	126.3	122.9	124.8	124.2	124.2	**124.7**
					CHANGE FROM PREVIOUS YEAR (%)				
1993–94	1.4	2.0	1.9	2.0	2.2	2.9	1.7	1.8	**1.8**
1994–95	3.5	2.7	3.7	3.1	3.5	3.1	3.3	2.9	**3.2**
1995–96	5.0	3.8	3.8	3.7	3.9	3.8	4.5	4.2	**4.2**
1996–97	1.4	1.3	1.6	0.9	1.4	1.5	0.7	1.8	**1.3**
1997–98	0.1	–0.1	0.5	–0.6	–0.3	–0.1	–0.7	–0.2	**0.0**
1998–99	1.7	0.9	1.1	1.3	1.8	1.0	0.9	0.9	**1.2**
1999–00	2.4	2.6	1.7	2.5	2.3	1.9	2.2	1.5	**2.4**

(a) Reference base year 1989–90 = 100.0. (b) The separate city indexes measure price movements within each city individually. They do not compare price levels between cities. (c) Index numbers for financial years are calculated as the simple arithmetic averages of the quarterly index numbers.

Source: Consumer Price Index, Australia (6401.0).

28.3 CONSUMER PRICE INDEX, Group Index Numbers—Weighted Average of Capital Cities(a)(b)

Year	Food	Alcohol and tobacco	Clothing and footwear	Housing	Household furnishings supplies and services	Health	Trans-portation	Communi-cation	Rec-reation	Educa-tion	Miscell-aneous	**All groups**
					INDEX NO.(c)							
1993–94	109.4	133.7	106.7	94.2	107.8	134.7	113.8	106.2	109.4	134.5	115.2	**110.4**
1994–95	112.1	141.0	106.7	100.0	109.2	142.7	117.5	107.6	111.7	139.9	120.7	**113.9**
1995–96	116.0	156.1	107.0	105.9	111.7	150.2	122.6	107.3	114.2	147.0	128.0	**118.7**
1996–97	119.7	161.4	107.3	101.6	113.5	159.7	124.3	106.5	115.0	156.0	133.4	**120.3**
1997–98	121.8	164.6	107.4	94.5	113.8	165.4	123.5	106.6	117.8	165.6	138.5	**120.3**
1998–99	126.5	168.7	106.7	95.8	113.7	163.4	122.1	102.9	119.4	174.1	143.5	**121.8**
1999–00	129.2	175.2	105.5	99.9	113.3	158.7	128.9	97.8	120.4	182.4	153.2	**124.7**
					CHANGE FROM PREVIOUS YEAR (%)							
1993–94	1.9	7.5	–0.7	–0.4	0.5	4.7	2.2	–0.1	2.1	3.9	3.5	**1.8**
1994–95	2.5	5.5	0.0	6.2	1.3	5.9	3.3	1.3	2.1	4.0	4.8	**3.2**
1995–96	3.5	10.7	0.3	5.9	2.3	5.3	4.3	–0.3	2.2	5.1	6.0	**4.2**
1996–97	3.2	3.4	0.3	–4.1	1.6	6.3	1.4	–0.7	0.7	6.1	4.2	**1.3**
1997–98	1.8	2.0	0.1	–7.0	0.3	3.6	–0.6	0.1	2.4	6.2	3.8	**0.0**
1998–99	3.9	2.5	–0.7	1.4	–0.1	–1.2	–1.1	–3.5	1.4	5.1	3.6	**1.2**
1999–00	2.1	3.9	–1.1	4.3	–0.4	–2.9	5.6	–5.0	0.8	4.8	6.8	**2.4**

(a) Groups based on 14th Series CPI structure. (b) Reference base year 1989–90 = 100.0. (c) Index numbers for financial years are calculated as the simple arithmetic averages of the quarterly index numbers.

Source: Consumer Price Index, Australia (6401.0).

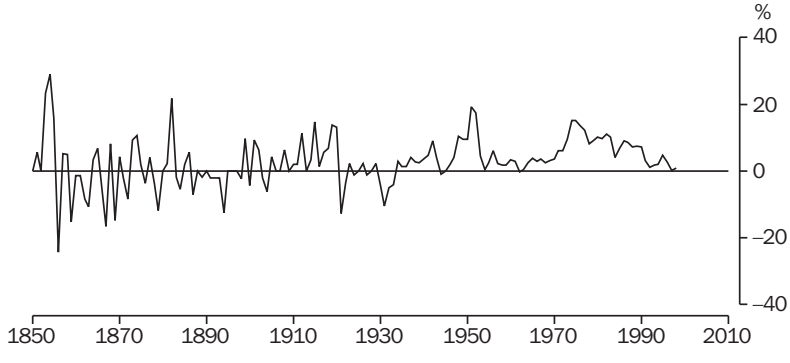
Long-term price series

Although the CPI has only been compiled from 1948, an approximate long-term measure of retail price change has been constructed by linking together other selected retail price index series (see graph 28.4 and table 28.5). The index numbers are expressed on a reference base 1945 = 100.0, which was the end of a period of relative price stability during World War II. The successive series linked together to produce this long-term series of index numbers are:

- from 1850 to 1901, Sydney Retail Price Index;
- from 1901 to 1914, the A Series Index;
- from 1914 to 1946–47, the C Series Index;
- from 1946–47 to 1948–49, a combination of the C Series Index (excluding rent) and the housing group of the CPI; and
- from 1948–49 onwards, the CPI.

For more information about these series see *Year Book Australia 1995* (1301.0).

28.4 RETAIL PRICE INDEX, Percentage Change from Previous Year



Source: Unpublished data, Consumer Price Index.

28.5 RETAIL PRICE INDEX NUMBERS(a)(b)—1850 to 1999

Year	Index no.	Year	Index no.	Year	Index no.	Year	Index no.	Year	Index no.	Year	Index no.
1850	53	1875	53	1900	43	1925	88	1950	140	1975	510
1851	56	1876	51	1901	47	1926	90	1951	167	1976	579
1852	56	1877	53	1902	50	1927	89	1952	196	1977	650
1853	69	1878	51	1903	49	1928	89	1953	205	1978	702
1854	89	1879	45	1904	46	1929	91	1954	206	1979	766
1855	103	1880	45	1905	48	1930	87	1955	211	1980	844
1856	78	1881	46	1906	48	1931	78	1956	224	1981	926
1857	82	1882	56	1907	48	1932	74	1957	229	1982	1 028
1858	86	1883	55	1908	51	1933	71	1958	233	1983	1 132
1859	73	1884	52	1909	51	1934	73	1959	237	1984	1 177
1860	72	1885	53	1910	52	1935	74	1960	245	1985	1 257
1861	71	1886	56	1911	53	1936	75	1961	252	1986	1 370
1862	65	1887	52	1912	59	1937	78	1962	251	1987	1 487
1863	58	1888	52	1913	59	1938	80	1963	252	1988	1 594
1864	60	1889	51	1914	61	1939	82	1964	258	1989	1 714
1865	64	1890	51	1915	70	1940	85	1965	268	1990	1 839
1866	60	1891	50	1916	71	1941	89	1966	276	1991	1 898
1867	50	1892	49	1917	75	1942	97	1967	286	1992	1 917
1868	54	1893	48	1918	80	1943	101	1968	293	1993	1 952
1869	46	1894	42	1919	91	1944	100	1969	302	1994	1 989
1870	48	1895	42	1920	103	1945	100	1970	313	1995	2 082
1871	47	1896	42	1921	90	1946	102	1971	332	1996	2 136
1872	43	1897	42	1922	87	1947	106	1972	352	1997	2 141
1873	47	1898	41	1923	89	1948	117	1973	385	1998	2 159
1874	52	1899	45	1924	88	1949	128	1974	443	1999	2 191

(a) Reference base year 1945 = 100.0. (b) The index numbers relate to Sydney from 1850 to 1900; from 1901 to 1980 they relate to the weighted average of six State capital cities; and from 1981 to the weighted average of eight capital cities. Index numbers are for calendar years.

Source: Unpublished data, Consumer Price Index.

International comparisons

In analysing price movements in Australia, an important consideration is Australia's performance relative to other countries. However, due to the many differences in the structure of the housing sector in different countries and in the way that housing is treated in their CPIs, a simple comparison of All groups (or headline) CPIs is often inappropriate. In order to provide a better basis for international comparisons, the Fourteenth International Conference of Labour Statisticians adopted a resolution which called for countries to "provide for dissemination at the international level of an index which excludes shelter, in addition to the all items index".

Table 28.6 presents indexes for selected countries on a basis consistent with the above resolution and comparable with the Australian series 'All groups excluding housing'.

28.6 CONSUMER PRICE INDEX, International Comparisons(a)(b)

	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
	INDEX NO.						
Australia	**113.5**	**116.5**	**121.1**	**123.9**	**125.4**	**126.9**	**129.4**
New Zealand(c)	109.4	110.5	111.9	113.7	114.9	116.9	118.7
Hong Kong (SAR of China)	139.5	150.7	159.5	166.8	173.0	171.2	165.8
Indonesia	137.8	150.3	163.7	174.1	232.7	368.3	367.1
Japan	107.9	107.8	107.3	108.2	112.4	112.4	111.6
Republic of Korea	130.4	138.0	144.4	151.3	162.1	169.0	172.1
Singapore	110.9	114.5	116.0	118.1	119.4	118.5	120.7
Taiwan	114.2	119.1	122.5	125.7	127.2	128.2	129.3
Canada	112.0	113.4	116.0	118.8	120.6	122.0	125.0
United States of America	114.8	118.0	120.9	124.3	125.8	127.2	130.9
Germany	113.7	115.8	117.0	118.2	120.3	120.7	121.8
United Kingdom	122.0	124.8	128.3	131.5	134.6	137.2	139.3
	CHANGE SINCE PREVIOUS YEAR (%)						
Australia	**2.3**	**2.6**	**3.9**	**2.3**	**1.2**	**1.2**	**2.0**
New Zealand(c)	0.6	1.0	1.3	1.6	1.1	1.7	1.5
Hong Kong (SAR of China)	7.1	8.0	5.8	4.6	3.7	–1.0	–3.2
Indonesia	6.8	9.1	8.9	6.4	33.7	58.3	–0.3
Japan	1.0	–0.1	–0.5	0.8	3.9	0.0	–0.7
Republic of Korea	5.6	5.8	4.6	4.8	7.1	4.3	1.8
Singapore	2.6	3.2	1.3	1.8	1.2	–0.8	1.9
Taiwan	2.5	4.3	2.9	2.6	1.2	0.8	0.9
Canada	1.1	1.3	2.3	2.4	1.5	1.2	2.5
United States of America	2.4	2.8	2.5	2.8	1.2	1.1	2.9
Germany	2.8	1.8	1.0	1.0	1.8	0.3	0.9
United Kingdom	2.9	2.3	2.8	2.5	2.4	1.9	1.5

(a) Reference base year 1989–90 = 100.0. (b) All groups excluding housing. (c) From March quarter 1994, the statistics for New Zealand refer to 'All groups excluding housing and credit services'.

Source: Consumer Price Index, Australia (6401.0).

Prices in Australia at the beginning and end of the 20th century

This article takes a brief look at how the relative prices of many of today's common items have changed since Federation. To assist in making comparisons, 1901 prices have been mulitiplied by a factor of 50 to take account of general inflation. This factor is derived from table 28.5, which shows that the purchasing power of one pound (or $2.00) in 1901 is equivalent to about $100 in 2001. The 1901 prices in this article (which were originally measured in pounds, shillings and pence) have been converted to decimal amounts. Likewise, imperial measurements of quantity have been converted to their metric equivalents.

In 1901, the average weekly wage for an adult male was about $4.35 for a working week of almost 50 hours, which after inflation equates to $217.50. However, wages have grown much faster than inflation, with the average weekly ordinary time earnings for adult males in May 2000 being about $830.00 for around 37 hours work, in far better conditions.

The price of gold has often been used as a measure of inflation. At Federation, the price of gold was $8.50 an ounce, or $425.00 in today's money. The actual price of gold in 1999–2000 averaged about $460.00 an ounce, showing that it has generally maintained pace with inflation.

The basket of items used in 1901 to calculate the equivalent of today's CPI consisted of a number of food items, a few laundry products such as starch, 'blue' (a laundry whitener) and soap, candles for lighting, kerosene for heating and house rents. Although the brands and range of products have changed over time, many of the items commonly used at the turn of century are still everyday items. However, in many cases there will have been changes in quality, presumably for the better.

A look at some common food items shows that some are relatively more expensive today, some are relatively cheaper and some are about the same. In 1901 a loaf of bread cost about 2 cents (equivalent to $1.00 today), while the actual price today is about $2.30; milk was 3 cents a litre ($1.50) compared with $1.40 today; 180 grams of tea cost 6 cents ($3.00) compared with $3.40; potatoes were 2 cents ($1.00) a kilogram compared with $1.30; eggs were 12 cents a dozen ($6.00) compared with $2.90, and rump steak was 14 cents a kilogram ($7.00) compared with $12.50 a century later.

A man's cotton business shirt cost about 85 cents (or $42.50 today after inflation), while a pair of ladies shoes was about $1.45 ($72.50). These items could be purchased for comparable prices today.

The average weekly rent for a three bedroom house in 1901 was $1.30, equivalent to about $65.00 today. The actual value today varies depending on location, but the average of 8 capital cities for a three bedroom house is about $250 a week. In the house, a metal-framed double bed, mattress, a pair of blankets and two pillows cost about $12.10 ($605.00) in 1901. Today, you could expect to pay upwards of $830.00.

At the time of Federation, motor cars were almost unheard of. Most people relied on public transport or walking to get around. While walking was free, a return train trip, travelling first class, from Sydney to Penrith was 60 cents ($3.00). Today, the same return trip costs $12.80. In 1901 such a journey was considered to be a day excursion, whereas today people commute regularly between Penrith and Sydney for work. Bicycles were starting to be seen on the streets, but were a luxury item for most people. A new bicycle at about $31.00 ($1,550.00) cost the equivalent of more than seven weeks wages, whereas today you can buy a good quality bicycle for about $320.00, less than half a week's wages.

Although wine was not as popular in 1901 as it is today, people still enjoyed a drink. A bottle of whisky cost 38 cents, or $19.00 after inflation. Today you would pay about $26.00 for a bottle of popular brand scotch whisky. For beer drinkers, only full strength beer was available. A carton of a dozen bottles cost 70 cents in 1901, or $35.00 after inflation, whereas the actual price today is about $28.00. For the smokers, a packet of cigarettes was 5 cents ($2.50) whereas today you pay about $11.20.

Of course, cigarettes carried no health warnings in 1901. In fact, an advertisement for a brand of cigarettes appearing in an issue of the Sydney Morning Herald of the time carried the endorsement that they were "guaranteed not to harm the throat or lungs" and, perhaps more disconcertingly, "recommended by doctors".

For recreation, there are far more choices today than there were a hundred years ago. Nevertheless, there are still some common forms of amusement. A newspaper cost 1 cent in 1901, or 50 cents after inflation, whereas the actual cost of a daily newspaper today is about $1.00. A new release novel cost about 25 cents ($12.50) compared with an actual price of about $45.00 for a hard cover new release today, although of course paperbacks are often available at cheaper prices. A concert at the Tivoli cost was 75 cents ($37.50) in 1901, much the same as the cost of a concert today (about $40). Admission to a game of football in 1901 was 10 cents ($5.00), considerably cheaper than the $21.70 you would pay today. However, some things do not change much—Essendon won the 1901 VFL Premiership and the 2000 AFL Premiership!

Table 28.7 summarises the costs of a common 'basket' of goods and services in 1901 and today.

References

Australian Bureau of Statistics:

—*Average Retail Prices of Selected Items* (6403.0).

—*Average Weekly Earnings, States and Australia* (6302.0).

Commonwealth Bureau of Census and Statistics:

—*Labour and Industrial Branch Report No. 1, Prices, Price Indexes and Cost of Living in Australia, December 1912*;

—*Official Year Book of the Commonwealth of Australia, No. 21, 1901–1928*.

Coopers Brewery Ltd.

Sydney Morning Herald 1901, various issues.

The Age 1901, various issues.

The Advertiser 1901, Adelaide, various issues.

28.7 Wages and prices—1901 and 2000

	1901 prices	1901 prices after inflation	2000 actual prices
	$	$	$
Average weekly wage, adult males	4.35	217.50	830.00
Gold (1oz)	8.50	425.00	460.00
Loaf of bread	0.02	1.00	2.30
Flour (2kg)	0.04	2.00	3.00
Sugar (2kg)	0.09	4.50	2.30
Coffee (150g)	0.05	2.50	6.00
Tea (180g)	0.06	3.00	3.40
Rice (1kg)	0.05	2.50	1.65
Butter (500g)	0.13	6.50	2.00
Potatoes (1kg)	0.02	1.00	1.30
Onions (1kg)	0.03	1.50	1.25
Rump steak (1kg)	0.14	7.00	12.50
Eggs (1 dozen)	0.12	6.00	2.90
Bacon (1kg)	0.19	9.50	9.40
Jam (500g)	0.04	2.00	2.50
Milk (1 litre)	0.03	1.50	1.40
Men's cotton shirt	0.85	42.50	53.10
Men's trousers'	0.50	25.00	58.50
Women's shoes (1 pair)	1.45	72.50	65.80
Umbrella	0.40	20.00	16.50
Rent on 3 bedroom house (1 week)	1.30	65.00	250.00
Double bed, mattress, blankets and pillows	12.10	605.00	830.00
Train trip	0.60	3.00	12.80
Bicycle	31.00	1 550.00	320.00
Whisky (1 bottle)	0.38	19.00	26.00
Carton of beer (1 dozen 750ml bottles)	0.70	35.00	28.00
Packet of cigarettes	0.05	2.50	11.20
Soap (600g)	0.03	1.50	3.05
Cough medicine (200ml)	0.25	12.50	14.90
Daily newspaper	0.01	50c	1.00
New release novel	0.25	12.50	45.00
Concert	0.75	37.50	39.30
Theatre	0.35	17.50	30.90
Game of football	0.10	5.00	21.70

Source: See references.

Producer price indexes

The Producer Price Indexes measure changes in prices received, or paid, by producers of commodities. In Australia they generally relate to prices for goods and services as they affect businesses, for example the input and output price of goods for the manufacturing sector, the input price of goods for the building industry and more recently the output price of property and business services and transport (freight) and storage services. This contrasts with the Consumer Price Index which measures changes in the retail prices paid by consumers, as explained earlier in this chapter.

Long-term price series

Table 28.8 presents a set of producer price indexes for the years 1861 to 1999–2000. The indexes comprise the linked wholesale price indexes from 1861 to 1967–68 and the producer price index for manufacturing from 1968–69 onwards. These indexes are discussed below.

The first price index of this kind, compiled by the Commonwealth Bureau of Census and Statistics, was the Melbourne Wholesale Price Index, which was introduced in 1912 with index numbers compiled back to 1861 using prices extracted from newspapers and trade publications. Index numbers were compiled up to 1961. The index related chiefly to basic materials and foods weighted in accordance with consumption in about the year 1910.

The next index published was the Wholesale Price (Basic Materials and Foodstuffs) Index which was introduced in 1939; index numbers are available for the period 1928 to 1970. The index related to commodities in their basic or primary form, and prices were obtained as near as possible to the point where they made their first effective impact on the local price structure. With few exceptions, prices were obtained from Melbourne sources.

The present range of producer price indexes was developed and produced progressively from the 1960s. Until recently, the range of indexes was restricted to the measurement of prices for goods used in or purchased by the building industry, manufacturing industry, and (not included in this chapter) the mining industry as well as outputs of the manufacturing industry.

As part of a long term program, the ABS is expanding the coverage of the producer price indexes to include the measurement of price changes for the output of the service industries and the construction industry (see *Services output price indexes*). In parallel with this expansion in coverage, an economy wide 'stage of production' framework has been implemented for the producer price indexes, to supplement the current industry sector approach (see *Stage of production producer price indexes)*.

28.8 PRODUCER AND WHOLESALE PRICE INDEXES(a)

	Index no.
Melbourne Wholesale Price Index (All groups)	
1861	24.2
1871	19.3
1881	17.6
1891	14.9
1901	15.3
1911	15.7
1921	30.0
1925–26	29.7
Wholesale Price (Basic Materials and Foodstuffs) Index (All groups)	
1930–31	25.4
1935–36	23.9
1940–41	29.3
1945–46	36.5
1950–51	62.7
1955–56	85.9
1960–61	92.5

...continued

28.8 PRODUCER AND WHOLESALE PRICE INDEXES(a)—*continued*

	Index no.
Wholesale Price (Basic Materials and Foodstuffs) Index (All groups)—(*continued*)	
1961–62	86.4
1962–63	87.4
1963–64	90.0
1964–65	91.3
1965–66	95.4
1966–67	98.4
1967–68	99.7
Price Index of Articles Produced by Manufacturing Industry	
1968–69	100.0
1969–70	103.9
1970–71	108.5
1971–72	113.9
1972–73	120.7
1973–74	134.6
1974–75	158.1
1975–76	177.8
1976–77	196.9
1977–78	213.8
1978–79	237.4
1979–80	274.9
1980–81	305.2
1981–82	328.9
1982–83	360.2
1983–84	382.8
1984–85	404.8
1985–86	430.3
1986–87	458.5
1987–88	492.1
1988–89	526.0
1989–90	559.9
1990–91	584.6
1991–92	586.7
1992–93	600.9
1993–94	607.3
1994–95	620.9
1995–96	636.7
1996–97	639.9
1997–98	648.3
1998–99	646.7
1999–00	674.5

(a) Reference base year 1968–69 = 100.0.

Source: Labour Report; Price Indexes of Articles Produced by Manufacturing Industry, Australia (6412.0).

Price indexes and The New Tax System

As part of The New Tax System (TNTS), a goods and services tax (GST) was introduced on 1 July 2000 to replace the existing wholesale sales tax (WST) and some State and Territory taxes. Unlike the WST, which was only levied on selected goods, the GST applies to most services as well as most goods. TNTS had implications for both the consumer and producer price indexes.

TNTS had both a direct and indirect impact on the CPI. The CPI continues to measure the final transaction prices inclusive of indirect taxes and hence it reflects the net effect of the tax changes in TNTS.

As a consequence of the implementation of TNTS, the CPI recorded an increase in the September quarter 2000. Most Australians would like to know "What was the total impact of TNTS on the CPI?". Unfortunately, this is not a question that can be answered precisely. To assist users and analysts of CPI data, the ABS compiled an *experimental constant tax rate measure*, which it published in the December 2000 issue of *Australian Economic Indicators* (1350.0). This measure, which provided an estimate of the what the percentage movement between the June and September quarters 2000 CPI would have been if tax rates were held constant at those prevailing at June quarter 2000, had a number of significant limitations. Specifically:

- the measure only abstracted from the direct or first round effects of tax changes on the prices of consumer goods and services. It could not, for example, account for the effects of changes in petroleum excise on the price of a jar of jam, but did account for the change in petrol excise on petrol purchased by households for use in their motor vehicles;
- in compiling the measure it was assumed that ad-valorem taxes are levied in proportion to final selling prices. This means that where ad-valorem taxes levied on wholesale prices (such as WST) were replaced by ad-valorem taxes levied on retail prices (such as the GST), the measure overstated the non-tax component of price change and therefore understated the impact of tax change on the CPI; and
- the constant tax rate measure was constructed with reference to the scheduled rates of tax prevailing in the June quarter 2000. This meant that no allowance was made for tax changes implemented before that quarter.

Because of these limitations, the ABS recommends that care should be taken when using the experimental constant tax rate measure to provide an estimate of the impact of TNTS on the CPI.

However, TNTS had no direct impact on producer price indexes, except for the Price Index of Materials Used in House Building and the Price Index of Materials Used in Building other than House Building. The removal of the wholesale sales tax has had a downward influence on some of the prices of building materials. The changes to the diesel rebate scheme, another aspect of TNTS, had some downward influence on the diesel component of the Price Index of Materials Used in Coal Mining.

Indirect effects of TNTS should have some downward influence on all producer price indexes.

For more information on the impact of TNTS on the ABS's price indexes, see *Information Paper: Price Indexes and The New Tax System* (6425.0) and the December 2000 issue of *Australian Economic Indicators* (1350.0).

Construction prices indexes

Price Index of Materials Used in House Building

The Price Index of Materials Used in House Building measures changes in prices of selected materials used in the construction of houses in the Statistical Division containing each State capital city. The current index series were introduced in December 1995 on a reference base of 1989–90 = 100.0 and were linked to previous series. The items and weights for the current series are based on estimated materials usage in a sample of representative houses constructed in the three years ending 1992–93.

The index was first compiled on a reference base of 1966–67 = 100.0, using a weighting pattern derived from estimated materials usage in 1968–69. Index numbers on a 1966–67 = 100.0 reference base are available for the period July 1966 to September 1986.

A rebased series of indexes, linked to the previous series, were introduced in October 1986 on a reference base of 1985–86 = 100.0. The items in the rebased series were selected and allocated weights on the basis of the estimated values of each material used in a sample of representative houses constructed in 1985–86.

28.9 PRICE INDEX OF MATERIALS USED IN HOUSE BUILDING, Six State Capital Cities(a)(b)

Year	Weighted average of six State capital cities	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart
1993–94	112.0	111.3	112.1	113.5	117.1	109.1	112.8
1994–95	115.4	115.0	115.9	115.9	118.8	112.7	117.3
1995–96	115.7	115.9	115.4	115.1	118.2	114.8	120.7
1996–97	116.1	116.3	115.3	115.3	120.6	115.3	120.1
1997–98	118.2	119.7	117.1	117.1	123.3	115.9	121.0
1998–99	119.5	121.6	118.0	118.2	125.0	116.1	122.2
1999–00	122.8	126.8	121.7	120.8	127.2	117.7	123.8

(a) Reference base year 1989–90 = 100.0. (b) The separate city indexes measure price movement within each city individually. They do not compare price levels between cities.

Source: Price Index of Materials Used in House Building, Six State Capital Cities (6408.0).

Table 28.9 shows price index series for the seven years 1993–94 to 1999–2000, for the weighted average of the six State capital cities and for the individual cities. The movements in the index are discussed in *Chapter 20, Construction*.

Price Index of Materials Used in Building Other than House Building

The Price Index of Materials Used in Building Other than House Building measures changes in prices of selected materials used in the construction of buildings other than houses in the Statistical Division containing each State capital city. The types of building directly represented in the index are: flats and other dwellings; hotels, motels and hostels; shops; factories; offices; other business premises; education buildings; health buildings; and other non-residential buildings.

The current index series were introduced in October 1993 on a reference base of 1989–90 = 100.0. The composition of these indexes reflects the usage of materials in the five years ending June 1992.

The index was first compiled on a reference base of 1966–67 = 100.0 using a weighting pattern derived from estimated materials usage in 1966–67. Rebased indexes for the six State capital cities were introduced in February 1981 on a reference base of 1979–80 = 100.0. The composition of these indexes reflected the usage of materials in the three years ending June 1977.

Table 28.10 shows price index series for the seven years 1993–94 to 1999–2000 for the weighted average of the six State capital cities and for the individual cities. The movements in the index are discussed in *Chapter 20, Construction*.

More detailed information in respect of individual building materials is contained in table 20.19 of that chapter.

28.10 PRICE INDEX OF MATERIALS USED IN BUILDING OTHER THAN HOUSE BUILDING, Six State Capital Cities(a)(b)

Year	Weighted average of six State capital cities	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart
1993–94	107.5	107.0	106.7	110.1	107.9	107.1	110.1
1994–95	110.4	110.3	108.9	112.9	110.9	110.1	112.2
1995–96	112.7	112.6	111.1	115.0	112.7	113.2	115.1
1996–97	113.2	113.1	110.9	115.9	114.1	114.6	116.3
1997–98	114.2	114.4	111.4	117.2	115.1	114.6	117.4
1998–99	115.2	115.2	113.2	118.4	115.5	114.1	118.5
1999–00	116.1	116.0	114.4	119.3	116.1	115.4	119.0

(a) Reference base year 1989–90 = 100.0. (b) The separate city indexes measure price movements within each city individually. They do not compare price levels between cities.

Source: Price Index of Materials Used in Building Other than House Building, Six State Capital Cities (6407.0).

Manufacturing price indexes

Price Indexes of Materials Used in Manufacturing Industries

These indexes measure changes in prices of materials used by establishments classified to the Manufacturing Division of the *Australian and New Zealand Standard Industrial Classification (ANZSIC)*, 1993 edition.

Indexes are published for materials used in the Manufacturing Industry as a whole (split into imported and domestic materials) and for each of 17 separate Manufacturing sectors (defined in terms of ANZSIC subdivisions or ANZSIC groups). Indexes are also published for materials sourced domestically and those that are imported.

The indexes are compiled and published on a net sector basis. That is, each index includes only those materials which are used in the defined sector of Australian manufacturing industry and which have been produced by establishments outside that sector.

The current index series were introduced in July 1996 on a reference base of 1989–90 = 100.0. The items included in the indexes were allocated weights in accordance with the estimated value of manufacturing usage in 1989–90.

The indexes were first compiled on a reference base of 1968–69 = 100.0, using a weighting pattern derived from estimated manufacturing usage in 1971–72. Index numbers for this first series are available for the period July 1968 to November 1985.

A rebased series was introduced in December 1985 on a reference base of 1984–85 = 100.0 using a weighting pattern based on estimated manufacturing usage in 1977–78.

Table 28.11 shows summary indexes for materials used. More detailed index numbers are contained in table 19.16 of *Chapter 19, Manufacturing*.

28.11 PRICE INDEXES OF MATERIALS USED IN MANUFACTURING INDUSTRIES(a)

Year	Imported materials	Domestic materials	**All materials**
1993–94	108.8	102.5	**104.7**
1994–95	112.7	104.9	**107.6**
1995–96	117.6	106.0	**110.1**
1996–97	109.4	104.2	**106.0**
1997–98	112.2	104.1	**107.0**
1998–99	113.5	101.5	**105.9**
1999–00	118.8	114.5	**115.8**

(a) Reference base year 1989–90 = 100.0.

Source: Price Indexes of Materials Used in Manufacturing Industries, Australia (6411.0).

Price Indexes of Articles Produced by Manufacturing Industries

These indexes measure movements in the prices of articles produced by establishments classified to the Manufacturing Division of the *Australian and New Zealand Standard Industrial Classification (ANZSIC)*, 1993 edition.

Indexes are published for articles produced by the Manufacturing Industry as a whole and for each of 15 separate Manufacturing sectors (defined in terms of ANZSIC subdivisions or ANZSIC groups).

The indexes are constructed on a net sector basis. This approach means that the All Manufacturing Industry Index represents price movements of goods which are produced by establishments in the Manufacturing Division, for sale or transfer to establishments outside the Manufacturing Division, for export, or for use as capital equipment. Articles which are sold or transferred to other establishments within manufacturing industry, for further processing or for use as inputs, are excluded.

The composition and weighting pattern have recently been updated and are now based on the value of production in 1993–94 and have a reference base of 1989–90 = 100.0.

The indexes were first published in June 1976 on a reference base of 1968–69 = 100.0, with indexes compiled retrospectively to July 1968. The composition and weighting patterns of the indexes were based on the value of production in 1971–72.

Table 28.12 sets out a summary index for articles produced. More detailed index numbers are contained in table 19.17 of *Chapter 19, Manufacturing*.

28.12 PRICE INDEXES OF ARTICLES PRODUCED BY MANUFACTURING INDUSTRIES(a)(b)

Year	Manufacturing Division Index
1993–94	108.5
1994–95	110.9
1995–96	113.7
1996–97	114.3
1997–98	115.9
1998–99	115.6
1999–00	120.6

(a) Reference base year 1989–90 = 100.0. (b) For a full description of Division C, Manufacturing and the subdivisions within the Manufacturing Division, see the Australian and New Zealand Standard Industrial Classification (ANZSIC)(1292.0).

Source: Price Indexes of Articles Produced by Manufacturing Industry, Australia (6412.0).

Services output price indexes

In recognition of the increasing contribution of service industries to the Australian economy, the ABS has embarked on a long-term development program to progressively extend the scope of the producer price indexes into the service sectors of the economy. This program is an important part of a broader ABS plan designed to provide a range of statistics that will improve the measurement of service industries in the Australian economy. Similar initiatives are also being undertaken by statistical agencies in several other countries.

The first experimental indexes from this program were published in March 1999, in *Information Paper: Producer Price Index Developments* (6422.0).

In April 2000 the ABS introduced a new quarterly publication, *Producer Price Indexes for Selected Service Industries, Australia* (6423.0). This publication presents producer price indexes for the output of the Transport (freight) and Storage Division, and the Property and Business Services Division of the *Australian and New Zealand Standard Industrial Classification (ANZSIC)*. The Transport (freight) and Storage Division index contains important freight transport industries such as road, rail, sea and air. The Property and Business Services Division index contains services such as real estate agents and the hire and lease of machinery and equipment; and a diverse range of business services including surveying, computer services, accounting services, market research and cleaning services. The index numbers are calculated on the reference base 1998–99 = 100.0.

Indexes for additional service industries will be released in the publication as they are developed.

