Sudan Household Health Survey 2010

NATIONAL REPORT

November 2012

Preface

The Sudan Household Health Survey - Second Round (SHHS2) was carried out during the period March to May 2010 by the Federal Ministry of Health (FMoH) and the Central Bureau of Statistics (CBS) of the Republic of Sudan. The SHHS2 was carried out in collaboration with several ministries and institutions of the Government of Sudan such as the Ministry of International Cooperation, Ministry of Education, Ministry of Welfare and Social Security National Population Council, National Council for Child Welfare (NCCW) and National Water Corporation as well as regional and international organisations such as the United Nations Children's Fund (UNICEF), the United Nations Population Fund (UNFPA), the World Health Organization (WHO), the United Nations Development Programme (UNDP), the World Food Programme (WFP), the UNAIDS, the Pan Arab Project for Family Health (PAPFAM), the United States Agency for International Development (USAID) and the Japan International Cooperation Agency (JICA).

The methodology and content of SHHS2 was based on the Multiple Indicator Cluster Survey (MICS) and Pan Arab Project for Family Health (PAPFAM). The SHHS2 was conducted as part of the fourth global round of MICS. The SHHS2 report provides up-to-date information on the situation of children and women in Sudan and on key indicators that allow the country to monitor progress towards some of the national development goals, targets, the MDGs and other internationally agreed upon commitments.

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Summary Table of Findings Sudan Household Health Survey (SHHS2) and Millennium Development Goals (MDG) Indicators, Sudan, 2010				
Topic	**SHHS2 indicator number**	**MDG indicator number**	**SHHS2 Indicator**	**Value/1000 live birth**
CHILD MORTALITY				
Child mortality	1.1		Neonatal mortality rate	34
	1.2		Post-neonatal mortality rate	26
	1.3	*4.2*	Infant mortality rate	60
	1.4		Child mortality rate	24
	1.5	*4.1*	Under-five mortality rate	83
NUTRITION				Percent
Nutritional status		*1.8*	Underweight prevalence	
	2.1a		Moderate and Severe (- 2 SD)	32
	2.1b		Severe (- 3 SD)	13
			Stunting prevalence	
	2.2a		Moderate and Severe (- 2 SD)	35
	2.2b		Severe (- 3 SD)	16
			Wasting prevalence	
	2.3a		Moderate and Severe (- 2 SD)	16
	2.3b		Severe (- 3 SD)	05
Breastfeeding and infant feeding	2.4		Children ever breastfed	99
	2.5		Early initiation of breastfeeding	73
	2.6		Exclusive breastfeeding under 6 months	41
	2.7		Continued breastfeeding at 1 year	88
	2.8		Continued breastfeeding at 2 years	40
	2.9		Predominant breastfeeding under 6 months	80
	2.10		Duration of breastfeeding	19
	2.11		Bottle feeding	05
	2.12		Introduction of solid, semi-solid or soft foods	51
	2.13		Minimum meal frequency	30
	2.14		Age-appropriate breastfeeding	49
	2.15		Milk feeding frequency for non-breastfed children	56
Salt iodization	2.16		Iodized salt consumption	10
Vitamin A	2.17		Vitamin A supplementation (children under age 5)	61
CHILD HEALTH				Value
Vaccinations	3.1		Tuberculosis immunization coverage	75
	3.2		Polio immunization coverage	62
	3.3		Immunization coverage for diphtheria, pertussis and tetanus (DPT)	58
	3.4	*4.3*	Measles immunization coverage	62
	3.5		Hepatitis B immunization coverage	
Tetanus toxoid	3.7		Neonatal tetanus protection	55

Summary Table of Findings Sudan Household Health Survey (SHHS2) and Millennium Development Goals (MDG) Indicators, Sudan, 2010				
Topic	**SHHS2 indicator number**	**MDG indicator number**	**SHHS2 Indicator**	**Value/1000 live birth**
Care of illness	3.8		Oral rehydration therapy with continued feeding	12
	3.9		Care seeking for suspected pneumonia	55
	3.10		Antibiotic treatment of suspected pneumonia	66
Solid fuel use	3.11		Solid fuels	63
Malaria	3.16		Malaria diagnostics usage	57
	3.17		Anti-malarial treatment of children under 5 the same or next day	43
	3.18	*6.8*	Anti-malarial treatment of children under age 5	65
WATER AND SANITATION				
Water and sanitation	4.1	*7.8*	Use of improved drinking water sources	61
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	4.3	*7.9*	Use of improved sanitation facilities	27
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REPRODUCTIVE HEALTH				Percent
Contraception and unmet need	5.2		Early childbearing	14
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Early childhood care and education	6.2		School readiness (children age 4-5 years)	45
	6.3		Net intake rate in primary education	46
Primary school participation	6.4	*2.1*	Primary school net attendance ratio (adjusted)	72 1
	6.5		Secondary school net attendance ratio (adjusted)	32
	6.6	*2.2*	Children reaching last grade of primary education (grade VIII)	82
	6.7		Primary completion rate	63
	6.8		Transition rate to secondary school	78
	6.9		Gender parity index (primary school)	0.94
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List of Abbreviations

AIDS	Acquired Immune Deficiency Syndrome
ANC	Antenatal Care
ARI	Acute Respiratory Infection
BCG	Bacillis-Cereus-Geuerin (Tuberculosis)
CBS	Central Bureau of Statistics
CPR	Contraceptive Prevalence Rate
CRC	Convention on the Rights of the Child
CSPro	Census and Survey Processing System
DHS	Demographic and Health Survey
DPT	Diphtheria Pertussis Tetanus
EPI	Expanded Programme on Immunization
FGM/C	Female genital mutilation/cutting
FMoH	Federal Ministry of Health
FP	Family Planning
GPI	Gender Parity Index
HIV	Human Immunodeficiency Virus
HTP	Harmful Traditional Practice
IDD	Iodine Deficiency Disorders
IMR	Infant Mortality Rate
ITN	Insecticide Treated Net
MD	Millennium Declaration
MDG	Millennium Development Goals
MICS	Multiple Indicator Cluster Survey
MMR	Maternal Mortality Ratio
MoH	Ministry of Health
NAR	Net Attendance Rate
NIDs	National Immunisation Days
NMR	Neonatal Mortality Rate
ORT	Oral rehydration treatment
PAPFAM	Pan Arab Project for Family Health
RH	Reproductive Health
SHHS	Sudan Household Health Survey
SPSS	Statistical Package for Social Sciences
STI	Sexually Transmitted Infections
TT	Tetanus Toxoid
UN	United Nations
U5MR	Under 5 Mortality Rate
UNAIDS	United Nations Programme on HIV/AIDS
UNDP	United Nations Development Programme
UNFPA	United Nations Population Fund
UNGASS	United Nations General Assembly Special Session on HIV/AIDS
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WFFC	World Fit for Children
WFP	World Food Programme
WHO	World Health Organization

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Executive Summary

This Report presents the detailed findings of the Sudan Household Health Survey second round (SHHS2), conducted jointly by the Federal Ministry of Health (FMOH) and The Central Bureau of Statistics with financial and technical assistance from the United Nations agencies and other partners. The SHHS2 is a customized version of the Multiple Indicator Cluster Survey (MICS) Round 4 and the Pan Arabic League Household Family Survey (PAPFAM). The survey is part of a worldwide survey program, originally developed to measure progress towards an internationally agreed set of goals that emerged from the 1990 World Summit for Children. This Main Report covers the following areas; sample and survey methodology, sample coverage and the characteristics of households and respondents, child mortality, child nutrition, child health, environment, reproductive health, education, child protection, and HIV and AIDS and orphaned and vulnerable children.

The survey was conducted at a time when x-Sudan is experiencing the separation with unprecedented socioeconomic challenges which had direct implications on the welfare of children and women.

The national and state-level data generated by the SHHS are expected to help in assessing the current status in relation to some of the key indicators relating to the Millennium Development Goals (MDGs), the World Fit For Children (WFFC) goals, Programme of Action adopted at the International Conference on Population and Development (ICPD), and other internationally and nationally agreed upon goals, as a basis for action.

Sample design and coverage

The sample for the Sudan Household Health Survey (SHHS) was designed to provide estimates in regard to some key indicators at the national level and for 15 states. It was judged that a minimum sample of about 1000 households in each state would be necessary to make survey estimates with the required degree of precision at the state level. A two-stage cluster sampling design was employed to draw the sample in each state. The villages or quarters (in the case of urban areas) constituted the Primary Sampling Units (PSUs). It was decided to draw 40 clusters from each state and 25 households from each cluster. Accordingly, the survey aimed at a total sample of 15,000 households in 15 states of Sudan.

Questionnaires

The survey tools consisted of five sets of questionnaires: (i) a Household questionnaire which was used to collect information on all de jure household members and the household; (ii) a Women's questionnaire administered to all women aged 15-49 years in each household; and (iii) a children's questionnaire administered to mothers or caretakers of all children under five years of age living in the household; (iv) Men's questionnaire administered to men living in the household; and (v) Food Security Questionnaire.

The first three questionnaires are based on the MICS4 and PAPFAM model questionnaires. A copy of the SHHS2 questionnaires is provided in Appendix F.

Background characteristics of Households and respondents

Of the 15,000 households selected for the sample, 14,921 were found to be occupied. Of these, 14,778 households were interviewed successfully for a household response rate of 99.0 per cent. In those households interviewed, 18,614 women (age 15-49 years) were identified. Of these, 17,174 women were interviewed, yielding a response rate of 92.3 per cent within interviewed households. In addition, 13,587 children under age five were listed in the household questionnaire. Questionnaires were completed for 13,282 of these children, corresponding to a response rate of 97.8 per cent. An overall response rate of 91.4 per cent was achieved for women. While an overall response rate of 96.8 per cent was achieved for under-five children (Table 3.1).

Infant and under-five mortality

The infant and under-five mortality rates that have been computed by using the direct estimation method indicate that the infant mortality rate (IMR) in Sudan was 60 per 1,000 live births while the under -5 mortality rate

(U5MR) was 83 per 1000 live births during the 5-year period before the SHHS2. Estimates of neonatal, post-neonatal and child mortality rates have also been made using the direct method. They were respectively 34.45 and 25.78 per 1,000 live births.

Children's nutritional status

Underweight prevalence (moderate and severe): Almost one in three children under age five in Sudan were found to be moderately or severely underweight. There was a slight difference in terms of those who were moderately or severely underweight among boys (33.6 per cent) and girls (30.7 per cent).

Underweight prevalence (severe): Almost one in eight (12.6 per cent) under age five in Sudan could be classified as severely underweight.

Stunting prevalence (moderate and severe): The SHHS2 findings indicated that about 35.0 per cent of children under age five in Sudan were moderately or severely stunted (too short for their age) . cent) and girls (32.6 per cent).

Wasting prevalence (moderate and severe): Approximately one out of six under-five children (16.4 per cent) in Sudan were found to be moderately or severely wasted (too thin for their height). Wasting is usually the result of a recent nutritional deficiency related to, for example, recent illness or inadequate diet intake. The prevalence estimate may exhibit significant seasonal shifts associated with changes in the availability of food or disease prevalence.

Breast feeding

Based on the survey findings, the proportion of children born in the last two years who were ever breastfed, and those who were first breastfed within one hour and one day of birth. Although a very important step in management of lactation and establishment of a physical and emotional relationship between the baby and the mother, only 73.2 per cent of babies were found to have been breastfed for the first time within one hour of birth, while 92.6 per cent of newborns in Sudan started breastfeeding within one day of birth.