The new Services price indexes aim to:

- assist in improving the quality of the national accounts by providing a wider range of deflators for deriving real measures of economic growth;
- contribute to the development of new measures of inflation by expanding the coverage of the indexes compiled under the Stage of Production framework (see *Stage of production producer price indexes*); and
- be of use in their own right for industry analysis.

Complex measurement problems have had to be overcome in developing the new services price indexes. Customised approaches to price collection have had to be adopted on a case-by case basis because of the tendency in many service industries to provide one-off, unique services tailored to each particular customer's needs. This has necessitated extensive consultation with industry associations and individual businesses to determine the most viable approach.

Tables 28.13 and 28.14 provide broad level, summary index series. More detailed indexes are presented in the quarterly publication *Producer Price Indexes for Selected Service Industries, Australia* (6422.0).

28.13 PRODUCER PRICE INDEXES FOR SELECTED SERVICE INDUSTRIES, Transport (Freight) and Storage(a)

Year	Transport (freight) & storage division	Road transport	Rail transport	Water transport	Air and space transport	Services to transport	Storage
1996–97	n.a.	n.a.	109.8	n.a.	n.a.	n.a.	95.9
1997–98	n.a.	98.8	105.1	n.a.	n.a.	n.a.	99.4
1998–99	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1999–00	100.2	101.0	94.4	103.8	99.1	97.2	100.9
1996							
March	n.a.	n.a.	112.1	n.a.	n.a.	n.a.	n.a.
June	n.a.	n.a.	112.3	n.a.	n.a.	n.a.	n.a.
September	n.a.	n.a.	111.0	n.a.	n.a.	n.a.	93.3
December	n.a.	n.a.	108.5	n.a.	n.a.	n.a.	94.4
1997							
March	n.a.	97.2	110.0	n.a.	n.a.	n.a.	97.6
June	n.a.	98.1	109.5	n.a.	n.a.	n.a.	98.3
September	n.a.	98.1	106.9	n.a.	n.a.	n.a.	99.5
December	n.a.	99.1	106.0	n.a.	n.a.	n.a.	99.3
1998							
March	n.a.	98.7	105.3	n.a.	n.a.	n.a.	99.1
June	n.a.	99.4	102.3	n.a.	n.a.	n.a.	99.5
September	100.1	99.4	103.3	101.8	99.2	100.2	99.5
December	100.0	99.7	99.8	100.4	100.2	100.3	100.3
1999							
March	100.3	100.5	99.5	99.4	102.3	99.7	100.1
June	99.6	100.4	97.4	98.3	98.3	99.9	100.1
September	99.5	100.5	95.9	99.7	98.2	97.2	100.3
December	99.5	100.7	93.6	102.1	96.7	97.2	100.4
2000							
March	100.4	100.9	94.2	104.7	100.5	97.2	101.3
June	101.2	101.8	93.9	108.6	101.1	97.0	101.7

(a) Reference base year 1998–99 = 100.0.

Source: Producer Price Indexes for Selected Service Industries (6423.0).

28.14 PRODUCER PRICE INDEXES FOR SELECTED SERVICE INDUSTRIES, Property and Business Services(a)

Year	Property and business services	Property services	Business services
1998–99	100.0	100.0	100.0
1999–00	105.6	106.9	103.8
1998			
September	98.7	98.3	99.4
December	99.9	99.9	99.8
1999			
March	99.8	100.4	99.0
June	101.6	101.4	101.7
September	103.4	103.6	103.1
December	105.0	105.6	104.1
2000			
March	105.8	107.8	103.3
June	108.0	110.5	104.6

(a) Reference base year 1998–99 = 100.0.

Source: Producer Price Indexes for Selected Service Industries (6423.0).

International trade price indexes

Export Price Index

The Export Price Index measures changes in prices of exports of merchandise from Australia. The index numbers for each month relate to prices of exports actually shipped during the period.

The first index of export prices was compiled annually from 1901 to 1916–17 as a current-weighted unit value index.

The method of calculation was changed in 1918 to incorporate fixed weights, applied to the average unit values of each export in successive years. This index was published for the years 1897 to 1929–30.

Two new series of monthly export price indexes were published in 1937, compiled back to 1928. One index used fixed weights and the other used changing weights. The methodology was changed and actual export prices were used instead of unit values. The indexes were compiled until 1962.

In 1962, a fixed weighted index on the reference base of 1959–60 = 100.0 was introduced. In July 1969 a new interim series was linked to this index, still with a reference base of 1959–60 = 100.0, but with updated weights. The interim index was replaced in 1979 by an index on a reference base of 1974–75. The current index, which was changed from a monthly to a quarterly basis after June 1997, has a reference base of 1989–90 = 100.0. It was recently reviewed and reweighted using 1998–99 and 1999–2000 international trade data. The plan is to update the index weights each year using the latest trade data.

Index numbers based on the *Australian Harmonised Export Commodity Classification (AHECC)* are contained in table 30.32 of *Chapter 30, International accounts and trade*. The export price index for all groups is provided for the whole of the last century in table 28.15.

Import Price Index

The Import Price Index measures changes in the prices of imports of merchandise landed in Australia using free-on-board prices in the country of origin. The index numbers for each quarter relate to prices of imports landed in Australia during the period.

The first Import Price Index produced by the ABS covered the period from the September quarter 1981 to the June quarter 1991 on a reference base of 1981–82 = 100.0. This index replaced an index previously published by the Reserve Bank of Australia on a reference base of 1966–67 = 100.0. The Reserve Bank's import price index was published from 1928 until September 1982.

A new Import Price Index series was introduced in December 1991 with monthly index numbers compiled from April 1991 until June 1997 when the index moved to a quarterly cycle. The current index has a reference base of 1989–90 = 100.0 and was recently reviewed and reweighted using 1999–2000 international trade data. The plan is to update the index weights each year using the latest trade data.

To give a broad indication of changes over the whole of the last century, table 28.15 draws on the available international trade indexes. Import Price Index numbers based on the *Standard International Trade Classification Revision 3* (SITC Rev. 3) are contained in table 30.33 of *Chapter 30, International accounts and trade*.

28.15 INTERNATIONAL TRADE PRICE INDEXES(a)

Year	Export Price Index (All groups)	Import Price Index (All groups)
1901	15	..
1911	17	..
1921–22	25	..
1931–32	18	22
1936–37	29	21
1941–42	27	35
1946–47	53	51
1951–52	123	92
1956–57	115	91
1960–61	93	95
1961–62	94	94
1962–63	99	94
1963–64	112	96
1964–65	103	97
1965–66	105	99
1966–67	103	100
1967–68	98	99
1968–69	100	100
1969–70	101	103
1970–71	99	108
1971–72	102	114
1972–73	131	113
1973–74	157	131
1974–75	177	189
1975–76	193	214
1976–77	216	246
1977–78	227	278
1978–79	256	307
1979–80	309	403
1980–81	328	450
1981–82	332	458
1982–83	360	506
1983–84	369	524
1984–85	396	580
1985–86	417	659
1986–87	430	731
1987–88	469	742
1988–89	501	694
1989–90	527	729
1990–91	501	752
1991–92	472	749
1992–93	493	817
1993–94	484	843
1994–95	501	837
1995–96	508	838
1996–97	488	791
1997–98	522	841
1998–99	505	874
1999–00	517	876

(a) Reference base year 1968–69 = 100.0.

Source: The sources used for the Import Price Index are the Reserve Bank of Australia Bulletin up to and including 1981–82, and the ABS Import Price Index, Australia (6414.0) thereafter. The source used for the Export Price Index is the ABS Export Price Index, Australia (6405.0).

Economy-wide price indexes

As part of a long-term development program to extend the measures available to support the study of inflation, the ABS has been developing new economy-wide price index measures. The basis for these developments is the statistical framework discussed *Information Paper: An Analytical Framework for Price Indexes in Australia* (6421.0). The new measures will cover prices of both goods and services and are to be released on a quarterly basis. Separate price measures are being developed to record price changes from the perspectives of producers and purchasers.

The first results from this program were published in March 1999 as experimental indexes in *Information Paper: Producer Price Index Developments* (6422.0). The Stage of Production indexes discussed in that paper have been further developed after consultation with users and are now being released on a regular quarterly basis.

A further measure entitled Price Index of Domestic Final Purchases is also being developed. The concepts underlying this measure were discussed in the 1997 Information Paper mentioned above.

Stage of Production producer price indexes

The first regular quarterly issue of the publication *Stage of Production Producer Price Indexes* (6426.0) was released in July 2000. This publication presents producer price index numbers for the supply of commodities (both goods and services) to the Australian economy in a 'stage of production' framework as described in *Information Paper: Producer Price Index Developments* (6422.0). The indexes cover both domestically produced and imported commodities. They represent an alternative arrangement of largely existing ABS producer price index series.

The Stage of Production concept

The indexes are compiled using the Stage of Production concept. Under this concept flows of commodities are categorised according to their economic destination on a sequential basis along the production chain. The basis for the categorisation is the 1994–95 Australian Input-Output tables. The primary categorisation is between final commodities (i.e. commodities destined for final consumption, capital formation or export) and non-final commodities (i.e. commodities that flow into intermediate consumption for further processing).

This initial breakdown of the commodity flows into final and non-final represents a useful economic dissection of producers' transactions. However, the non-final commodities can flow into the production of both final and other non-final commodities. Therefore, to aid analysis, the non-final commodity flows have been divided on a sequential basis between Stage 1 (or preliminary) commodities and Stage 2 (or intermediate) commodities. This approach results in three separate stages of production.

In order to avoid multiple counting of transactions, the three stages are not aggregated.

Under this framework, preliminary (Stage 1) commodities are used in the production of intermediate (Stage 2) commodities; in turn intermediate (Stage 2) commodities flow into the production of final (Stage 3) commodities.

The framework allows for analyses of price change as commodities flow through production processes. Price changes for earlier stages of production may be indicators of possible future price changes for later stages.

Transaction flow approach

The ABS has adopted a market transactions approach in disaggregating commodity supply into the various production stages. Under this approach, it is the individual transactions in a given commodity which are assigned to the relevent stage. Therefore, a particular 'commodity', within the index classification system, can be assigned to more than one stage, on the basis of the usage pattern of that commodity in the Input-Output tables.

Index coverage

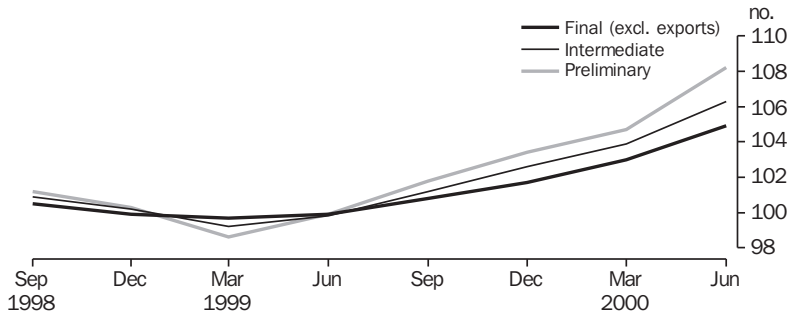
In concept, the scope of the Stage of Production index is economy-wide, relating to the output of all the goods and services industries. However, there are limits on the availability of price indexes for service industries and coverage is currently restricted to the output of the Transport (freight) and Storage, and Property and Business Services sectors. Similarly, coverage of the Construction sector is confined to indexes for the output of the following industries: House construction, Residential building construction n.e.c., Non-residential building construction, and Road and bridge construction. Coverage of the Stage of Production index will be progressively extended as additional service and construction industry collections are established. Table 28.16 and graph 28.17 show stage of production producer price indexes for 1998–99 and 1999–2000.

28.16 STAGE OF PRODUCTION PRODUCER PRICE INDEXES, Index Numbers by Stage and Source

	Preliminary			Intermediate			Final (excluding exports)		
Year	Domestic	Imports	Total	Domestic	Imports	Total	Domestic	Imports	Total
1998–99	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1999–00	104.1	107.1	104.5	103.4	104.4	103.6	104.3	95.7	102.6
1998									
September	100.9	103.3	101.2	100.6	102.8	100.9	99.7	103.5	100.5
December	100.2	101.0	100.3	100.0	101.2	100.2	99.5	101.7	99.9
1999									
March	98.7	97.6	98.6	99.3	98.4	99.2	99.9	99.2	99.7
June	100.2	98.2	99.9	100.1	97.6	99.8	100.9	95.6	99.9
September	102.1	100.1	101.8	101.5	99.1	101.2	102.4	94.2	100.8
December	103.4	103.6	103.4	102.7	101.9	102.6	103.3	95.0	101.7
2000									
March	104.1	108.6	104.7	103.7	105.1	103.9	105.0	94.7	103.0
June	106.9	116.2	108.2	105.7	111.6	106.5	106.4	98.9	104.9

Source: Stage of Production Producer Price Indexes (6426.0).

28.17 STAGE OF PRODUCTION PRODUCER PRICE INDEXES, Index Numbers by Stage and Source



(a) Reference base year 1998–99 = 100.0.

Source: Stage of Production Producer Price Indexes (6426.0).

Bibliography

ABS publications

A Guide to the Consumer Price Index (6440.0). Available in the Statistical Concepts Library on the ABS Internet site at *http://www.abs.gov.au*

Australian and New Zealand Standard Industrial Classification (ANZSIC) (1292.0). Available in the Statistical Concepts Library on the ABS Internet site.

Australian Consumer Price Index: Concepts, Sources and Methods (6461.0).

Australian Economic Indicators (1350.0).

Australian Harmonised Export Commodity Classification (1233.0).

Australian Standard Industrial Classification, Volume 1—The Classification (1201.0).

Average Retail Prices of Selected Items, Eight Capital Cities (6403.0).

Average Weekly Earnings, States and Australia (6302.0).

Consumer Price Index (6401.0).

Employee Earnings and Hours, Australia, Preliminary (6350.0).

Export Price Index, Australia (6405.0).

House Price Indexes: Eight Capital Cities (6416.0).

Import Price Index, Australia (6414.0).

Information Paper: An Analytical Framework for Price Indexes in Australia (6421.0). Available in the Statistical Concepts Library on the ABS Internet site.

Information Paper: Introduction of the 14th Series Australian Consumer Price Index, 2000 (6456.0). Available on the ABS Internet site.

Information Paper: Price Indexes and The New Tax System (6425.0).

Information Paper: Producer Price Index Developments (6422.0).

Information Paper: Review of the Import Price Index and Export Price Index 1999 (6424.0). Available on the ABS Internet site.

Information paper: The Australian Consumer Price Index 12th Series Review (6450.0). Available on the ABS Internet site.

Price Indexes of Articles Produced by Manufacturing Industry, Australia (6412.0).

Price Index of Materials Used in Building Other Than House Building, Six State Capital Cities (6407.0).

Price Index of Materials Used in House Building, Six State Capital Cities (6408.0).

Price Indexes of Materials Used in Manufacturing Industries, Australia (6411.0).

Price Indexes of Articles Produced by Manufacturing Industry, Australia (6412.0).

Producer Price Indexes for Selected Service Industries, Australia (6423.0).

Stage of Production Producer Price Indexes, Australia (6426.0).

Year Book Australia (1301.0), 1998 and 1999.

Other publications

Commonwealth Bureau of Census and Statistics, *Labour and Industrial Branch Report No. 1, Prices, Price Indexes and Cost of Living in Australia, December 1912*.

Commonwealth Bureau of Census and Statistics, *Official Year Book of the Commonwealth of Australia No. 21, 1901–1928*.

Commonwealth Statistician, *A Statistical Account of Australia and New Zealand 1902–3*.

Reserve Bank of Australia, *The Reserve Bank of Australia Bulletin*, various issues. Articles published in the Bulletin since September 1996 can be found on the Reserve Bank's Internet site at *http://www.rba.gov.au*

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Introduction

A wide range of economic data is available to analyse the performance of various components of the Australian economy over time. For example, data are regularly published on the number of houses being built, the number of cars produced, whether employment is rising or falling, the composition of exports and imports and so on. While these and other statistical series are important in their own right, none of them in isolation can provide an overall picture of the state of the economy.

National accounts are designed to provide a systematic summary of national economic activity, and have been developed to assist in the practical application of economic theory. The system of national accounts includes national income, expenditure and product accounts, financial accounts, the national balance sheet and input-output tables. At their summary level, the national income, expenditure and product accounts reflect key economic flows: production, the distribution of incomes, consumption, saving and investment. At their more detailed level, they are designed to present a statistical picture of the structure of the economy and the detailed processes that make up domestic production and its distribution. The financial accounts show the financial assets and liabilities of the nation and of each institutional sector, the market for financial instruments and inter-sectoral financial transactions. The balance sheet is a comprehensive statement of produced and non-produced assets, liabilities to the rest of the world and net worth. Input-output tables show which goods and services are produced by each industry and how they are used.

The national accounts include many detailed classifications (e.g. by industry, by purpose, by commodity, by State and Territory, and by asset type) relating to major economic aggregates.

The main output from the national accounts is a measure of the overall value of economic production in Australia in a given period, but without any double counting of the goods and services being produced. Many goods and services are bought by businesses for use in their own productive activities (e.g. steel is bought by car manufacturers). If the value of all goods and services produced were simply added together there would be serious duplication because some goods and services would be added in several times at various stages of production. The overall measure of production, excluding double counting, is called 'gross domestic product', which is commonly referred to as GDP. It is formally defined as:

> "the total market value of goods and services produced in Australia after deducting the cost of goods and services used up (intermediate consumption) in the process of production, but before deducting allowances for the consumption of fixed capital (depreciation)".

The performance of the economy is represented in the national accounts by such measures as growth in GDP. While movements in the chain volume measure of GDP (from which the direct effects of price changes have been removed) are an important indicator of economic growth, there is no single measure which can describe all aspects of the wellbeing of a country's citizens.

There are significant aspects of the quality of life which cannot be comprehended in a system of economic accounts, just as there are significant aspects of an individual's wellbeing which are not measured in the conventional concept (or any other concept) of that individual's income.

Notwithstanding their limitations, especially in relation to uses for which they were never designed, the national accounts provide vital information for a range of important purposes. The system of national accounts also provides a framework or structure which can be, and has been, adapted and extended to facilitate the examination of other economic and social policy issues.

A detailed presentation of the concepts underlying the national accounts is provided in the ABS publication *Australian National Accounts: Concepts, Sources and Methods* (5216.0). An updated version, reflecting the latest international standards, was for released late in 2000 as part of the Statistical Concepts Library on the ABS Internet site at *http://www.abs.gov.au*.

History of national accounts in Australia

The first official estimates of national income for Australia (based on estimates prepared by Clark and Crawford) were published in 1938 in *The Australian Balance of Payments, 1928–29 to 1937–38*, although unofficial estimates by several economists had been published in the 1920s and 1930s.[1] In 1945, the first official set of national accounts was prepared by the then Commonwealth Bureau of Census and Statistics (CBCS) and published in the Commonwealth Budget Paper *Estimates of National Income and Public Authority Income and Expenditure*.

The 1960s and early 1970s were times of significant development for Australian national accounting. The first official quarterly estimates of national income and expenditure were published in December 1960.[2] In 1963 the CBCS published the first *Australian National Accounts: National Income and Expenditure* (ANA) bulletin, which included the first annual constant price estimates for Australia.[3] Experimental input-output estimates were published in 1964.[4] The CBCS began to seasonally adjust its quarterly estimates of national income and expenditure in 1967. Estimates of gross product by industry at constant prices were published for the first time in 1969.[5] In 1971, the CBCS first published seasonally adjusted, constant price quarterly estimates of national income and expenditure, which later proved to be among the most used of all national accounting estimates. The CBCS published estimates of national income and expenditure based on the revised United Nations publication *A System of National Accounts* (1968 version) in 1973, and also published the first official input-output statistics in the same year.[6]

In the 1980s, the former CBCS, now called the Australian Bureau of Statistics (ABS), again made significant progress in national accounting. The first full edition of *Australian National Accounts: Concepts, Sources and Methods* was published in 1981 at about the same time as the first experimental estimates of capital stock.[7] The ABS conducted a study into the accuracy and reliability of the quarterly estimates of national income and expenditure and published the results in 1982.[8] Experimental State accounts[9] were published in 1984, followed by the first official estimates in 1987.[10] They are now published annually. In 1985, the ABS published an assessment of the effects of rebasing constant price estimates from a 1979–80 base to a 1984–85 base.[11] In 1986, the second set of experimental estimates of capital stock was published[12] followed in 1987 by the first official estimates of capital stock.[13] The first quarterly estimates of constant price gross product by industry were released in 1988.[14] These estimates have now been incorporated into the quarterly *Australian National Accounts: National Income, Expenditure and Product* (5206.0).

Further significant developments in national accounting and associated statistics have occurred during the 1990s. An updated edition of *Australian National Accounts: Concepts, Sources and Methods* was published in 1990 (subsequently available on CD-ROM), the same year as the first estimates of multifactor productivity were published.[15] In 1990, the ABS also published developmental flow of funds accounts, showing the changes in financial assets and liabilities arising from the financing of productive activity in the economy.[16] Flow of funds estimates are now published on a quarterly basis, along with estimates of stocks of financial assets and liabilities at the end of each quarter. An Information Paper describing the impact of rebasing constant price estimates from a 1984–85 base to a 1989–90 base was published in 1993.[17] Experimental estimates of national balance sheets for Australia were first released in 1995,[18] followed by the publication of regular annual national and sector balance sheet estimates in 1997.

Following the release of revised international standards for national accounts in the *System of National Accounts, 1993* (SNA93), the ABS worked toward implementation of the revised and extended system recommended in that document. The first official release of Australian national accounts statistics on an SNA93 basis was for the September quarter 1998. Prior information on the nature and impact of implementation of the revised standards and methodology was provided in a series of discussion and information papers as follows:

- *Discussion Paper: Introduction of Revised International Statistical Standards in ABS Macro-economic Statistics* (5245.0), December 1994.

- *Information Paper: Implementation of Revised International Standards in the Australian National Accounts* (5251.0), September 1997.
- *Information Paper: Introduction of Chain Volume Measures in the Australian National Accounts* (5248.0), March 1998.

Preliminary data on an SNA93 basis were made available in re-releases of the following publications:

- *Australian National Accounts: National Income, Expenditure and Product* (5206.0), June quarter 1998, re-released in November 1998 in *Information Paper: Upgraded Australian National Accounts* (5253.0).
- *Australian National Accounts: Financial Accounts* (5232.0), June quarter 1998, re-released in December 1998 in *Information Paper: Upgraded Australian National Accounts: Financial Accounts* (5254.0).

GDP and gross fixed capital formation—historical series

Table 29.1 provides time series for gross domestic product and gross fixed capital formation from 1900–01. As consistent time series are not available for the whole period, four overlapping data sets are shown for each aggregate. Data for the period 1900–01 to 1938–39 are taken from estimates published by Barnard and Butlin ; data for 1938–39 to 1948–49 were published in the Budget White Paper *National Income and Expenditure, 1955–56*; data for 1948–49 to 1959–60 were published in the 1995–96 issue of *Australian National Accounts: National Income, Expenditure and Product* (5204.0), and are on an SNA68 basis; while the estimates for 1959–60 to 1998–99 were published in the 1998–99 issue of *Australian System of National Accounts* (5204.0). Although there are conceptual and methodological differences between the estimates for the various time periods shown in this table, it provides the best available time series for GDP for Australia over the last century.

29.1 GDP AND GROSS FIXED CAPITAL FORMATION, At Current Prices—1900–01 to 1998–99

	Gross domestic product ($m)				Gross fixed capital formation ($m)			
Year	(a)	(b)	(c)	(d)	(e)	(b)	(c)	(d)
1900–01	419				55			
1901–02	444				78			
1902–03	428				68			
1903–04	448				52			
1904–05	444				47			
1905–06	479				53			
1906–07	538				72			
1907–08	536				76			
1908–09	573				75			
1909–10	623				81			
1910–11	684				98			
1911–12	734				124			
1912–13	802				147			
1913–14	864				155			
1914–15	838				140			
1915–16	969				160			
1916–17	1 022				184			
1917–18	1 062				173			
1918–19	1 145				185			
1919–20	1 253				213			
1920–21	1 382				246			
1921–22	1 378				260			
1922–23	1 510				274			
1923–24	1 569				291			
1924–25	1 722				302			
1925–26	1 659				307			
1926–27	1 729				326			

For footnotes see end of table.

...continued

29.1 GDP AND GROSS FIXED CAPITAL FORMATION, At Current Prices—1900–01 to 1998–99 — *continued*

	Gross domestic product ($m)				Gross fixed capital formation ($m)			
Year	(a)	(b)	(c)	(d)	(e)	(b)	(c)	(d)
1927–28	1 739				326			
1928–29	1 712				305			
1929–30	1 566				237			
1930–31	1 287				173			
1931–32	1 210				122			
1932–33	1 264				135			
1933–34	1 356				155			
1934–35	1 432				206			
1935–36	1 574				230			
1936–37	1 717				249			
1937–38	1 857				304			
1938–39	1 819	1 860			307	322		
1939–40		2 040				368		
1940–41		2 174				446		
1941–42		2 548				534		
1942–43		2 936				768		
1943–44		2 986				702		
1944–45		2 906				580		
1945–46		3 006				648		
1946–47		3 234				652		
1947–48		3 988				744		
1948–49		4 524	4 493			792	806	
1949–50			5 302				1 085	
1950–51			7 034				1 554	
1951–52			7 590				1 957	
1952–53			8 601				1 951	
1953–54			9 393				2 156	
1954–55			10 004				2 382	
1955–56			10 829				2 593	
1956–57			11 785				2 685	
1957–58			12 059				2 884	
1958–59			12 952				3 050	
1959–60			14 308	14 877			3 442	3 757
1960–61				15 936				4 069
1961–62				16 312				4 150
1962–63				17 601				4 444
1963–64				19 537				4 986
1964–65				21 417				5 739
1965–66				22 486				6 289
1966–67				24 903				6 739
1967–68				26 712				7 313
1968–69				30 141				8 215
1969–70				33 525				9 146
1970–71				37 103				10 191
1971–72				41 028				11 143
1972–73				46 353				11 998
1973–74				55 900				14 028
1974–75				67 105				15 766
1975–76				79 272				18 928
1976–77				91 225				21 463
1977–78				99 340				23 858
1978–79				112 764				27 478
1979–80				128 216				30 874
1980–81				145 566				37 785
1981–82				166 362				44 814
1982–83				179 512				44 297

For footnotes see end of table.

...continued

29.1 GDP AND GROSS FIXED CAPITAL FORMATION, At Current Prices—1900–01 to 1998–99 — *continued*

	Gross domestic product ($m)				Gross fixed capital formation ($m)			
Year	(a)	(b)	(c)	(d)	(e)	(b)	(c)	(d)
1983–84				202 593				48 220
1984–85				224 858				55 317
1985–86				248 468				63 738
1986–87				272 546				69 110
1987–88				310 868				79 055
1988–89				351 933				92 915
1989–90				384 710				97 917
1990–91				397 180				88 992
1991–92				406 427				84 846
1992–93				427 404				92 043
1993–94				449 785				98 941
1994–95				474 546				110 652
1995–96				508 113				113 658
1996–97				533 632				121 170
1997–98				565 881				133 215
1998–99				593 311				141 126

(a) Barnard and Butlin, "Australian Public and Private Capital Formation, 1901–1975", Economic Record 57, pp. 354–367. (b) Published by Commonwealth Statistician. Figures are from National Income and Expenditure 1955–56, and are not strictly comparable with subsequent years because of a number of definitional changes and statistical revisions; see pages 18–19 and 117–120 Australian National Accounts: National Income and Expenditure 1948–49 to 1961–62, Commonwealth Bureau of Census and Statistics. (c) Australian National Accounts: National Income, Expenditure and Product, 1995–96, Australian Bureau of Statistics. (d) Australian System of National Accounts, 1998–99, Australian Bureau of Statistics. (e) Barnard and Butlin, op.cit. For a variety of reasons, Professor Butlin's gross domestic capital formation figures differ conceptually from those for gross fixed capital formation in the Australian national accounts.

Source: See footnotes.

Endnotes

1 Clark, Colin & Crawford J.G. 1938, *The National Income of Australia*, Angus and Robertson, Sydney; Commonwealth Bureau of Census and Statistics 1938, *The Australian Balance of Payments*, 1928–29 to 1937–38, AGPS, Canberra; the earlier unofficial estimates are discussed in N.G. Butlin 1962, *Australian Domestic Product, Investment and Foreign Borrowing, 1861 to 1938–39*, Cambridge, Ch. 2.

2 Commonwealth Bureau of Census and Statistics 1960, *Quarterly Estimates of National Income and Expenditure*, CBCS, Canberra.

3 Commonwealth Bureau of Census and Statistics 1963, *Australian National Accounts: National Income and Expenditure, 1948–49 to 1961–62*, CBCS, Canberra.

4 Commonwealth Bureau of Census and Statistics 1964, *Australian Input-Output Tables, 1958–59*, CBCS, Canberra.

5 Commonwealth Bureau of Census and Statistics 1969, *Estimates of Gross Product by Industry at Current and Constant Prices, 1959–60 to 1965–66*, CBCS, Canberra.

6 Commonwealth Bureau of Census and Statistics 1973, *Australian National Accounts: Input-Output Tables, 1962–63*, CBCS, Canberra.

7 Bailey, Cherylee 1981, *Studies in National Accounting: Current-cost and Constant-cost Depreciation and Net Capital Stock*, ABS, Canberra.

8 Johnson A.G. 1982, *The Accuracy and Reliability of the Quarterly Australian National Accounts*, ABS, Canberra.

9 Burrell S., Daniel J., Johnson A. and Walters R. 1984, *State Accounts, Australia: Issues and Experimental Estimates*, ABS, Canberra.

10 Australian Bureau of Statistics 1987, *Australian National Accounts: State Accounts, 1985–86*, ABS, Canberra.

11 Dippelsman R.J. 1985, *The Effects of Rebasing the Constant Price Estimates of the Australian National Accounts*, ABS, Canberra.

12 Walters R. and Dippelsman R. 1986, *Estimates of Depreciation and Capital Stock, Australia*, ABS, Canberra.

13 Australian Bureau of Statistics 1987, *Australian National Accounts: Estimates of Capital Stock, 1985–86*, ABS, Canberra.

14 Australian Bureau of Statistics 1988, *Australian National Accounts: Gross Product, Employment and Hours Worked, June Quarter 1988*, ABS, Canberra.

15 Australian Bureau of Statistics 1990, *Occasional Paper: Estimates of Multifactor Productivity, Australia*, ABS, Canberra.

16 Australian Bureau of Statistics 1990, *Information Paper: Australian National Accounts: Flow of Funds Developmental Estimates*, ABS, Canberra.

17 Australian Bureau of Statistics 1993, *Information Paper: Australian National Accounts: Introduction of Constant Price Estimates at Average 1989–90 Prices*, ABS, Canberra.

18 Australian Bureau of Statistics 1995, *Occasional Paper: National Balance Sheets for Australia: Issues and Experimental Estimates, 1989 to 1992*, ABS, Canberra.

Measuring GDP

There are three ways of measuring GDP:

- the *income approach*, which measures GDP by summing the incomes accruing from production: compensation of employees (wages and salaries, and employers' social contributions); gross operating surplus (profits); gross mixed income (income from unincorporated businesses, including a return to the owners of these businesses for their labour); and taxes less subsidies on production and imports;
- the *expenditure approach*, which involves summing all final expenditures on goods and services (i.e. those goods and services which are not processed any further), adding on the contributions of changes in inventories and the value of exports, and deducting the value of imports. Final expenditures consist of final consumption expenditure and gross fixed capital formation. Exports are included in GDP because they are part of Australian production even though they are sold to overseas purchasers. Imports are deducted because, although they are included in final expenditures (e.g. when someone buys an imported video recorder its value is included as part of household final consumption expenditure), they are not part of Australian production; and
- the *production approach*, which calculates GDP by taking the value of goods and services produced by an industry (its output at basic values, which implicitly includes taxes less subsidies on production) and deducting the cost of goods and services used up by the industry in the productive process (intermediate consumption), which leaves the value added by the industry. GDP is then obtained by summing value added across all industries, and adding taxes less subsidies on products.

While each approach should, conceptually, deliver the same estimate of GDP, if the three measures are compiled independently using different data sources then different estimates of GDP result. However, the Australian national income, expenditure and product estimates have been integrated with annual balanced supply and use tables which are available for 1994–95 to 1997–98. Integration with balanced supply and use tables ensures that the same estimate of GDP is obtained from the three approaches, so that annual estimates using the income, expenditure and production approaches are identical for the years for which supply and use tables are available.

Prior to 1994–95, and for 1998–99, the estimates using each approach are based on independent sources, and there are usually differences between the income, expenditure and production estimates. Nevertheless, for these periods, a single estimate of GDP has been compiled.

Table 29.2 shows time series of chain volume measures for GDP, and GDP per capita, from 1972–73 to 1998–99. (For a discussion of chain volume measures, see the section *Chain volume or 'real' GDP*.)

29.2 GROSS DOMESTIC PRODUCT, Chain Volume Measures(a)

Year	GDP $m	GDP per capita
1972–73	253 713	18 924
1973–74	267 567	19 657
1974–75	270 576	19 581
1975–76	278 159	19 917
1976–77	287 943	20 406
1977–78	291 211	20 393
1978–79	306 536	21 234
1979–80	314 200	21 518
1980–81	323 949	21 874
1981–82	335 833	22 307
1982–83	327 778	21 435
1983–84	346 017	22 345
1984–85	361 840	23 074
1985–86	376 960	23 707
1986–87	387 354	24 000
1987–88	408 191	24 891
1988–89	424 832	25 461
1989–90	440 584	26 011
1990–91	439 783	25 603
1991–92	441 458	25 379
1992–93	457 735	26 026
1993–94	476 556	26 824
1994–95	498 113	27 732
1995–96	520 669	28 616
1996–97	540 379	29 327
1997–98	565 881	30 363
1998–99	591 546	31 363

(a) Reference year 1997–98.

Source: Australian National Accounts: National Income, Expenditure and Product (5206.0); Australian System of National Accounts (5204.0).

The chain volume measure of GDP increased by 4.5% in 1998–99, following an increase of 4.7% in 1997–98. For some analytical purposes, it is important to allow for the impact of population growth on movements in GDP. Annual growth in GDP per capita has been about one to two percentage points lower than that for GDP since the mid-1970s and was negative in 1974–75, 1977–78, 1982–83, 1990–91 and 1991–92 (graph 29.3). In 1998–99 GDP per capita increased by 3.3%.

Chain volume or 'real' GDP

Chain volume measures were introduced into the Australian national accounts in 1998. They were first presented as experimental measures for the expenditure components of GDP in the December quarter 1997 issue of *Australian National Accounts: National Income, Expenditure and Product* (5206.0), and were an addition to the long-standing constant price estimates which were still the 'official' volume estimates. Subsequently, in the September quarter 1998 issue of 5206.0, the constant price estimates of both the expenditure and production components of GDP were replaced with chain volume measures from the September quarter 1986, and they became the ABS's 'official' volume estimates.

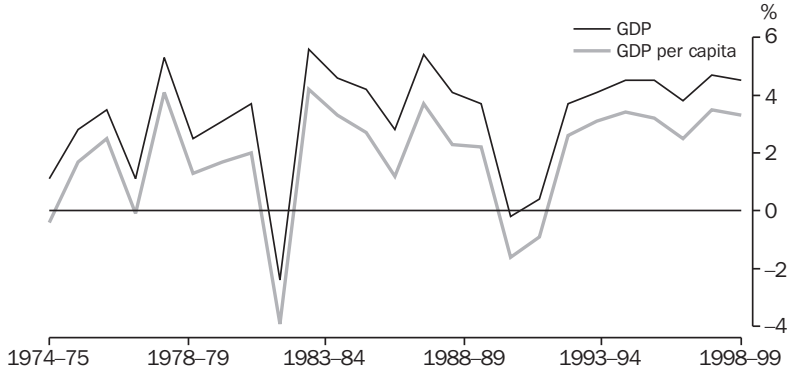
The reason for having either chain volume or constant price estimates in the national accounts is to provide time series of expenditure and production aggregates which are free of the direct effects of price change. All the current price aggregates of expenditure and production appearing in the national accounts are estimates of the sums of the values of individual transactions. Each of these transactions has two components: a price and a quantity. From one period to another the quantities and prices comprising the transactions change. This means that when the current price value of an aggregate, such as GDP, in one period is compared with the current price value in another period the difference between them usually reflects both changes in quantity and changes in price of the constituent transactions. In order to estimate by how much the 'volume' of GDP has changed between the two periods we need to measure the value of GDP in each period using the same unit prices.

For many years the ABS derived constant price estimates as a means of measuring changes in the volumes of aggregates. Constant price estimates are derived by fixing the unit prices of goods and services to those of some base year. These base year unit prices are effectively the weights used to combine the quantities of the different goods and services purchased or produced. The unit prices of different goods and services tend to grow at different rates—some at dramatically different rates, e.g. the prices of computer equipment are estimated to have declined by about 75% between 1989–90 and 1997–98, while the prices of most other goods and services have increased. Therefore, over time, the price relativities of some goods and services change appreciably. This adversely affects the usefulness of constant price estimates for periods distant from the base year, and implies that the base year used to derive constant price estimates needs to be changed from time to time. It was ABS practice, in common with many other national statistical agencies, to change the base year every five years. However, it has been found that rebasing every five years is commonly insufficient, and SNA93 recommends rebasing every year and linking the resulting indexes to form annually reweighted chain volume measures. ABS analysis of Australian data has confirmed the need to adopt annually reweighted chain volume measures.

Chain volume estimates are not generally additive. In other words, in general, component chain volume estimates do not sum to a total in the way original current price components do. In order to minimise the impact of this property, the ABS is using the latest base year as the reference year (i.e. the year when the annual chain volume estimate equals the current price value). Re-referencing changes the level of the chain volume estimates, but does not of itself change the growth rates. By adopting this approach, non-additivity does not apply to the reference year and the following year.

The decision to replace all of the ABS's constant price estimates with chain volume measures was announced in March 1998 in *Information Paper: Introduction of Chain Volume Measures in the Australian National Accounts* (5248.0). That paper describes what chain volume measures are, their advantages and disadvantages with respect to constant price estimates, the advantages and disadvantages of different chain volume formulae, and the results of an empirical analysis.

29.3 GDP AND GDP PER CAPITA



Source: Australian System of National Accounts (5204.0).

Chain price indexes and implicit price deflators

A by-product of the calculation of chain volume measures is the Implicit Price Deflator (IPD). An IPD is the price index obtained when a current price estimate is divided by the corresponding chain volume measure. The ABS publishes a time series of IPDs for each of the expenditure components of GDP (excluding the changes in inventories).

Chain price indexes are also published for the major expenditure aggregates. They are the prices analogue of chain volume estimates. Quarterly chain price indexes are generally superior to IPDs for measuring price change, because the quarter-to-quarter growth rates calculated from the IPDs reflect changes in composition of the expenditure aggregate as well as pure price change. For example, it is possible for an IPD to increase or decrease from one quarter to another without there being any change in price. Changes in chain price indexes, on the other hand, only reflect pure price change.

National income, expenditure and product accounts

The Australian national income, expenditure and product accounts are compiled and published in some detail every quarter, in *Australian National Accounts: National Income, Expenditure and Product* (5206.0), and in greater detail once a year, in *Australian System of National Accounts* (5204.0).

Gross domestic product account

The gross domestic product account indicates changes in Australian production over time. Tables 29.4 and 29.5 show the gross domestic product account in current prices for a number of years between 1965–66 and 1998–99; table 29.4 shows a series of snapshots at five-yearly intervals to 1985–86, while table 29.5 shows annual time series from 1990–91 to 1998–99. Tables 29.6 and

29.7 show expenditure on GDP in real or chain volume terms.

In real terms (i.e. after the effects of inflation are removed from the dollar value of Australia's production), there was a fall in production during the 1990–91 financial year. However, the eight years since the recession in 1990–91 have all shown growth in GDP. Although growth in 1991–92 was relatively low (0.4%), by 1994–95 it had accelerated to 4.5%, a growth rate which has generally been maintained since, except for a slowing in 1996–97.

29.4 DOMESTIC PRODUCTION ACCOUNT, Current Prices—Five-Yearly

	1965–66	1970–71	1975–76	1980–81	1985–86
	$m	$m	$m	$m	$m
Final consumption expenditure					
General government	3 139	5 586	15 474	27 889	50 992
Households	13 401	21 010	44 679	82 877	143 009
Total final consumption expenditure	*16 540*	*26 596*	*60 153*	*110 766*	*194 001*
Gross fixed capital formation					
Private	4 284	7 353	12 450	27 996	44 699
Public	2 005	2 838	6 478	9 789	19 039
Total gross fixed capital formation	*6 289*	*10 191*	*18 928*	*37 785*	*63 738*
Changes in inventories	84	586	180	406	833
Gross national expenditure	*22 913*	*37 373*	*79 261*	*148 957*	*258 572*
Exports of goods and services	3 136	5 086	11 225	22 604	38 948
less Imports of goods and services	3 683	5 214	11 163	25 530	47 199
Statistical discrepancy (expenditure-based)	120	–142	–51	–465	–1 853
Gross domestic product	**22 486**	**37 103**	**79 272**	**145 566**	**248 468**
Compensation of employees	11 361	19 375	44 137	75 437	124 033
Gross operating surplus	5 149	9 285	17 438	36 389	69 060
Gross mixed income	3 919	5 421	9 867	18 745	27 551
Total factor income	*20 429*	*34 081*	*71 442*	*130 571*	*220 644*
Taxes less subsidies on production and imports	2 087	3 163	7 872	14 733	27 801
Statistical discrepancy (income-based)	–30	–141	–42	262	23
Gross domestic product	**22 486**	**37 103**	**79 272**	**145 566**	**248 468**

Source: Australian System of National Accounts (5204.0).

29.5 GROSS DOMESTIC PRODUCT ACCOUNT, Current Prices—Annual

	1990–91	1991–92	1992–93	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99
	$m	$m	$m	$m	$m	$m	$m	$m	$m
Final consumption expenditure									
General government	75 766	80 936	84 582	86 528	89 591	94 993	97 481	103 045	107 945
Households	232 238	243 996	255 066	265 952	282 395	301 282	313 575	333 407	352 650
Total final consumption expenditure	*308 004*	*324 932*	*339 648*	*352 480*	*371 986*	*396 275*	*411 056*	*436 452*	*460 595*
Gross fixed capital formation									
Private	65 950	62 100	69 850	77 476	86 794	90 254	98 556	112 391	116 429
Public	23 042	22 746	22 193	21 465	23 858	23 404	22 614	20 824	24 697
Total gross fixed capital formation	*88 992*	*84 846*	*92 043*	*98 941*	*110 652*	*113 658*	*121 170*	*133 215*	*141 126*
Changes in inventories	–1 531	–2 415	312	1 799	1 908	163	–164	960	4 844
Gross national expenditure	*395 465*	*407 363*	*432 003*	*453 220*	*484 546*	*510 096*	*532 062*	*570 627*	*606 565*
Exports of goods and services	66 259	70 080	76 899	83 015	87 654	99 095	105 160	113 829	111 603
less Imports of goods and services	66 948	69 269	79 077	85 396	97 654	101 078	103 590	118 575	126 536
Statistical discrepancy (expenditure-based)	2 404	–1 747	–2 421	–1 054	—	—	—	—	1 679
Gross domestic product	**397 180**	**406 427**	**427 404**	**449 785**	**474 546**	**508 113**	**533 632**	**565 881**	**593 311**
Compensation of employees	192 300	195 774	202 656	212 131	226 904	242 347	258 797	270 267	288 110
Gross operating surplus	118 972	124 565	133 285	140 890	146 354	155 686	161 402	175 399	182 623
Gross mixed income	40 772	40 391	43 624	44 959	46 539	51 329	51 988	55 315	58 216
Total factor income	*352 044*	*360 730*	*379 565*	*397 980*	*419 797*	*449 362*	*472 187*	*500 981*	*528 949*
Taxes less subsidies on production and imports	43 357	42 750	44 180	49 424	54 749	58 751	61 445	64 900	68 132
Statistical discrepancy (income-based)	1 779	2 947	3 659	2 381	—	—	—	—	–3 770
Gross domestic product	**397 180**	**406 427**	**427 404**	**449 785**	**474 546**	**508 113**	**533 632**	**565 881**	**593 311**

Source: Australian System of National Accounts (5204.0).

29.6 EXPENDITURE ON GDP, Chain Volume Measures(a)—Five-Yearly

	1965–66	1970–71	1975–76	1980–81	1985–86
	$m	$m	$m	$m	m
Final consumption expenditure	137 779	177 379	223 208	258 999	303 785
Gross fixed capital formation	41 337	54 218	56 541	71 681	82 925
Domestic final demand	*181 163*	*237 469*	*281 522*	*332 195*	*386 491*
Gross national expenditure	*183 296*	*241 182*	*283 134*	*331 775*	*385 286*
Exports of goods and services	15 855	25 194	29 517	35 303	46 872
less Imports of goods and services	22 167	27 379	33 891	41 907	52 802
Statistical discrepancy (expenditure-based)	317	–2 371	–485	–1 199	–2 790
Gross domestic product	**176 001**	**236 961**	**278 159**	**323 949**	**376 960**

(a) Reference year for chain volume measures is 1997–98.

Source: Australian System of National Accounts (5204.0).

29.7 EXPENDITURE ON GDP, Chain Volume Measures(a)—Annual

	1990–91	1991–92	1992–93	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99
	$m	$m	$m	$m	$m	$m	$m	$m	$m
Final consumption expenditure									
General government	87 179	88 906	90 530	91 710	94 400	98 177	98 931	103 045	105 596
Households	264 209	269 695	275 556	282 225	296 905	309 804	317 842	333 407	348 475
Total final consumption expenditure	*351 390*	*358 604*	*366 088*	*373 930*	*391 298*	*407 973*	*416 772*	*436 452*	*454 071*
Gross fixed capital formation									
Private	67 248	64 148	70 362	76 751	85 871	88 824	99 461	112 391	114 961
Public	22 608	22 354	21 765	21 088	23 595	22 729	22 588	20 824	24 790
Total gross fixed capital formation	*90 445*	*87 085*	*92 638*	*98 314*	*109 994*	*111 921*	*122 083*	*133 215*	*139 751*
Domestic final demand	*440 949*	*444 308*	*457 549*	*471 265*	*500 640*	*519 279*	*538 839*	*569 667*	*593 823*
Changes in inventories	–1 290	–2 678	735	1 489	3 015	285	–162	960	4 816
Gross national expenditure	*438 423*	*440 753*	*457 310*	*472 154*	*502 611*	*519 581*	*538 797*	*570 627*	*598 639*
Exports of goods and services	67 299	73 363	78 265	85 859	90 039	99 318	109 700	113 829	115 766
less Imports of goods and services	69 085	71 598	76 102	81 196	94 633	98 409	108 070	118 575	124 518
Statistical discrepancy (expenditure-based)	2 662	–1 903	–2 601	–1 122	—	—	—	—	1 659
Gross domestic product	**439 783**	**441 458**	**457 735**	**476 556**	**498 113**	**520 669**	**540 379**	**565 881**	**591 546**

(a) Reference year for chain volume measures is 1997–98.

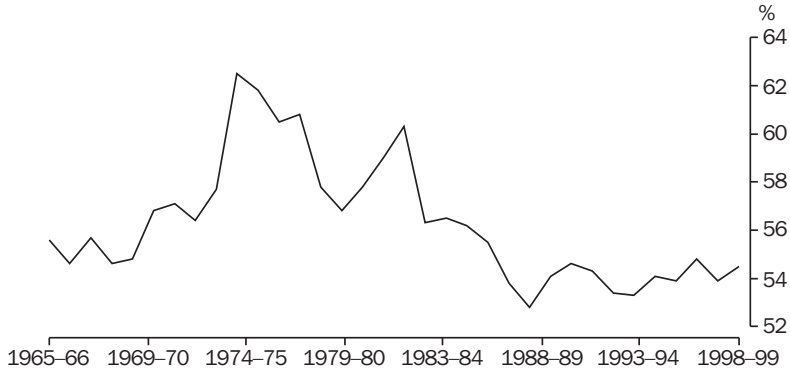
Source: Australian System of National Accounts (5204.0).

The gross domestic product account can also be used to show changes in the share of income accruing to labour (i.e. compensation of employees) compared with the share accruing to capital (i.e. profits, defined as the gross operating surplus of non-financial and financial corporations). Graphs 29.8 and 29.9 show how the shares of total factor income accruing to wages and to profits have changed since 1965–66. (Total factor income is equal to the sum of compensation of employees, gross operating surplus and gross mixed income.)

The highest recorded value of the wages share of total factor income was 62.5% in 1974–75. The wages share has recovered somewhat from its low value of 52.8% in 1988–89, but remains below the level recorded for most of the 1970s and early 1980s. The wages share has remained relatively stable during the 1990s, maintaining levels similar to those during the 1960s.

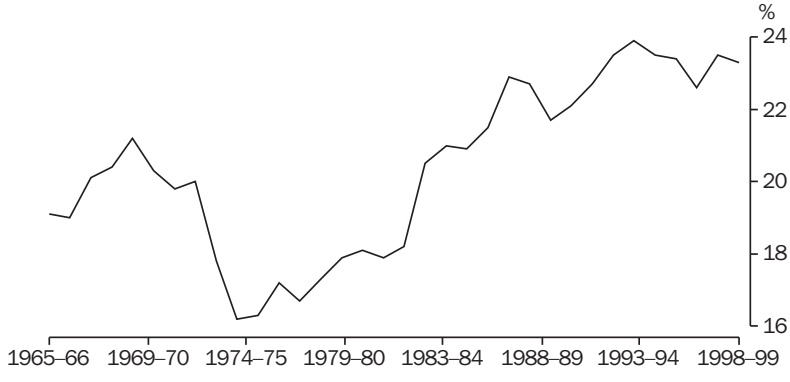
In 1998–99, the profits share of total factor income (23.3%) was marginally below its highest share of 23.9%, recorded in 1993–94.

29.8 WAGES SHARE OF TOTAL FACTOR INCOME



Source: Australian System of National Accounts (5204.0).

29.9 PROFITS SHARE OF TOTAL FACTOR INCOME



Source: Australian System of National Accounts (5204.0).

National income account

The national income account shows the sources of national income and how much of this income is spent on final consumption. That part of income which is not spent in this way is saving. Tables 29.10 and 29.11 show the income account for a number of years between 1965–66 and 1998–99; table 29.10 shows a series of snapshots at five-yearly intervals to 1985–86, while table 29.11 shows annual time series from 1990–91 to 1998–99.

Graph 29.12 shows saving by institutional sector as a proportion of GDP for the years 1965–66 to 1998–99. Household net saving as a percentage of GDP generally rose between 1965–66 and 1974–75, but has fallen subsequently from its high of 12.0% in 1974–75 to 1.3% in 1998–99 ($7.6b). General government net saving was negative from 1974–75 to 1996–97 (except for 1988–89 and 1989–90). In 1998–99 it was 1.4% of GDP ($8.1b). In 1998–99 net saving of non-financial corporations was 0.5% of GDP ($2.7b). Net saving of financial corporations was negative from 1981–82 to 1986–87, the only period for which this sector has recorded negative net saving. In 1998–99 net saving of financial corporations was 1.2% of GDP ($7.3b).

29.10 NATIONAL INCOME ACCOUNT, Current Prices—Five-Yearly

	1965–66	1970–71	1975–76	1980–81	1985–86
	$m	$m	$m	$m	$m
Income					
Compensation of employees	11 361	19 375	44 137	75 437	124 033
Gross operating surplus	5 149	9 285	17 438	36 389	69 060
Gross mixed income	3 919	5 421	9 867	18 745	27 551
Taxes less subsidies on production and imports	2 087	3 163	7 872	14 733	27 801
Net primary income from non-residents	–308	–600	–1 202	–2 397	–6 853
Gross national income	*22 208*	*36 644*	*78 112*	*142 907*	*241 592*
Net secondary income from non-residents	–63	–25	–133	–164	313
Gross disposable income	**22 118**	**36 534**	**77 825**	**142 466**	**241 208**
Use of gross disposable income					
Final consumption expenditure					
General government	3 139	5 586	15 474	27 889	50 992
Households	13 401	21 010	44 679	82 877	143 009
Total final consumption expenditure	*16 540*	*26 596*	*60 153*	*110 766*	*194 001*
Net saving(a)	2 380	4 521	6 220	10 040	7 794
Consumption of fixed capital	3 198	5 417	11 452	21 660	39 413
Total use of gross disposable income	**22 118**	**36 534**	**77 825**	**142 466**	**241 208**

(a) Net saving is derived as a balancing item.

Source: Australian System of National Accounts (5204.0).

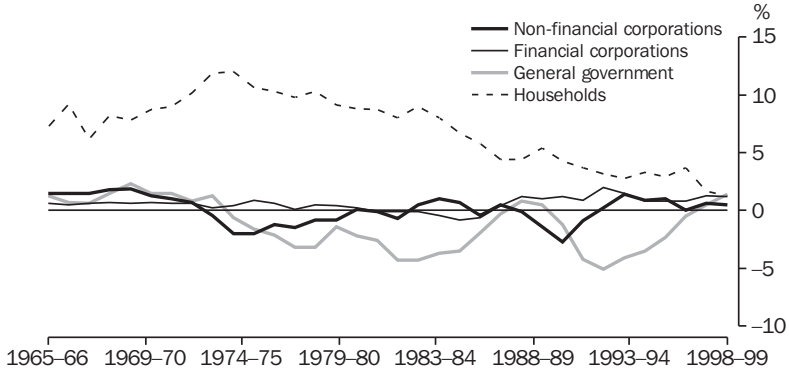
29.11 NATIONAL INCOME ACCOUNT, Current Prices—Annual

	1990–91	1991–92	1992–93	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99
	$m	$m	$m	$m	$m	$m	$m	$m	$m
Income									
Compensation of employees	192 300	195 774	202 656	212 131	226 904	242 347	258 797	270 267	288 110
Gross operating surplus	118 972	124 565	133 285	140 890	146 354	155 686	161 402	175 399	182 623
Gross mixed income	40 772	40 391	43 624	44 959	46 539	51 329	51 988	55 315	58 216
Taxes less subsidies on production and imports	43 357	42 750	44 180	49 424	54 749	58 751	61 445	64 900	68 132
Net primary income from non-residents	–17 222	–14 054	–12 682	–13 534	–18 118	–19 533	–19 307	–17 955	–17 534
Gross national income	*378 179*	*389 426*	*411 063*	*433 870*	*456 428*	*488 580*	*514 325*	*547 926*	*579 547*
Net secondary income from non-residents	222	–134	–350	–339	–528	–129	–81	–75	50
Gross disposable income	**378 401**	**389 292**	**410 713**	**433 531**	**455 900**	**488 451**	**514 244**	**547 851**	**579 597**
Use of gross disposable income									
Final consumption expenditure									
General government	75 766	80 936	84 582	86 528	89 591	94 993	97 481	103 045	107 945
Households	232 238	243 996	255 066	265 952	282 395	301 282	313 575	333 407	352 650
Total final consumption expenditure	*308 004*	*324 932*	*339 648*	*352 480*	*371 986*	*396 275*	*411 056*	*436 452*	*460 595*
Net saving(a)	6 531	–1 819	1 223	7 158	7 456	12 209	21 385	23 778	25 649
Consumption of fixed capital	63 866	66 179	69 842	73 893	76 458	79 967	81 803	87 621	93 353
Total use of gross disposable income	**378 401**	**389 292**	**410 713**	**433 531**	**455 900**	**488 451**	**514 244**	**547 851**	**579 597**

(a) Net saving is derived as a balancing item.

Source: Australian System of National Accounts (5204.0).

29.12 NET SAVING, By Sector—Share of GDP



Source: Australian System of National Accounts (5204.0).

National capital account

The national capital account shows how the saving from the national income account and consumption of fixed capital (depreciation) are used to finance gross fixed capital formation. If, as is currently the case for Australia, the nation's saving and consumption of fixed capital are not sufficient to pay for all the fixed capital needed for Australian production, the shortfall must be borrowed from overseas. The amount borrowed from overseas is shown in the national capital account as a negative entry for net lending to non-residents.

Tables 29.13 and 29.14 show the national capital account for a number of years between 1965–66 and 1998–99; table 29.13 shows a series of snapshots at five-yearly intervals to 1985–86, while table 29.14 shows annual time series from 1990–91 to 1998–99.

Graph 29.15 shows gross fixed capital formation (investment) by institutional sector as a proportion of GDP. For non-financial corporations this proportion generally fell during the 1970s, then rose to a peak of 13.2% in 1981–82. It has subsequently been above 10% except for the years 1991–92 and 1992–93, and was 11.7% in 1998–99. Household investment as a proportion of GDP was 8.9% in 1998–99. General government investment as a proportion of GDP peaked at 4.6% in 1965–66. It has generally fallen since then and was 2.3% of GDP in 1998–99. Financial corporations investment peaked in 1988–89 and 1989–90 at 1.9% of GDP. It has generally fallen since then and was 0.9% of GDP in 1998–99.

29.13 NATIONAL CAPITAL ACCOUNT, Current Prices—Five–Yearly

	1965–66	1970–71	1975–76	1980–81	1985–86
	$m	$m	$m	$m	$m
Net saving					
Non-financial corporations	347	465	–1 561	137	1 817
Financial corporations	130	274	717	275	–1 972
General government	290	544	–1 303	–3 180	–8 680
Households	1 613	3 238	8 367	12 808	16 629
Total net saving	*2 380*	*4 521*	*6 220*	*10 040*	*7 794*
Consumption of fixed capital	3 198	5 417	11 452	21 660	39 413
Net capital transfers receivable from non-residents	46	56	–27	167	830
Gross saving and capital transfers	**5 624**	**9 994**	**17 645**	**31 867**	**48 037**
Gross fixed capital formation					
Private	4 284	7 353	12 450	27 996	44 699
Public corporations	966	1 401	2 883	5 640	11 033
General government	1 039	1 437	3 595	4 149	8 006
Total gross fixed capital formation	*6 289*	*10 191*	*18 928*	*37 785*	*63 738*
Changes in inventories					
Private non-farm	190	480	25	634	1 356
Farm and public authorities	–106	106	155	–228	–523
Total changes in inventories	*84*	*586*	*180*	*406*	*833*
Acquisitions less disposals of non-produced non-financial assets	—	—	—	—	—
Statistical discrepancy	150	–1	–9	–727	–1 876
Net lending to non-residents	–899	–782	–1 454	–5 597	–14 658
Total capital accumulation and net lending	**5 624**	**9 994**	**17 645**	**31 867**	**48 037**

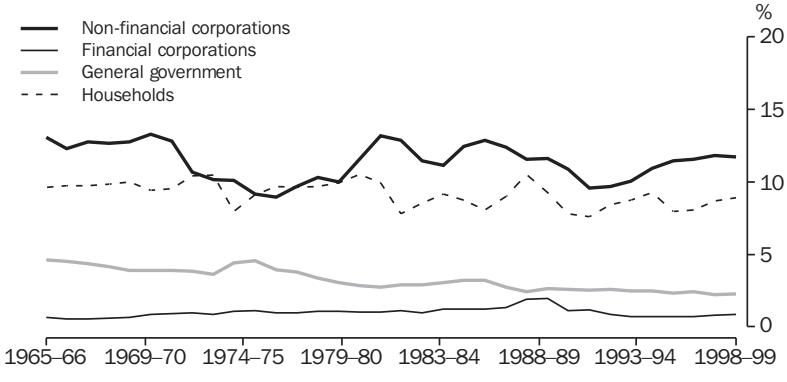
Source: Australian System of National Accounts (5204.0).

29.14 NATIONAL CAPITAL ACCOUNT, Current Prices—Annual

	1990–91	1991–92	1992–93	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99
	$m	$m	$m	$m	$m	$m	$m	$m	$m
Net saving									
Non-financial corporations	–10 753	–3 807	744	6 505	4 366	5 031	231	3 507	2 702
Financial corporations	4 868	3 838	8 570	6 537	3 948	3 960	4 531	7 517	7 274
General government	–4 756	–17 006	–21 628	–18 597	–16 692	–11 621	–2 891	3 042	8 056
Households	17 172	15 156	13 537	12 713	15 834	14 839	19 514	9 712	7 617
Total net saving	*6 531*	*–1 819*	*1 223*	*7 158*	*7 456*	*12 209*	*21 385*	*23 778*	*25 649*
Consumption of fixed capital	63 866	66 179	69 842	73 893	76 458	79 967	81 803	87 621	93 353
Net capital transfers receivable from non-residents	2 071	2 079	604	300	540	1 049	1 323	1 097	1 189
Gross saving and capital transfers	**72 468**	**66 439**	**71 669**	**81 351**	**84 454**	**93 225**	**104 511**	**112 496**	**120 191**
Gross fixed capital formation									
Private	65 950	62 100	69 850	77 476	86 794	90 254	98 556	112 391	116 429
Public corporations	12 732	12 381	11 086	10 346	12 202	11 639	9 831	8 398	11 193
General government	10 310	10 365	11 107	11 119	11 656	11 765	12 783	12 426	13 504
Total gross fixed capital formation	*88 992*	*84 846*	*92 043*	*98 941*	*110 652*	*113 658*	*121 170*	*133 215*	*141 126*
Changes in inventories									
Private non-farm	–2 569	–1 804	444	1 421	2 940	1 114	2 577	504	4 432
Farm and public authorities	1 038	–611	–132	378	–1 032	–951	–2 741	456	412
Total changes in inventories	*–1 531*	*–2 415*	*312*	*1 799*	*1 908*	*163*	*–164*	*960*	*4 844*
Acquisitions less disposals of non-produced non-financial assets	–7	—	33	–17	–32	–25	6	–30	–8
Statistical discrepancy	625	–4 694	–6 080	–3 435	—	—	—	—	5 449
Net lending to non-residents	–15 611	–11 298	–14 639	–15 937	–28 074	–20 571	–16 501	–21 649	–31 220
Total capital accumulation and net lending	**72 468**	**66 439**	**71 669**	**81 351**	**84 454**	**93 225**	**104 511**	**112 496**	**120 191**

Source: Australian System of National Accounts (5204.0).

29.15 GROSS FIXED CAPITAL FORMATION, By Sector—Share of GDP



Source: Australian System of National Accounts (5204.0).

Graph 29.16 shows net lending by institutional sector as a proportion of GDP. A positive percentage for a sector indicates that it is a net lender to other sectors; a negative percentage indicates that it is a net borrower. The household sector has been a net lender for all years except 1993–94, 1994–95, 1997–98 and 1998–99 when it was a net borrower. As a proportion of GDP, borrowing by households was 2.1% in 1998–99. Non-financial corporations have been net borrowers over the whole period from 1965–66 to 1998–99, and the amounts borrowed have fluctuated significantly from year to year; as a proportion of GDP, their net borrowing was 4.1% in 1998–99. After being a net borrower thoughout the 1980s, the financial corporations sector returned to being a net lender in 1990–91 and has remained so since then. In 1998–99 financial corporations net lending represented 1.1% of GDP. After recording a record level of borrowing in 1992–93 as a proportion of GDP (6.0%), general government borrowing has steadily declined, and from 1997–98 this sector became a net lender. In 1998–99 general government net lending represented 0.8% of GDP.

External account

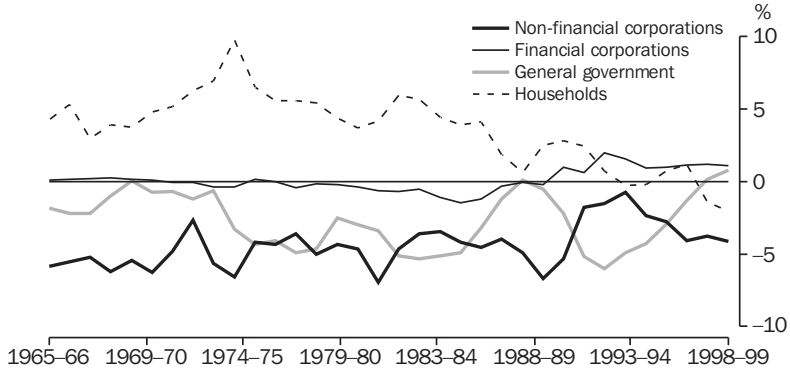
The external account is derived from the detailed balance of payments current and capital accounts (see *Chapter 30, International accounts and trade*). It shows Australia's exports and imports, incomes and transfers received by Australian residents from non-residents, and incomes and transfers payable to non-residents by Australian residents. The balance on the external account is net lending to non-residents. This is the same as the balance in the national capital account.

Tables 29.17 and 29.18 show the external account for a number of years between 1965–66 and 1998–99; table 29.17 shows a series of snapshots at five-yearly intervals to 1985–86, while table 29.18 shows annual time series from 1990–91 to 1998–99.

Australia has generally been a net borrower of funds from overseas. In the national accounts, this situation is reflected by a negative value for net lending to non-residents. Australia was a net lender to non-residents in 1972–73. Net borrowing from non-residents, expressed as a proportion of GDP, increased significantly during the early 1980s and has remained at relatively high levels since then. Graph 29.19 shows net lending to non-residents as a proportion of GDP since 1965–66.

The importance of foreign trade to the Australian economy is illustrated by graph 29.20, which shows the ratios of exports and imports of goods and services to GDP for the financial years 1965–66 to 1998–99. In 1998–99 the import ratio was 21.3% and the export ratio was 18.8%.

29.16 NET LENDING, By Sector—Share of GDP



Source: Australian System of National Accounts (5204.0).