The SHHS2 data indicated that about 87.6 percent of children age 12-15 months received continued breastfeeding at one year. The percentage of children age 12-15 months who received continued breastfeeding was higher in urban areas (90.8 per cent) than that of children in rural areas (86.3 per cent).
.
About 2.5 per cent of children aged 2-3 months were weaned (not breastfed). The percentage of children that were exclusively breastfed was only 18.3 per cent among children aged 4-5 months, though exclusive breastfeeding is considered as adequate feeding up to six months. Few mothers continued breastfeeding up to 23 months. In all, only about 29.4 percent of children aged 22-23 months were receiving breast milk.

Iodized Salt. A very small proportion of households (2.4 per cent), there was no salt available at the time of the survey. The SHHS2 findings indicated that only a very small proportion of households (14.7 per cent) were found to be using iodized salt. In only 9.5 percent of households, salt was found to contain 15 parts per million (ppm) or more of iodine, while in the case of 5.3 percent of households, salt was found to contain less than the required 15 parts per million (ppm).

Vitamin A. The survey results indicate the percent distribution of children aged 6-23 months who received Vitamin A during the last six months preceding the SHHS. Within the six months prior to the SHHS, 60.5 percent of children aged 6-23 months received a high dose Vitamin A supplement. The percentage of children aged 6-23 months that received a high dose Vitamin A supplement was slightly higher for male children (61.2 per cent) than that for female children (59.7 per cent). Similarly, the percentage of children aged 6-23 months that received a high dose Vitamin A supplement was slightly higher for children in urban areas (60.7 per cent) than that for children in rural areas (60.4 per cent).

Child health

Immunization coverage. The SHHS2 data indicated that only half (49.4 per cent) of Sudan's children age 12-23 months were fully immunized with BCG vaccine against tuberculosis, three doses of polio vaccine against polio, three doses of Pentavalent against DPT (diphtheria, pertussis and tetanus), Hepatitis B (HB), and Haemophilus influenza (HIB) and measles vaccine before their first birthday. This leaves the rest of the children age 12-23 months unprotected against life-threatening diseases. The percentage of fully immunized children was slightly higher among females (50.3 per cent) than that among male children (48.5 per cent). The percentage of fully immunized children was higher for children in urban areas (56.2 per cent) than among children in rural areas (46.6 per cent). The percentage of fully immunized children ranged from 41.3 per cent for children of mothers with no education to 58.4 per cent for children of mothers with primary education, and to 60.8 per cent for children of mothers with secondary or higher education.

The SHHS2 data indicates that the percentage of women aged 15-49 years with a live birth in the last two years protected against neonatal tetanus was only 54.7. The percentage of women who received at least two doses of tetanus toxoid (TT) vaccine during last pregnancy was only 34.1 per cent.

Management of diarrhoea. The SHHS2 data indicated that overall, 26.8 percent of under-five children had diarrhoea in the two weeks preceding the survey (Table CH.4). The peak of diarrhoea prevalence (36.3 per cent) was observed among children aged 12-23 months. There was slight difference in the proportion of under-five children who had diarrhoea in the two weeks preceding the survey in rural and urban areas**.**

Care seeking for suspected pneumonia.

The SHHS2 data indicates that about 18.7 percent of children aged 0-59 months were reported to have had symptoms of pneumonia during the two weeks preceding the survey. Very little difference between boys (18.9 per cent) and girls (18.5 per cent) was observed with regard to suspected pneumonia. There was slight difference with regard to suspected pneumonia between children from urban areas (17.6 per cent) and children from rural areas (19.1 per cent). There was slight difference with regard to suspected pneumonia between children of mothers with no education (18.7 per cen**t)**

Water and Sanitation

The SHHS2 findings indicated that overall, 60.5 per cent of the population was using an improved source of drinking water at the time of the survey. The percentage of household population using an improved source of drinking water was higher for household members in urban areas (66.6 per cent) than that for household members in rural areas (57.7 per cent). The percentage of household population using improved sources of drinking water increases with the educational level of the household head. The percentage of household population using improved sources of drinking water showed an increasing trend from 55.8 per cent in the case of households which had household heads with no education to 62.9 per cent in the case of households which had household heads with primary education and to 72.7 per cent in the case of households which had household heads with secondary or higher level of education. The percentage of household population using improved sources of drinking water also increases with the family wealth.

The SHHS2 findings indicated that 35.1 per cent of the population of Sudan were living in households using improved sanitation facilities. This percentage was 60.2 per cent in urban areas compared to 23.4 per cent in rural areas. The proportion of household members using improved sanitation facilities was highest in Khartoum State (67.9 percent) and the lowest in Blue Nile State (5.7 per cent)

Reproductive Health

The SHHS2 data indicated that 13.4 per cent of women age 15-19 years has already had a birth, 2.9 per cent were pregnant with their first child, 16.3 per cent have begun childbearing and 1.2 per cent has had a live birth before age 15. The SHHS findings also indicated that 14.0 per cent of women aged 20-24 have had a live birth before age 18.

Percentage of women with a live birth before age 15 years: The SHHS2 findings indicated that about 1.2 per cent of women have had a live birth before age 15 and The SHHS2 findings indicated that about 14.0 per cent of women have had a live birth before age 18. There were some differences in percentage of women in urban and rural areas who have had a live birth by age 18.

Contraception. Table 8.3 provides information on the use of contraception. It indicates the percentage of women age 15-49 years currently married who are using (or whose partner is using) a contraceptive method. Current use of contraception was reported by 9.0 per cent of women currently married. The most popular method is the pill which is used by 6.3 per cent of married women in Sudan. The next most popular method was the use of injectable, which accounted for 0.9 per cent of married women. About 0.5 per cent of women reported use of the IUD

Unmet need. The SHHS2 findings indicated that the percentage of women age 15 - 49 years (currently married) with unmet need for contraception for spacing and limiting were 18.4 per cent and 10 .5 percent respectively. The unmet need for contraception varied marginally by urban/rural areas. The unmet need for contraception for spacing was 17.5 per cent in the case of women in urban areas compared to 18.8 per cent for women in rural areas. The unmet need for contraception for limiting was 11.9 per cent in the case of women in urban areas compared to 9.8 per cent for women in rural areas

Antenatal care. In the country as a whole, about a quarter of women (25.7 per cent) age 15-49 years who gave birth in the two years preceding the survey received no antenatal care from qualified health personnel (a doctor, nurse, health visitor or midwife). About 46.9 per cent of women received ANC from a medical doctor, 3.6 per cent received ANC from a nurse, 5.4 per cent from a health visitor and 18.4 per cent from a midwife.

Place of delivery. The SHHS2 findings indicated that about 20.5 per cent of births in Sudan (North) were delivered in a health facility; 19.6 per cent of deliveries occurred in a hospital and 0.9 per cent occurred in a primary health care facility (PHCF). Three in four births (76.0 per cent) occurred at home. Women in urban areas (36.1 per cent) were more likely to deliver in a health facility compared to their rural counterparts (13.3 per cent).

Literacy and Education

The SHHS2 data indicated that the literacy rate among young women remains low. Nationwide, only 45.2 per cent of women age 15-24 years was literate. The percentage of literate women age 15-24 years was higher in urban areas (56.6 per cent) than that among women in rural areas (39.0 per cent). Of women who stated that primary school was their highest level of education, only 52.0 per cent of them were actually able to read the statement shown to them while of the women who stated that secondary school was their highest level of education, 71 per cent of them were able to read the statement shown to them.

*Primary school entry (Net intake rate in primary education)**:*** Table 9.4 provides information regarding the net intake rate in primary education, i.e. percentage of children of primary school entry age entering grade I in primary school. Of children who were of primary school entry age (age 6) in Sudan, about 46.0 per cent of them were attending the first grade of primary school at the time of the SHHS2. Of male children who were of primary school entry age, 46.9 per cent of them were attending the first grade of primary school compared to 45.1 per cent of female children of primary school entry age.

The SHHS2 data indicate that about 71.8 per cent of children of primary school age were attending school at the time of the survey. This means that about 28.2 per cent of the children were out of school when they were expected to be participating in primary education. The percentage of children of primary-school age attending school at the time of the survey was highest (81.9 per cent) among children aged 10 years and lowest among children aged 6 years (49.4 per cent).

At the time of the SHHS2, the primary school completion rate was 62.7 per cent (71.6 per cent for boys and 54.9 per cent for girls). The primary school completion rate was 92.4 per cent for children in urban areas compared to 49.4 per cent for children in rural areas.

Birth registration

The SHHS2 data indicated that the births of 59.3 percent of under-five children in Sudan were reported registered on the reference date of the survey. Of the children under age five whose birth was not registered, mothers/caretakers of 26.3 per cent of these children knew how to register birth

Early marriage and polygyny

The SHHS2 data indicated that about one in ten (9.5 per cent) young women married before age 15. The proportion of young women who were married before age 15 varied between urban and rural areas. . Nationwide, about 20.0 per cent of women age15-49 years were in Polygamous marriage. This percentage was lower among women in urban areas (15.3 per cent) than that among women in rural areas (22.1 per cent). The incidence of polygamy appears to be linked to women's education level and the household wealth

Female Genital Mutilation/Cutting

The SHHS2 data shows that 87.6 per cent of women aged 15-49 and 65.5 per cent of ever women aged 0-50+ had some form of genital cutting. The percentage of women who had been subjected to FGM/C was highest (89.8) among women in the age group 40-44 years and lowest (9.2) among girls in the age group 0-4 years.. Younger women are less likely to have undergone any form of FGM/C than women in the older age groups, and fewer girls are circumcised due to age, however the gap between the girls and women due age has to be taken with caution.

Attitudes toward domestic violence

The responses to SHHS2 questions are indicated in Table 10.10. Overall, 47.0 per cent of women in Sudan feel that their husband/partner has a right to hit or beat them for at least one of a variety of reasons.

Prevalence of orphans

Nationwide, the prevalence of orphans (percentage of children under age 18 who have one or both of their parents dead) was 5.7 per cent. There was only a marginal difference in the percentage of children who had one or both of their parents dead between female children (5.7 per cent) and male children (5.6 per cent). The proportion of children who had one or both of their parents dead was marginally higher in urban areas (6.5 per cent) than that in rural areas (5.3 per cent

HIV/AIDS knowledge and attitude

Women age 15-49 years who have heard about AIDS: The SHHS2 data indicated that overall, more than three-fourths (76.4 per cent) of women age 15-49 years have heard of AIDS

The SHHS2 findings indicated that 62.0 per cent of women age 15-49 years knew of having one faithful uninfected sex partner and 17.2 per cent of them knew of using a condom every time during sexual intercourse as main ways of preventing HIV transmission

Overall, 36.2 per cent of women age 15-49 years knew that a healthy looking person could have the AIDS virus. The proportion of women who knew that a healthy looking person could have the AIDS virus was higher among women in urban areas (54.9 per cent) than among women in rural areas (26.5 per cent).