29.17 EXTERNAL ACCOUNT, Current Prices—Five-Yearly

	1965–66	1970–71	1975–76	1980–81	1985–86
	$m	$m	$m	$m	$m
Imports of goods and services	3 683	5 214	11 163	25 530	47 199
Primary income receivable					
Compensation of employees	11	17	44	110	164
Property income	400	760	1 587	3 147	8 879
Total primary income receivable	*411*	*777*	*1 631*	*3 257*	*9 043*
Secondary income receivable	169	358	773	1 264	1 797
Capital transfers to non-residents	40	78	203	320	486
Acquisitions less disposals of non-produced non-financial assets	—	—	—	—	—
Net lending	–899	–782	–1 454	–5 597	–14 658
Resources provided by non-residents	**3 404**	**5 645**	**12 316**	**24 774**	**43 867**
Exports of goods and services	3 136	5 086	11 225	22 604	38 948
Primary income payable					
Compensation of employees	10	13	59	119	165
Property income	93	164	370	741	2 025
Total primary income payable	*103*	*177*	*429*	*860*	*2 190*
Secondary income payable	79	248	486	823	1 413
Capital transfers from non-residents	86	134	176	487	1 316
Resources provided to non-residents	**3 404**	**5 645**	**12 316**	**24 774**	**43 867**

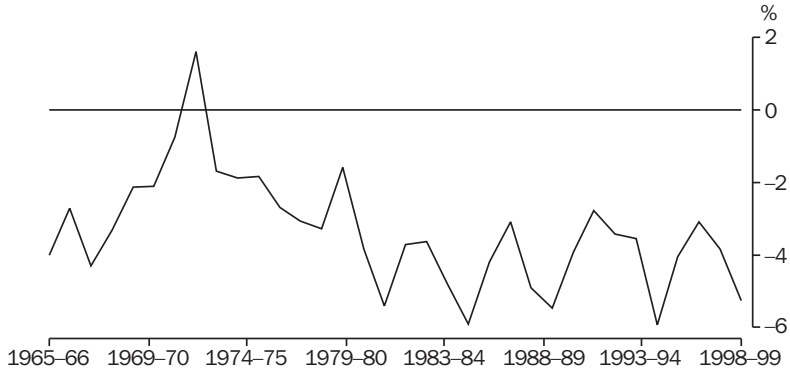
Source: Australian System of National Accounts (5204.0).

29.18 EXTERNAL ACCOUNT, Current Prices—Annual

	1990–91	1991–92	1992–93	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99
	$m	$m	$m	$m	$m	$m	$m	$m	$m
Imports of goods and services	66 948	69 269	79 077	85 396	97 654	101 078	103 590	118 575	126 536
Primary income receivable									
Compensation of employees	429	326	311	283	389	458	539	742	813
Property income	20 550	18 179	18 451	19 031	24 670	26 215	27 331	27 597	27 560
Total primary income receivable	*20 979*	*18 505*	*18 762*	*19 314*	*25 059*	*26 673*	*27 870*	*28 339*	*28 373*
Secondary income receivable	2 653	2 898	3 423	3 451	3 554	3 463	3 674	4 051	4 242
Capital transfers to non-residents	653	695	743	758	843	907	877	971	1 008
Acquisitions less disposals of non-produced non-financial assets	–7	—	33	–17	–32	–25	6	–30	19
Net lending	–15 611	–11 298	–14 639	–15 937	–28 074	–20 571	–16 501	–21 649	–31 220
Resources provided by non-residents	**75 615**	**80 069**	**87 399**	**92 965**	**99 004**	**111 483**	**119 420**	**130 249**	**128 297**
Exports of goods and services	66 259	70 080	76 899	83 015	87 654	99 095	105 160	113 829	111 603
Primary income payable									
Compensation of employees	432	455	497	511	551	610	678	747	804
Property income	3 325	3 996	5 583	5 269	6 390	6 530	7 885	9 637	9 167
Total primary income payable	*3 757*	*4 451*	*6 080*	*5 780*	*6 941*	*7 140*	*8 563*	*10 384*	*9 971*
Secondary income payable	2 875	2 764	3 073	3 112	3 026	3 292	3 497	3 976	4 141
Capital transfers from non-residents	2 724	2 774	1 347	1 058	1 383	1 956	2 200	2 068	2 197
Resources provided to non-residents	**75 615**	**80 069**	**87 399**	**92 965**	**99 004**	**111 483**	**119 420**	**130 249**	**128 297**

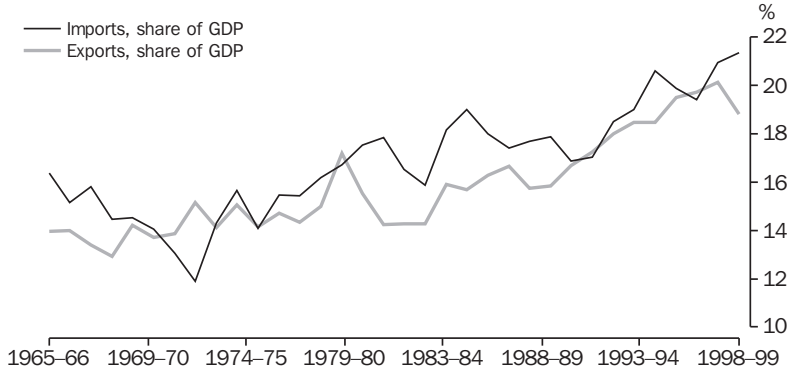
Source: Australian System of National Accounts (5204.0).

29.19 NET LENDING TO NON-RESIDENTS, Share of GDP



Source: Australian System of National Accounts (5204.0).

29.20 EXPORTS AND IMPORTS, Share of GDP



Source: Australian System of National Accounts (5204.0).

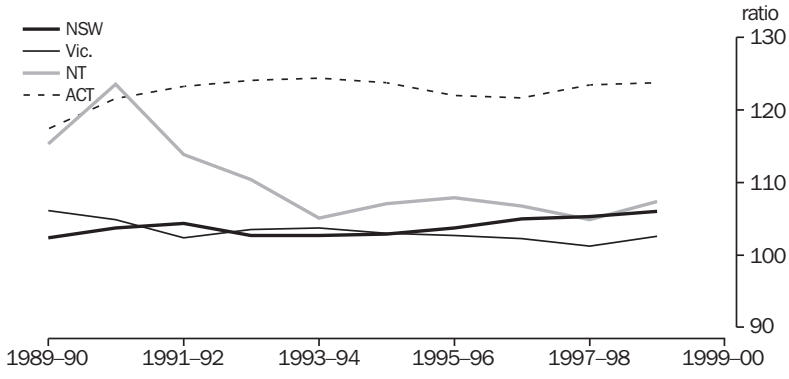
State accounts

As well as Australia's national accounts, the ABS produces annual accounts for each of Australia's States and Territories each year. These provide estimates of gross State product (GSP) and State final demand. GSP is produced by summing the incomes generated in the production process (the income approach to measuring total production). State final demand is equal to the sum of government and household final consumption expenditure and government and private gross fixed capital formation. Estimates of State final demand and GSP are available in both current price and chain volume terms. The chain volume GSP estimates are experimental.

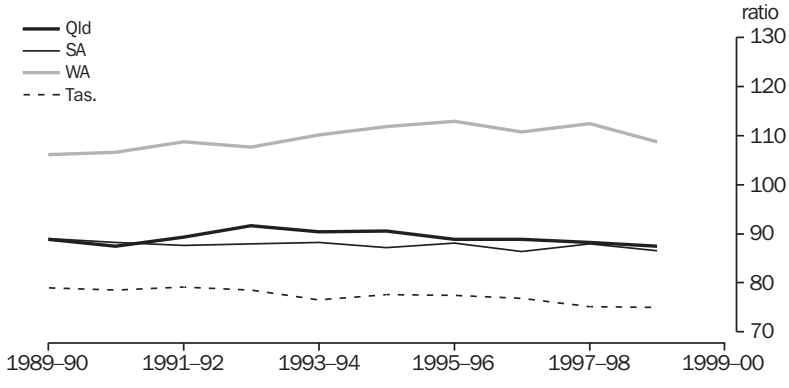
An important use of State accounts is to compare the performance of each State and Territory. Graph 29.21 shows the ratio of GSP, in current prices, per head of mean population for each State and Territory to the Australian value (GDP per head of mean population) since 1989–90.

For New South Wales, Victoria, Western Australia, the Northern Territory and the Australian Capital Territory, GSP per head of mean population in 1998–99 was above the national average. For Queensland, South Australia and Tasmania, GSP per head of mean population has been below the national average for the whole length of the time series (i.e. since 1989–90).

29.21 GROSS STATE PRODUCT PER HEAD OF MEAN POPULATION(a)



(a) Aust. = 100.0.



(a) Aust. = 100.0.

Source: Australian National Accounts: State Accounts (5220.0).

Input-output tables

Basic structure

Input-output (I-O) tables show the structure of a country's entire production system for a particular period, usually one year. They show which goods and services are produced by each industry and how they are used (e.g. some goods, such as cars, are sold to final consumers while others, such as steel, are used as inputs by other industries in producing more goods and services). The tables are based on the principle that the value of the output of each industry can be expressed as the sum of the values of all the inputs to that industry plus any profits made from production plus any taxes on production paid less any subsidies received. All the goods and services produced in a period are identified as being used as inputs by industries in their production process, being sold to final users of the goods and services (either in Australia, or overseas as exports), or contributing to the changes in inventories (an increase in inventories if more goods are produced than purchased, or a run-down in inventories if purchases exceed production). For the production system as a whole, the sum of all outputs must equal the sum of all inputs and, for the economy as a whole, total supply must equal total use (inventories provide the mechanism which balances supply and use).

Relationship to the national income and expenditure accounts

I-O tables are directly related to the gross domestic product account. The income side of the gross domestic product account shows the amount of income generated in the economy accruing to labour (in the form of compensation

of employees) and to capital (as profits or, in national accounting terms, gross operating surplus and gross mixed income—the latter including some return to owners of businesses for their labour). The expenditure side of the account shows the value of goods and services entering into the various categories of final demand.

The I-O tables provide a much more detailed disaggregation of the gross domestic product account than is available in the national income, expenditure and product accounts. The latter only shows details of the end results of economic activity, whereas the I-O tables show the flows of goods and services through the production process. The extra detail provided by the I-O tables is essential for many analyses.

Input-output table for seven industry sectors

Table 29.22 and diagram 29.23 show the flows of goods and services in respect of 1994–95.

The links between the table and the diagram are explained by working through the following formulas.

Intermediate use ($443,966m) in the diagram is derived by summing from column 8 of the table: intermediate use ($388,099m); competing imports ($55,512m); and complementary imports ($355m).

Gross value added ($473,463m) in the diagram is derived by summing from column 14 of the table: compensation of employees ($226,904m); gross operating surplus and mixed income ($191,810m); taxes on products (net) ($35,651m); and other taxes on production (net) ($19,098m).

Domestic production ($917,429m) in the diagram is derived by summing: intermediate use from column 8 of the table ($388,099m); total final demand at basic values from column 13 ($503,963m); and the taxes payable on those final demand items (also from column 13): taxes on products (net) ($22,677m), and other taxes on production (net) ($2,690m).

Imports ($97,654m) in the diagram is derived by summing from column 14 of the table: competing imports ($97,075m) and complementary imports ($579m).

Total supply ($1,015,083m), which equals total use, is the sum of domestic production ($917,429m) and imports ($97,654m).

Domestic final use ($483,463m) in the diagram is derived from the table by subtracting total exports ($87,654m), column 12, from total final demand ($571,117m), column 13.

Exports ($87,654m) in the diagram is total exports, column 12 in the table.

Total use ($1,015,083m), which equals total supply, is the sum of domestic final use ($483,463m), intermediate use ($443,966m), and exports ($87,654m).

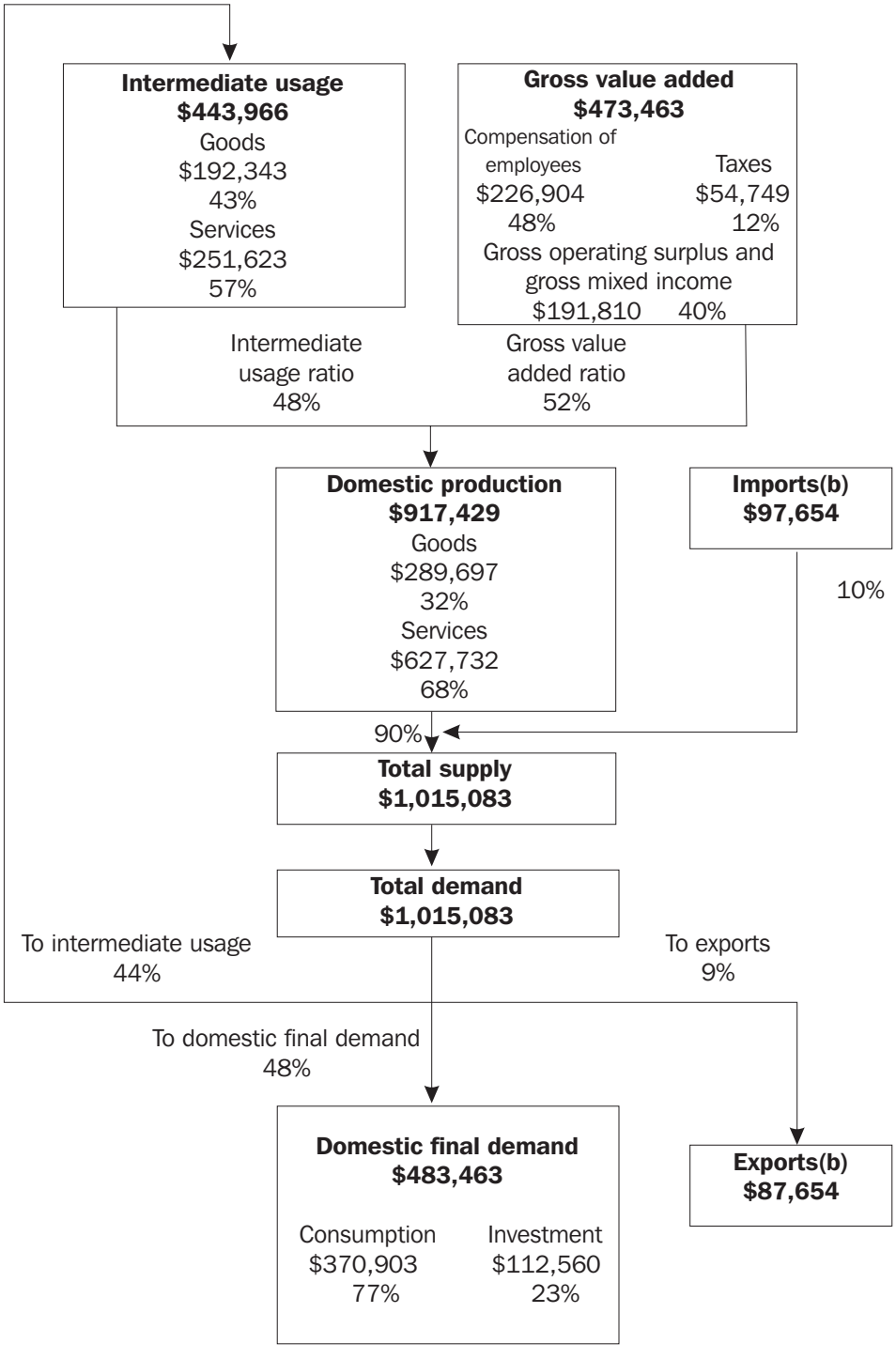
29.22 INDUSTRY BY INDUSTRY FLOW TABLE, Basic Values—1994–95

	1	2	3	4	5	6	7
	Agriculture	Mining	Manufacturing	Construction	Trade and transport	Service industries	Public admin. and defence
Supply	$m	$m	$m	$m	$m	$m	$m
Agriculture	3 624	13	14 529	64	399	1 439	44
Mining	59	2 348	9 942	781	236	2 766	128
Manufacturing	3 822	2 617	47 431	16 566	15 771	19 928	3 696
Construction	238	202	48	58	509	2 376	713
Trade and transportation	2 938	3 402	21 609	4 033	18 183	14 150	2 247
Service Industries	3 262	4 209	17 549	6 976	42 076	83 002	7 225
Public admin. and defence	67	148	740	179	1 291	1 359	3 107
Intermediate use	*14 010*	*12 940*	*111 849*	*28 656*	*78 465*	*125 019*	*17 160*
Compensation of employees	3 468	4 909	33 127	13 325	43 426	111 740	16 909
Gross operating surplus and gross mixed income	9 482	15 058	25 349	11 935	23 079	104 547	2 359
Taxes on products (net)	556	186	1 729	642	4 178	5 386	297
Other taxes on production (net)	491	521	3 011	824	1 858	9 679	24
Competing imports	1 804	2 218	25 956	3 041	6 257	14 238	1 999
Complementary imports	0	0	355	0	0	0	0
Australian production	**29 811**	**35 833**	**201 376**	**58 423**	**157 262**	**370 609**	**38 749**

	8	9	10	11	12	13	14
	Intermediate usage = Sum (1 to 7)	Final consumption expenditure	Gross fixed capital formation	Changes in inventories	Exports	Final demand = Sum (9 to 12)	Total supply = Sum (8+13)
Supply	$m	$m	$m	$m	$m	$m	$m
Agriculture	20 113	4 301	638	–632	5 391	9 698	29 811
Mining	16 259	474	1 802	–1 532	18 830	19 574	35 833
Manufacturing	109 832	43 499	12 985	1 772	33 287	91 544	201 376
Construction	4 145	2 245	51 911	2	121	54 278	58 423
Trade and transportation	66 563	62 115	11 457	380	16 747	90 699	157 262
Service Industries	164 298	188 079	9 423	4	8 806	206 312	370 610
Public admin. and defence	6 890	31 334	341	—	183	31 857	38 747
Intermediate use	*388 099*	*332 047*	*88 557*	*–6*	*83 365*	*503 963*	*892 062*
Compensation of employees	226 904	—	—	—	—	—	226 904
Gross operating surplus and gross mixed income	191 810	—	—	—	—	—	191 810
Taxes on products (net)	12 974	17 971	3 112	134	1 461	22 677	35 651
Other taxes on production (net)	16 408	—	2 690	—	—	2 690	19 098
Competing imports	55 512	20 795	16 167	1 773	2 828	41 563	97 075
Complementary imports	355	91	126	7	—	224	579
Australian production	**892 063**	**370 903**	**110 652**	**1 908**	**87 654**	**571 117**	**1 463 179**

Source: Derived from Australian National Accounts: Input-Output Tables (5209.0).

29.23 THE AUSTRALIAN ECONOMY, Flow of Goods and Services(a) ($m)



(a) Flows are based on 1994–95 input-output tables. (b) Includes re-exports.
Source: Derived from Australian National Accounts: Input-Output Tables (5209.0).

Financial accounts

In addition to the national accounts, the ABS produces quarterly information on the levels of financial assets and liabilities of each institutional sector of the economy, the market for financial instruments, and inter-sectoral transactions in financial assets and liabilities classified by financial instrument (see *Chapter 26, Financial system*). National and sectoral financial accounts, which show major financial aggregates, are published in *Australian System of National Accounts* (5204.0).

National balance sheet

The national balance sheet provides estimates of the value of Australia's produced, non-produced and financial assets, its liabilities to the rest of the world, and the net worth (defined as the difference between total assets and liabilities, including the value of equity in Australian enterprises owned by non-residents) of the total economy. The major national and sectoral balance sheet tables are published in *Australian System of National Accounts* (5204.0) and more detailed statistics are published in *Australian National Accounts: National Balance Sheet* (5241.0.40.001). Balance sheets are provided for each of the four domestic sectors: non-financial corporations, financial corporations, general government and households (including unincorporated enterprises).

The non-produced assets included in the balance sheet cover experimental estimates of the value of some of Australia's natural resources: subsoil assets, timber available for log production and land. The monetary estimates of natural resources contained in the balance sheet are underpinned by physical estimates of particular natural resources. The monetary estimates of these natural resources should be considered in conjunction with the physical estimates. Valuation of natural resources is a difficult and contentious undertaking. The ABS continues to work with agencies, in Australia and abroad, to explore the best approaches to the measurement of the physical resources as well as the valuation of these resources, but it will be some time before there is an agreed approach. For this reason the estimates of natural resources presented in the balance sheet are considered to be experimental.

The natural resource estimates are used to monitor the availability and exploitation of these resources and to assist in the formulation of environmental policies. More generally, data on the level, composition and change in assets and liabilities shown in the balance sheet indicate the extent of economic resources available to and claims on a nation and each of its institutional sectors.

Sectoral balance sheets provide information necessary for analysing a number of topics. Examples include: determining household liquidity; and the computation of widely used ratios, such as assets to liabilities, net worth to total liabilities, non-financial to financial assets, and debt to income. In a period of concern about the level of saving in Australia, national and sector balance sheets provide additional information on the relationships between consumption, saving and wealth accumulation.

The ABS will continue to develop estimates of the value of Australia's assets for inclusion in national balance sheets as additional data become available. Estimation techniques will be refined as research in Australia and abroad explores issues relating to the valuation of natural resources. Development work is being undertaken on estimating non-produced intangible assets, such as patents and goodwill; they may be included in the national balance sheet in future years.

Balance sheet estimates

Australia's net worth at the end of June 1999 was estimated at $2,213.4b, an increase of $106.1b (5.0%) since June 1998. Of the increase, $19.5b was due to transactions (both capital and financial), and $86.6b was due to revaluations and other flows (including discoveries of subsoil assets). The average annual rise over the period 30 June 1990 to 30 June 1999 was 4.5%. Net worth relative to annual GDP has fallen from 4.1:1 at the end of June 1990 to 3.7:1 at the end of June 1996, and has maintained this ratio since. Graph 29.24 shows that the net worth series exhibited the strongest growth during the years 1996–97, 1997–98 and 1998–99 when annual rates of at least 5% were achieved.

Total produced assets at 30 June 1999 were estimated at $1,611.6b, an increase of 4.7% from the level at end of June 1998 (table 29.25). The estimated value of produced assets rose at an average annual rate of 4.4% between 30 June 1990 and 30 June 1999, and consistently accounted for over 70% of net worth. Dwellings, other buildings and structures, and machinery and equipment represent about 90% of total produced assets. While computer software has consistently accounted for only 1% of total produced assets over the period, the series has exhibited by far the strongest growth of produced assets, with an average annual growth of 21.7%.

29.24 PERCENTAGE CHANGE IN TOTAL NET WORTH—As at 30 June

Source: Australian National Accounts: National Balance Sheet (5241.0.40.001).

29.25 CONSOLIDATED BALANCE SHEET, Australia—As at 30 June

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	$b	$b	$b	$b	$b	$b	$b	$b	$b	$b
	TOTAL ASSETS									
Tangible fixed assets										
Dwellings	359.7	375.4	385.1	401.1	423.9	448.8	466.5	482.6	507.6	533.9
Other buildings and structures	478.6	491.8	494.9	501.9	517.4	540.2	563.6	588.7	614.7	637.9
Machinery and equipment	212.1	220.2	229.5	242.3	248.1	257.5	262.1	269.5	289.3	304.2
Livestock—fixed assets	13.9	12.5	12.7	14.7	16.4	16.2	16.1	15.4	16.5	17.7
Total tangible fixed assets	*1064.4*	*1100.0*	*1122.2*	*1160.0*	*1205.8*	*1262.7*	*1308.3*	*1356.2*	*1428.0*	*1493.7*
Intangible fixed assets										
Computer software	6.1	7.2	8.0	9.4	10.4	11.1	11.5	12.5	14.6	18.0
Entertainment, literary or artistic originals	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4
Total intangible fixed assets	*6.5*	*7.5*	*8.3*	*9.6*	*10.7*	*11.4*	*11.8*	*12.9*	*15.1*	*18.4*
Total fixed assets	*1070.9*	*1107.5*	*1130.5*	*1169.7*	*1216.5*	*1274.1*	*1320.1*	*1369.1*	*1443.1*	*1512.2*
Inventories										
Private non-farm stocks	60.8	60.9	59.8	62.0	63.9	69.3	70.0	72.3	74.0	77.9
Farm stocks	6.0	6.1	6.0	5.6	6.1	6.6	6.6	6.4	6.7	6.5
Public marketing authorities	3.8	4.3	4.1	4.4	5.0	3.9	3.4	2.8	1.9	1.3
Other public authorities	3.8	3.5	3.4	3.1	3.0	3.2	2.3	0.1	0.5	0.9
Livestock—inventories	5.7	5.5	5.2	5.6	6.0	5.7	5.3	5.0	5.2	5.0
Plantation forests	4.3	4.6	4.5	5.3	6.2	5.9	6.1	6.8	7.6	7.8
Total inventories	*84.5*	*84.9*	*82.9*	*86.0*	*90.3*	*94.6*	*93.7*	*93.3*	*95.9*	*99.5*
Total produced assets	*1155.3*	*1192.4*	*1213.4*	*1255.6*	*1306.9*	*1368.7*	*1413.8*	*1462.4*	*1539.0*	*1611.6*
Non-produced assets										
Land	533.1	544.8	525.3	557.5	597.5	625.3	643.3	710.2	768.9	822.7
Subsoil assets(a)	52.7	57.3	56.7	69.8	77.7	98.6	94.7	110.4	118.2	130.2
Native standing timber(a)	1.3	1.7	1.5	1.7	2.2	2.1	2.1	2.2	2.2	2.5
Total non-produced assets	*587.2*	*603.8*	*583.5*	*629.0*	*677.3*	*726.0*	*740.2*	*822.8*	*889.2*	*955.5*
Total non-financial assets	*1 742.5*	*1 796.2*	*1 796.9*	*1 884.6*	*1 984.2*	*2 094.7*	*2 154.0*	*2 285.2*	*2 428.2*	*2 567.1*
Financial assets with Rest of the World										
Monetary gold and SDRs	3.9	4.2	4.0	4.6	4.3	4.4	3.9	1.8	1.3	1.1
Currency and deposits	4.8	4.6	3.2	3.4	3.7	3.3	5.6	10.0	20.0	15.6
Securities other than shares	20.1	24.1	25.4	28.6	25.3	36.2	34.4	39.4	39.7	48.8
Loans	16.2	15.2	17.7	20.9	22.9	25.7	30.3	32.2	39.7	37.6
Shares and other equity	57.6	55.9	65.2	73.4	85.1	91.9	104.0	125.1	146.6	154.7
Other accounts receivable	8.9	8.6	7.2	8.3	7.9	8.7	8.8	10.3	12.8	15.8
Total financial assets with Rest of the World	*111.5*	*112.6*	*122.7*	*139.2*	*149.2*	*170.2*	*187.0*	*218.8*	*260.0*	*273.6*
Total assets	**1 854.0**	**1 908.8**	**1 919.6**	**2 023.8**	**2 133.4**	**2 264.9**	**2 341.0**	**2 504.0**	**2 688.2**	**2 840.7**

For footnotes see end of table.

...continued

29.25 CONSOLIDATED BALANCE SHEET, Australia—As at 30 June— *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	$b	$b	$b	$b	$b	$b	$b	$b	$b	$b
LIABILITIES TO THE REST OF THE WORLD(b)										
Currency and deposits	7.1	7.3	7.9	8.4	10.2	17.8	18.4	22.2	34.3	39.4
Securities other than shares	115.9	127.7	138.3	152.7	148.8	180.5	194.8	224.1	246.8	242.7
Loans	59.7	61.7	64.0	69.6	67.4	61.5	53.9	54.2	51.7	57.2
Shares and other equity	97.4	105.4	110.8	122.5	156.1	168.8	189.9	215.4	240.5	280.4
Other accounts payable	2.3	2.4	2.5	2.8	5.1	4.7	9.1	6.1	7.6	7.8
Total liabilities to Rest of the World	*282.4*	*304.5*	*323.5*	*356.0*	*387.6*	*433.3*	*466.1*	*522.0*	*580.9*	*627.3*
Net worth	**1571.6**	**1604.3**	**1596.1**	**1667.8**	**1745.8**	**1831.6**	**1874.9**	**1982.0**	**2107.3**	**2213.4**
Memorandum items										
Consumer durables	86.2	89.3	92.1	96.6	100.1	104.5	107.7	106.5	109.7	114.8
Direct investment										
Foreign investment in Australia	92.4	97.4	104.9	114.3	119.3	123.4	136.4	150.2	155.7	176.3
Australian investment abroad	39.6	39.4	46.3	52.7	54.7	62.4	64.9	77.1	90.9	92.5
Non-rateable land	n.a.	n.a.	n.a.	26.9	28.3	30.2	30.2	37.9	38.2	38.2

(a) Experimental estimates. For more information see Explanatory Notes of bulletin (source below), paragraph 25. (b) Series break at 30 June 1995. See Information Paper: Upgraded Australian National Accounts: Financial Accounts (5254.0).

Source: Australian National Accounts: National Balance Sheet (5241.0.40.001).

Bibliography

ABS publications

Australian National Accounts: Concepts, Sources and Methods 2000 (5216.0). Available in the Statistical Concepts Library on the ABS Internet site at *http://www.abs.gov.au*

Australian National Accounts: Financial Accounts (5232.0)—quarterly.

Australian National Accounts: Input-Output Tables (5209.0).

Australian National Accounts: Input-Output Tables (Commodity Details) (5215.0).

Australian National Accounts: National Balance Sheet (5241.0.40.001)—annual.

Australian National Accounts: National Income, Expenditure and Product (5206.0)—quarterly.

Australian National Accounts: Quarterly State Details (5206.0.40.001)—quarterly.

Australian National Accounts: State Accounts (5220.0)—annual.

Australian System of National Accounts (5204.0)—annual.

Information Paper: Implementation of Revised International Standards in the Australian National Accounts (5251.0). Available on the ABS Internet site.

Information Paper: Introduction of Chain Volume Measures in the Australian National Accounts (5248.0). Available on the ABS Internet site.

Information Paper: Upgraded Australian National Accounts (5253.0). Available on the ABS Internet site.

Information Paper: Upgraded Australian National Accounts; Financial Accounts (5254.0). Available on the ABS Internet site.

Statistical Concepts Library on CD-ROM (1361.0.30.001)—contains the current international standard (the 1993 edition of *System of National Accounts* (SNA93)).

ABS occasional papers

Aspden, C. 1990, *Estimates of Multifactor Productivity, Australia* (5233.0).

Burrell, S., Daniel, J., Johnson, A. and Walters, R., *State Accounts, Australia: Issues and Experimental Estimates* (1984/4).

Castles, I. 1992, *Productivity, Prices, Profits and Pay, 1964–65 to 1989–90* (5239.0).

Johnson, A.G., *The Accuracy and Reliability of the Quarterly Australian National Accounts* (1982/2).

Measuring Unpaid Household Work—Issues and Experimental Estimates (5236.0).

National Balance Sheets for Australia—Issues and Experimental Estimates (5241.0).

Unpaid Work and the Australian Economy 2000 (5240.0).

Walters, R. and Dippelsman, R., *Estimates of Depreciation and Capital Stock, Australia* (1985/3).

Internet sites

Commonwealth Department of the Treasury, *http://www.treasury.gov.au*

Reserve Bank of Australia, *http://www.rba.gov.au*

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Introduction

This chapter presents statistics on Australia's international accounts, covering exports and imports of goods, international trade in services, international investment transactions, and the levels of Australia's foreign financial assets and liabilities.

These statistics are used by economic analysts and policy advisers to monitor, evaluate and forecast developments in Australia's external trade and external sector accounts for the purposes of domestic and international macroeconomic analysis and policy determination. They are also used by governments, government agencies, businesses, industry associations, research institutions and others to analyse patterns of trade and assess particular types of transactions and financial claims and liabilities between Australian residents and non-residents, for purposes such as trade promotion and negotiations, market and industry performance studies, etc.

International accounts

International accounts cover the closely related and integrated balance of payments and international investment position statistics. Diagram 30.1 presents the broad structure and relationship of these statistics.

Australia's balance of payments provides a statistical statement that systematically summarises the economic transactions between residents of Australia and residents of other countries. 'Residents', who may be people or businesses, need not be Australian nationals. Transactions cover the provision (changes in ownership) of goods, services, income, and financial claims on and liabilities to the rest of the world, and transfers (such as gifts) without anything provided in exchange.

Australia's international investment position is a balance sheet of the stock of foreign financial assets and liabilities of Australian residents. International investment statistics integrate the balance sheet positions at two points in time with information on increases and decreases in the levels of these assets and liabilities as a result of the changes due to transactions (investment flows, including reinvestment of earnings) as shown in the financial account of the balance of payments, together with the other changes that affect either the value of the stock (price, exchange rate) or the volume (other adjustments) of the stock of financial assets and liabilities.

Foreign ownership in Australia

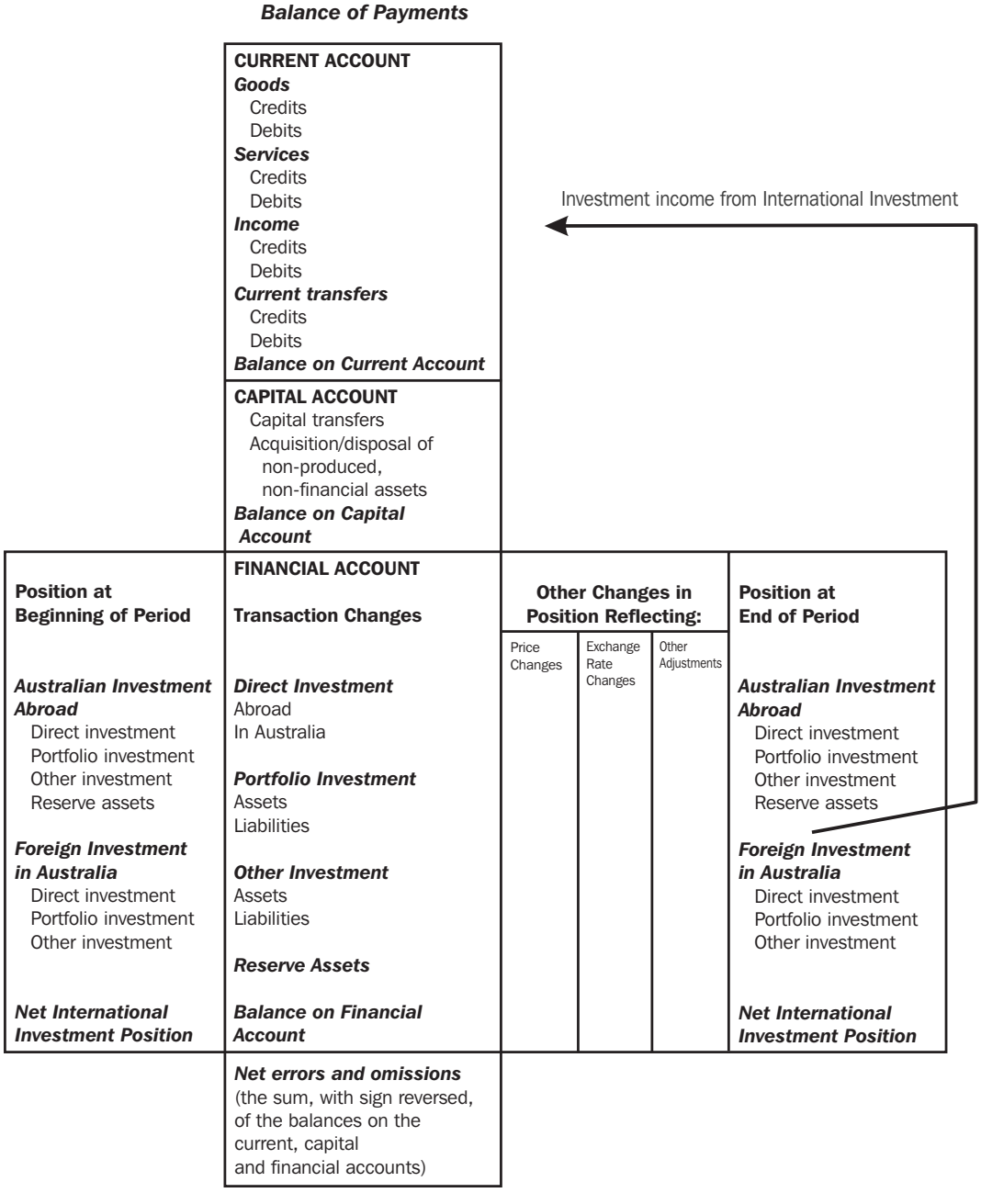
Statistics of foreign ownership in Australia presented in this chapter use levels data from Australia's international investment position to estimate the foreign ownership of equity in Australian enterprises.

International merchandise trade

International merchandise trade statistics cover all movable goods which add to (imports) or subtract from (exports) Australia's stock of material resources. The statistics are compiled from information submitted by importers and exporters to the Australian Customs Service. Some goods are excluded for conceptual or practical reasons, for example those goods temporarily brought to Australia for subsequent forwarding to foreign destinations, and low-value imports and exports in the parcel post system.

The data about merchandise exports and imports are used in the compilation of the balance of payments. However, various adjustments relating to coverage, timing, classification and (for imports only) valuation are necessary before international merchandise trade statistics can be put on a balance of payments basis. Therefore, the merchandise exports and imports statistics, and the excess of exports (+) or imports (–), shown in the *International merchandise trade* section later in this chapter, will differ from those shown in the *International accounts* section.

30.1 RELATIONSHIP BETWEEN THE BALANCE OF PAYMENTS AND INTERNATIONAL INVESTMENT POSITION STATEMENTS



International accounts

Conceptual framework

Australia's international accounts statistics, which cover both the balance of payments and the international investment position, are compiled in accordance with international statistical standards. In this edition of Year Book Australia the data are compiled in accordance with the Fifth Edition of the International Monetary Fund's *Balance of Payments Manual (BPM5)*. The concepts of residency, transactions, valuation and time of recording are common to the balance of payments and international investment position statistics.

The balance of payments accounts, which present systematically the economic transactions between Australia and the rest of the world, incorporate four types of economic transactions. The first involves the provision of real resources, i.e. transactions in goods, services and income. The second involves the provision of financial resources, i.e. foreign financial assets and liabilities. The third covers those one sided transactions of a current nature (described as current transfers) that are offsets to transactions in current real or financial resources that are undertaken without an exchange. Current resources are not associated with, nor finance, fixed assets. For example, famine relief, whether in cash or in kind, would have its offset in current transfers. The fourth type is capital transfers that offset transactions which are undertaken, without exchange, in fixed assets or in their financing (such as development aid). For example, migrants' funds represent the shift of the migrants' net worth to or from Australia, and are classified as capital transfers.

The first and third of these types of transactions comprise the current account, while the second type comprises the financial account. The fourth type (capital transfers), together with a minor item for the acquisition and disposal of non-produced, non-financial assets (such as patents), comprises the capital account.

The double entry accounting system is used for recording balance of payments transactions. Under this system, credit entries, which are shown with no arithmetic sign, are used to record the provision of real or financial resources. Credit entries are therefore required for exports of goods and services, and for income earned by residents (a return for providing the use of financial capital to non-residents, or for providing the labour of Australian residents). Credit entries are also required for providing financial resources to the rest of the world, either as new liabilities (such as issuing bonds), or through returning existing foreign assets (such as selling foreign equity securities to non-residents). Therefore, any credit entry in the financial account will reflect either an increase in Australia's foreign liabilities (more foreign debt or foreign ownership), or a decrease in Australia's foreign financial assets (such as a run-down in foreign exchange reserves).

Conversely, debit entries, which are identified by a minus sign (–), are used to record the provision by the rest of the world of real or financial resources to Australia, and are shown against imports of goods and services, income earned from Australia by non-residents, and financial transactions involving either an increase in foreign financial assets or a decrease in foreign liabilities.

Transactions in a double entry accounting system are reflected in pairs of equal credit and debit entries. For example, an export transaction for which payment is received through the banking system involves a credit entry for providing the good to a non-resident and a debit entry for being provided with foreign exchange assets due as payment for the export. Any entries that are not automatically paired in a transaction, i.e. for which there is no 'quid pro quo', are matched by special offsetting entries. Such offsetting entries are made in the categories 'current transfers' (when offsetting the provision of current resources such as food for famine relief) and 'capital transfers' (when offsetting the provision of capital resources such as development aid to build a new dam).

In principle, the net sum of all credit and debit entries is zero. In practice, some transactions are not measured accurately (errors), while others are not measured at all (omissions). Equality between the sums of the credit and debit entries is then brought about by the inclusion of a 'net errors and omissions' item which balances the accounts.

Transactions and other changes should be valued in the balance of payments at market prices. However, for practical reasons, transactions are generally valued in the statistics at transaction prices as this basis provides the closest practical approximation to the market price principle.

Transactions and other changes recorded in the balance of payments should be recorded at the time of change of ownership (either actual or imputed). For current account transactions, this occurs when ownership of goods changes, or services are provided. Investment income is recorded on a full accrual basis, that is, when it is

earned. Reinvested earnings are calculated for the earnings of the period of account, using current replacement cost estimates of depreciation and excluding holding gains and losses. Current and capital transfers should be recorded when the goods, services, cash, etc., to which they are offsets, change ownership. Those transfers, such as taxes and fines, which are imposed by one party on another, should ideally be recorded at the time of the occurrence of the underlying transactions or other flows or events that give rise to the liability to pay. For the financial account transactions, the time of recording is at the change of ownership of the financial claims, which by convention is the time at which transactions are entered in the books of the transactors.

In practice, the nature of the available data sources is such that the time of recording of transactions will often differ from the time of change of ownership. Where practical, timing adjustments are made for transactions to ensure that they are recorded in the time period in which change of ownership occurs.

International investment position statistics provide information on the levels (stock) of Australia's foreign financial assets and liabilities. The investment position at the end of a period reflects the foreign financial asset and liability positions at the start of the period, and the financial transactions (investment flows) from the balance of payments which increase or decrease these assets and liabilities, together with the non-transaction changes due to exchange rate effects, other price effects and changes in the volume of these assets and liabilities that are not due to transactions (such as debt write-off).

While the international investment position statistics form an integral part of Australia's balance of payments (see diagram 30.1), they are also useful in their own right, for example in determining the impact of foreign investment policies and the level of Australia's foreign assets and liabilities, including foreign debt. They are also useful when analysing the behaviour of financial markets.

As with the balance of payments, market price is the principal method of valuation in international investment position statistics, and financial assets and liabilities are recognised on a change of ownership basis, that is, at the time when the foreign financial asset or liability is acquired, sold, repaid or otherwise disposed of. By convention, this is generally taken to be the time at which the event is recorded in the books.

Classifications

In the following tables, global estimates are presented of the current, capital and financial accounts of Australia's balance of payments. Current and capital account transactions are generally recorded gross. This means that, for each item in the current and capital accounts, the credit entries are recorded separately from the debit entries. For example, goods credits are shown separately from goods debits. For each item in the financial account, however, debit and credit transactions are combined to produce a single result for the item which may be either a net credit or a net debit. For example, in a given period, non-resident purchases of shares issued by companies in Australia (credit) are netted against sales of Australian shares to residents by non-residents (debit) and the net result is recorded in the financial account as either a net credit or a net debit.

The current account records transactions between Australian residents and non-residents in goods, services, income and current transfers. Goods are classified into five main components—general merchandise; goods for processing; goods procured in ports by carriers; repairs on goods; and non-monetary gold. Changes of ownership from residents to non-residents are recorded as credits (also referred to as exports), and changes from non-residents to residents are recorded as debits (also referred to as imports). Services, comprising 11 primary components, cover services provided by Australian residents to non-residents (credits) and by non-residents to residents (debits), together with transactions in a few types of goods (for example, goods purchased by travellers). Income, comprising investment income (for example, dividends and interest) and compensation of employees (for example, wages), covers income earned by Australian residents from non-residents (credits) or earned by non-residents from residents (debits). Current transfers cover the offsetting entries required when resources are provided, without something of economic value being received in return. When non-residents provide something to Australian residents, offsetting credits are required; when residents provide resources to non-residents, offsetting debits are required. General government transfers (for example, official foreign aid) are distinguished from transfers by other sectors.

The capital account covers capital transfers (such as migrants' funds), distinguished between general government and other sectors, and the acquisition/disposal of non-produced, non-financial assets.

The financial account shows transactions in foreign financial assets and liabilities. The primary split is by functional type of capital (direct investment, portfolio investment, other investment and reserve assets) further split into assets and liabilities (where appropriate). Within the asset and liability categories, details are presented of instruments of investment and resident sectors (for other than direct investment), and in some cases the contractual maturity of the instruments used.

The primary distinction used in international investment position statistics is between assets and liabilities. Assets primarily represent Australian investment abroad, and liabilities represent foreign investment in Australia. The difference between the two represents the net international investment position (see graph 30.12 and table 30.13). Australian investment abroad refers to the stock of foreign financial assets owned by Australian residents, after netting off any liabilities of Australian direct investors to their direct investment enterprises abroad. Conversely, foreign investment in Australia refers to the stock of financial assets in Australia owned by non-residents, after netting off any claims of Australian direct investment enterprises on their foreign direct investors. The first breakdown below this asset/liability dichotomy is by functional type of capital, with details of the instruments of investment (table 30.15), the resident sectors and contractual maturities involved.

While many types of instruments of investment can be identified, similar instruments are combined for analytical reasons and ease of reporting. Some of those instruments are:

- equity capital, which includes ordinary and participating preference shares, units in trusts and net equity in branches;
- reinvestment of earnings of direct investors, which refers to income retained within the enterprise from after-tax profits that is attributable to direct investors;
- debt securities, which include longer term, generally tradable security instruments such as bonds and debentures, with a contractual maturity of more than one year after issue, together with money market instruments (for example, bills, commercial finance paper, negotiable certificates of deposit) with a contractual maturity of one year or less;
- trade credits, which cover the direct extension by suppliers and buyers for goods and services, including advances for work in progress or to be undertaken;
- loans, which cover the direct lending of funds either without a security evidencing the transaction, or with non-negotiable documentation. They include financial leases;
- deposits, which comprise both transferable and other deposits; and
- other assets and liabilities, which consist of miscellaneous accounts in respect of interest, dividends, etc.

Statistical overview

As shown in table 30.2, the balance on current account for 1999–2000 was a deficit of $33.7b. The level of this deficit is similar to the level of the deficit recorded for the previous year, but its composition is somewhat different. The deficit on goods and services rose by $0.6b, with the increase in imported goods outstripping the strong rise in goods exports. However, offsetting the increase in the trade deficit is a turnaround, from deficit to surplus, of $0.9b in the balance on current transfers. In 1998–99 there was a significant one-off rise in claims payable to the rest of the world on reinsurance business written by Australian insurance enterprises that pushed the transfers deficit to $0.8b. The net services deficit was little changed during 1999–2000 while the net income deficit rose slightly to $18.6b, with a strong increase in income earned on Australia's equity investments abroad being more than offset by higher interest accruing on Australia's foreign debt.

The surplus on capital account declined by $48m (4%) to $1.1b in 1999–2000.

The balance on financial account recorded a net inflow of $33.1b, up $0.9b (3%) on the previous year. There was a decrease of $3.3b in the net inflow on direct investment, with a rise in the outflow on Australian direct investment abroad of $1.2b augmenting the fall of $2.0b in the inflow of direct investment into Australia. The net inflow on portfolio investment rose $7.9b, largely due to net new issues of debt securities by private financial institutions. Partly offsetting these movements were a fall of $1.5b in the net inflow on other investment and a rise of $2.2b in the net outflow on reserve assets.

30.2 BALANCE OF PAYMENTS, Summary

	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
	$m	$m	$m	$m	$m	$m
Current account	**–28 646**	**–21 645**	**–17 818**	**–22 818**	**–33 716**	**–33 677**
Goods and services	*–10 000*	*–1 983*	*1 570*	*–4 738*	*–14 610*	*–15 180*
Credits	87 654	99 095	105 160	113 744	111 843	125 774
Debits	–97 654	–101 078	–103 590	–118 482	–126 453	–140 954
Goods	*–8 216*	*–1 583*	*1 496*	*–3 546*	*–12 740*	*–13 331*
Credits	67 101	76 146	80 934	88 538	85 687	97 476
Debits	–75 317	–77 729	–79 438	–92 084	–98 427	–110 807
Services	*–1 784*	*–400*	*74*	*–1 192*	*–1 870*	*–1 849*
Credits	20 553	22 949	24 226	25 206	26 156	28 298
Debits	–22 337	–23 349	–24 152	–26 398	–28 026	–30 147
Income	*–18 118*	*–19 533*	*–19 307*	*–18 005*	*–18 328*	*–18 591*
Credits	6 941	7 140	8 563	10 384	9 998	12 744
Debits	–25 059	–26 673	–27 870	–28 389	–28 326	–31 335
Current transfers	*–528*	*–129*	*–81*	*–75*	*–778*	*94*
Credits	3 026	3 292	3 497	3 976	4 599	4 562
Debits	–3 554	–3 421	–3 578	–4 051	–5 377	–4 558
Capital and financial account	**28 610**	**22 320**	**17 309**	**23 747**	**33 372**	**34 218**
Capital account	*572*	*1 074*	*1 317*	*1 127*	*1 167*	*1 119*
Capital transfers	540	1 049	1 323	1 097	1 186	1 183
Credits	1 383	1 956	2 200	2 068	2 197	2 413
Debits	–843	–907	–877	–971	–1 011	–1 230
Net acquisition/disposal of non-produced, non-financial assets	32	25	–6	30	–19	–64
Financial account	*28 038*	*21 246*	*15 992*	*22 620*	*32 205*	*33 099*
Direct investment	4 081	4 846	4 901	1 475	13 190	9 918
Abroad	–3 428	–7 955	–5 726	–6 462	–672	–1 901
In Australia	7 509	12 801	10 627	7 937	13 862	11 819
Portfolio investment	18 377	25 934	16 084	16 937	8 610	16 544
Other investment	3 609	–8 717	210	3 750	10 799	9 259
Reserve assets	1 971	–817	–5 203	458	–394	–2 622
Net errors and omissions	**36**	**–675**	**509**	**–929**	**344**	**–541**

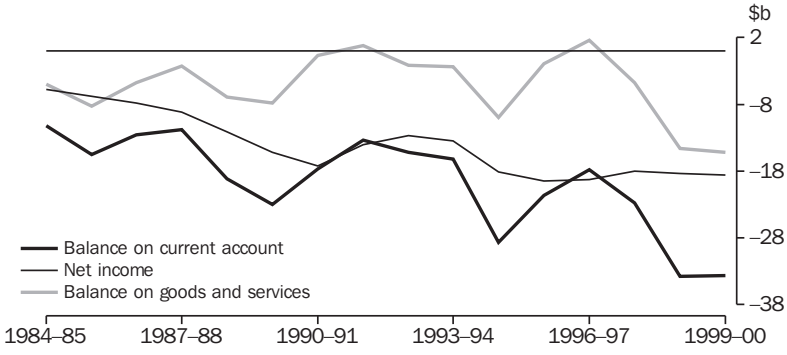
Source: Balance of Payments and International Investment Position, Australia (5302.0).

Graph 30.3 illustrates the differing influences of the trade balance and the net income deficit on the balance on current account. With both increasing levels of debt and higher interest rates in the late 1980s and early 1990s, the net income deficit rose rapidly from about $6b in 1984–85 to $18–19b each year from 1994–95 onwards. The underlying level of net income will continue to drive the level and direction of the current account deficit as Australia continues to service its external liabilities. However the trade deficit has fluctuated quite significantly over the past 16 years.

While the deficit has averaged a little over $5b per year it has swung from surpluses of about $2b to deficits of $15b. The volatility of this series is mirrored in the plot line for the current account deficit in graph 30.3.

Table 30.4 shows the annual levels of Australia's official reserve assets and both the end of year and period average exchange rates for the major currencies, special drawing rights, and the trade weighted index.

30.3 BALANCE ON CURRENT ACCOUNT COMPARED TO NET INCOME



Source: Balance of Payments and International Investment Position, Australia (5302.0).

30.4 RESERVE ASSETS AND EXCHANGE RATES

	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
RESERVE ASSETS ($m)							
Total reserve assets	**–20 661**	**–20 184**	**–19 059**	**–22 791**	**–24 260**	**–23 954**	**n.y.a.**
Monetary gold	–4 208	–4 316	–3 826	–1 757	–1 236	–1 013	n.y.a.
Special drawing rights	–110	–95	–57	–37	–25	–88	n.y.a.
Reserve position in IMF	–749	–753	–615	–627	–1 449	–2 338	n.y.a.
Foreign exchange	–15 594	–15 020	–14 562	–20 370	–21 550	–20 515	n.y.a.
Currency and deposits	n.a.	n.a.	n.a.	–4 572	–11 675	–7 971	n.y.a.
Securities	–15 594	–15 020	–14 562	–15 798	–9 875	–12 544	n.y.a.
EXCHANGE RATES							
End of period							
United States dollar	0.7291	0.7086	0.7890	0.7455	0.6135	0.6596	0.5986
United Kingdom pound	0.4721	0.4452	0.5099	0.4482	0.3681	0.4188	0.3941
Euro	. .	. .	. .	. .	. .	0.6379	0.6282
Japanese yen	72.20	60.08	86.48	85.20	86.16	79.66	63.19
Special drawing right	0.5026	0.4539	0.5476	0.5347	0.4617	0.4932	0.4481
Period average(a)							
United States dollar	0.6919	0.7427	0.7593	0.7828	0.6808	0.6276	0.6289
United Kingdom pound	0.4623	0.4705	0.4909	0.4851	0.4138	0.3824	0.3948
Euro	. .	. .	. .	. .	. .	. .	0.6356
Japanese yen	73.52	70.35	77.66	90.51	86.02	77.81	67.90
Special drawing right	0.4944	0.4972	0.5156	0.5521	0.5026	0.4589	0.4642
TRADE-WEIGHTED INDEX OF VALUE OF THE AUSTRALIAN DOLLAR(b)							
End of period	53.0	48.4	58.1	56.7	57.9	58.4	53.3
Period average(a)	51.4	52.8	54.8	58.7	58.3	56.0	55.2

(a) These period average exchange rates and index numbers are derived by averaging figures for each trading day.
(b) May 1970 =100.0. The Trade Weighted Index is reweighted annually and on special occasions as required.

Source: Reserve Bank of Australia for reserve assets, daily exchange rates and the trade-weighted index.

International trade in goods and services (balance of payments basis)

Australia's international trade in goods and services for the six years to 1999–2000 is shown in tables 30.5 (exports or credits) and 30.6 (imports or debits). The tables provide both current price and chain volume measures.

The components of merchandise goods shown in tables 30.5 and 30.6 are defined in terms of groupings of items in the United Nations *Standard International Trade Classification Revision 3 (SITC Rev. 3)* for credits, and the UN's *Classification of Broad Economic Categories* for debits.

Chain volume measures of exports and imports remove the effects of inflation. They provide measures, in dollar values, which indicate changes in the actual volume of exports and imports.

The current price value of a transaction may be expressed conceptually as the product of a price and quantity. The value of the transaction in chain volume measures may then be thought of as being derived by substituting, for the current price, the corresponding price in the chosen reference year.

There are, however, many transactions recorded in statistics of international trade in goods and services for which it is not possible to apply such an approach. In such cases it is necessary to make assumptions and approximations (e.g. revaluing by means of the price index which is considered to be most closely related to the commodity involved). The published chain volume measures should be viewed in this light. For more information on chain volume measures refer to *Information Paper: Australian National Accounts, Introduction of Chain Volume and Price Indexes* (5248.0).

The deficit on goods and services widened slightly to $15.2b (current prices) in 1999–2000. Goods credits rose by 14% to $97.5b, with the largest increases recorded in other mineral fuels (up $4.5b mainly due to prices increasing), metals (excluding non-monetary gold) (up $1.8b due to prices and volumes rising) and goods for processing (up $1.0b as a result of volumes increasing). The largest fall was in non-monetary gold (down $1.2b due to volumes and prices declining).

Goods debits increased 13% to $110.8b. The most significant increase occurred in intermediate and other merchandise goods (up $5.9b due to higher prices and volumes) with fuels and lubricants (up $3.1b due to prices) being the largest contributor to this rise. Capital goods also rose strongly (up $3.7b) with telecommunications equipment up $1.4b due to strong volume increases more than offsetting falling prices; and industrial transport equipment (up $1.1b) due largely to imports of Hercules aircraft during 1999–2000. Consumption goods were up 10% to $30.8b, with increases in all broad commodity groups in this category.

Exports and imports of merchandise goods, on a recorded trade basis without adjustment for balance of payments purposes, are shown by country in table 30.26.

In current price terms, the services deficit fell by $21m to $1.8b in 1999–2000. The terms of trade in services improved in 1999–2000 with export prices rising, reflecting the declining value of the Australian dollar and import prices falling, particularly for freight. However services imports volumes (up 8%) grew more strongly than exports, offsetting the price improvements.

In chain volume terms the balance on goods and services recorded a deficit of $20.3b in 1999–2000, up 39% on the deficit recorded in the previous year. Goods and services debits increased by $16.2b (13%) and goods and services credits increased by $10.5b (9%).

Table 30.7 presents various price indexes for Australia's trade in goods and services. The implicit price deflators (IPDs) are derived by dividing the current price measures by the corresponding chain volume measures. These IPDs reflect not only price change but compositional effects from year to year.

Unlike implicit price deflators, chain price indexes measure only the impact of a price change. The chain Laspeyres price index for goods and services credits rose 2.5% in 1999–2000 to 102.5. The rise results from increasing commodity prices in 1999–2000 and a weaker Australian dollar. The chain Laspeyres price index for goods and services debits fell 0.3% in 1999–2000 to 99.7. Falling transportation, telecommunications and ADP equipment prices more than offset the price increases for oil imports and from the weaker Australian currency.

Australia's terms of trade rose by 4% in 1999–2000, resulting from a 2.8% rise in the IPD (current prices over chain volume measures) for goods and services credits, augmented by a 1.2% fall in the IPD for goods and services debits (table 30.7).

30.5 GOODS AND SERVICES CREDITS

	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
	$m	$m	$m	$m	$m	$m
	AT CURRENT PRICES					
Goods and services credits	**87 654**	**99 095**	**105 160**	**113 744**	**111 843**	**125 774**
Goods credits	*67 101*	*76 146*	*80 934*	*88 538*	*85 687*	*97 476*
General merchandise	61 539	69 609	73 379	80 571	78 198	89 896
Rural goods	17 315	19 588	21 045	22 130	21 862	23 577
Meat and meat preparations	3 654	3 292	2 957	3 731	4 008	4 459
Cereal grains and cereal preparations	2 523	4 926	5 954	5 094	5 046	4 941
Wool and sheepskins	4 216	3 664	3 744	4 020	2 583	2 960
Other rural	6 922	7 706	8 390	9 285	10 225	11 217
Non-rural goods	44 224	50 021	52 334	58 441	56 365	66 319
Metal ores and minerals	7 968	9 088	9 407	10 835	11 037	11 757
Coal, coke and briquettes	6 936	7 843	8 005	9 586	9 288	8 367
Other mineral fuels	3 794	4 165	5 154	5 309	4 461	8 995
Metals (excluding non-monetary gold)	6 097	6 799	6 054	7 185	6 984	8 810
Machinery	6 035	7 119	7 001	7 549	6 569	7 120
Transport equipment	2 047	2 500	3 649	3 412	3 343	4 592
Other manufactures	7 907	8 755	9 108	9 834	10 273	11 521
Other non-rural	3 440	3 752	3 956	4 731	4 410	5 157
Sugar, sugar preparations and honey	1 730	1 712	1 694	1 939	1 472	n.p.
Other	1 710	2 040	2 262	2 792	2 938	n.p.
Other goods	5 562	6 537	7 555	7 967	7 460	7 580
Services credits	*20 553*	*22 949*	*24 226*	*25 206*	*26 156*	*28 298*
	CHAIN VOLUME MEASURES(a)(b)					
Goods and services credits	**90 039**	**99 317**	**109 700**	**109 750**	**111 843**	**122 366**
Goods credits	*68 462*	*75 717*	*85 069*	*84 314*	*85 686*	*94 814*
General merchandise	63 757	70 103	77 763	76 171	78 227	87 284
Rural goods	17 551	18 974	22 412	20 423	21 862	24 187
Meat and meat preparations	3 444	3 352	3 281	3 776	4 007	4 083
Cereal grains and cereal preparations	2 906	4 219	6 088	4 369	5 046	5 036
Wool and sheepskins	4 132	3 962	4 301	3 045	2 583	3 026
Other rural	7 063	7 611	8 716	9 098	10 225	12 041
Non-rural goods	46 266	51 205	55 358	55 777	56 365	63 096
Metal ores and minerals	9 547	10 114	10 686	10 751	11 037	11 286
Coal, coke and briquettes	8 071	8 261	8 638	8 971	9 288	9 759
Other mineral fuels	4 092	4 348	4 763	4 656	4 462	5 229
Metals (excluding non-monetary gold)	6 238	6 811	6 933	6 266	6 984	7 680
Machinery	5 126	6 521	6 927	7 281	6 570	7 390
Transport equipment	2 047	2 599	3 868	3 469	3 343	4 554
Other manufactures	7 876	8 677	9 399	9 847	10 273	11 783
Other non-rural	3 633	3 938	4 223	4 582	4 410	5 415
Sugar, sugar preparations and honey	1 757	1 754	1 815	1 747	1 471	n.p.
Other	1 865	2 181	2 410	2 809	2 937	n.p.
Other goods	4 888	5 753	7 337	8 227	7 460	7 532
Services credits	*21 618*	*23 639*	*24 621*	*25 420*	*26 156*	*27 551*

(a) Reference year for chain volume measures is 1998–99. (b) Chain volume measures are not additive for most periods; the component measures do not sum to a total in the same way as the corresponding current price components do.

Source: Balance of Payments and International Investment Position, Australia (5302.0).

30.6 GOODS AND SERVICES DEBITS

	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
	$m	$m	$m	$m	$m	$m
	AT CURRENT PRICES					
Goods and services debits	**–97 654**	**–101 078**	**–103 590**	**–118 482**	**–126 453**	**–140 954**
Goods debits	*–75 317*	*–77 729*	*–79 438*	*–92 084*	*–98 427*	*–110 807*
General merchandise	–73 620	–76 007	–77 205	–87 521	–94 389	–106 735
Consumption goods	–19 418	–19 860	–21 293	–25 899	–28 041	–30 805
Food and beverages, mainly for consumption	–2 592	–2 760	–2 879	–3 282	–3 606	–3 943
Household electrical items	–1 744	–1 766	–1 890	–2 062	–2 245	–2 466
Non-industrial transport equipment	–4 758	–4 436	–5 143	–7 102	–7 231	–7 736
Textiles, clothing and footwear	–2 566	–2 726	–2 880	–3 456	–3 739	–4 236
Toys, books and leisure goods	–2 545	–2 534	–2 567	–2 956	–3 184	–3 240
Consumption goods n.e.s.	–5 213	–5 638	–5 934	–7 041	–8 036	–9 184
Capital goods	–18 541	–19 183	–18 884	–21 168	–23 055	–26 725
Machinery and industrial equipment	–7 897	–8 326	–8 020	–8 862	–9 226	–8 924
ADP equipment	–3 232	–3 593	–3 719	–4 345	–4 496	–4 911
Telecommunications equipment	–1 804	–1 996	–1 748	–2 070	–2 812	–4 167
Civil aircraft	–529	–688	–784	–464	–649	–1 414
Industrial transport equipment n.e.s.	–2 714	–2 214	–2 178	–2 560	–2 860	–3 980
Capital goods n.e.s.	–2 365	–2 366	–2 435	–2 867	–3 012	–3 329
Intermediate and other merchandise goods	–35 661	–36 964	–37 028	–40 454	–43 293	–49 205
Food and beverages, mainly for industry	–774	–700	–641	–746	–758	–731
Primary industrial supplies n.e.s.	–901	–879	–839	–950	–882	–1 117
Fuels and lubricants	–3 566	–4 163	–5 004	–4 276	–4 428	–7 553
Parts for transport equipment	–4 714	–4 600	–4 609	–5 346	–6 085	–6 876
Parts for ADP equipment	–1 858	–1 857	–1 759	–1 993	–1 944	–1 936
Other parts for capital goods	–5 975	–6 393	–6 507	–7 193	–7 692	–8 028
Organic and inorganic chemicals	–2 431	–2 754	–2 743	–2 814	–3 139	–3 572
Paper and paperboard	–1 794	–1 868	–1 713	–1 901	–1 978	–2 208
Textile yarn and fabrics	–2 036	–1 922	–1 817	–2 005	–2 006	–1 987
Iron and steel	–1 285	–1 408	–1 297	–1 623	–1 470	–1 510
Plastics	–1 646	–1 685	–1 577	–1 814	–1 889	–2 037
Processed industrial supplies n.e.s.	–8 290	–8 398	–8 212	–9 431	–10 140	–10 840
Other merchandise goods	–391	–337	–310	–362	–882	–810
Other goods	–1 697	–1 722	–2 233	–4 563	–4 038	–4 072
Services debits	*–22 337*	*–23 349*	*–24 152*	*–26 398*	*–28 026*	*–30 147*

...continued

30.6 GOODS AND SERVICES DEBITS—*continued*

	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
	$m	$m	$m	$m	$m	$m
CHAIN VOLUME MEASURES(a)(b)						
Goods and services debits	**–94 633**	**–98 409**	**–108 070**	**–120 528**	**–126 452**	**–142 630**
Goods debits	*–70 961*	*–73 986*	*–82 043*	*–92 763*	*–98 428*	*–112 341*
General merchandise	–69 353	–72 381	–79 835	–88 026	–94 389	–108 199
Consumption goods	–19 528	–19 858	–22 279	–27 113	–28 041	–31 594
Food and beverages, mainly for consumption	–2 825	–2 877	–3 053	–3 279	–3 606	–4 032
Household electrical items	–1 656	–1 719	–1 976	–2 108	–2 244	–2 546
Non-industrial transport equipment	–4 537	–4 262	–5 311	–7 415	–7 231	–7 690
Textiles, clothing and footwear	–2 669	–2 874	–3 083	–3 641	–3 738	–4 383
Toys, books and leisure goods	–2 786	–2 702	–2 803	–3 266	–3 183	–3 370
Consumption goods n.e.s.	–5 113	–5 490	–6 078	–7 421	–8 036	–9 574
Capital goods	–15 246	–16 871	–19 229	–20 585	–23 055	–28 449
Machinery and industrial equipment	–7 986	–8 477	–8 719	–9 639	–9 226	–9 164
ADP equipment	–1 619	–2 274	–3 262	–3 328	–4 495	–6 205
Telecommunications equipment	–1 070	–1 358	–1 709	–1 824	–2 811	–4 397
Civil aircraft	–606	–817	–957	–545	–649	–1 420
Industrial transport equipment n.e.s.	–2 723	–2 220	–2 271	–2 686	–2 861	–3 942
Capital goods n.e.s.	–2 344	–2 360	–2 557	–2 992	–3 012	–3 320
Intermediate and other merchandise goods	–34 797	–35 683	–38 314	–40 397	–43 293	–48 157
Food and beverages, mainly for industry	–846	–788	–796	–720	–758	–940
Primary industrial supplies n.e.s.	–986	–905	–900	–899	–881	–1 198
Fuels and lubricants	–3 765	–4 336	–4 626	–3 872	–4 428	–4 272
Parts for transport equipment	–4 605	–4 522	–4 924	–5 801	–6 085	–6 850
Parts for ADP equipment	–938	–1 176	–1 542	–1 538	–1 945	–2 447
Other parts for capital goods	–5 630	–6 211	–6 908	–7 364	–7 692	–8 716
Organic and inorganic chemicals	–2 483	–2 675	–2 865	–2 780	–3 140	–3 867
Paper and paperboard	–1 900	–1 675	–1 779	–2 055	–1 978	–2 240
Textile yarn and fabrics	–1 848	–1 727	–1 894	–1 953	–2 006	–2 086
Iron and steel	–1 319	–1 333	–1 318	–1 665	–1 471	–1 509
Plastics	–1 793	–1 643	–1 674	–1 791	–1 889	–2 081
Processed industrial supplies n.e.s.	–8 701	–8 532	–8 763	–9 721	–10 141	–11 101
Other merchandise goods	–392	–332	–329	–373	–882	–849
Other goods	–1 647	–1 644	–2 253	–4 799	–4 038	–4 143
Services debits	*–23 847*	*–24 581*	*–26 116*	*–27 815*	*–28 026*	*–30 287*

(a) Reference year for chain volume measures is 1998–99. (b) Chain volume measures are not additive for most periods; the component measures do not sum to a total in the same way as the corresponding current price components do.