Overall, only 5.8 per cent of women were found to have comprehensive knowledge of HIV prevention, which was higher among women in urban areas (11.4 per cent) than among women in rural areas (3.0 per cent. The proportion of women who had comprehensive knowledge about HIV prevention was highest among women in the age group 30-39 years (7.2 per cent) and lowest among women in the age group 40-49 years (4.4 per cent

Injury and Chronic diseases

The SHHS2 data indicates that the major chronic diseases that are prevalent among people of Sudan and the percent distribution of respondents according to diseases are as follows: Hypertension (24.3 per cent), Diabetes (14.5 per cent), Asthma (8.1 per cent), Hypothyroidism (6.6 per cent), Glaucoma (6.3 per cent), Cataract (4.7 per cent), Mental health-related problems (3.0 per cent), Heart disease (2.7 per cent), Rheumatic heart disease (2.7 per cent), Renal failure (2.4 per cent), TB (1.5 per cent), Epilepsy (1.3 per cent), cancer (0.3 per cent), Leprosy (0.2 per cent) and other diseases (30.6 per cent).

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Food security

Diets in Sudan are diverse, linked in large part to its climatic conditions and resource base. The main dietary sources for people in Sudan includes cereal, sugar, oil, milk, meat, pulses, vegetables, fruits and eggs. Though the main staples of the Sudanese diet are sorghum and millet, in certain areas, especially in pastoral areas, there is a significant amount of meat and milk consumed as well.

The SHHS2 data indicated that a total of about 8.4 per cent of households were moderately or severely food insecure. The proportion of moderately and severely food insecure households ranged between 0.4 per cent in River Nile State and 20.1 per cent in West Darfur State.

I. Introduction

Background

Administratively, the Sudan is governed by a federal system, comprising of 15 States. Sudan neighbours seven countries – Central African Republic, Chad, Egypt, Eritrea, Ethiopia, Libya, and Republic of South Sudan -

Sudan Household Survey (SHHS2)

The Government's efforts aimed at formulating and implementing policies and programmes that would have a positive impact on the situation of children and women in Sudan in particular, and on the achievement of the MDGs in general, necessitates periodic collection of relevant data/information for assessing progress towards achievement of the defined developmental goals and targets. The Sudan Household Survey represents one of the major tools to make available the data/information required for assessing progress towards achievement of the defined national and international developmental goals and targets and for the formulation and implementation of policies and programmes to improve the situation of children and women in Sudan.

Sudan has been conducting surveys to generate data on important indicators for assessing progress towards developmental targets. Some of these surveys conducted earlier include the Demographic and Health Survey (DHS) carried out in 1989-90, a Maternal and Child Health survey which was conducted in 1993 (Sudan, Ministry of Health, 1994) under the Pan Arab Project on Child Development (PAPCHILD), Safe Motherhood Survey (SMS) of 1999, conducted by the Central Bureau of Statistics under the overall supervision of the Federal Ministry of Health. The SMS was followed by the Multiple-Indicator Cluster Survey (MICS) of 2000 covering all northern states and selected urban areas of three states in Southern Sudan.

The Sudan Household Health Survey (SHHS), conducted in 2006, was the first nationally representative survey covering the whole of Sudan in two decades covering key social development indicators. The national and state-level data generated by the SHHS helped in creating a baseline for assessing the progress towards some of the key MDG goals and targets, assisting in monitoring of MDG commitments and in informed decision making in regard to development planning.

The Sudan Household Health Survey - Second Round (SHHS2) conducted during the period March to May 2010 by the Federal Ministry of Health (FMoH) and the Central Bureau of Statistics (CBS), Government of Sudan represents a major effort on the part of the Government of Sudan to assess the situation of children and women and to monitor progress towards selected national development goals and the Millennium Development Goals (MDGs) and targets.. The survey was carried out in collaboration with several ministries and institutions of the Government of Sudan as well as regional and international organisations such as the United Nations Children's Fund (UNICEF), the United Nations development Programme (UNDP), the World Health Organisation (WHO), the United Nations Population Fund (UNFPA), the World Food Programme (WFP), the United States Agency for International Development (USAID), the Pan Arab Project for Family Health (PAPFAM).

Survey Objectives

The primary objectives of the 2010 Sudan Household Health Survey (SHHS2) were as follows:

- To provide up-to-date information for assessing the situation of children and women in Sudan;
- To furnish data needed for monitoring progress toward goals established in the Millennium Declaration and other internationally agreed upon goals, as a basis for future action;
- To contribute to the improvement of data and monitoring systems in Sudan and to strengthen technical expertise in the design, implementation, and analysis of such systems.

- To generate data on the situation of children and women, including the identification of vulnerable groups and of disparities, to inform policies and interventions.

The methodology and content of SHH2 are based on the models and standards developed by the global Multiple Indicator Cluster Survey (MICS) project, an international household survey programme developed and supported by UNICEF. The SHHS2 was conducted as part of the fourth round of MICS. The SHHS2 provides valuable information on the situation of children and women in Sudan, and measures of key indicators that allow Sudan to monitor progress towards the goals and targets emanating from some of the international agreements: the Millennium Declaration, adopted by all 191 United Nations Member States in September 2000, and the Plan of Action of A World Fit For Children, adopted by 189 Member States at the United Nations Special Session on Children in May 2002. Both of these commitments build upon promises made by the international community at the 1990 World Summit for Children.

II. Sample and Survey Methodology

Sample Design

The sample for the Sudan Household Health Survey (SHHS) was designed to provide estimates on some key indicators on the situation of children and women at the national level and for 15 states (Northern , River Nile, Red Sea, Kassala, Gedarif, Khartoum, Gezira, Sinnar, Blue Nile, WhiteNile, North Kordofan, South Kordofan, North Darfur, West Darfur, South Darfur). The target universe for the SHHS includes the households and members of individual households, including nomadic households camping at a location/place at the time of the survey. The population living in institutions and group quarters such as hospitals, military bases and prisons, were excluded from the sampling frame.

The states constitute the main sampling domains and in each state a two stage cluster sampling design was employed to draw the sample for the SHHS. The villages or quarters (in the case of urban areas) constituted the Primary Sampling Units (PSUs) for the SHHS. The PSU represented the smallest area or administrative unit which could be identified in the field with commonly recognized boundaries. The sampling frame for 15 states was compiled using the list of villages and quarters and estimated population updated by the Central Bureau of Statistics on the basis of the updated frame from the 2008 Population Census . The 15 states clusters were distributed to urban and rural areas, proportional to the size of urban and rural populations in each state. The urban and rural clusters in each of these states were selected randomly with probability of selection proportional to size.

The sample size for the survey was determined by the accuracy and degree of precision required for the survey estimates for each state. It was judged that a minimum sample of 900 households would be necessary to make estimates/results with some degree of precision at the state level. Allowing for some non-response in the survey, it was decided to take a sample of 1,000 households in each state. Since a similar level of precision was required for the survey results from each state, it was decided to draw 40 clusters from each state and 25 households from each cluster. The sampling frame of villages/quarters was compiled separately for each state based on the best available population measures. In cases where a selected village/quarter could not be reached because of security or access problems, it was replaced by a neighboring village/quarter in the sampling frame. All selected clusters (villages/quarters) in each state were fully covered .After a household listing was carried out within the selected clusters, a sample of 25 households was drawn from each selected cluster using the method of systematic random sampling.

Although each state sample can be considered as self-weighting, the total sample for Sudan is not self-weighting since a fixed sample of households was drawn from each state, irrespective of its population size. Therefore, to derive estimates for Sudan as a whole it was necessary to assign a weight to each state-level sample. For reporting national level results, and to obtain unbiased estimates from the data, appropriate weights were applied to the sample data based on the probabilities of selection. Measures of sampling variability for key survey estimates were also calculated. Sample weights were calculated for each state-level sample and these were used in the subsequent analyses of the survey data.

The formula used for the calculation of the sample size was:

$n = z2*(P)\ (1-p)\ (1+ NRR)\ (deff) / (d2)(h)$

Where:
n = the required sample size, (number of households)
z = the value in the normal distribution that gives a level of confidence at 95% (z = 1.96)
p = for the key indicator selected = 0.05.
deff = the design effect, (deff = 2)
d = the desired margin of error, (d = 0.01).
NRR= non-response rate, NRR= 30% (0.3).
h = Household size

For the calculation of the sample size, p was assumed to be 5 percent. The value of deff (design effect) was taken as 2 based on estimates from previous surveys, and average household size was taken as 6 individuals. The estimated sample size was approximately 863 households per state. Though an effective sample size of 900 households was considered sufficient for most state-level estimates, it was decided to target 1,000 households in each state, thus yielding a total of about 15,000 households nationally. The average cluster size in the SHHS was determined as 25 households, based on a number of considerations, including the budget available, and the time that would be needed per team to complete data collection in one cluster. Equal allocation of the total sample size to the 15 states was targeted. Therefore, 40 clusters were allocated to each state, with the final sample size calculated at 15,000 households (i.e., 40 clusters x 15 states x 25 households per cluster).

Questionnaires

The survey tools consisted of five sets of questionnaires: (i) a ***Household questionnaire*** which was used to collect information on all *de jure* household members (usual residents) , the household and the dwelling; (ii) a ***Women's questionnaire*** administered to all women aged 15-49 years in each household; (iii) a children's ***questionnaire*** administered to mothers or caretakers of all children under five years of age living in the household; (iv) a men's questionnaire administered to all men aged 15-49 years living in the household; and (v) ***Food Security Questionnaire***.

The first three questionnaires are based on the MICS4 and PAPFAM model questionnaires. A copy of the SHHS2 questionnaires is provided in Appendix F.

The ***Household Questionnaire*** included the following modules:

- Household listing form;
- Education;
- Chronic diseases and injuries(country specific module);
- Female Genital Mutilation/Cutting (FGM/C) (country specific module);
- Child disability;
- Water and sanitation
- Household characteristics/income;
- Insecticide treated nets (ITNs);
- Salt iodization

The ***Questionnaire for Individual Woman*** included the following modules:

- Woman's Background;
- Marriage
- Child Mortality
- Desire For Last Birth;
- Birth History
- Maternal and newborn Health;

- Contraception;
- Unmet Need;
- Female Genital Mutilation/Cutting (FGM/C) (country specific module);
- Attitude Towards Domestic Violence;
- HIV/AIDS Knowledge,
- Sexually Transmitted Infections (STI) (country specific module).

The Questionnaire for Children under five years of age was administered to mothers of under-five children. In cases when the mother was not listed in the household list/roster, a primary caretaker for the child was identified and interviewed. The ***Questionnaire for Children under Five*** included the following modules:

- Age;
- Birth registration;
- Early childhood development(country specific module);
- Care of illness and Illness Symptoms
- Vitamin A;
- Malaria;
- Breastfeeding;
- Immunisation;
- Anthropometry.

The ***Questionnaire for Individual Men*** included the following modules:

- Man's background;
- Marriage;
- Approval for FGM;
- Condom use
- Sexually Transmitted Infections (STI);
- HIV/AIDS knowledge, including sexual behaviour;

The ***Food Security Questionnaire*** included the following modules:

- Income sources;
- Household expenditures;
- Food consumption and dietary diversity.

In addition to the administration of questionnaires, fieldwork teams tested the salt used for cooking in the households for iodine content, tested blood for HH members and measured the weights and heights of children under five years of age. Details and findings of these measurements are provided in the respective sections of the report.

Training and Fieldwork

The questionnaires were pre-tested during the last quarter of 2009 and the first quarter of 2010 and modifications were made to the wording and translation of the questionnaires based on the results of the pre-test.

Training programmes for the fieldwork were conducted for all the states involved in the SHHS2 during the month of February and March 2010, the duration of training varying between 7-10 days. The training was conducted at three levels -- national, sub-national and state levels. To ensure consistency, the sub-national training sessions for all trainees in all states were conducted by the same trainers. The training included lectures and discussions relating to interviewing techniques and the contents of the questionnaires, supervision and monitoring of quality of data. Towards the end of the training period, trainees spent some days in the field to practice interviewing in selected states.

A total of 240 interviewers and 60 supervisors were trained to collect data. Field work was undertaken from March to May 2010. The average period to complete the field work was 33 days, with a minimum of 27 days for the main questionnaires excluding MM survey and a maximum of 43 days, extended to overcome the low response rate, for blood collection and for covering additional clusters for collecting data on maternal mortality.

The data were collected by --- cluster teams in the 15 States of Sudan, involving at least four teams for each of the States. Each cluster team comprised of four interviewers (including the measurer), one field editor, one

blood sample officer and the supervisor. In all, the data collection involved ---- interviewers, and --- team leaders and supervisors, and --- national supervisors and leaders.

Data Processing

Data were entered using the CSPro software. In order to ensure quality control, all questionnaires were double entered and internal consistency checks were performed. Procedures and standard programmes developed under the global MICS4 project and adapted to the SHHS2 questionnaires were used throughout. Data processing was concluded in August -2010. Data were analysed using the Statistical Package for. Social Sciences (SPSS) software programme (Version 18), and the model syntax and tabulation plans developed for the SHHS2 based on MICS Syntax.

III. Sample Coverage and the Characteristics of Households and Respondents

Sample Coverage

Of the 15,000 households selected for the sample, 14,921 were found to be occupied. Of these, 14,778 households were interviewed successfully for a household response rate of 99.0 per cent. In those households interviewed, 18,614 women (age 15-49 years) were identified. Of these, 17,174 women were interviewed, yielding a response rate of 92.3 per cent within interviewed households. In addition, 13,587 children under age five were listed in the household questionnaire. Questionnaires were completed for 13,282 of these children, corresponding to a response rate of 97.8 per cent. An overall response rate of 91.4 per cent was achieved for women, while an overall response rate of 96.8 per cent was achieved for under-five children (Table 3.1).

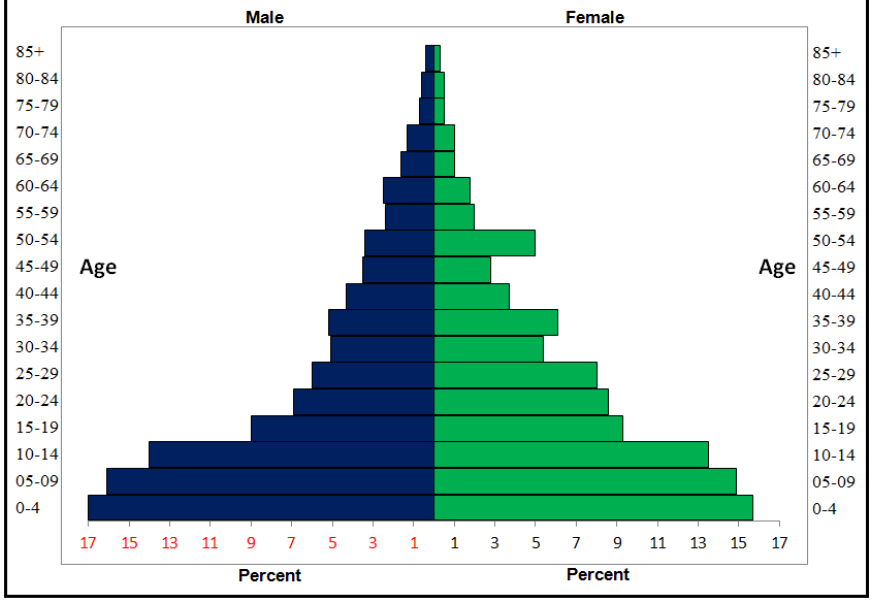
The sample response rates to some extent by urban –rural and by states. Rural areas shows little variations for household, women and children than those of urban area. The response rate among the states for the three questionable does not show notable differences between the states. . The women's overall response rate was also higher in rural areas (93.1 per cent) than that in urban areas (90.6 per cent). The overall response rate for under-five children was 97.2 per cent in rural areas compared to 95.9 per cent in urban areas. The overall response rate for women's questionnaire was 92.3 in rural areas compared to 89.4 per cent in urban areas.

In the interviewed households, 16,448 men (age 15-49 years) were identified. Of these, only 5,573 men could be successfully interviewed, yielding a response rate of 33.9 per cent within interviewed households. Overall response rate of 33.6 per cent was calculated for the men's interviews (Table 3.1). One of the reasons for the low response rate for men was that at the time of visit to the households by the interviewer, men in a large proportion of the households were out on work. The relatively lower response rate for men implies that the results for men in regard to relevant indicators cannot be presented as they will not be representative.

Table 3.1: Results of household, women's, men's and under-five interviews
Numbers of households, women, men and under-five children by results of the household, women's, men's and under-5 children's interviews, and household, women's, men's and under-five children's response rates, Sudan, 2010

	Area		State															Total
	Urban	Rural	Northern	River Nile	Red Sea	Kassala	Gadarif	Khartou	Gezira	White Nile	Sinnar	Blue Nile	North Kordofan	South Kordofan	North Darfur	West Darfur	South Darfur	
Number of households																		
Households Sampled	4575	10425	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	15000
Households Occupied	4542	10379	994	992	995	995	993	992	1000	990	998	999	999	991	997	994	992	14921
Households Interviewed	4479	10299	984	983	988	970	973	971	1000	976	989	998	999	988	992	987	980	14778
Household response rate (%)	98.6	99.2	99.0	99.1	99.3	97.5	98.0	97.9	100.0	98.6	99.1	99.9	100.0	99.7	99.5	99.3	98.8	99.0
Number of women																		
Women Eligible	6406	12208	1405	1306	1156	1153	1175	1479	1417	1310	1202	1277	1212	1135	1124	1042	1221	18614
Women Interviewed	5807	11367	1223	1179	1081	1077	1090	1327	1385	1165	1131	1186	1155	1066	1024	1000	1085	17174
Women's response rate	90.6	93.1	87.0	90.3	93.5	93.4	92.8	89.7	97.7	88.9	94.1	92.9	95.3	93.9	91.1	96.0	88.9	92.3
Women's overall response rate (%)	89.4	92.4	86.2	89.5	92.9	91.1	90.9	87.8	97.7	87.7	93.2	92.8	95.3	93.6	90.6	95.3	87.8	91.4
Number of men																		
Men Eligible	6000	10448	1230	1263	1151	1127	972	1450	1080	1129	1101	1177	936	916	1054	808	1054	16448
Men Interviewed	1956	3617	251	473	224	253	395	412	389	474	432	466	397	332	378	286	411	5573
Men's response rate	32.6	34.6	20.4	37.5	19.5	22.4	40.6	28.4	36.0	42.0	39.2	39.6	42.4	36.2	35.9	35.4	39.0	33.9
Men's overall response rate (%)	32.1	34.4	20.2	37.1	19.3	21.9	39.8	27.8	36.0	41.4	38.9	39.6	42.4	36.1	35.7	35.1	38.5	33.6
Number of children under 5																		
Children under 5 Eligible	3877	9710	637	789	641	824	935	862	843	889	853	1257	910	1031	1067	975	1074	13587
Children under 5 Mother/Caretaker Interviewed	3771	9511	607	765	625	818	901	828	839	856	843	1234	902	1020	1043	967	1034	13282
Under-5's response rate	97.3	98.0	95.3	97.0	97.5	99.3	96.4	96.1	99.5	96.3	98.8	98.2	99.1	98.9	97.8	99.2	96.3	97.8
Under-5's overall response rate (%)	95.9	97.2	94.3	96.1	96.8	96.8	94.4	94.0	99.5	94.9	97.9	98.1	99.1	98.6	97.3	98.5	95.1	96.8

Figure HH.1: Age and sex distribution of household population, Sudan, 2010



Characteristics of Households

The household age distribution by sex is provided in Table 3.2. The Table indicates the distribution of the household population by five-year age groups, dependency age groups, and child (age 0-17 years) and adult populations (age 18 or more), by sex. In the 14,778 households successfully interviewed in the survey, 84,530 household members were listed. Of these, 41,313 (48.9 per cent) were males, and 43,217 (51.1 per cent) were females. Based on these figures, the average household size was estimated at 5.7.

The total number of children in the age group 0-14 years (below age 15) in the households was 38,525 (Male: 19,441; Female: 19,084), constituting 45.6 per cent of the total survey population. The number of household members in the age group 15-64 years was estimated at 42,690 (Male: 19,991; Female: 22,699), constituting 50.5 per cent of the total survey population. The household members aged 65 years and above was 3,270 (Male: 1,860; Female: 1,410), constituting 3.9 per cent of the total survey population.

Table 3.2: Household age distribution by sex
Percent and frequency distribution of the household population by five-year age groups, dependency age groups, and by child (age 0-17 years) and adult populations (age 18 or more), by sex, Sudan, 2010

	Males		Females		Total	
	Number	Per cent	Number	Per cent	Number	Per cent
Age group						
0-4	7021	17.0	6802	15.7	13823	16.4
5-9	6635	16.1	6457	14.9	13091	15.5
10-14	5786	14.0	5825	13.5	11611	13.7
15-19	3736	9.0	4035	9.3	7771	9.2
20-24	2840	6.9	3700	8.6	6540	7.7
25-29	2498	6.0	3471	8.0	5969	7.1
30-34	2101	5.1	2314	5.4	4415	5.2
35-39	2128	5.2	2626	6.1	4754	5.6
40-44	1786	4.3	1610	3.7	3397	4.0
45-49	1465	3.5	1192	2.8	2657	3.1
50-54	1417	3.4	2143	5.0	3560	4.2
55-59	1003	2.4	849	2.0	1852	2.2
60-64	1016	2.5	760	1.8	1776	2.1
65-69	642	1.6	417	1.0	1059	1.3

70-74	544	1.3	443	1.0	988	1.2
75-79	280	.7	202	.5	482	.6
80-84	243	.6	220	.5	463	.5
85+	151	.4	126	.3	277	.3
Missing/DK	21	.1	24	.1	45	.1
Dependency age group						
0-14	19441	47.1	19084	44.2	38525	45.6
15-64	19991	48.4	22699	52.5	42690	50.5
65+	1860	4.5	1410	3.3	3270	3.9
Missing/DK	21	.1	24	.1	45	.1
Children and adult populations						
Children age 0-17 years	21663	52.4	21315	49.3	42978	50.8
Adults age 18+ years	19630	47.5	21878	50.6	41508	49.1
Missing/DK	21	.1	24	.1	45	.1
Total	41314	100.0	43217	100.0	84530	100.0

The total number of children in the age group 0-17 years in the households and survey population was 42,978 (Male: 21,663; Female: 21,315), constituting 50.8 per cent of the total survey population, the sex ratio being 984 girls for 1,000boys. The household members aged 18 years and above constituted 49.1 per cent of the survey population. The under-five children in the total survey population was 13,823 (Male: 7,021); Female (6,802). The proportion of under-five children in the total survey population was estimated at 16.4 per cent, the sex ratio being 969 females for 1,000 males.

The proportion of children in the age group 0-17 years (50.8 per cent) in the total survey population was higher than the proportion of under-18 population (48.5 per cent) at the time of the 2008 Census. The percentage of female household members (51.1 per cent) to total survey population was also higher than the percentage of female population to total population at the time of the 2008 Census (49.0 per cent). Similarly, the percentage of under-five children to total survey population was also higher (16.4 per cent) than the percentage of under-five children to total population at the time of the 2008 Census.