Source: Balance of Payments and International Investment Position, Australia (5302.0).

30.7 IMPLICIT PRICE DEFLATORS AND TERMS OF TRADE

	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
Implicit price deflators(a)(b)						
Goods and services credits	100.9	103.4	99.3	103.6	100.0	102.8
Goods credits	102.9	105.6	99.9	105.0	100.0	102.8
Services credits	94.3	96.3	97.6	99.2	100.0	102.7
Goods and services debits	101.5	101.0	94.2	98.3	100.0	98.8
Goods debits	105.4	104.3	96.1	99.3	100.0	98.6
Services debits	88.9	90.2	87.8	94.9	100.0	99.5
Chain Laspeyres price indexes(b)						
Goods and services credits	99.9	102.4	99.0	103.5	100.0	102.5
Goods credits	101.7	104.4	99.4	104.8	100.0	102.4
Services credits	94.2	96.2	97.5	99.1	100.0	102.7
Goods and services debits	98.6	98.8	92.9	97.4	100.0	99.7
Goods debits	101.9	101.8	94.6	98.2	100.0	99.7
Services debits	88.5	89.8	87.4	94.8	100.0	99.6
Terms of trade(b)(c)						
Goods and services	99.4	102.4	105.4	105.4	100.0	104.0
Goods	97.7	101.2	103.9	105.8	100.0	104.2
Services	106.0	106.8	111.2	104.5	100.0	103.2

(a) 1998–99 = 100.0. Derived by dividing the estimates at current prices in tables 30.5 and 30.6 by the chain volume measures in those tables. (b) Reference year for price and terms of trade indexes is 1998–99. (c) 1998–99 = 100.0. Derived by dividing the IPDs for credits by the IPDs for debits.

Source: Balance of Payments and International Investment Position, Australia (5302.0).

International trade in services

In current price terms, net services for 1999–2000 recorded a deficit of $1.8b, a fall of $21m (1%) on the deficit recorded in 1998–99. Services credits increased by $2.1b (8%) to $28.3b, mainly due to increases in personal travel services and in miscellaneous business, professional and technical services. Services debits increased by $2.1b (8%) to $30.1b, mainly due to increases in transportation, travel, communication services and miscellaneous business, professional and technical services. Table 30.8 provides details of the international trade in services.

As shown in table 30.9, the main destinations for services exports (credits) in 1998–99 (the latest year available for regional data) were: United States (17%), Japan (13%), United Kingdom (11%), New Zealand (7%), Singapore (5%) and Hong Kong (4%). Significant growth has been recorded since 1993–94 in services exports to each of these markets except Japan where growth has been more modest overall, with strong growth in the mid 1990s offset by falling trade towards the end of the decade. The main source countries for services debits in 1998–99, as shown in table 30.10, were: United States (20%), United Kingdom (12%), Japan (6%), Singapore (6%), New Zealand (5%) and Hong Kong (4%).

30.8 INTERNATIONAL TRADE IN SERVICES

	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
	$m	$m	$m	$m	$m	$m
	CREDITS					
Services credits	**20 553**	**22 949**	**24 226**	**25 206**	**26 156**	**28 298**
Transportation services	5 985	6 526	6 648	6 611	6 803	6 903
Passenger	4 858	5 305	5 697	5 550	5 604	5 781
Freight	1 127	1 221	951	1 061	1 199	1 122
Other	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.
Travel services	9 956	11 252	11 756	11 540	11 944	13 033
Business	677	798	675	893	1 009	1 020
Personal	9 279	10 454	11 081	10 647	10 935	12 013
Communications services	808	896	947	1 361	1 153	1 316
Construction services	105	66	70	31	18	20
Insurance services	556	672	772	840	859	887
Financial services	526	577	634	713	716	747
Computer and information services	218	217	277	532	676	665
Royalties and licence fees	320	329	376	449	488	572
Other business services	1 340	1 613	1 882	2 224	2 552	2 947
Merchanting and other trade-related	256	331	436	481	586	588
Operational leasing	12	7	10	8	8	13
Miscellaneous business, professional and technical	1 072	1 275	1 436	1 735	1 958	2 346
Personal, cultural and recreational services	185	248	304	352	388	471
Government services n.e.i.	554	553	560	553	559	737
	DEBITS					
Services debits	**–22 337**	**–23 349**	**–24 152**	**–26 398**	**–28 026**	**–30 147**
Transportation services	–8 259	–8 488	–8 439	–9 110	–9 367	–9 893
Passenger	–2 721	–2 928	–3 003	–3 224	–3 485	–3 798
Freight	–4 360	–4 405	–4 373	–5 013	–5 009	–5 224
Other	–1 178	–1 155	–1 063	–873	–873	–871
Travel services	–6 272	–6 988	–7 769	–8 372	–9 044	–9 785
Business	–1 696	–2 056	–2 286	–2 416	–2 239	–2 530
Personal	–4 576	–4 932	–5 483	–5 956	–6 805	–7 255
Communications services	–1 020	–1 060	–1 066	–1 407	–1 467	–1 691
Construction services	0	0	0	0	0	0
Insurance services	–1 064	–1 064	–1 012	–915	–922	–936
Financial services	–672	–472	–451	–442	–468	–527
Computer and information services	–200	–203	–253	–336	–424	–535
Royalties and license fees	–1 283	–1 304	–1 397	–1 519	–1 692	–1 898
Other business services	–2 510	–2 646	–2 699	–3 003	–3 253	–3 379
Merchanting and other trade-related	–250	–276	–362	–392	–329	–239
Operational leasing	–1 041	–1 032	–814	–864	–1 034	–980
Miscellaneous business, professional and technical	–1 219	–1 338	–1 523	–1 747	–1 890	–2 160
Personal, cultural and recreational services	–519	–555	–547	–702	–756	–854
Government services n.e.i.	–538	–569	–519	–592	–633	–649

Source: Balance of Payments and International Investment Position, Australia (5302.0).

30.9 SERVICES CREDITS, By Country and Country Group

	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99
	$m	$m	$m	$m	$m	$m
COUNTRIES						
Belgium and Luxembourg	32	47	64	105	125	107
Brunei Darussalam	15	23	25	22	21	24
Canada	293	240	281	309	357	366
Central America and Caribbean	18	12	11	15	13	35
Chile	5	5	7	5	5	5
China, People's Republic of	320	375	378	396	484	535
Fiji	91	80	72	62	117	156
France	232	197	169	207	194	224
Germany	603	591	576	665	719	746
Greece	53	42	52	49	47	31
Hong Kong (SAR of China)	868	863	1 072	1 054	1 029	1 027
Indonesia	630	840	971	1 029	921	877
Ireland, Republic of	50	61	69	77	97	126
Italy	181	177	184	244	251	294
Japan	3 135	3 425	3 658	3 688	3 476	3 318
Korea, Republic of	536	835	1 115	927	608	445
Malaysia	627	684	769	733	767	629
Mexico	15	9	4	4	4	15
Netherlands	162	192	163	211	255	272
New Zealand	1 176	1 254	1 418	1 666	1 786	1 761
Papua New Guinea	269	240	236	279	335	295
Philippines	152	161	182	189	195	176
Russian Federation	85	66	69	63	56	43
Singapore	865	1 277	1 241	1 256	1 189	1 327
South Africa	139	152	173	177	167	219
Sweden	81	80	94	99	106	174
Switzerland	210	259	261	261	278	303
Taiwan	559	679	702	570	537	517
Thailand	384	503	523	474	354	370
United Kingdom	1 832	1 922	2 040	2 171	2 453	2 837
United States of America	2 396	2 403	2 977	3 220	4 099	4 430
Africa n.e.s.	160	93	106	103	126	100
America n.e.s.	84	118	131	330	253	338
Asia n.e.s.	573	808	873	994	1 022	1 121
Europe n.e.s.	823	652	674	650	721	751
Oceania n.e.s.	327	260	264	274	191	224
International institutions	4	4	4	2	0	0
Unallocated	611	924	1 341	1 646	1 848	1 938
Total all countries	**18 596**	**20 553**	**22 949**	**24 226**	**25 206**	**26 156**
COUNTRY GROUPS(a)						
APEC	12 237	13 816	15 559	15 821	16 167	16 117
ASEAN	2 743	3 529	3 814	3 834	3 568	3 526
EU	3 440	3 603	3 706	4 192	4 683	5 313
OECD	10 884	11 423	12 527	14 422	15 430	16 124

(a) APEC includes Brunei Darussalam, Canada, Chile (from 1995), Peoples' Republic of China, Hong Kong, Indonesia, Japan, Republic of Korea, Malaysia, Mexico (from 1994), New Zealand, Papua New Guinea (from 1994), Philippines, Singapore, Taiwan, Thailand and United States of America. ASEAN includes Brunei Darussalam, Burma (from 1997), Laos (from 1997), Indonesia, Malaysia, Philippines, Singapore, Thailand and Viet Nam (from 1996). EU includes Austria (from 1995), Belgium, Denmark, Finland (from 1995), France, Germany, Greece, Republic of Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden (from 1995) and United Kingdom. OECD includes Austria, Belgium, Canada, Czech Republic (from 1996), Denmark, Finland, France, Germany, Greece, Hungary (from 1997), Iceland, Republic of Ireland, Italy, Japan, Republic of Korea (from 1997), Luxembourg, Mexico (from 1995), New Zealand, Netherlands, Norway, Poland (from 1997), Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom and United States of America.

Source: Balance of Payments and International Investment Position, Australia (5363.0).

30.10 SERVICES DEBITS, By Country and Country Group

	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99
	$m	$m	$m	$m	$m	$m
COUNTRIES						
Belgium and Luxembourg	–115	–107	–86	–68	–108	–71
Brunei Darussalam	–6	–9	–10	–7	–10	–11
Canada	–296	–301	–318	–319	–298	–320
Central America and Caribbean	–294	–202	–197	–163	–189	–212
Chile	–15	–16	–21	–18	–65	–19
China, People's Republic of	–311	–443	–458	–447	–592	–613
Fiji	–171	–176	–190	–178	–209	–323
France	–270	–270	–272	–290	–404	–347
Germany	–444	–507	–503	–530	–710	–851
Greece	–263	–237	–230	–217	–234	–239
Hong Kong (SAR of China)	–889	–999	–1 090	–1 266	–1 248	–1 186
Indonesia	–396	–485	–549	–706	–691	–587
Ireland, Republic of	–84	–97	–110	–142	–174	–150
Italy	–348	–385	–433	–541	–525	–498
Japan	–1 446	–1 714	–1 508	–1 545	–1 308	–1 690
Korea, Republic of	–208	–262	–303	–283	–257	–286
Malaysia	–436	–483	–524	–626	–694	–746
Mexico	–9	–11	–13	–16	–17	–22
Netherlands	–457	–538	–408	–411	–501	–518
New Zealand	–864	–950	–1 063	–1 149	–1 360	–1 451
Papua New Guinea	–154	–134	–162	–174	–222	–151
Philippines	–93	–111	–122	–144	–222	–164
Russian Federation	–231	–150	–116	–81	–61	–53
Singapore	–927	–1 196	–1 237	–1 200	–1 207	–1 694
South Africa	–80	–103	–118	–155	–193	–193
Sweden	–137	–166	–128	–100	–183	–90
Switzerland	–355	–462	–511	–569	–621	–738
Taiwan	–136	–142	–152	–155	–186	–122
Thailand	–359	–384	–435	–403	–501	–553
United Kingdom	–3 363	–3 560	–3 826	–3 874	–3 613	–3 240
United States of America	–4 171	–4 332	–4 590	–4 949	–5 521	–5 662
Africa n.e.s.	–147	–130	–149	–163	–183	–266
America n.e.s.	–107	–117	–154	–217	–228	–203
Asia n.e.s.	–654	–746	–622	–607	–821	–1 038
Europe n.e.s.	–974	–1 089	–1 084	–876	–1 066	–1 086
Oceania n.e.s.	–187	–158	–164	–155	–216	–214
International institutions	–2	0	0	0	0	–1
Unallocated	–1 134	–1 165	–1 493	–1 408	–1 760	–2 418
Total all countries	**–20 533**	**–22 337**	**–23 349**	**–24 152**	**–26 398**	**–28 026**
COUNTRY GROUPS(a)						
APEC	–10 701	–11 972	–12 555	–13 407	–14 399	–15 277
ASEAN	–2 333	–2 791	–3 068	–3 293	–3 551	–4 050
EU	–5 601	–6 154	–6 373	–6 448	–6 852	–6 417
OECD	–13 250	–14 430	–14 767	–15 633	–16 634	–16 969

(a) APEC includes Brunei Darussalam, Canada, Chile (from 1995), Peoples' Republic of China, Hong Kong, Indonesia, Japan, Republic of Korea, Malaysia, Mexico (from 1994), New Zealand, Papua New Guinea (from 1994), Philippines, Singapore, Taiwan, Thailand and United States of America. ASEAN includes Brunei Darussalam, Burma (from 1997), Laos (from 1997), Indonesia, Malaysia, Philippines, Singapore, Thailand and Viet Nam (from 1996). EU includes Austria (from 1995), Belgium, Denmark, Finland (from 1995), France, Germany, Greece, Republic of Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden (from 1995) and United Kingdom. OECD includes Austria, Belgium, Canada, Czech Republic (from 1996), Denmark, Finland, France, Germany, Greece, Hungary (from 1997), Iceland, Republic of Ireland, Italy, Japan, Republic of Korea (from 1997), Luxembourg, Mexico (from 1995), New Zealand, Netherlands, Norway, Poland (from 1997), Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom and United States of America.

Source: Balance of Payments and International Investment Position, Australia (5363.0).

A century of Australia's balance of payments performance

Official estimates of Australia's balance of payments were first published in the 1931 edition (No. 34) of the *Official Year Book of the Commonwealth of Australia* for the period 1928–29 to 1930–31. No official estimates exist for earlier periods for the accounts as a whole. However, a range of estimates have been compiled by various researchers that can be used to broadly compare Australia's current account performance at the start of the century with the position for 1999–2000. In this article the estimates for the current account for calendar year 1901, from Chapter 11 by Alan Lougheed in W. Vamprey (ed.) *Australians: Historical Statistics* (Fairfax, Syme & Weldon Associates, Broadway, New South Wales, 1987), are compared with the 1999–2000 estimates in the June 2000 issue of *Balance of Payments and International Investment Position, Australia* (5302.0).

The balance on current account for the year ended 31 December 1901 was a deficit of £2.3m and represented –1.0% of Australia's Gross Domestic Product (GDP) (table 30.11). For the year ended 30 June 2000, the current account balance was a deficit of $33.7b and represented –5.4% of GDP. The major change in the composition of the current account (as a proportion of GDP) over the century is the decline in the share of exports of goods—down from 22% at the start to 16% by 1999–2000. At the same time the exports of services have risen from a 1% share in 1901 to account for nearly 5% in 1999–2000. Imports of goods have increased their share from –19% to –23%, while the GDP share of imports of services has also risen (from –2% to –5%) over the same period.

Interestingly, the net income deficit has declined in significance over the past century, from –5.2% of GDP in 1901 to –3.0% in 1999–2000. The deficit on income was about –5% of GDP up until 1935–36 when rapid growth in GDP and strong trade performances leading up to World War II pushed the ratio down to about –3%. It fell further to about –2% in the early 1960s, and stayed low until the accumulating deficits since the mid 1970s drove the ratio up to around –4% in the mid 1990s.

The following detail on the goods trade in 1901 should be used with care. Goods imported into one State and trans-shipped to another were excluded from imports. The amounts involved are not known but could well be as much as 5% of imports; while estimated at about £1.8m in Vamprey, they have not been included in the balance of payments for 1901. A similar problem also affected goods trans-shipped from the State of production to another State for export, which are excluded from total Australian exports in 1901. However, the problem for exports is likely to be larger than for imports due to the wider distribution of agricultural and mining production for export than applies to the population and industry distribution for the trans-shipment of imports. For particular export and import commodities the undercoverage may be quite significant. Other coverage and valuation problems also affect the 1901 estimates.

In 1901, recorded goods credits were £48.8m. Rural goods accounted for £26.2m or 54% of total goods credits, with wool being the largest single contributor at £15.2m or 31% of total goods credits. Non-rural goods (including ships' stores) accounted for £9.1m or 19% of total goods credits, with mining at £5.4m (11%) and other exports and re-exports at £3.7m (8%). Gold exports were £13.5m (28%).

By 1999–2000, the composition of exports had changed significantly. Non-rural exports were $66.3b or 68% of total goods credits. The largest contributors were metal ores and minerals, and other manufactures, both accounting for 12% of total goods credits. However, fuel exports had risen to 18% of exports compared with negligible levels in 1901. Similarly, elaborately transformed manufactured exports had risen from negligible levels to about a quarter of all exports of goods by 1999–2000. Rural goods accounted for 24% of total goods credits, with cereal grains and cereal preparations, and meat and meat preparations, the largest two contributors, both accounting for 5% of total goods credits. Gold exports and goods for processing (mainly gold) were 7%.

In 1901, goods debits were £38.0m. As with exports, the shift in imports composition is away from primary inputs and towards finished goods, particularly capital goods, as well as towards fuels. Imports of apparel, textiles and yarn accounted for the largest proportion of goods imports in 1901, at 29%, compared with

just 6% for these goods a century on. Food, beverages and tobacco were at 18% of imports in 1901, slipping to 4% in 1999–2000. In contrast, machinery imports have risen from 5% of total goods debits at the opening of the century to be about a quarter of all imports at its close. If parts for these capital goods are included, the imports share rises to nearly 40% in 1999–2000. Fuels imports are now about 7% of imports compared with negligible levels a hundred years earlier.

In 1901, Australia's services trade recorded a deficit of £1.8m, attributable mostly to transportation. Transportation debits of £2.9m were only partly offset by transportation credits of £1.7m. By 1999–2000, services recorded a deficit of $1.8b, again with transportation services being the dominant contributor to the deficit. Transportation debits exceeded credits by $3.0b, with most of that outcome contributed by a net freight deficit. Unlike 1901, however, when travel also recorded a significant net deficit, by the close of the century travel was contributing a net surplus of $3.2b, most of which was derived from the education-related travel expenditures of foreign students in Australia. In the later part of the century, trade in a range of business, professional, technical and personal services grew to account for about 30% of Australia's trade in services by 1999–2000. At the dawn of the century these components were less than 15% of services exports.

In 1901, income debits were recorded at £11.7m. Two-thirds of this deficit (or 3% of GDP) were contributed by the interest payments of general government (State and local). By 1999–2000 the public sector net interest bill was less than half of 1% of GDP and only accounted for one-seventh of the net income deficit. Data on income credits are not available for 1901. While estimates appear from 1906, measured income credits were negligible until 1928–29, the first year of official balance of payments estimates, when they accounted for about 3% of total current account credits. By the end of the century this share of total current credits had tripled to about 9%.

Current transfers recorded surpluses for both 1901 and 1999–2000 of £0.4m and $94m respectively.

30.11 BALANCE OF PAYMENTS, Current Account—1901 and 1999–2000

	1901		1999–2000	
	£m	% of GDP	$b	% of GDP
Current account	**–2.3**	**–1.0**	**–33.7**	**–5.4**
Goods and services	*9.0*	*4.0*	*–15.2*	*–2.4*
Credits	51.4	22.7	125.8	20.2
Debits	–42.4	–18.8	–141.0	–22.7
Goods	*10.8*	*4.8*	*–13.3*	*–2.1*
Credits	48.8	21.6	97.5	15.7
Debits	–38.0	–16.8	–110.8	–17.8
Services	*–1.8*	*–0.8*	*–1.9*	*–0.3*
Credits	2.6	1.2	28.3	4.6
Debits	–4.4	–1.9	–30.1	–4.8
Income	*–11.7*	*–5.2*	*–18.6*	*–3.0*
Credits	n.a.	—	12.7	2.0
Debits	–11.7	–5.2	–31.3	–5.0
Current transfers	*0.4*	*0.2*	*0.1*	*0*
Credits	0.9	0.4	4.7	0.7
Debits	–0.5	–0.2	–4.6	–0.7

Source: Australians: Historical Statistics (W. Vamprey); Balance of Payments and International Investment Position, Australia (5302.0).

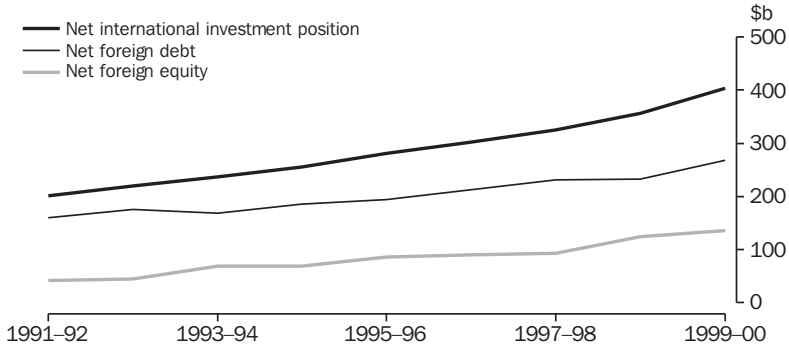
International investment position

Australia's net international investment position is the difference between the levels of Australia's foreign financial liabilities and the levels of its foreign financial assets. Historically, Australia has had a net liabilities position with the rest of the world.

Australia's net international investment position at 30 June 2000 was a net foreign financial liability of $403.8b. This was up $46.7b (13%) on the position a year earlier and resulted from net increases of $10.6b in the level of foreign equity and $36.1b in the level of foreign debt.

Graph 30.12 shows the components of Australia's international investment position between 1991–92 and 1999–2000. It shows that the increases in net foreign liabilities reflect increases in both net foreign debt and net foreign equity in most years.

30.12 NET INTERNATIONAL INVESTMENT POSITION, Level at End of Period



Source: Balance of Payments and International Investment Position, Australia (5302.0).

Table 30.13 shows a reconciliation between opening and closing levels for foreign financial assets, foreign financial liabilities and Australia's net international investment position. Increases or decreases in these assets and liabilities are due to financial transactions (investment flows), price changes, exchange rate changes and other adjustments.

30.13 INTERNATIONAL INVESTMENT POSITION

	Position at beginning of period	Changes in position reflecting				Position at end of period
		Transactions	Price changes	Exchange rate changes	Other adjustments	
	$m	$m	$m	$m	$m	$m
NET INTERNATIONAL INVESTMENT POSITION						
Total						
1997–98	302 933	22 621	–3 999	1 917	1 284	324 757
1998–99	324 757	32 204	4 296	–321	–3 813	357 123
1999–00	357 123	33 098	15 726	–2 575	404	403 776
Equity						
1997–98	89 948	19 657	–5 732	–10 562	–187	93 125
1998–99	93 125	22 246	6 510	3 992	–808	125 064
1999–00	125 064	6 874	15 984	–12 095	–168	135 660
Debt						
1997–98	212 986	2 965	1 732	12 478	1 472	231 633
1998–99	231 633	9 961	–2 213	–4 314	–3 005	232 059
1999–00	232 059	26 225	–259	9 519	571	268 115
FOREIGN ASSETS(a)						
Total						
1997–98	–218 578	–13 543	–8 962	–17 146	145	–258 087
1998–99	–258 087	–14 510	–2 853	6 700	–1 752	–270 505
1999–00	–270 505	–13 594	–2 874	–16 676	147	–303 502
Equity						
1997–98	–125 368	–5 173	–5 610	–10 561	–173	–146 885
1998–99	–146 885	–5 921	–3 240	3 992	–576	–152 629
1999–00	–152 629	–9 480	–2 509	–12 095	–849	–177 562
Debt						
1997–98	–93 210	–8 370	–3 352	–6 586	317	–111 202
1998–99	–111 202	–8 591	387	2 707	–1 177	–117 875
1999–00	–117 875	–4 114	–364	–4 582	995	–125 940
FOREIGN LIABILITIES(b)						
Total						
1997–98	521 511	36 166	4 963	19 065	1 139	582 844
1998–99	582 844	46 718	7 149	–7 021	–2 061	627 628
1999–00	627 628	46 692	18 598	14 101	258	707 277
Equity						
1997–98	215 316	24 830	–121	0	–13	240 010
1998–99	240 010	28 167	9 749	0	–232	277 693
1999–00	277 693	16 354	18 494	0	680	313 222
Debt						
1997–98	306 196	11 334	5 085	19 065	1 153	342 834
1998–99	342 834	18 550	–2 600	–7 021	–1 829	349 935
1999–00	349 935	30 337	104	14 101	–422	394 055

(a) Assets include claims of Australian direct investment enterprises on direct investors abroad, which are classified as part of direct investment in Australia. (b) Liabilities include liabilities of Australian direct investors to direct investment enterprises abroad, which are classified as part of direct investment abroad.

Source: Balance of Payments and International Investment Position, Australia (5302.0).

Foreign debt

Foreign debt is a subset of the financial obligations that comprise a country's international investment position. It includes all the non-equity components of the net international investment position, that is, all recorded assets and liabilities other than equity securities and direct investment equity capital, including reinvested earnings.

The level of borrowing and other non-equity liabilities by Australian residents at a particular date can be equated with Australia's foreign debt liabilities. The level of Australian lending abroad and other non-equity assets at the same date are deducted from the level of borrowing to arrive at Australia's net foreign debt.

The level of net foreign debt at 30 June 2000 was $268.1b, up nearly 16% on 30 June 1999 ($232.1b). The increase during 1999–2000 resulted from net financial transactions of $26.2b, price changes of –$0.3b, exchange rate changes of $9.5b and other adjustments of $0.6b (table 30.13).

At 30 June 2000, the net foreign debt of the public sector (general government plus public financial and non-financial corporations) was $31.9b, which accounted for 12% of total net foreign debt at that date. Net foreign debt levels of private financial corporations and private non-financial corporations were $183.1b (68% of total net foreign debt) and $53.1b (20%) respectively (table 30.14).

30.14 LEVELS OF FOREIGN DEBT—At 30 June

	1995	1996	1997	1998	1999	2000
	$m	$m	$m	$m	$m	$m
Foreign debt assets(a)	**–78 296**	**–81 375**	**–93 210**	**–111 202**	**–117 875**	**–125 940**
Public sector	*–31 188*	*–31 104*	*–30 208*	*–36 141*	*–36 244*	*–40 491*
General government	–1 589	–2 288	–1 934	–3 045	–4 231	–3 868
Financial corporations	–28 595	–28 144	–26 853	–32 058	–31 178	–36 022
Reserve Bank	–19 431	–18 445	–22 164	–23 998	–22 883	–27 184
Central Borrowing Authorities	–48	–11	–8	–179	–385	–498
Other financial corporations	–9 116	–9 688	–4 681	–7 881	–7 911	–8 340
Non-financial corporations	–1 004	–672	–1 421	–1 037	–835	–601
Private sector	*–47 108*	*–50 271*	*–63 002*	*–75 061*	*–81 631*	*–85 449*
Financial corporations	–32 893	–35 854	–45 289	–56 709	–60 333	–61 284
Non-financial corporations	–14 215	–14 417	–17 713	–18 352	–21 298	–24 165
Foreign debt liabilities(a)	**264 609**	**276 265**	**306 196**	**342 834**	**349 935**	**394 055**
Public sector	*99 477*	*101 269*	*97 632*	*88 880*	*79 938*	*72 358*
General government	29 300	39 697	43 849	40 580	36 905	29 343
Financial corporations	61 846	56 472	48 213	41 392	37 284	33 460
Reserve Bank	67	51	72	48	40	34
Central Borrowing Authorities	47 695	41 388	40 203	36 571	32 772	28 661
Other financial corporations	14 084	15 032	7 938	4 774	4 473	4 766
Non-financial corporations	8 330	5 100	5 570	6 908	5 748	9 554
Private sector	*165 133*	*174 996*	*208 564*	*253 954*	*269 997*	*321 697*
Financial corporations	101 536	115 700	146 008	180 443	197 819	244 414
Non-financial corporations	63 597	59 296	62 556	73 511	72 178	77 283
Net foreign debt	**186 313**	**194 890**	**212 986**	**231 633**	**232 059**	**268 115**
Public sector	*68 289*	*70 165*	*67 424*	*52 739*	*43 694*	*31 867*
General government	27 711	37 409	41 915	37 535	32 674	25 475
Financial corporations	33 251	28 328	21 360	9 334	6 106	–2 562
Reserve Bank	–19 364	–18 394	–22 092	–23 950	–22 843	–27 151
Central Borrowing Authorities	47 647	41 378	40 195	36 391	32 387	28 162
Other financial corporations	4 968	5 344	3 257	–3 107	–3 438	–3 574
Non-financial corporationsy	7 326	4 428	4 148	5 870	4 913	8 953
Private sector	*118 025*	*124 725*	*145 562*	*178 893*	*188 366*	*236 248*
Financial corporations	68 643	79 845	100 718	123 734	137 486	183 130
Non-financial corporations	49 382	44 880	44 844	55 159	50 879	53 118

(a) Foreign debt levels between direct investors and direct investment enterprises are recorded on a gross basis for assets and liabilities.

Source: Balance of Payments and International Investment Position, Australia (5302.0).

Levels of Australian investment abroad and foreign investment in Australia

In table 30.15, levels of investment are categorised by direction (Australian investment abroad and foreign investment in Australia), type of investment (direct, portfolio, other and reserve assets) and instrument.

Direct investment is a category of international investment that reflects the objective of obtaining a lasting interest by a resident in one economy in an enterprise in another economy, and implies a significant degree of influence by the investor in the management of the enterprise. A direct investment relationship is established when a direct investor, who is a resident in one economy, holds 10% or more of the ordinary shares or voting stock of an enterprise (direct investment enterprise) in another economy. The portfolio investment category covers investment in equity and debt securities (other than direct investment and reserve assets).

The items Australian investment abroad and Foreign investment in Australia in table 30.15 do not equate with foreign assets and liabilities respectively in table 30.13. The difference is due to netting of assets and liabilities in regard to direct investment, both abroad and in Australia. Claims by direct investment enterprises on their direct investors, separately identified in table 30.15, are netted off in that table against liabilities to direct investors. These items are not netted off in table 30.13.

At 30 June 2000, Australian investment abroad totalled $287.4b, up 12% on the level a year earlier. This rise was the net effect of a $6.3b increase in direct investment abroad, a $19.3b increase in portfolio investment assets, a $1.7b increase in other investment assets and a $4.0b increase in reserve assets.

Foreign investment in Australia totalled $691.2b at 30 June 2000, up 13% on June 1999. This rise was due to a $21.6b increase in direct investment in Australia, a $42.4b increase in portfolio investment liabilities, and a $13.9b increase in other investment liabilities. The increase in portfolio investment liabilities was attributable to significant increases in both equity ($14.9b) and debt securities ($27.5b).