The data in Table HH.2 are also used to produce Figure HH.2 which depicts the age and sex distribution of the household population by five-year age groups.

The above figure (demographic pyramid) shows the age structure of the survey population. The pyramid consists of two sets of horizontal bar graphs, one for each sex, which indicates the proportion of people in each age group. The pyramid shows that the proportion of males is larger than that of females, except in those groups aged 10-14, 15-19, 20-24, 25-29, 30-34, 35-39, and 50-54 years.

Household Composition

Table 3.3 - 3.5 provide basic information on the households, female respondents age 15-49 years, and children under-five by presenting the un weighted, as well as the weighted numbers. Information on the basic characteristics of households, women and children under-five interviewed in the survey is essential for the interpretation of findings presented later in the report and also can provide an indication of the representativeness of the survey. The remaining tables in this report are presented only with weighted numbers. See Appendix A for more details about the weighting.

Table 3.3 provides basic background information on the households. Within households, the sex of the household head, state of residence, area of residence, number of household members, education of household head and household distribution by age group are shown in the Table 3.3. These background characteristics are used in subsequent tables in this report; the figures in the table are also intended to show the number of observations by major categories of analysis in the report.

The weighted and unweighted numbers of households are equal, since sample weights were normalized (See Appendix A). The table also shows the proportions of households with at least one child under 18, at least one child under 5, and at least one eligible woman age 15-49 years. The table also shows the weighted average household size estimated by the survey.

Table 3.3: Household composition Percent distribution of households by selected characteristics, Sudan, 2010			
	Weighted per cent	Number of households	
		Weighted	Unweighted
Sex of household head			
Male	82.5	12187	12324
Female	17.5	2591	2454
State of residence			
Northern	1.9	279	984
River Nile	3.6	528	983
Red Sea	3.1	455	988
Kassala	6.3	935	970
Gadarif	5.0	734	973
Khartoum	14.7	2167	971
Gezira	14.6	2160	1000
White Nile	5.0	745	976
Sinnar	4.2	619	989
Blue Nile	3.3	493	998
North Kordofan	11.0	1620	999
South Kordofan	4.6	682	988
North Darfur	6.1	907	992
West Darfur	4.8	711	987
South Darfur	11.8	1742	980
Area of residence			
Urban	29.5	4359	4479
Rural	70.5	10419	10299
Number of household members			
1	1.6	232	254
2	8.2	1216	1261
3	11.9	1763	1839
4	14.6	2160	2151
5	14.5	2143	2192
6	14.1	2085	2034
7	11.5	1694	1680
8	8.8	1303	1305
9	6.5	964	910
10+	8.3	1220	1152
Education of household head			
None	57.7	8523	8620
Primary	25.1	3703	3664
Secondary +	16.6	2454	2391
Missing/DK	.7	98	103
Household distribution by age group	**100.0**	**14778**	**14778**
Households with at least: one child age 0-4 years	58.1	14778	14778
Households with at least: one child age 0-17 years	85.2	14778	14778
Households with at least: one woman age 15-49 years	89.7	14778	14778
Households with at least: one man age 15-49 years	75.4	14778	14778
Mean household size	5.7	14778	14778
SUDAN (TOTAL)	**100.0**	**14778**	**14778**

Male household heads constituted 82.5 per cent of the total household heads while female household heads constituted 17.5 per cent. About 57.7 per cent of the household heads had no formal education, while about 25.1 per cent of the household heads had primary education and 16.6 per cent

of them had secondary or higher level of education. The members in the households in urban areas constituted 29.5 per cent of the total household members while household members in rural areas constituted 70.5 per cent of the total household members.

The households with four members constituted the largest proportion (14.6 per cent) of the surveyed households followed by households with five members (14.5 per cent) and households with six members (14.1 per cent) while households with only one member constituted the least proportion (1.6 per cent) of all households. This indicates that a large proportion of households/families had four or more than four members which reflect the preference for larger families among a majority (78.3 per cent) of the households. The SHHS2 findings indicate that smaller households (with three or less than three members) constitute a very small proportion (21.7 per cent).

About 58.1 per cent of the households had at least one child under five while 85.2 per cent of the households had at least one child under 18. About 89.7 per cent of the households had at least one woman in the age group 15-49 years while 75.4 per cent of the households had at least one man in the age group 15-49 years. The weighted average household size estimated by the survey was 5.7.

Characteristics of Female Respondents 15-49 Years of Age and Children Under-5

Table 3.4 provides information on the background characteristics of female respondents 15-49 years of age. The table includes information on the distribution of women according to state of residence, area of residence, age group, marital status, motherhood status, births in last two years preceding the SHHS, educational status[1], and wealth index quintiles[2].

Of the total women in the age group 15-49 years in the survey population, women in urban areas constituted 34.0 per cent of total women in the survey population while women in rural areas constituted 66.0 per cent. Women in the age group 15-19 years constituted the largest proportion (20.7 per cent) of women in the survey population followed by women in the age group 20-24 years (19.3 per cent) and those in the age group 25-29 years (18.5 per cent) while the lowest proportion of women was in the age group 45-49 years (6.2 per cent).

About 64.1 per cent of the women aged 15-49 years were currently married and 5.7 per cent were formerly married (widowed, divorced or separated) while never married women constituted 30.2 per cent. Approximately six out of ten (62.3 per cent) women had given birth to a child while 37.6 per cent never gave birth to a child. About 32.9 per cent of the women age15-49 years had a birth in last two years preceding the SHHS2. Women with no formal education made up 35.3 per cent of the total women in the survey population while 32.4 per cent had primary education and 28.0 per cent had secondary or higher level of education. The results in regard to wealth index quintiles show that about 17.5 per cent of women belonged to households in the poorest quintile while women from households in the richest quintile constituted about 23.3 per cent.

[1] Unless otherwise stated, "education" refers to educational level attended by the respondent throughout this report when it is used as a background variable.

[2] Principal components analysis was performed by using information on the ownership of consumer goods, dwelling characteristics, water and sanitation, and other characteristics that are related to the household's wealth to assign weights (factor scores) to each of the household assets. Each household was then assigned a wealth score based on these weights and the assets owned by that household. The survey household population was then ranked according to the wealth score of the household they are living in, and was finally divided into 5 equal parts (quintiles) from lowest (poorest) to highest (richest). The wealth index is assumed to capture the underlying long-term wealth through information on the household assets, and is intended to produce a ranking of households by wealth, from poorest to richest. The wealth index does not provide information on absolute poverty, current income or expenditure levels. The wealth scores calculated are applicable for only the particular data set they are based on. Further information on the construction of the wealth index can be found in *Filmer, D. and Pritchett, L., 2001. "Estimating wealth effects without expenditure data – or tears: An application to educational enrolments in states of India". **Demography** 38(1): 115-132. Gwatkin, D.R., Rutstein, S., Johnson, K. , Pande, R. and Wagstaff. A., 2000. Socio-Economic Differences in Health, Nutrition, and Population. HNP/Poverty Thematic Group, Washington, DC: World Bank. Rutstein, S.O. and Johnson, K., 2004. The DHS Wealth Index. DHS Comparative Reports No. 6. Calverton, Maryland: ORC Macro.*

Table 3.4: Women's background characteristics
Percent and frequency distribution of women age 15-49 years by selected characteristics, Sudan, 2010

	Weighted percent	Number of women	
		Weighted	Unweighted
State of residence			
Northern	2.0	351	1223
River Nile	3.7	637	1179
Red Sea	2.8	477	1081
Kassala	5.8	1004	1077
Gadarif	4.5	773	1090
Khartoum	17.5	3005	1327
Gezira	16.2	2791	1385
White Nile	5.3	906	1165
Sinnar	3.9	675	1131
Blue Nile	3.3	566	1186
North Kordofan	10.3	1765	1155
South Kordofan	4.1	700	1066
North Darfur	5.4	930	1024
West Darfur	3.9	672	1000
South Darfur	11.2	1923	1085
Area of residence			
Urban	34.0	5842	5807
Rural	66.0	11332	11367
Age group			
15-19	20.7	3559	3447
20-24	19.3	3321	3286
25-29	18.5	3176	3219
30-34	12.5	2139	2250
35-39	14.2	2446	2458
40-44	8.5	1466	1441
45-49	6.2	1067	1073
Marital status			
Currently married/in union	64.1	11006	11182
Widowed	1.7	295	309
Divorced	3.7	627	645
Separated	.3	50	37
Never married/in union	30.2	5193	4997
Missing	.0	4	4
Motherhood status			
Ever gave birth	62.3	10708	10840
Never gave birth	7.4	1274	1337
Never married/in union	30.2	5193	4997
Birth in last two years			
Had a birth in last two years	32.9	5646	5730
Had no birth in last two years	36.9	6336	6447
Never married/in union	30.2	5193	4997
Education status			
None	35.3	6062	6313
Primary	32.4	5570	5555
Secondary +	28.0	4803	4464
Adult education/Khalwa/Sunday education	4.3	739	842
Wealth index quintiles			
Poorest	17.5	3013	2647
Second	18.5	3176	3474

Middle	19.6	3375	3737
Fourth	21.0	3604	3686
Richest	23.3	4006	3630
SUDAN (TOTAL)	**100.0**	**17174**	**17174**

Children's Background Characteristics

Some background characteristics of children under five years of age are presented in Table 3.5. These include the distribution of children by several attributes: sex, state of residence, area of residence, age group, mothers' or caretakers' education level, and wealth index quintiles.

Table 3.5: Background characteristics of under-five children
Percent and frequency distribution of children under five years of age by selected characteristics, Sudan, 2010

		Number of children	
	Weighted percent	Weighted	Unweighted
Sex			
Male	50.8	6742	6735
Female	49.2	6540	6547
State of residence			
Northern	1.3	170	607
River Nile	3.0	404	765
Red Sea	2.1	281	625
Kassala	5.9	780	818
Gadarif	5.1	678	901
Khartoum	14.1	1868	828
Gezira	13.2	1750	839
White Nile	5.1	675	856
Sinnar	3.9	517	843
Blue Nile	4.5	595	1234
North Kordofan	10.7	1425	902
South Kordofan	5.1	681	1020
North Darfur	7.1	947	1043
West Darfur	5.1	682	967
South Darfur	13.8	1829	1034
Area of residence			
Urban	27.6	3669	3771
Rural	72.4	9613	9511
Age group			
0-5 months	11.7	1556	1524
6-11 months	10.6	1408	1440
12-23 months	19.7	2613	2652
24-35 months	20.8	2762	2746
36-47 months	21.2	2811	2802
48-59 months	16.0	2131	2118
Mother's or caretaker's education			
None	55.4	7359	7553
Primary	30.4	4044	3934
Secondary	13.4	1785	1708
Missing/DK	.7	94	87
Wealth index quintiles			
Poorest	24.2	3213	2803
Second	21.8	2901	3185
Middle	21.1	2800	3123
Fourth	18.7	2490	2461
Richest	14.1	1878	1710
TOTAL	**100.0**	**13282**	**13282**

Children under the age of five years constituted about 16.4 per cent of the total survey population. Male children constituted 50.8 per cent of the total number of under-five children while female children constituted 49.2 per cent. The proportion of under-five children in urban areas was 27.6 per cent of the total under-five children in the survey population while the proportion of under-five children in rural areas was 72.4 per cent. Children age 36-47 months constituted the largest proportion (21.2 per cent) of under-five children followed by children age 24-35 months (20.8 per cent) and children age 12-23 months (19.7 per cent) while the lowest proportion of under-five children was in the age group 6-11 months (10.6 per cent). Under-five children whose mothers had no formal education constituted 55.4 per cent, while 30.4 per cent of under-five children had mothers with primary education and 13.4 per cent had mothers with secondary or higher level of education. The data relating to the wealth index quintiles showed that about 24.2 per cent of under-five children belonged to households in the poorest quintile while children from households in the richest quintile constituted about 14.1 percent.

IV. Child Mortality

One of the overarching goals of the Millennium Development Goals (MDGs) is the reduction of infant and under-five mortality. Specifically, the MDGs call for the reduction in under-five mortality by two-thirds between 1990 and 2015. Monitoring progress towards this goal is an important but difficult objective.

In the SHHS2, estimates the infant and under five mortality rates, were computed using the direct method of calculation, based on the full birth histories that included information on sex, month and year of birth, survivorship status and current age, and if the child had died, the age at death. This information is used to work out the proportion dead among children of women in each age group into probabilities of dying taking into account the approximate length of exposure of children to the risk of dying (Table 4.1).

Table 4.1: Child mortality: Deaths among children, exposure of children to the risk of dying and probability of dying , Sudan , 2010

Age	Periods of analysis of 5 years				
	0-4	5-9	10-14	15-19	20-24
	Mean	Mean	Mean	Mean	Mean
Deaths					
0	490.64	400.03	355.88	252.04	149.37
1-2	106.93	96.18	87.49	60.82	24.97
3-5	91.14	96.80	80.76	45.08	39.73
6-11	167.17	139.60	143.61	105.66	49.60
12-23	130.48	158.07	134.68	87.15	55.46
24-35	90.47	104.76	100.75	73.42	36.12
36-47	47.37	62.06	60.09	35.54	30.83
48-59	32.05	24.88	25.41	16.53	5.44
Exposure to the risk of dying					
0	14239.99	12296.72	9539.35	5603.44	3192.40
1-2	13891.58	11823.55	8912.65	5344.56	2947.93
3-5	13675.67	11671.02	8532.55	5261.94	2806.49
6-11	13295.14	11368.48	8209.22	5107.44	2628.59
12-23	12965.77	10621.73	7712.00	4637.96	2299.00
24-35	12561.90	9835.11	6869.91	4046.12	1889.12
36-47	11973.97	9266.35	6029.59	3472.76	1523.30
48-59	11495.21	8784.00	5306.37	2975.41	1211.29
Probability of dying					
0	34.45	32.53	37.31	44.98	46.79
1-2	7.70	8.13	9.82	11.38	8.47
3-5	6.66	8.29	9.46	8.57	14.16
6-11	12.57	12.28	17.49	20.69	18.87
12-23	10.06	14.88	17.46	18.79	24.12
24-35	7.20	10.65	14.67	18.15	19.12
36-47	3.96	6.70	9.97	10.23	20.24
48-59	2.79	2.83	4.79	5.56	4.49

Using the direct method, estimates of the neonatal, post-neonatal, infant, child and under five mortality rates were derived. The results are presented in the following Table 4.2.

Table 4.2: Child mortality
Infant and under-five mortality rates by 5 year periods, Sudan, 2010

Period of analysis of five years	Neonatal mortality	Post neonatal mortality	Infant mortality	Child mortality	Under five mortality
	Mean	Mean	Mean	Mean	Mean
0-4	34.45	25.78	60.24	23.81	82.62

5-9	32.53	27.51	60.05	34.64	92.61
10-14	37.31	34.99	72.30	46.11	115.07
15-19	44.98	38.32	83.30	51.75	130.74
20-24	46.79	39.04	85.83	66.36	146.49

Estimates of the neonatal, post-neonatal, infant, child and under-five mortality rates by background characteristics are presented in the following Table 4.3.

Table 4.3: Child mortality
Neonatal, post-neonatal, infant, child and under-five mortality rates by background characteristics, Sudan, 2010

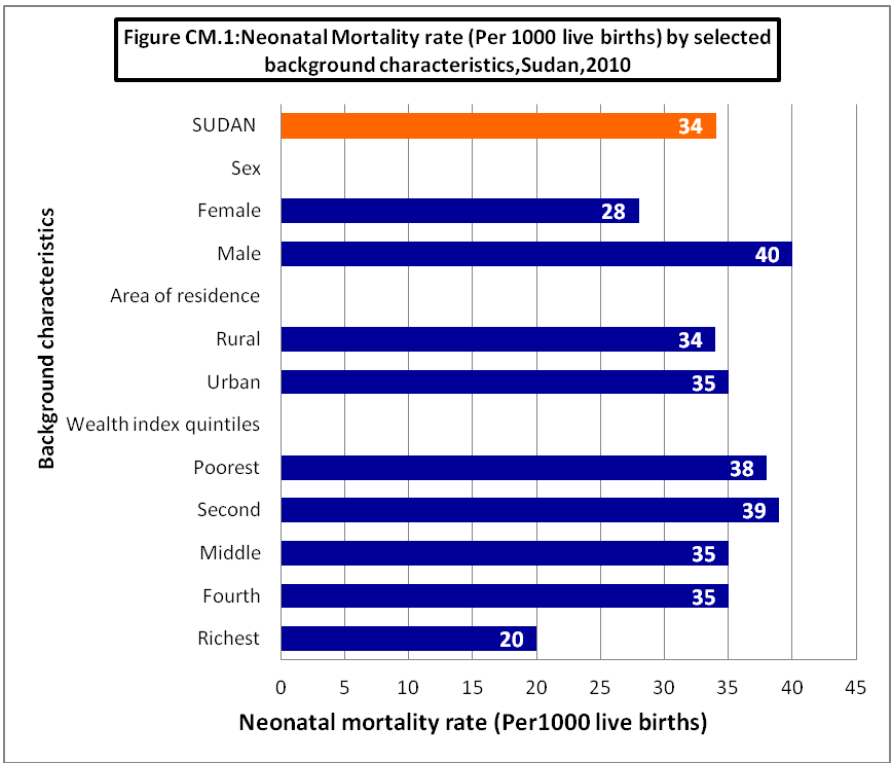
Background characteristics	Neonatal mortality rate (per 1000 live births) [1]	Post neo-natal mortality rate (per 1000 live births) [2]	Infant mortality rate (per 1000 live births) [3]	Child mortality rate (per 1000 live births) [4]	Under-five mortality rate (per 1000 live births) [5]
Sex					
Male	40	25	66	24	89
Female	28	26	54	23	76
Area					
Urban	35	26	62	18	79
Rural	34	26	60	26	84
State					
Northern	38	19	56	8	64
River Nile	33	13	46	14	60
Red Sea	32	53	85	41	122
Kassala	28	34	62	27	87
Gadarif	28	37	65	45	107
Khartoum	27	29	55	13	67
Gezira	21	18	39	15	53
White Nile	33	21	54	22	74
Sinnar	23	17	40	23	62
Blue Nile	36	30	66	69	131
North Kordofan	43	21	64	19	82
South Kordofan	40	39	79	48	123
North Darfur	44	19	63	6	69
West Darfur	39	27	66	23	88
South Darfur	48	26	74	23	95
Wealth index quintiles					
Poorest	38	21	59	29	86
Second	39	31	69	30	97
Middle	35	32	68	29	95
Fourth	35	25	60	18	77
Richest	20	18	37	5	42
SUDAN (Total)	**34**	**26**	**60**	**24**	**83**

[1] SHHS indicator 1.1
[2] SHHS indicator 1.2
[3] SHHS indicator 1.3
[4] SHHS indicator 1.4
[5] SHHS indicator 1.5

The SHHS2 findings indicate that mortality rates are higher for males than females and mortality rates are lowest among children of mothers from households in the richest quintile than those from households in other wealth quintiles.

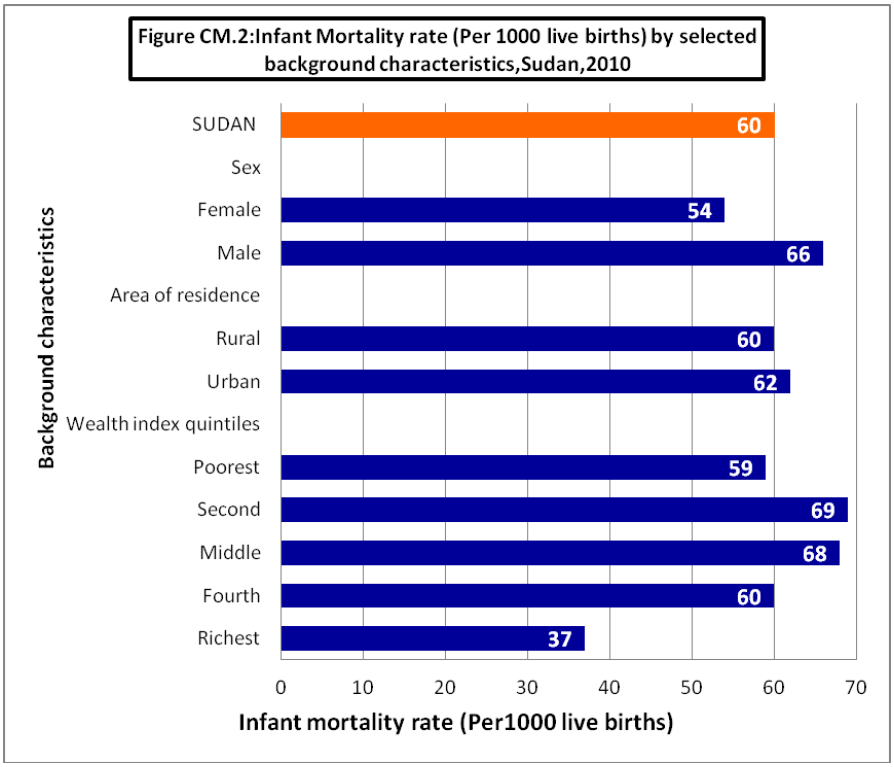
Neonatal mortality rate (NMR): The neonatal mortality rate (NMR) was estimated at 34 per thousand live births. The NMR was higher for males (40 per thousand live births) than females (28 per thousand live births. There was a marginal difference in NMR between children living in urban and rural locations. The NMR among children living in urban areas was 35 per thousand live births compared to

34 per thousand live births among children living in rural areas.. The NMR among children of mothers from households in the poorest quintile was highest at 38 per thousand live births compared to 20 per thousand live births among children of mothers from households in the richest quintile.