30.15 LEVELS OF AUSTRALIAN INVESTMENT ABROAD AND FOREIGN INVESTMENT IN AUSTRALIA—At 30 June

	1995	1996	1997	1998	1999	2000
	$m	$m	$m	$m	$m	$m
Levels of Australian investment abroad	**–167 752**	**–177 859**	**–208 869**	**–246 998**	**–256 140**	**–287 397**
Direct investment abroad(a)	*–62 356*	*–66 296*	*–77 368*	*–91 201*	*–90 273*	*–96 570*
Equity capital and reinvested earnings	–64 918	–67 207	–77 845	–91 582	–92 132	–99 561
Other capital	2 562	911	477	381	1 859	2 991
Claims on affiliated enterprises	–3 018	–3 545	–4 489	–4 821	–5 387	–5 632
Liabilities to affiliated enterprises	5 580	4 457	4 967	5 201	7 246	8 623
Portfolio investment assets	*–56 322*	*–59 563*	*–70 244*	*–82 589*	*–90 704*	*–109 963*
Equity securities	–35 160	–37 485	–47 523	–55 303	–60 497	–78 001
Debt securities	–21 162	–22 078	–22 721	–27 286	–30 207	–31 963
Other investment assets	*–28 890*	*–32 940*	*–38 466*	*–48 948*	*–51 208*	*–52 916*
Trade credits	–6 295	–6 056	–7 256	–8 027	–8 813	–9 087
Loans and other assets	–19 286	–23 484	–26 429	–34 022	–35 096	–36 925
Currency and deposits	–3 309	–3 400	–4 780	–6 898	–7 300	–6 905
Reserve assets	*–20 184*	*–19 060*	*–22 791*	*–24 260*	*–23 954*	*–27 948*
Levels of foreign investment in Australia	**422 750**	**458 600**	**511 802**	**571 755**	**613 264**	**691 172**
Direct investment in Australia(b)	*123 409*	*137 236*	*148 707*	*154 953*	*171 574*	*193 161*
Equity capital and reinvested earnings	104 633	117 154	128 051	134 344	151 706	172 321
Other capital	18 776	20 082	20 657	20 609	19 868	20 840
Claims on direct investors	–5 043	–3 751	–4 743	–5 888	–7 118	–7 482
Liabilities to direct investors	23 819	23 834	25 400	26 496	26 986	28 322
Portfolio investment liabilities	*236 290*	*264 885*	*301 046*	*338 567*	*353 174*	*395 612*
Equity securities	64 131	73 390	87 265	105 666	125 987	140 901
Debt securities	172 159	191 495	213 781	232 901	227 187	254 711
Other investment liabilities	*63 051*	*56 479*	*62 049*	*78 236*	*88 515*	*102 399*
Trade credits	7 211	5 822	6 056	7 289	7 762	7 633
Loans	37 729	31 506	31 906	33 859	36 239	47 194
Currency and deposits	17 626	17 355	21 764	34 159	40 620	43 342
Other liabilities	485	1 795	2 322	2 929	3 895	4 230

(a) Net direct investment abroad, after deduction of liabilities to direct investment enterprises abroad. (b) Net direct investment in Australia, after deduction of claims of Australian direct investment enterprises on direct investors.

Source: Balance of Payments and International Investment Position, Australia (5302.0).

An account of investment in and by the six colonies

Australia's International Investment Position summarises Australia's financial assets and liabilities with the rest of the world. The position at any given time is the accumulation of the surpluses or deficits that Australia has produced with the rest of the world over time, mainly as a result of its trade and the receipt and payment of income on investments. In the year 2000 we have a very complete framework for the quarterly compilation of Australia's International Investment Position. Interest by users extends to direction of investment, type and instrument of investment and into sector and industry of investment. However, this complete and detailed framework has been developed quite recently. In 1901 statisticians focused very much on 'real' activity, such as buying and selling, imports and exports, and any investment statistics were calculated and published in bits and pieces, depending on the interests of the compiler or author, giving us a very fragmented picture.

At the beginning of the century, the only source of funds invested in Australia was the United Kingdom. Coghlan[1] states that total foreign investment in Australia (both equity and debt) at the end of 1901 was £320m, or £83 11s 4d per inhabitant. In current prices that is equivalent to $31b, or $8,000 per inhabitant. By June 2000, foreign investment in Australia had increased over twenty fold to $677b, or $35,568 per inhabitant. Writing in 1902, Coghlan's main concern is easily recognisable today. He was worried about "the tribute paid yearly by Australasia to London", or the ability of Australia (and New Zealand) to service their debts.

Coghlan records the annual servicing of this debt at £13m, a rate of 4% per annum.

In 1901 the public sector received 60% of the foreign investment, while the private sector received 40%. While we do not know much about the composition of this foreign investment beyond the public/private split, Butlin[2] has published data on flows which tell us that, of new debt being incurred in 1900, 64% was public borrowing. Of the remainder, the most significant flow was investment in the mining industry.

Throughout the century, Australia continued to rely on overseas funds to finance investment. During the first half of the century, the sources of these funds were limited, with most continuing to come from the United Kingdom.

It was not until the late 1940s that the first reasonably comprehensive surveys of investment in Australia and by Australia overseas were conducted by the Commonwealth Statistician.[3] While the scope and definitions differ considerably and we are unable to compare the data directly with today's data, they give us a reasonable picture of the situation about half way through the century, and we can make some indicative comparisons using proportions. Table 30.16 shows the proportion of equity investment in Australia by country in 1949 and 1999, using the set of countries published for 1949.

30.16 FOREIGN INVESTMENT IN AUSTRALIA, Equity—1949 and 1999

	1949	1999
	%	%
Country of investor		
United Kingdom	73.3	35.1
New Zealand	5.4	3.5
Canada	2.0	0.7
United States of America	15.1	32.4
Other countries	4.2	28.3
Total	100.0	100.0

Source: The Australian Balance of Payments 1928–29 to 1948–49 (Commonwealth Bureau of Census and Statistics); International Investment Position, Australia, 1998–99: Supplementary Country Statistics (5352.0).

In 1999 the main contributors to 'Other countries', were Japan, with 5.4% of total foreign investment, the Netherlands 3.2%, Germany 2.2% and Switzerland 2.1%.

Table 30.17 shows the proportion of equity investment by Australia abroad by investee country in 1949 and 1999, using the 1949 set of countries.

30.17 AUSTRALIAN INVESTMENT ABROAD, Equity—1949 and 1999

	1949	1999
	%	%
Country of investee		
United Kingdom	29.9	24.4
New Zealand	41.3	5.5
Canada	2.5	1.5
United States of America	1.0	41.0
Other countries	25.3	27.6
Total	100.0	100.0

Source: The Australian Balance of Payments 1928–29 to 1948–49 (Commonwealth Bureau of Census and Statistics); International Investment Position, Australia, 1998–99: Supplementary Country Statistics (5352.0).

Of Australian investment in 'Other countries' in 1999, the main investee countries are Japan, with 4.6% of total Australian investment abroad, Hong Kong (SAR of China) 2.8%, and Netherlands 2.6%.

As well as the main source of equity funding, the United Kingdom remained the main source of debt funding throughout the first half of the century. As an example, of the overseas public debt liabilities in 1949, 90% was domiciled in London, with the remainder domiciled in New York. In 1999 the main sources of debt financing (both public and private) were from the United States of America, with 22.8% of total debt, the United Kingdom 18.1%, International Capital Markets 15.7%, Japan 8.6%, Singapore 4.4% and Hong Kong (SAR of China) 4.3%.

The second half of the century was typified by a diversification of the sources of both equity and debt funding and by increasing levels and diversity of Australian investment abroad.

During the 1920s and again during the 1980s, a political issue was debt incurred to pay for levels of imports which could not be sustained using only receipts from exports, with many claiming that we were "living beyond our means". This debate is alive again in the year 2000, and one wonders, if Coghlan were still with us, to what extent he would worry about "the tribute paid yearly by Australia to New York and Tokyo".

Endnotes

1. Coghlan T.A. 1902, *A Statistical Account of the Seven Colonies of Australia, 1901–1902*, The Government of New South Wales and the Commonwealth of Australia, William Applegate Gullick, Government Printer, Sydney.

2. Cited in Vamplew, W. (ed.) 1987, *Australians: Historical Statistics*, Fairfax, Syme and Weldon Associates, Broadway, New South Wales.

3. Commonwealth Bureau of Census and Statistics 1950, *The Australian Balance of Payments 1928–29 to 1948–49*, Canberra.

Ratios

Table 30.18 and graph 30.19 show that the ratio of the current account deficit to GDP was 5.3% in 1999–2000, down marginally on the previous year but above the average for the last ten years.

Graph 30.20 shows that the ratio of Australia's net foreign liabilities (Australia's net international investment position) to GDP has been rising since 30 June 1988 and reached its highest level of nearly 64% at 30 June 2000. The ratio of net foreign debt to GDP was 42.4% at 30 June 2000, up on the results for recent years. The ratio of net foreign equity to GDP, 21.5% at 30 June 2000, is up less than one percentage point on the ratio as at 30 June 1999, but is double the ratio ten years earlier.

Table 30.18 shows that the net investment income payable on net foreign debt as a percentage of goods and services credits was 9.8% in 1999–2000, up marginally on the previous year. The ratio of net investment income payable on equity to goods and services credits was 4.9% in 1999–2000, down significantly on the ratio for the previous five years.

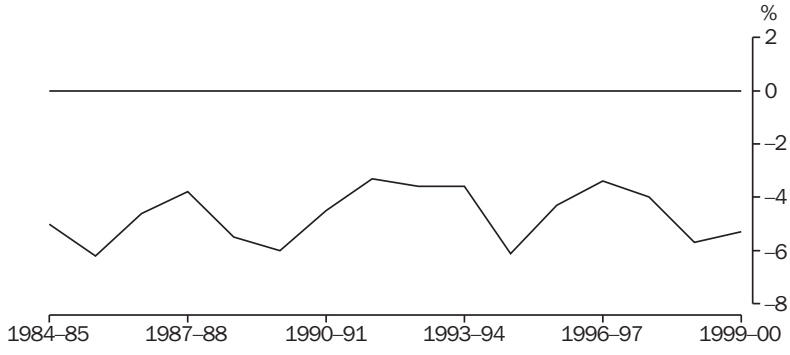
30.18 RATIOS

	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
	$ MILLION					
GDP(a)	473 381	506 975	532 170	564 653	595 417	632 290
	RATIOS TO GDP (%)					
Current account	–6.1	–4.3	–3.4	–4.0	–5.7	–5.3
Goods and services	–2.1	–0.4	0.3	–0.8	–2.5	–2.4
Credits	18.5	19.5	19.8	20.2	18.8	19.9
Debits	–20.6	–19.9	–19.5	–21.0	–21.3	–22.3
Income	–3.8	–3.9	–3.6	–3.2	–3.1	–2.9
Net international investment position(b)	53.9	55.4	56.9	57.5	60.0	63.9
Net foreign equity	14.5	16.9	16.9	16.5	21.0	21.5
Net foreign debt	39.4	38.5	40.0	41.0	39.0	42.4
	RATIOS TO GOODS AND SERVICES CREDITS (%)					
Net investment income	–20.9	–19.9	–18.5	–15.8	–16.3	–14.7
Net foreign equity	–8.6	–8.4	–7.2	–6.1	–7.1	–4.9
Net foreign debt	–12.3	–11.5	–11.3	–9.7	–9.3	–9.8

(a) GDP at current prices, Australian National Accounts: National Income, Expenditure and Product (5206.0). (b) These ratios are derived by expressing net foreign liabilities at end of year as a percentage of GDP at current prices for that year.

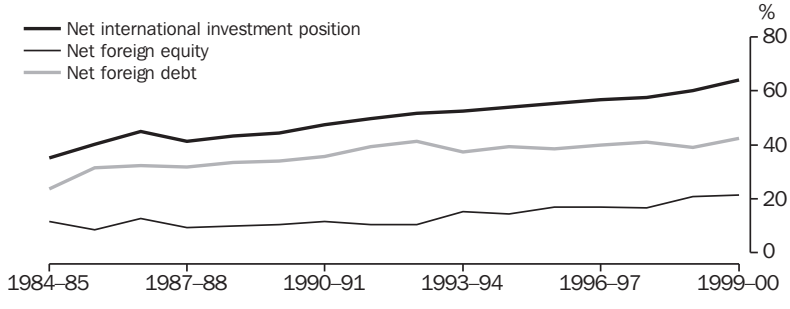
Source: Balance of Payments and International Investment Position, Australia (5302.0).

30.19 RATIO OF BALANCE ON CURRENT ACCOUNT TO GDP



Source: Balance of Payments and International Investment Position, Australia (5302.0); Australian National Accounts: National Income, Expenditure and Product (5206.0).

30.20 RATIOS OF NET INTERNATIONAL INVESTMENT POSITION TO GDP



(a) These ratios are derived by expressing net foreign liabilities at end of year as a percentage of GDP at current prices for that year.

Source: Balance of Payments and International Investment Position, Australia (5302.0); Australian National Accounts: National Income, Expenditure and Product (5206.0).

Foreign ownership in Australia

Table 30.21 shows that the value of equity on issue by Australian enterprise groups at 30 June 2000 stood at $1,132.6b. Of this total, 70% related to shares or equivalent equity interests issued by corporate trading enterprises. Banks accounted for a further 12% of total equity issued, while lesser amounts were issued by non-bank deposit taking institutions (1% of the total); the central bank (1%) and other financial sub-sectors, including life offices and superannuation funds (15%).

Of the total equity on issue by Australian enterprise groups at 30 June 2000, non-residents held equity valued at $313.2b (28%), while residents held $819.4b (72%).

Although the proportion of equity held by non-residents has remained relatively stable at around 28%, the total value of equity on issue has increased by 78%, from $637.5b to $1,132.6b, over the period 30 June 1996 to 30 June 2000.

Analysed by sub-sector, at 30 June 2000 non-residents held 31% of the equity in corporate trading enterprises, which has changed little over recent years. The value of equity on issue by corporate trading enterprises at 30 June 2000 increased by 11% on the previous year.

The amount issued by banks has increased by 145% over the period 30 June 1996 to 30 June 2000. However, the proportion of non-resident holdings of the total equity issued by banks has only risen marginally over this period, from 25% at 30 June 1996 to 27% at 30 June 2000.

Although the value of equity issued by life offices, superannuation funds and other financial institutions has more than tripled over the period 30 June 1996 to 30 June 2000, the foreign ownership of this equity has fallen from 20% at 30 June 1996 to 13% at 30 June 2000.

Data for equity on issue by unlisted corporations are of lesser quality than the data supplied by the Australian Stock Exchange for listed corporations. Data for unlisted corporations are compiled from returns supplied in the ABS Survey of Financial Information, ABS Survey of International Investment, selected annual reports and estimates synthesised from analysing residual items in demand and supply tables for the various share markets.

In terms of the analysis undertaken here, errors in the estimated market value of equity on issue will impact on the accuracy of estimates of the proportion of that equity owned by non-residents.

International merchandise trade

Conceptual framework

Australia's international merchandise trade statistics, relating to the exports and imports of goods, are compiled in broad agreement with the United Nations' (UN) recommendations for the compilation of international trade statistics.

The UN recommendations state that merchandise trade covers all movable goods which add to (imports) or subtract from (exports) the stock of material resources of a country as a result of their movement into or out of the country.

30.21 FOREIGN OWNERSHIP OF EQUITY(a)—At 30 June

	Unit	1996	1997	1998	1999	2000
ALL SECTORS COMBINED						
Amount issued	$b	637.5	756.7	878.4	990.5	1 132.6
Amount held by rest of the world	$b	190.5	215.3	240.0	277.7	313.2
Percentage of foreign ownership	%	30	28	27	28	28
SUB-SECTORS						
Corporate trading enterprises(b)						
Amount issued(c)	$b	502.4	563.0	608.5	722.3	798.2
Amount held by rest of the world	$b	161.2	178.6	185.8	219.8	248.7
Percentage of foreign ownership	%	32	32	31	30	31
Banks						
Amount issued(c)	$b	57.3	92.5	103.6	112.8	140.2
Amount held by rest of the world	$b	14.2	19.2	28.5	33.2	38.0
Percentage of foreign ownership	%	25	21	28	29	27
Non-bank deposit taking institutions						
Amount issued(c)	$b	16.1	15.9	15.8	16.3	16.9
Amount held by rest of the world	$b	4.8	4.7	5.0	4.3	4.4
Percentage of foreign ownership	%	30	29	32	26	26
Other financial sub-sectors(d)						
Amount issued(c)	$b	52.4	75.7	138.0	128.1	166.8
Amount held by rest of the world	$b	10.4	12.8	20.8	20.4	22.1
Percentage of foreign ownership	%	20	17	15	16	13
Central bank						
Amount issued(e)(f)	$b	9.4	9.7	12.6	10.9	10.4

(a) Equity includes units in trusts. (b) Includes private non-financial corporations, and Commonwealth, State and local public non-financial corporations. (c) These estimated market values are considered to be of poor quality. They should be used cautiously. (d) Includes life offices and superannuation funds, central borrowing authorities, and other financial institutions. (e) Net asset values. (f) There is no foreign ownership in this sub-sector.

Source: Australian National Accounts: Financial Accounts (5232.0); Balance of Payments and International Investment Position, Australia (5302.0).

The UN definition excludes:

- direct transit trade, i.e. goods being trans-shipped or moved through Australia for purposes of transport only;
- ships and aircraft moving through Australia while engaged in the transport of passengers or goods between Australia and other countries; and
- non-merchandise trade, consisting primarily of goods moving on a temporary basis (e.g. mobile equipment, goods under repair and goods for exhibition) and passengers' effects.

International merchandise trade statistics are compiled by the ABS from information submitted by exporters and importers or their agents to the Australian Customs Service.

The UN recommendations for the compilation of merchandise trade statistics recognise that the basic sources used by most compiling countries—customs records—will not be able to capture certain transactions. In Australia the following types of goods, which fall within the scope of the UN definition of merchandise trade, are excluded because customs entries are not required:

- parcel post exports for values not exceeding $2,000 and parcel post imports for values not exceeding $1,000; and
- migrants' and passengers' effects exported or imported.

For exports only, types of goods excluded are:

- fish and other sea products landed abroad directly from the high seas by Australian ships; and
- individual transaction lines (within an export consignment) where the value of the goods is less than $500.

For imports only, types of goods excluded are:

- bunkers, aviation fuel and stores supplied abroad to Australian ships and aircraft; and
- consignments screened free or entered on informal clearance documents for values not exceeding $250. From July 1998 individual transactions lines (within a formally entered import consignment), where the value of goods is less than $250, are not processed by the ABS and are also excluded.

Classification

In addition to the primary classification between exports and imports, international merchandise trade is also classified by commodity, by country of origin/destination, by Australian State of production/destination, and by industry of origin.

Export and import commodity statistics are available classified according to:

- the *Harmonized System*, a World Customs Organization classification which groups goods according to their component materials, from raw materials through to processed and manufactured products;
- the codes and descriptions of the third revision of the United Nations *Standard International Trade Classification (SITC Rev. 3)*. This classification groups commodities according to the degree of processing they have undergone, from food and crude raw materials through to highly transformed manufactures; and
- the 19 categories of the United Nations *Classification by Broad Economic Categories (BEC)*. The BEC classifies international trade statistics for the purposes of general economic analysis according to the main end use of the commodities traded.

Commodity export and import statistics in this section are presented according to SITC Rev. 3.

Valuation

For exports, the point of valuation adopted is free-on-board (f.o.b.) at the Australian port of shipment, while the basis of valuation is 'transactions value', the actual price at which the goods are sold.

For imports, the point of valuation is the point of containerisation (in most cases), or f.o.b. at the customs frontier of the exporting country or the port of loading, whichever comes first. The basis of valuation is the customs value. For transactions between independent buyers and sellers, this will generally be the price actually payable. Where traders are not independent (for example if they are related or affiliated in some way), an appropriate customs value may be determined.

Total merchandise exports and imports

In 1999–2000, Australian merchandise exports rose by 13.1% to $97,255m and Australian merchandise imports rose by 12.8% to $110,083m. Imports exceeded exports by $12,828m, an increase of $1,209m on the $11,619m deficit recorded in 1998–99 (table 30.22 and graph 30.23).

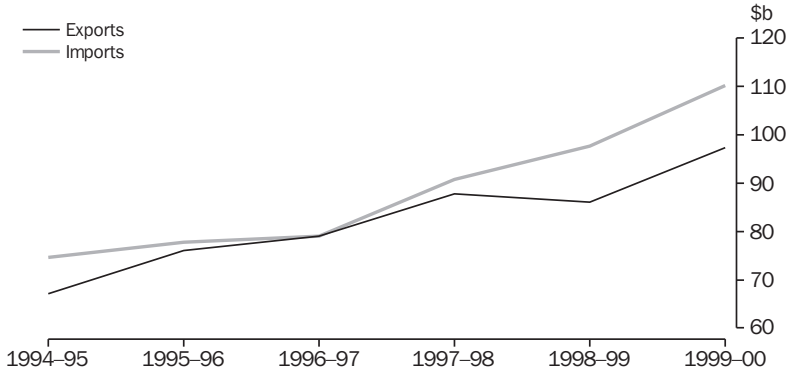
30.22 TOTAL MERCHANDISE EXPORTS AND IMPORTS

Financial year	Exports $m	Imports $m	Excess of exports or imports(a) $m
1994–95	67 052	74 619	–7 567
1995–96	76 005	77 792	–1 787
1996–97	78 932	78 998	–66
1997–98	87 769	90 684	–2 915
1998–99	85 991	97 611	–11 620
1999–00	97 255	110 083	–12 828

(a) A negative sign indicates that imports exceed exports.

Source: International Merchandise Trade (5422.0).

30.23 TOTAL MERCHANDISE EXPORTS AND IMPORTS



Source: International Merchandise Trade (5422.0).

Merchandise exports and imports by country

In Australian merchandise trade statistics, external territories under Australian administration are treated as separate countries, as are some self-governing territories and dependent territories under the administration of other countries.

Country has a different meaning for exports and imports. For exports, country refers to the country to which the goods were consigned at the time of export. For imports, country refers to the country of origin of the goods, that is, where the majority of processing of the goods takes place. Where the country of consignment/origin is not known at the time of export/import, goods are recorded as Destination Unknown (exports) or Origin Unknown (imports).

Graphs 30.24 and 30.25 show, respectively, Australia's merchandise exports to selected countries and Australia's merchandise imports from selected countries in 1999–2000. Table 30.26 shows merchandise trade for the last three financial years, classified by country and the two country groups APEC and the European Union. Map 30.27 shows Australia's net balance of trade with the rest of the world in 1999–2000.

The main contributors to the $1,208m increase in the merchandise trade deficit for 1999–2000 were:

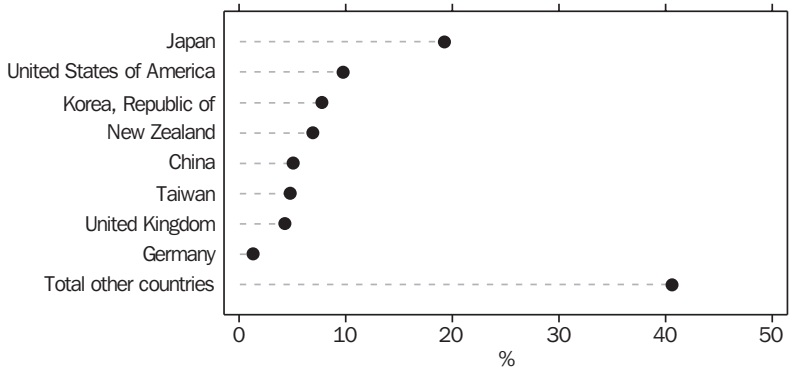
- a $1,127m rise in the deficit with the United Kingdom as a result of a rise in imports of $811m (mainly Telecommunications and sound recording and reproducing apparatus and equipment; and Transport equipment, excluding road vehicles);

- a $516m rise in the deficit with the United States of America as a result of a rise in imports of $2,110m (mainly Transport equipment excluding road vehicles; and Telecommunications and sound recording and reproducing apparatus and equipment); and
- a $402m rise in the deficit with China as a result of a rise in imports of $1,414m (mainly Articles of apparel and clothing) which was partly offset by a rise in exports of $1,011 (mainly Petroleum, petroleum products and related materials; and Combined confidential items of trade and commodities n.e.s.).

These were partly offset by:

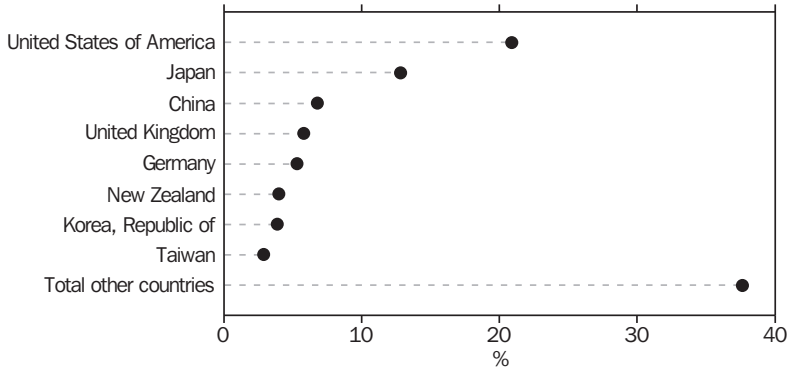
- a $1,683m increase in the surplus with Japan as a result of a rise in exports of $2,234m (mainly Petroleum, petroleum products and related materials; and Combined confidential items of trade and commodities n.e.s.) which was partly offset by a rise in imports of $551m (mainly Road vehicles including air-cushion vehicles; and Office machines and automatic data processing machines);
- a $878m increase in the surplus with the Republic of Korea as a result of a rise in exports of $1,295m (mainly Petroleum, petroleum products and related materials) which was partly offset by a rise in imports of $417m (mainly Telecommunications and sound recording and reproducing apparatus and equipment); and
- a $126m fall in the deficit with Germany as a result of a fall in imports of $290m (mainly Road vehicles including air-cushion vehicles and General industrial machinery and equipment).

30.24 AUSTRALIAN MERCHANDISE EXPORTS, Selected Countries—1999–2000



Source: International Merchandise Trade, Australia (5422.0).

30.25 AUSTRALIAN MERCHANDISE IMPORTS, Selected Countries—1999–2000



Source: International Merchandise Trade, Australia (5422.0).

30.26 MERCHANDISE EXPORTS AND IMPORTS, By Country

	Exports			Imports		
	1997–98	1998–99	1999–00	1997–98	1998–99	1999–00
	$m	$m	$m	$m	$m	$m
Asia Pacific Economic Cooperation (APEC)						
Australia (Re-imports)	. .	. .	. .	344	333	460
Brunei Darussalum	52	49	40	5	11	211
Canada	1 276	1 274	1 176	1 436	1 547	1 854
Chile	178	212	129	81	68	61
China	3 872	3 748	4 959	5 303	6 106	7 494
Hong Kong (SAR of China)	4 138	3 071	3 208	1 031	1 228	1 277
Indonesia	2 751	2 199	2 401	2 868	3 275	2 701
Japan	17 582	16 566	18 800	12 660	13 587	14 139
Korea, Republic of	6 397	6 320	7 615	3 767	3 894	4 310
Malaysia	2 097	1 859	2 138	2 404	2 845	3 769
Mexico	216	314	254	270	365	381
New Zealand	5 663	5 838	6 731	3 723	3 950	4 371
Papua New Guinea	1 152	1 014	926	768	781	1 380
Peru	64	55	42	14	20	36
Philippines	1 163	1 208	1 304	418	405	457
Russian Federation	224	170	189	17	23	59
Singapore	3 697	3 417	4 860	2 643	2 944	4 355
Taiwan	4 180	4 202	4 687	2 809	2 978	3 241
Thailand	1 390	1 306	1 703	1 480	1 902	2 423
United States of America	7 794	7 983	9 577	19 834	20 893	22 987
Viet Nam	325	349	385	664	972	1 726
Total	*64 211*	*61 154*	*71 124*	*62 539*	*68 127*	*77 692*
European Union (EU)						
Austria	32	44	51	458	474	482
Belgium-Luxembourg	1 154	1 085	1 090	739	661	737
Denmark	205	77	140	399	459	541
Finland	295	191	371	686	601	668
France	856	914	871	2 029	2 202	2 244
Germany	1 243	1 409	1 246	5 207	6 082	5 791
Greece	61	55	102	91	101	97
Ireland	66	174	134	830	1 000	937
Italy	1 752	1 564	1 574	2 614	2 916	3 044
Netherlands	829	866	1 379	847	917	990
Portugal	31	54	41	121	141	168
Spain	514	562	714	652	653	661
Sweden	157	160	169	1 557	1 575	1 642
United Kingdom	3 040	4 473	4 156	5 593	5 545	6 351
Total	*10 235*	*11 628*	*12 038*	*21 823*	*23 327*	*24 353*
Other countries						
Algeria	42	58	49	1	. .	5
Angola	4	2	2	. .	. .	. .
Argentina	109	123	96	79	86	73
Bahamas	3	4	5	6	10	11
Bahrain(a)	107	75	69	29	25	58
Bangladesh	251	289	296	51	43	54
Barbados	4	5	7	. .	1	. .
Bolivia	2	1	1	6	2	3
Brazil	408	447	470	363	342	441
Bulgaria	23	26	3	6	7	6
Cambodia	10	14	11	1	1	2
Christmas Island	15	13	17	7	9	9
Cocos (Keeling) Island	5	4	5	. .	. .	. .
Colombia	30	19	25	21	19	18

For footnotes see end of table.

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30.26 MERCHANDISE EXPORTS AND IMPORTS, By Country—*continued*

	Exports			Imports		
	1997–98	1998–99	1999–00	1997–98	1998–99	1999–00
	$m	$m	$m	$m	$m	$m
Other countries —(*continued*)						
Cook Islands	5	6	5	1	2	3
Costa Rica	2	3	5	9	27	21
Cote d'Ivoire	2	1	7	8	13	11
Croatia	10	6	2	8	8	10
Cuba	1	3	2	4	4	5
Cyprus	9	14	12	4	3	4
Czech Republic	60	53	58	50	67	68
Dominican Republic	6	16	11	2	3	3
Ecuador	19	9	3	2	3	3
Egypt(a)	343	588	502	14	11	16
Ethiopia	11	20	7	2	2	2
Fiji	526	556	592	307	349	355
French Polynesia	120	102	171	5	8	6
Ghana	63	56	57	6	7	6
Guam	16	18	19	. .	. .	. .
Guatemala	11	19	9	5	4	3
Hungary	15	7	7	56	66	78
Iceland(a)	6	4	3	4	3	3
India	1 852	1 837	1 595	687	666	714
Iran	274	450	410	25	27	29
Iraq	318	267	456	16	143	74
Israel	122	159	191	387	386	443
Jamaica	13	19	46	1	1	1
Jordan	64	88	87	30	26	12
Kenya	37	78	54	18	21	16
Kiribati	20	28	27	. .	1	. .
Kuwait	178	274	299	92	54	106
Laos	2	4	2	. .	. .	1
Lebanon	33	40	57	6	7	7
Libya	124	58	33	. .	. .	. .
Lithuania	6	9	3	1	1	3
Macau (SAR of China)	8	15	16	9	7	7
Madagascar	2	7	4	1	1	1
Malawi	3	2	1	6	6	7
Maldives	4	6	7	. .	. .	. .
Malta	13	13	13	6	4	5
Marianas, Northern	3	3	2	1	. .	. .
Marshall Islands	4	6	6	. .	. .	. .
Mauritius	91	106	109	2	2	3
Micronesia, Federated States of	16	16	13	. .	. .	. .
Morocco	39	29	13	19	26	27
Mozambique	22	21	36	. .	. .	. .
Myanmar	26	13	17	13	12	17
Namibia	2	5	58	6	8	8
Nauru	27	17	23	10	6	7
Nepal	6	15	6	2	1	3
Netherlands Antilles	7	66	5	2	1	—
New Caledonia	183	184	200	41	46	48
Nigeria	17	14	19	. .	12	61
Norfolk Island	14	17	18	. .	1	1
Norway	147	159	113	206	206	149
Oman	196	131	203	19	16	86
Pakistan	467	475	532	173	162	156
Palau	2	1	2	. .	. .	. .
Panama	7	2	20	1	. .	. .

For footnotes see end of table.