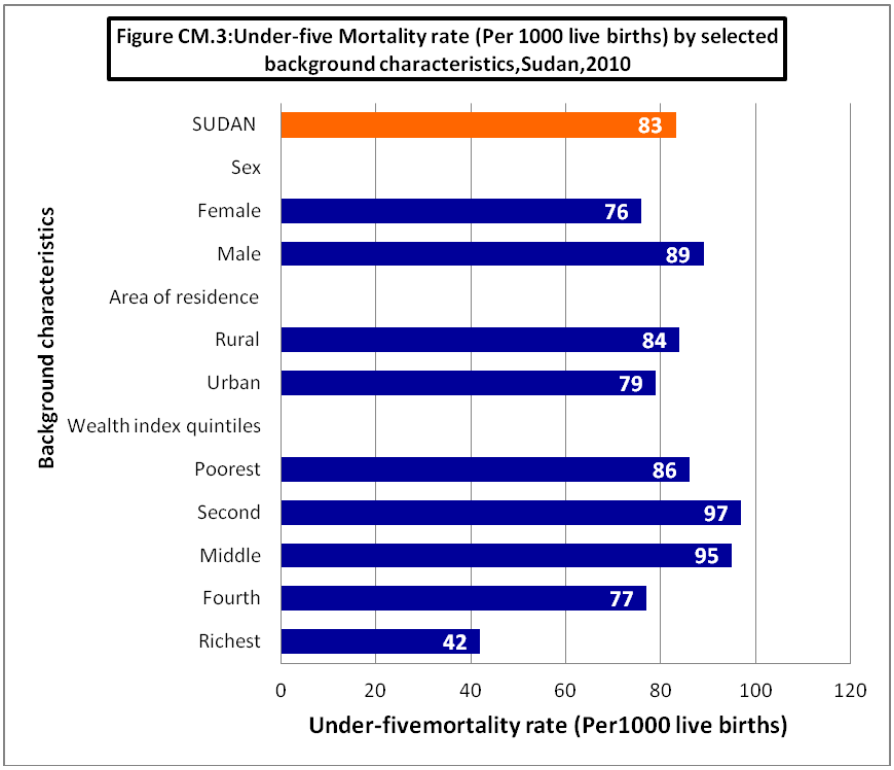
Post-neonatal mortality rate (PNMR): The post-neonatal mortality rate (PNMR) was estimated at 26 per thousand live births. There was no difference in PNMR between males and females. The PNMR among children of mothers from households in the second wealth quintile was highest at 31 per thousand live births compared to 18 per thousand live births among children of mothers from households in the richest quintile.

Infant mortality rate (IMR): The infant mortality rate (IMR) was estimated at 60 per thousand live births. The IMR was much higher for males (66 per thousand live births) than females (54 per thousand live births. No difference in IMR between infants living in urban and rural areas was noted. The. The IMR among infants of mothers in the second wealth quintile was highest at 69 per thousand live births 37 per thousand live births among children of mothers from households in the richest quintile.



Child mortality rate (CMR): The Child mortality rate (CMR) was estimated at 24 per thousand live births. The CMR was higher for children living in rural areas (26 per thousand live births) than for children living in urban areas (18 per thousand live births). The CMR among children of mothers from households in the second wealth quintile was highest at 30 per thousand live births compared to 5 per thousand live births among children of mothers from households in the richest quintile.

Under-five mortality rate (U5MR): The under-five mortality rate (U5MR) was estimated at 83 per thousand live births. The U5MR was much higher for males (89 per thousand live births) than females (76 per thousand live births). The U5MR was higher for children living in rural areas (84 per thousand live births) than for children living in urban areas (79 per thousand live births). The U5MR among children of mothers from households in the second wealth quintile was highest at 97 per thousand live births compared to 42 per thousand live births among children of mothers from households in the richest quintile.



The SHHS findingsimply that a child born into households in the poorest quintile is approximately twice as likely to die by his/her fifth birth day as those born into households in the richest quintile.

V. Nutrition

Children's Nutritional Status

Children's nutritional status is a reflection of their overall health. When children have access to an adequate food supply, are not exposed to repeated illness, and are well cared for, they reach their growth potential and are considered well nourished.

The nutrition program in Sudan is aimed at reducing child mortality associated with malnutrition in the short-term as well as preventing malnutrition and it's life-long effects in the long-term. Program interventions include food fortification initiatives, promotion of exclusive breastfeeding for the first six months of life and other good infant feeding practices, mass Vitamin A supplementation for children and pregnant and lactating women, as well as treatment of severe and moderate acute malnutrition. The nutrition situation is monitored through locality and state level surveys, a community-based nutrition surveillance system and on-going data collection from feeding programs and health facilities.

The Millennium Development Goal target is to reduce by half the proportion of people who suffer from hunger between 1990 and 2015. One of the indicators for measuring progress towards this target is *underweight prevalence (moderate and severe) i.e. p*roportion of children under age five who fall below minus two standard deviations from the median weight-for-age of the WHO growth standards. A reduction in the prevalence of malnutrition is also expected to contribute to the achievement of the goal of reducing child mortality.

In a well-nourished population, there is a reference distribution of height and weight for children under age five. Under-nourishment in a population can be gauged by comparing children to a reference population. The reference population used in this report is based on the WHO growth standards[3]. Each of the three nutritional status indicators – *weight for age*, *height for age* and *weight for height* - can be expressed in standard deviation units (z-scores) from the median of the reference population.

Weight-for- age is a measure of both acute and chronic malnutrition. Children whose weight for age is below minus two standard deviations from the median weight for age of the WHO growth standard are considered *moderately or severely underweight* while those whose weight for age is below minus two standard deviations from the median weight for age of the WHO growth standard are classified as *severely underweight.*

Height-for-age is a measure of linear growth. Children whose height for age is below minus two standard deviations from the median weight for age of the WHO growth standard are considered short for their age and classified as *moderately or severely stunted.* Those whose height for age is below minus three standard deviations from the median weight-for-age of the WHO growth standard are classified as *severely stunted.* Stunting is a reflection of chronic malnutrition as a result of failure to receive adequate nutrition over a long period and recurrent or chronic illness.

[3] http://www.who.int/childgrowth/standards/second_set/technical_report_2.pdf
In 2006, WHO published child growth standards for attained weight and height to replace the previously recommended 1977 NCHS/WHO child growth reference. These new standards are based on breastfed infants and appropriately fed children of different ethnic origins raised in optimal conditions and measured in a standardized way. The same cohort was used to produce standards of mid-upper arm circumference (MUAC) in relation to age. The new WHO growth standards confirm earlier observations that the effect of ethnic differences on the growth of infants and young children in populations is small compared with the effects of the environment. Studies have shown that there may be some ethnic differences among groups, just as there are genetic differences among individuals, but for practical purposes they are not considered large enough to invalidate the general use of the WHO growth standards population as a standard in all populations. These new standards have been endorsed by international bodies such as the United Nations Standing Committee on Nutrition, the International Union of Nutritional Sciences and International Paediatric Association and adopted in more than 90 countries.

Weight-for- height represents a measure of wasting. Children whose *weight for height* is below minus two standard deviations from median weight for height of the WHO growth standard are classified as *moderately or severely wasted,* while those whose *weight-for-height* is below minus three standard deviations from median weight for height of the WHO growth standard are classified as *severely wasted*. Wasting is usually the result of a recent nutritional deficiency. The indicator may exhibit significant seasonal shifts associated with changes in the availability of food or disease prevalence.

Finally, the weight for height z-scores (WHZ) and the presence of bilateral pitting oedema among children age 6-59 months provides a measure of acute malnutrition in the population. This is conventionally expressed in terms of Global Acute Malnutrition (GAM) prevalence, Moderate Acute Malnutrition (MAM) prevalence and Severe Acute Malnutrition (SAM) prevalence. Indicators of acute malnutrition (GAM, MAM and SAM) prevalence are estimated on the basis of the weight for height z-scores (WHZ) and/or oedema in regard to children age 6-9 months. Global Acute Malnutrition (GAM) is defined in terms low weight for height z-scores (<-2SD from the median weight for height of the WHO growth standard) and/or oedema. Moderate Acute Malnutrition (MAM) is defined in terms low weight for height z-scores (<-2SD and >_3SD from the median weight for height of the WHO growth standard) and no oedema, while Severe Acute Malnutrition (GAM) is defined in terms very low weight for height z-scores (<-3SD from the median weight for height of the WHO growth standard) and/or oedema.

In SHHS2, weights and heights of all children under five years of age were measured using anthropometric equipment recommended by UNICEF (www.childinfo.org)**.** Findings in this section are based on the results of these measurements.

Table 5.1 shows the percentages of children aged 0-59 months who were classified into each of the above mentioned categories, based on the anthropometric measurements that were taken during fieldwork. It presents the underweight, stunting and wasting prevalence rates among under-five children. Additionally, the table includes the percentage of children who were found to be overweight, which takes into account those children whose weight for height is above two standard deviations from the median of the reference population, and mean z-scores for all three anthropometric indicators.

Table 5.1: Nutritional status of children

Percentage of children under age 5 by nutritional status according to three anthropometric indices: weight for age, height for age, and weight for height, Sudan, 2010

Background characteristics	Weight for age: % below -2 SD [1]	Weight for age: % below -3 SD [2]	Weight for age: Mean Z-Score (SD)	Weight for age: Number of children	Height for age: % below -2 SD [3]	Height for age: % below -3 SD [4]	Height for age: Mean Z-Score (SD)	Height for age: Number of children	Weight for height: % below -2 SD [5]	Weight for height: % below -3 SD [6]	Weight for height: % above +2 SD	Weight for height: Mean Z-Score (SD)	Weight for height: Number of children
Sex													
Male	33.6	13.7	-1.4	6228	37.4	17.3	-1.5	6046	17.9	5.9	3.2	-.8	6021
Female	30.7	11.4	-1.3	6038	32.6	14.0	-1.3	5886	14.8	4.6	2.5	-.8	5877
State of residence													
Northern	22.2	6.8	-1.0	159	24.0	9.9	-.9	155	12.9	6.4	3.9	-.7	155
River Nile	32.2	12.3	-1.3	347	30.3	14.1	-1.2	336	18.5	5.4	1.8	-.9	337
Red Sea	49.2	32.7	-1.8	201	54.1	30.6	-2.0	184	28.5	14.7	6.2	-1.0	183
Kassala	38.5	19.0	-1.7	712	49.1	26.9	-1.9	703	16.7	5.6	3.0	-.8	701
Gadarif	38.6	17.3	-1.6	642	39.7	20.3	-1.7	629	17.1	6.4	2.4	-.8	635
Khartoum	19.9	6.1	-1.0	1732	21.9	7.8	-.9	1706	12.8	3.9	2.2	-.6	1712
Gezira	23.5	7.2	-1.1	1638	29.7	12.4	-1.1	1614	13.2	4.4	2.6	-.6	1601
White Nile	34.1	12.7	-1.5	617	37.0	20.0	-1.5	606	18.1	7.8	4.4	-.8	600
Sinnar	42.6	18.6	-1.6	482	47.1	26.4	-1.7	469	21.6	8.5	3.9	-1.0	467
Blue Nile	31.7	11.8	-1.5	569	37.1	15.1	-1.5	560	16.2	4.3	2.4	-.9	562
North Kordofan	41.4	18.9	-1.6	1292	46.7	24.5	-1.8	1224	18.1	6.7	4.8	-.8	1218
South Kordofan	40.3	16.7	-1.5	599	36.6	16.9	-1.5	552	17.4	4.4	3.1	-.9	550
North Darfur	35.7	11.5	-1.6	897	35.3	12.2	-1.4	891	21.6	6.5	3.2	-.9	886
West Darfur	33.1	13.1	-1.5	649	36.6	17.5	-1.4	637	18.6	6.7	3.8	-.9	636
South Darfur	31.2	10.6	-1.4	1731	31.1	9.5	-1.4	1665	14.0	2.3	1.0	-.9	1656
SUDAN (Total)	**32.2**	**12.6**	**-1.4**	**12266**	**35.0**	**15.7**	**-1.4**	**11932**	**16.4**	**5.3**	**2.9**	**-.8**	**11898**
Age groups													
0-5 months	27.2	17.5	-.7	1399	16.9	8.5	-.3	1238	17.6	7.6	6.6	-.6	1218
6-11 months	27.0	9.7	-1.2	1321	20.3	6.4	-.8	1289	19.9	5.0	2.0	-.9	1290
12-23 months	36.2	12.9	-1.5	2419	38.9	17.2	-1.6	2374	20.6	6.7	2.2	-1.0	2372
24-35 months	35.4	14.4	-1.5	2583	43.4	21.1	-1.7	2540	15.4	4.7	2.9	-.8	2520
36-47 months	31.6	11.2	-1.5	2575	40.5	17.2	-1.6	2546	13.1	4.4	2.4	-.8	2535
48-59 months	30.7	9.9	-1.5	1970	33.4	15.4	-1.5	1946	13.7	4.1	2.6	-.8	1964
Mother's education													
None	35.9	15.1	-1.5	6774	40.0	18.8	-1.6	6568	17.4	5.9	3.3	-.9	6578
Primary	29.4	10.6	-1.3	3754	31.4	13.1	-1.3	3659	15.6	4.7	2.3	-.7	3628
Secondary	23.2	6.8	-1.1	1650	22.9	9.0	-.9	1617	14.1	4.0	2.6	-.8	1604
Missing/DK	29.2	4.5	-1.2	88	35.3	8.4	-1.2	88	12.1	.6	.6	-.8	88
Wealth index quintile													
Poorest	40.0	15.6	-1.7	3017	42.1	18.6	-1.7	2917	18.8	5.9	2.7	-1.0	2911
Second	39.7	17.0	-1.6	2662	43.8	21.3	-1.7	2586	18.4	6.2	3.8	-.9	2582
Middle	32.4	13.1	-1.4	2560	38.1	17.6	-1.5	2484	16.0	5.6	3.3	-.7	2475
Fourth	24.5	7.9	-1.2	2312	27.4	11.2	-1.2	2263	14.1	4.0	2.2	-.7	2262
Richest	16.5	5.8	-.8	1715	15.0	5.2	-.6	1682	12.7	3.8	2.0	-.7	1668