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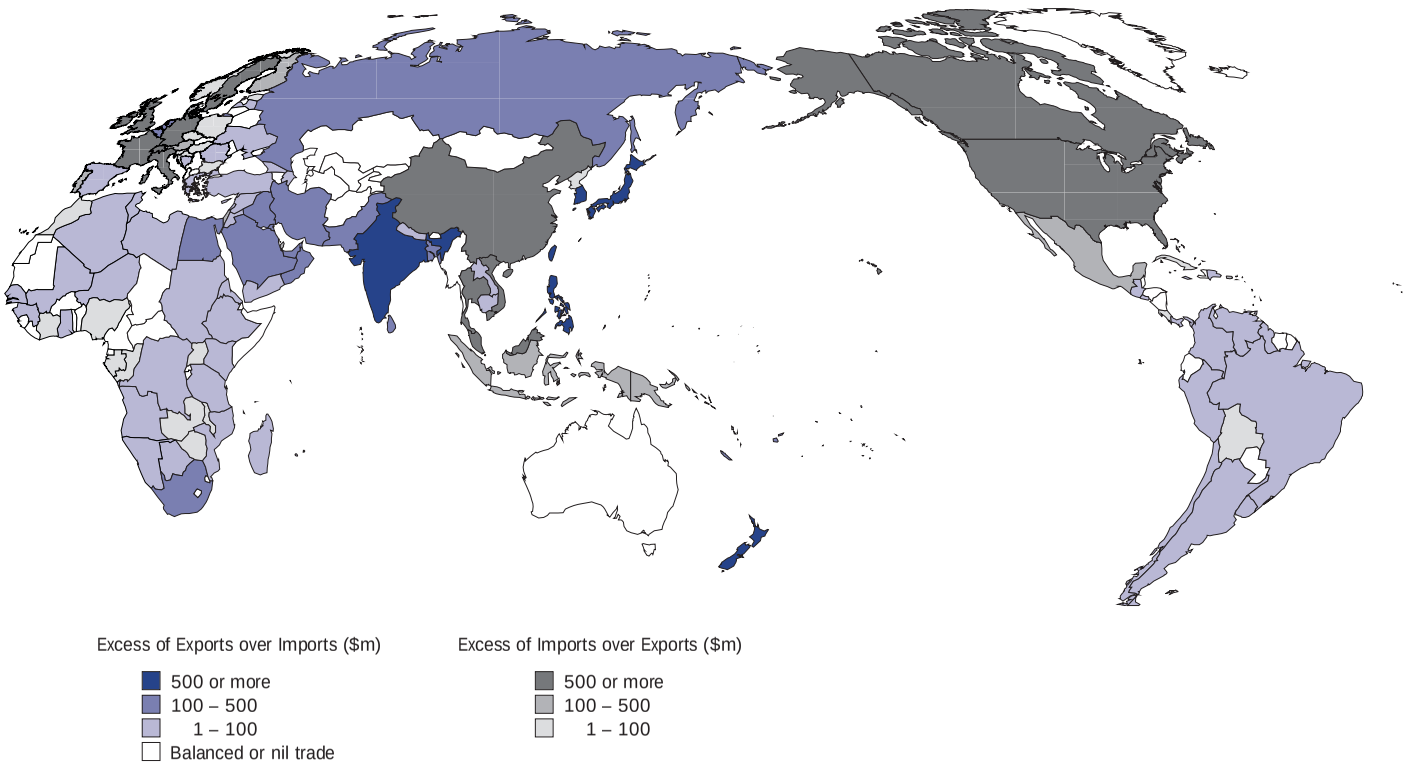
30.26 MERCHANDISE EXPORTS AND IMPORTS, By Country—*continued*

	Exports			Imports		
	1997–98	1998–99	1999–00	1997–98	1998–99	1999–00
	$m	$m	$m	$m	$m	$m
Other countries —(*continued*)						
Poland	38	22	20	90	35	38
Puerto Rico	8	7	6	122	124	192
Qatar	59	67	69	167	74	170
Romania	96	78	62	7	9	9
Samoa	35	31	41	56	56	58
Samoa (American)	18	14	46	6	4	3
Saudi Arabia	545	1 060	1 333	648	532	1 002
Seychelles	9	7	5	1	. .	. .
Slovak Republic	4	4	6	4	8	6
Slovenia	7	12	11	30	35	33
Solomon Islands	101	98	83	6	4	4
South Africa	1 093	943	1 039	582	537	748
Sri Lanka	179	241	221	74	75	76
Sudan	36	50	67	. .	. .	46
Switzerland	1 097	443	319	950	1 092	1 281
Syria	8	14	16	1	1	1
Tanzania	35	70	84	5	5	5
Tonga	19	17	15	1	1	1
Trinidad and Tobago	27	29	35	1	1	1
Tunisia	10	15	6	5	16	3
Turkey	636	349	230	112	114	134
Uganda	4	2	6	6	6	15
Ukraine	12	9	31	2	8	7
United Arab Emirates	1 006	835	874	492	201	401
United States Virgin Islands	8	1	1	6	1	1
Uruguay	9	11	11	3	6	4
Vanuatu	44	49	53	1	1	1
Venezuela	12	15	14	2	2	1
Wallis & Futuna Islands	5	8	7	. .	. .	. .
Yemen	144	119	131	. .	42	67
Zimbabwe	48	15	9	18	12	16
Zone of Co-op A—Timor Gap	132	25	28	. .	41	64
Other countries	145	284	184	25	78	105
Destination or Origin Unknown	. .	1	2	57	61	219
International Waters	208	125	626	. .	. .	. .
No Country Details(a)	315	412	444	. .	. .	. .
Ships' Stores	579	467	734	. .	. .	. .
Unidentified(b)	. .	65	. .	. .	. .	. .
Total	*13 318*	*13 209*	*14 093*	*6 317*	*6 157*	*7 981*
Total	**87 769**	**85 991**	**97 255**	**90 684**	**97 611**	**110 083**

(a) Exports of alumina to Bahrain, Egypt and Iceland are excluded from country totals and included in the 'No country details' category. (b) Includes $45m of exports for June 2000 which cannot yet be allocated by country.

Source: International Merchandise Trade (5422.0).

30.27 AUSTRALIA'S NET BALANCE OF TRADE, Partner Countries—1999–2000



Merchandise exports and imports by commodity

Commodity export and import statistics are presented according to the codes and descriptions of the third revision of the United Nations' *Standard International Trade Classification (SITC Rev. 3)*. This classification groups commodities according to the degree of processing they have undergone, from food and crude raw materials through to highly transformed manufactures.

Table 30.28 shows the value of all exports and imports, at a broad commodity level, for the two years 1998–99 and 1999–2000, and the percentage contribution to total exports and imports for 1999–2000.

For the year ended June 2000, exports were $97,255m, up $11,263m (13%) on the previous financial year. The most significant contributors to the increase were Non-ferrous metals, up $1,954m (36%) to $7,398m; Petroleum, petroleum products and related materials, up $3,998m (128%) to $7,129m; and Special transactions and commodities not classified according to kind, up $1,116m (104%) to $2,189m. Special transactions and commodities not classified according to kind includes Mixed goods (including ship and aircraft stores), Re-exports and Goods re-exported from Australia after industrial processing.

Australia's major commodity exports for 1999–2000 and their principal markets were:

- Coal, $8,333m—9% of total exports: Japan (46% of total coal exports), the Republic of Korea (9%), India (7%), and Taiwan (6%);
- Non-monetary gold, $5,090m—5% of total exports: Singapore (40% of total non-monetary gold exports), the United Kingdom (15%), the Republic of Korea (13%) and Hong Kong (7%). This comprises gold produced in Australia, and gold previously imported for refining or manufacturing;
- Crude petroleum products, $4,865m—5% of total exports: Republic of Korea (23% of total Crude petroleum products exports), United States of America (18%); Singapore (17%), Japan (15%) and Taiwan (12%);
- Iron ore, $3,820m—4% of total exports: Japan (45% of total iron ore exports), China (23%), and the Republic of Korea (14%);
- Wheat, $3,412m—4% of total exports; principal market information is confidential; and
- Alumina, $3,406m—4% of total exports; principal market information is confidential.

For the year ended June 2000, imports were $110,083m, up $12,472m (13%) on the previous year. The most significant rises were recorded for: Petroleum, petroleum products and related materials, up $3,017m (67%) to $7,543m; Telecommunications and sound recording and reproducing apparatus and equipment, up $1,181m (38%) to $6,808m; Transport equipment (excluding road vehicles), up $2,428m (85%) to $5,276m; Medicinal and pharmaceutical products, up $487m (16%) to $3,520m; Organic chemicals, up $487m (20%) to $2,874m; Power generating machinery and equipment, up $394m (17%) to $2,659m; and, Non-metallic mineral manufactures n.e.s., up $336m (21%) to $1,915m.

Australia's major commodity imports for 1999–2000 and their principal sources were:

- Cars and other passenger motor vehicles, $6,911m—6% of total imports: Japan (59% of total passenger motor vehicle imports), Germany (12%), and the Republic of Korea (10%);
- Telecommunications equipment, $6,808m—6% of total imports: the United States of America (19% of total telecommunications equipment imports), the United Kingdom (13%), the Republic of Korea (12%), and Japan (12%);
- Crude petroleum oils, $5,941m—5% of total imports: Viet Nam (24% of total crude petroleum imports), Indonesia (15%), Papua New Guinea (15%), Malaysia (11%) and Saudi Arabia (8%);
- Computing equipment, $4,900m—4% of total imports: the United States of America (20% of total computing equipment imports), Singapore (18%), Malaysia (15%), Taiwan (13%) and Japan (11%); and
- Aircraft, $4,315m—4% of total imports: the United States of America (76% of total aircraft imports), the United Kingdom (13%) and Canada (7%).

30.28 MERCHANDISE EXPORTS AND IMPORTS, By Commodity

	Exports			Imports		
Standard International Trade Classification	1998–99 $m	1999–00 $m	% contribution	1998–99 $m	1999–00 $m	% contribution
Food and live animals						
Live animals other than fish, crustaceans, molluscs and aquatic invertebrates	616	733	0.8	122	128	0.1
Meat and meat preparations	4 000	4 459	4.6	73	155	0.1
Dairy products and birds' eggs	2 225	2 382	2.4	263	268	0.2
Fish (not marine mammals), crustaceans, molluscs and aquatic invertebrates, and preparations thereof(a)	1 220	1 536	1.6	745	781	0.7
Cereals and cereal preparations(a)	5 041	4 939	5.1	244	266	0.2
Vegetables and fruit(a)	1 141	1 304	1.3	715	737	0.7
Sugars, sugar preparations and honey(a)	150	173	0.2	106	110	0.1
Coffee, tea, cocoa, spices, and manufactures thereof	190	232	0.2	661	610	0.6
Feeding stuff for animals (excl. unmilled cereals)(a)	553	676	0.7	146	152	0.1
Miscellaneous edible products and preparations	317	367	0.4	685	749	0.7
Total(a)	*15 453*	*16 801*	*17.3*	*3 760*	*3 955*	*3.6*
Beverages and tobacco						
Beverages	1 174	1 513	1.6	453	542	0.5
Tobacco and tobacco manufactures	64	57	0.1	169	165	0.1
Total	*1 238*	*1 570*	*1.6*	*622*	*707*	*0.6*
Crude materials, inedible, except fuels						
Hides, skins and furskins, raw(a)	393	413	0.4	2	3	0.0
Oil seeds and oleaginous fruits	701	809	0.8	62	81	0.1
Crude rubber (incl. synthetic and reclaimed)	9	13	0.0	110	108	0.1
Cork and wood	689	778	0.8	477	618	0.6
Pulp and waste paper	26	42	0.0	202	232	0.2
Textile fibres and their wastes (not manufactured into yarn or fabric)(a)	4 070	4 293	4.4	135	151	0.1
Crude fertilisers and crude minerals (excl. coal, petroleum and precious stones)(a)(b)	415	441	0.5	179	170	0.2
Metalliferous ores and metal scrap(a)	10 665	11 308	11.6	174	203	0.2
Crude animal and vegetable materials, n.e.s.	251	271	0.3	271	283	0.3
Total(a)(b)	*17 219*	*18 369*	*18.9*	*1 611*	*1 848*	*1.7*
Mineral fuels, lubricants and related materials						
Coal, coke and briquettes	9 302	8347	8.6	25	20	0.0
Petroleum, petroleum products and related materials(b)	3 133	7 129	7.3	4 526	7 543	6.9
Gas, natural and manufactured	1 727	2 590	2.7	70	117	0.1
Total(b)	*14 162*	*18 066*	*18.6*	*4 621*	*7 680*	*7.0*
Animal and vegetable oils, fats and waxes						
Animal oils and fats(a)	256	212	0.2	8	8	0.0
Fixed vegetable fats and oils, crude, refined or fractionated(a)	70	43	0.0	261	232	0.2
Fats and oils (processed), waxes and inedible mixtures or preparations, of animal or vegetable origin, n.e.s.	52	47	0.0	27	36	0.0
Total(a)	*377*	*302*	*0.3*	*296*	*277*	*0.3*

For footnotes see end of table.

...continued

30.28 MERCHANDISE EXPORTS AND IMPORTS, By Commodity—*continued*

	Exports			Imports		
Standard International Trade Classification	1998–99 $m	1999–00 $m	% contribution	1998–99 $m	1999–00 $m	% contribution
Chemical and related products, n.e.s.						
Organic chemicals(a)(b)	167	128	0.1	2 388	2 874	2.6
Inorganic chemicals(a)(b)	314	453	0.5	752	682	0.6
Dyeing, tanning and colouring materials	522	550	0.6	483	518	0.5
Medicinal and pharmaceutical products(a)	1 331	1 714	1.8	3 041	3 520	3.2
Essential oils and resinoids and perfume materials; toilet, polishing and cleansing preparations	299	343	0.4	850	915	0.8
Fertilisers (excl. crude)(a)	34	45	0.0	785	717	0.7
Plastics in primary forms(a)(b)	242	210	0.2	992	1 093	1.0
Plastics in non-primary forms	167	192	0.2	895	937	0.9
Chemical materials and products, n.e.s.	499	558	0.6	1 249	1 241	1.1
Total(a)(b)	*3 575*	*4 193*	*4.3*	*11 435*	*12 498*	*11.4*
Manufactured goods classified chiefly by material						
Leather, leather manufactures, and dressed furskins, n.e.s.	449	460	0.5	148	160	0.1
Rubber manufactures, n.e.s.(b)	176	169	0.2	1 272	1 256	1.1
Cork and wood manufactures (excl. furniture)(a)	124	138	0.1	456	567	0.5
Paper, paperboard, and articles of paper pulp, of paper or of paperboard(a)(b)	428	542	0.6	2 082	2 330	2.1
Textile yarn, fabrics, made-up articles, n.e.s., and related products	600	598	0.6	2 588	2 633	2.4
Non-metallic mineral manufactures, n.e.s.(a)	734	965	1.0	1 579	1 915	1.7
Iron and steel(a)(b)	1 540	1 407	1.4	1 472	1 505	1.4
Non-ferrous metals(b)	5 399	7 398	7.6	850	804	0.7
Manufactures of metals, n.e.s.(b)	667	636	0.7	2 408	2 523	2.3
Total(a)(b)	*10 117*	*12 313*	*12.7*	*12 855*	*13 692*	*12.4*
Machinery and transport equipment						
Power generating machinery and equipment	713	920	0.9	2 264	2 659	2.4
Machinery specialised for particular industries	1 377	1 109	1.1	4 234	4 155	3.8
Metal working machinery	190	243	0.2	497	445	0.4
General industrial machinery and equipment, n.e.s. and machine parts, n.e.s.(a)	1 030	1 038	1.1	5 770	5 399	4.9
Office machines and automatic data processing machines	1 455	1 312	1.3	7 104	7 590	6.9
Telecommunications and sound recording and reproducing apparatus and equipment	740	1 180	1.2	4 926	6 808	6.2
Electrical machinery, apparatus, appliances,parts (incl. non-electrical counterparts of electrical domestic equipment)(a)(b)	1 322	1 321	1.4	5 870	6 234	5.7
Road vehicles (incl. air-cushion vehicles)	2 091	2 811	2.9	11 904	12 784	11.6
Transport equipment (excl. road vehicles)	1 405	1 672	1.7	2 848	5 276	4.8
Total(a)(b)	*10 324*	*11 606*	*11.9*	*45 418*	*51 349*	*46.6*

For footnotes see end of table.

...continued

30.28 MERCHANDISE EXPORTS AND IMPORTS, By Commodity—*continued*

	Exports			Imports		
Standard International Trade Classification	1998–99 $m	1999–00 $m	% contribution	1998–99 $m	1999–00 $m	% contribution
Miscellaneous manufactured articles						
Prefabricated buildings; sanitary, plumbing, heating and lighting fixtures and fittings, n.e.s.(b)	79	77	0.1	310	380	0.3
Furniture, parts thereof; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings	109	123	0.1	797	1 003	0.9
Travel goods, handbags and similar containers	13	13	0.0	366	410	0.4
Articles of apparel and clothing accessories	351	340	0.4	2 459	2 795	2.5
Footwear(a)	65	64	0.1	780	848	0.8
Professional, scientific and controlling instruments and apparatus, n.e.s.	929	1 066	1.1	2 533	2 593	2.4
Photographic apparatus, equipment and supplies and optical goods, n.e.s.; watches and clocks(b)	654	926	1.0	1 418	1 519	1.4
Miscellaneous manufactured articles, n.e.s.	1 246	1 218	1.3	5 801	5 964	5.4
Total(a)(b)	*3 447*	*3 829*	*3.9*	*14 463*	*15 512*	*14.1*
Commodities and transactions not classified elsewhere in the SITC						
Special transactions and commodities not classified according to kind	1 068	2 189	2.3	39	42	0.0
Gold coin whether or not legal tender, and other coin being legal tender	115	89	0.1	6	8	0.0
Coin (excl. gold coin), not being legal tender	5	9	0.0	0	7	0.0
Gold, non-monetary (excl. gold ores and concentrates)	6 335	5 090	5.2	2 351	2 397	2.2
Combined confidential items of trade(c)	2 565	2 829	2.9	134	112	0.1
Total(c)	*10 089*	*10 206*	*10.5*	*2 531*	*2 566*	*2.3*
Total merchandise exports and imports	**85 991**	**97 255**	**100.0**	**97 611**	**110 083**	**100.0**

(a) Excludes export commodities subject to a 'No commodity details' restriction. (b) Excludes import commodities subject to a 'No commodity details' restriction. (c) Includes commodities subject to a 'No commodity details' restriction.

Source: International Merchandise Trade (5422.0).

Trade since 1900

This article reviews Australia's merchandise trade between 1900 and 2000, drawing on official statistics beginning in 1900. Comparing data over such a long time period makes it necessary to include particular caveats:

- prior to 1950–51 the terminology Merchandise trade was not used. Publications show Australian produce and Other produce. To maintain broad equivalence between data compiled under the different definitions, Australian produce data are used for the earlier periods;
- between 1906 and 1982 ships' stores were excluded from Australian produce and merchandise trade data; and
- data used for analysis are expressed in the prices prevailing in the reference time period. No attempt has been made to remove inflationary effects from the data analysed.

In 1900 Australia exported goods valued at £40m and imported goods valued at £38m; the trade surplus, although small, was significant for the period. A century later Australia exported goods valued at $97,255m and imported goods valued at $110,083m, a trade deficit of $12,828m. Graph 30.29 shows the balance of trade as a percentage of total trade (i.e. imports plus exports) over the 20th century. On average there has been a surplus of approximately 7% of total trade over the century.

The largest percentage surplus (31%) occurred in 1931–32, shortly after the Wall Street crash in 1929 and the onset of the Great Depression. Trade surpluses continued in every year of the 1930s. Australia's largest trade surplus (in percentage terms) occurred in 1942–43, during the Second World War, at 33% of total trade. Two further years of large surpluses, 25% and 16%, occurred in 1943–44 and 1944–45. International trade in these years was, of course, at a low level because of dangers to shipping.

Australia's greatest period of trade volatility occurred in 1951–52 and 1952–53, when the balance of trade changed from a deficit of 21% to a surplus of 26% of total trade, the latter in the year in which wool achieved the all-time record price of 'a pound a pound'. The longest period of trade stability has occurred since 1982–83. Over this period the balance of trade (surplus or deficit) has not exceeded 7% of total trade, and has tended to be a deficit in most years.

Australia's trading partners

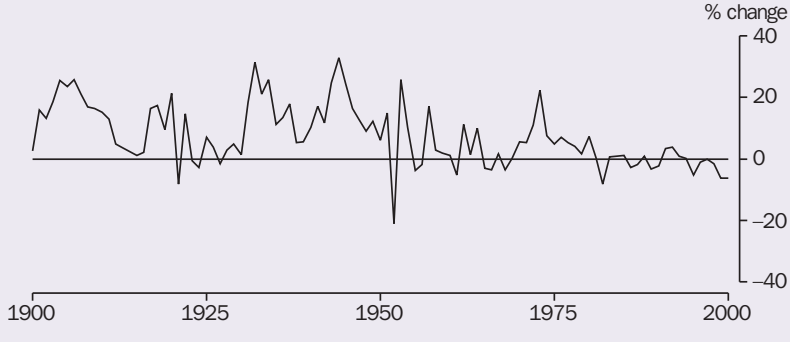
In 1900 the United Kingdom was Australia's primary trading partner. Total trade with the UK was over five times greater than the total trade with Australia's second largest trading partner, the United States of America. With the exception of the USA, the other major trading partners were either European countries or members of the British Empire, reflecting Australia's close historical association with the UK in its developing trading relationships.

By 1999–2000, the balance of Australia's trading relationships had changed significantly. Our trade focus is now firmly on the members of the Asia Pacific Economic Cooperation forum (APEC). Nine of Australia's ten major trading partners are members of APEC; the UK now ranks sixth.

The USA is currently Australia's major source of imports. As graph 30.30 shows, through the century the share of Australia's total imports coming from the USA trended upwards until 1930s, and then fell back in the last years of World War II. There was strong growth in the US share of Australian imports during the 1950s and 1960s; since then the US share has remained roughly stable.

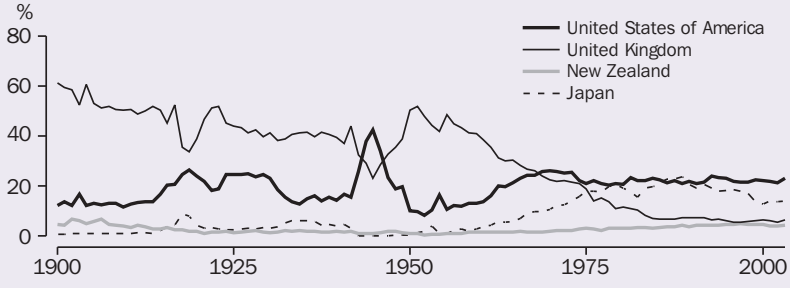
The share of Australia's total imports coming from the UK declined steadily to the end of the 1940s, and then recovered some lost ground until the mid 1950s. The UK share fell away sharply during the 1960s and 1970s (graph 30.30). The share of Australia's total imports coming from New Zealand has remained steady through most of the century, but has been rising slowly since the 1970s. The Australia–New Zealand Closer Economic Relations Trade Agreement (CER) came into effect on 1 January 1983, providing each country with easier access to the other's markets. The share of Australia's total imports coming from Japan rose rapidly from the early 1960s until the mid 1980s, but has declined slowly since.

30.29 TRADE BALANCE, Percentage of Total Trade—1900 to 2000



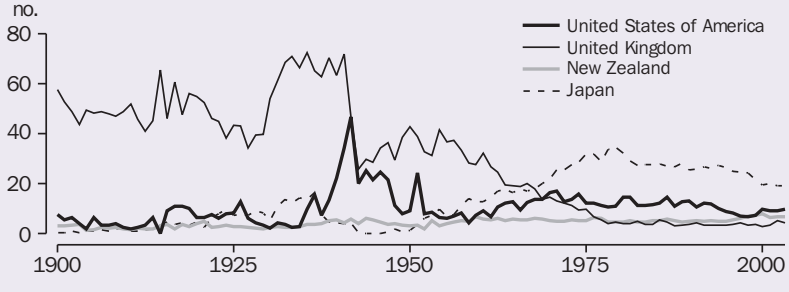
Source: Australian Exports; Country by Commodity (5411.0); Australian Imports, Country by Commodity (5414.0); International Merchandise Trade (5422.0); Lougheed 1987; Wilson 1931.

30.30 AUSTRALIA'S IMPORTS FROM SELECTED COUNTRIES, Proportion of Total Imports—1900 to 2000



Source: Trade and Customs Returns (5409.0); Commonwealth Trade (5409.0); Overseas Trade Part 1, Exports and Imports (5409.0); Australian Imports, Country by Commodity (5414.0); International Merchandise Trade (5422.0).

30.31 AUSTRALIA'S EXPORTS FROM SELECTED COUNTRIES, Proportion of Total Exports—1900 to 2000



Source: Trade and Customs Returns (5409.0); Commonwealth Trade (5409.0); Overseas Trade Part 1, Exports and Imports (5409.0); Australian Exports; Country by Commodity (5411.0); International Merchandise Trade (5422.0).

The share of Australia's total exports going to the USA rose significantly through the mid 1930s, reaching a peak in the mid 1940s (graph 30.31). From the 1950s the US share of Australian exports was fairly steady in trend terms, but has fallen in recent years. At the turn of the century, the UK was by far Australia's major export destination, receiving nearly 60% by value of total Australian exports, rising to 70% during the 1930s. It fell sharply during World War II, recovering somewhat in the post-war years and in the 1950s. It has trended down since then.

The share of Australia's total exports going to NZ has been increasing slightly over the century. In 2000 Japan is Australia's major export destination. The share of Australia's total exports going to Japan grew strongly from the 1950s, peaked in the early 1980s, and has been declining slowly since.

Modes of transport

Sea freight

In 1904, it is recorded that 1,873 vessels carried 3.4 million net tons of goods from Australian ports. Of those vessels, 48% were steam ships, the remainder sailing ships. The majority of ships entering Australian ports were registered in the UK (42%) and Australia (19%). In 1924–25, 1,723 vessels departed Australian ports carrying 5.6 million net tons of goods. Of these vessels, 97% were steam ships. Again UK registered ships made up the majority of vessels clearing Australian ports (23%).

By 1949–50, the 1,965 vessels that departed Australian ports carried 8.7 million net tons of goods. UK registered ships still comprised the greatest share (53%) of vessels entering Australian ports, but there were also ships registered in Norway, New Zealand and the United States. In 1974–75, 6,254 vessels departed Australia carrying 80.3 million net tonnes of goods. The largest proportion (21%) of vessels were Japanese. Significant proportions of UK, Liberian and Greek registered ships also entered Australian ports.

In 1999–2000, total exports by sea freight weighed 463 million tonnes. The majority of vessels were registered in Panama (24%) and Japan. Other significant sources of registration included Liberia, Hong Kong, Taiwan and Singapore. The majority of vessels were destined for Japan.

Air freight

In 1949–50 a small volume (and proportion) of overseas exports and imports was moved by air. Official statistics record four aviation companies involved in overseas freight in this early period: British Commonwealth Pacific Airlines, Qantas Empire Airways Ltd., British Overseas Airways Corporation and Tasman Empire Airways Ltd. Common destinations included the South Pacific islands, Vancouver, Tokyo, Hong Kong and London. In that year, 797 tons were flown out of Sydney.

By 1974–75, 27 million tonnes of exports from all States were carried by air, the largest proportion (8 million tonnes) going to New Zealand.

In 1999–2000 air freighted exports weighed 1,770 million tonnes. For the majority of these exports the initial destination was Singapore.

References

Australian Bureau of Statistics publications:

—*Australian Exports, Country by Commodity, 1974–75* (5411.0).

—*Australian Imports, Country by Commodity, 1974–75* (5414.0).

—*Commonwealth Trade, 1924–25* (5409.0).

—*Commonwealth Trade, 1949–50* (5409.0).

—*Exports by Mode of Transport, 1974–75* (5415.0).

—*Overseas Shipping, Cargo, 1974–75* (9207.0).

—*Overseas Trade Part 1, Exports and Imports, 1974–75* (5409.0).

—*Trade and Customs Returns, 1903* (5409.0).

—*Year Book Australia 1988* (1301.0).

Commonwealth Bureau of Census and Statistics publications:

—*Transport and Communication*, *1906* (CS 385.0), CBCS, Canberra.

—*Transport and Communication*, *1924–25* (CS 385.0), CBCS, Canberra.

—*Transport and Communication*, *1949–50* (CS 385.0), CBCS, Canberra.

Other publications:

Lougheed, A. 1987, "International Transactions and Foreign Commerce", in Wray Vamplew (ed.), *Australians: Historical Statistics*, Fairfax, Syme and Weldon Associates, Sydney.

Wilson, R. 1931, *Capital Imports and the Terms of Trade: Examined in the light of sixty years of Australian borrowings*, Melbourne University Press, Melbourne.

Export Price Index

The export price index (all groups) increased by 3.5% between 1994–95 and 1999–2000. The price of Mineral products, which increased by 23.0%, made an important contribution to this overall increase. On the other hand, the depreciation of the Australian dollar over the period (it fell by 14.9% against the US dollar, to 62.7 cents) did little to offset the falling international prices for Australian commodities. Table 30.32, showing broad commodity groups of the *Australian Harmonised Export Commodity Classification (AHECC)*, provides more details of price movement in recent years. Highlights included:

- in 1998–99 the export price index fell by 2.2%, partly due to falls in Vegetable products and Prepared foodstuffs;
- in 1999–2000 the index increased by 1.3%, mainly due to the increases in prices of Mineral products and Base metals and articles of base metals.

Import Price Index

The import price index (all groups) increased by 4.7% between 1994–95 and 1999–2000. Manufactured goods classified chiefly by material, and Miscellaneous manufactured articles, which increased by 8.9% and 11.2% respectively, were both important contributors to the overall increase. As with export prices, exchange rate movements also contributed to the increase. Table 30.33, showing broad commodity groups of the *Standard International Trade Classification Revision 3 (SITC Rev.3)*, provides more detail of price movements in recent years. Highlights included:

- in 1997–98 the import price index increased by 6.3%. The strong rises in the import prices of Machinery and transport equipment (by 6.5%), Manufactured goods classified chiefly by material (by 6.5%) and Miscellaneous manufactured articles (by 8.2%), all contributed to the reversal in import prices from the previous year;
- in 1999–2000 the overall index increased by 0.25%, despite falls in import prices across most categories. A 60% increase in the import price of Mineral fuels, lubricants and other related materials led to the overall increase.

30.32 EXPORT PRICE INDEX(a), Index Numbers Based on AHECC

AHECC	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
Live animals, animal products	105.9	98.8	92.7	100.0	100.7	107.8
Vegetable products	82.7	101.1	98.1	96.3	90.9	83.9
Prepared foodstuffs	104.6	101.3	99.8	109.7	102.8	94.9
Mineral products	95.1	100.9	103.0	113.7	114.6	117.0
Products of chemical or allied industries	84.4	89.5	86.9	94.9	95.6	101.5
Wool and cotton fibres	80.8	72.7	67.6	75.8	61.4	62.5
Gold, diamonds and coin	104.0	102.3	92.1	89.8	93.1	93.5
Base metals and articles of base metals	96.8	97.0	86.1	94.1	85.6	99.3
Machinery and mechanical appliances	97.2	95.8	88.5	89.1	90.3	90.9
Motor vehicles, aircraft and vessels	108.2	107.3	103.6	110.0	113.0	113.2
All groups	**94.7**	**96.1**	**92.4**	**98.9**	**96.7**	**98.0**

(a) Reference year 1989–90 = 100.

Source: Export Price Index (6405.0).

30.33 IMPORT PRICE INDEX(a), Index Numbers Based on SITC

SITC	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
Food and live animals chiefly for food	116.6	115.9	112.8	129.0	125.1	116.9
Beverages and tobacco	106.6	109.8	114.3	126.0	130.5	127.0
Crude materials, inedible, except fuels	121.9	125.8	110.2	119.1	119.8	124.9
Mineral fuels, lubricants and other related materials	90.1	89.8	98.1	93.4	84.9	135.4
Animal and vegetable oils, fats and waxes	140.4	170.1	158.8	156.4	178.2	138.5
Chemicals and related products n.e.s.	108.8	115.1	107.5	112.9	114.2	111.0
Manufactured goods classified chiefly by material	110.4	115.7	109.6	116.7	122.6	120.2
Machinery and transport equipment	121.1	117.4	108.5	115.5	121.9	119.4
Miscellaneous manufactured articles	113.4	114.2	111.2	120.3	127.9	126.1
Commodities and transactions n.e.c.	104.4	103.7	93.6	90.5	91.9	89.8
All groups	114.8	115.0	108.6	115.4	119.9	120.2

(a) Reference year 1989–90 = 100.0.

Source: Import Price Index (6414.0).

Bibliography

ABS publications

Australian National Accounts: Financial Accounts (5232.0).

Australian National Accounts: National Income, Expenditure and Product (5206.0).

Balance of Payments and International Investment Position, Australia (5302.0).

Balance of Payments and International Investment Position, Australia (5363.0).

Balance of Payments and International Investment Position, Australia: Concepts, Sources and Methods (5331.0). Available in the Statistical Concepts Library on the ABS Internet site at *http://www.abs.gov.au*

Export Price Index, Australia (6405.0).

Import Price Index, Australia (6414.0).

Information Paper: Introduction of Chain Volume Measures in the Australian National Accounts (5248.0). Available on the ABS Internet site.

Information Paper: Implementing New International Statistical Standards in ABS International Accounts Statistics (5364.0). Available on the ABS Internet site.

Information Paper: Upgraded Balance of Payments and International Investment Position Statistics, Australia (5365.0). Available on the ABS Internet site.

International Merchandise Imports, Australia (5439.0).

International Merchandise Trade, Australia (5422.0).

International Trade in Goods and Services, Australia (5368.0).

Other publications

Commission of the European Communities, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations, World Bank 1993, *System of National Accounts*, New York.

International Monetary Fund 1993, *Balance of Payments Manual, 5th edition*, Washington.

United Nations, *International Trade Statistics Concepts and Definitions, Statistical Paper Series M No. 53, Rev.1.*

United Nations, *Classification by Broad Economic Categories, Statistical Paper Series M No. 53, Rev.3.*

Internet sites

APEC, *http://www.apecsec.org*

International Monetary Fund, *http://www.imf.org*

United Nations Statistics Division, *http://www.un.org/Depts/unsd/statdiv.htm*

World Customs Organization, *http://www.wcoomd.org*

World Trade Organization, *http://www.wto.org*

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