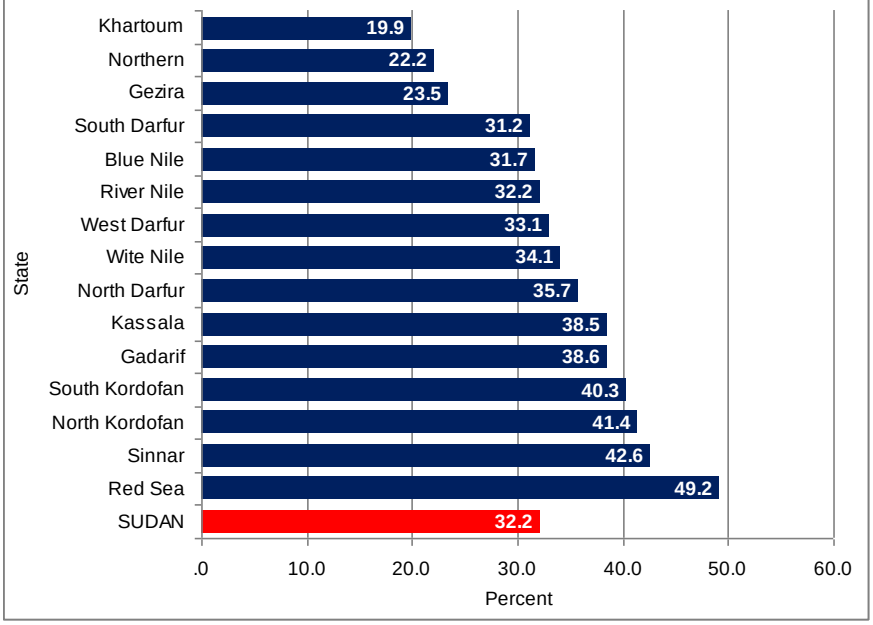
[1] SHHS indicator 2.1a and MDG indicator 1.8; [2] SHHS indicator 2.1b; [3] SHHS indicator 2.2a; [4] SHHS indicator 2.2b; [5] SHHS indicator 2.3a; [6] SHHS indicator 2.3b

Children whose full birth date (month and year) were not obtained, and children whose measurements were outside a plausible range are excluded from Table 5.1. Children are excluded from one or more of the anthropometric indicators when their weights and heights have not been measured, whichever applicable. For example if a child has been weighed but his/her height has not been measured, the child is included in underweight calculations, but not in the calculations for stunting and wasting. Percentages of children by age and reasons for exclusion are shown in the data quality tables DQ.6 and DQ.7.

Underweight prevalence

***Underweight prevalence (moderate and severe)*:** Almost one in three children (32.2 per cent) under age five in Sudan were found to be moderately or severely underweight (Table 5.1). There was a slight difference in terms of those who were moderately or severely underweight among boys (33.6 per cent) and girls (30.7 per cent). The proportion of moderately or severely underweight children was higher in rural areas (35.4 per cent) than in urban areas (23.6 per cent). The percentage of children classified as moderately or severely underweight decreases with increasing levels of education of the mother. For instance, the percentage of moderately or severely underweight children was 35.9 among children of mothers with no formal education compared to 29.4 among children of mothers with primary education and 23.2 among children of mothers with secondary or higher levels of education. The percentage of children classified as moderately or severely underweight also decreases with increasing levels of economic status of the households. The percentage of moderately or severely underweight children was 40.0 for children from households in the poorest quintile compared to 16.5 for children belonging to households in the richest quintile. The proportion of children who were moderately or severely underweight was lowest in Khartoum State (19.9 per cent) and the highest in Red Sea State (49.2 per cent) (Table 5.1 and Figure 5.1).

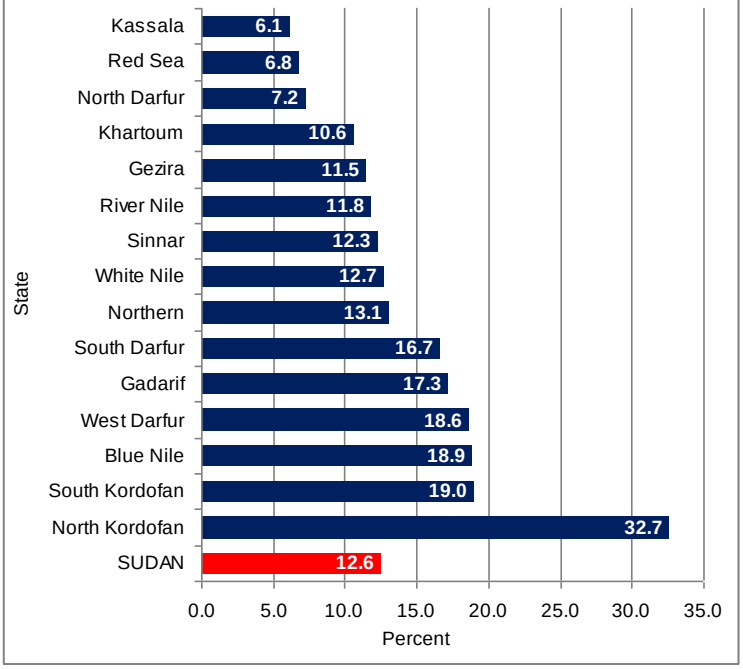
Figure 5.1: Underweight prevalence (moderate and severe) among under-five children, Sudan, 2010



Underweight prevalence (severe): Almost one in eight (12.6 per cent) under age five in Sudan could be classified as severely underweight (Table 5.1). There was a marginal difference in terms of those who were severely underweight among boys (13.7 per cent) and girls (11.4 per cent). The proportion of severely underweight children was higher in rural areas (14.0 per cent) than in urban areas (8.7 per

cent). The percentage of children classified as severely underweight decreases with increasing levels of education of the mother. For instance, the percentage of severely underweight children was 15.1 among children of mothers with no formal education compared to 10.6 among children of mothers with primary education, and 6.8 among children of mothers with secondary or higher levels of education. The percentage of severely underweight children also decreases with increasing levels of economic status of the households. The percentage of severely underweight children was 15.6 among children from households in the poorest quintile compared to 5.8 among children belonging to households in the richest quintile. The proportion of children who were severely underweight was lowest in Khartoum State (6.1 per cent) and the highest in Red Sea State (32.7 per cent) (Table 5.1 and Figure 5.2)

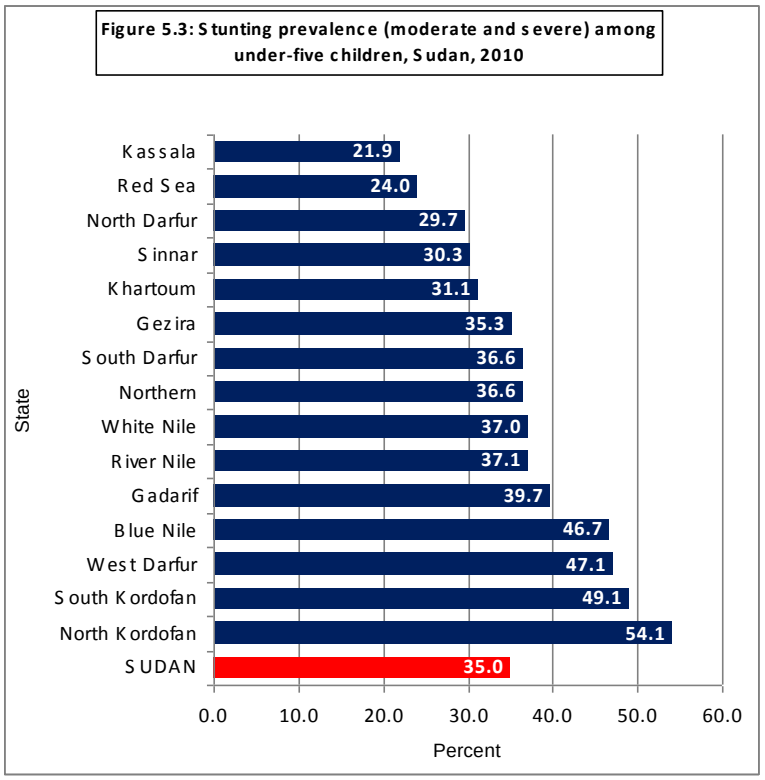
Figure 5.2: Underweight prevalence (severe) among under-five children, Sudan, 2010



Stunting prevalence

Stunting prevalence (moderate and severe): The SHHS2 findings indicated that about 35.0 per cent of children under age five in Sudan were moderately or severely stunted (too short for their age) (Table 5.1). There was some difference in terms of those who were severely and moderately stunted among boys (37.4 per cent) and girls (32.6 per cent). The proportion of moderately or severely stunted children was higher in rural areas (38.7 per cent) than in urban areas (25.3 per cent). The percentage of children classified as moderately or severely stunted decreases with increasing levels of education of the mother. For instance, the percentage of moderately stunted children was 40.0 for children of mothers with no formal education, 31.4 for children of mothers with primary education, and 22.9 among children of mothers with secondary or higher levels of education. The percentage of moderately or severely stunted children also decreases with increasing levels of economic status of the households. The percentage of moderately or severely stunted children was 42.1 among children from households in the poorest quintile compared to 15.0 among children belonging to households in

the richest quintile. The proportion of children who were moderately or severely stunted was the lowest in Khartoum State (21.9 per cent) and the highest in Red Sea State (Table 5.1 and Figure 5.3).



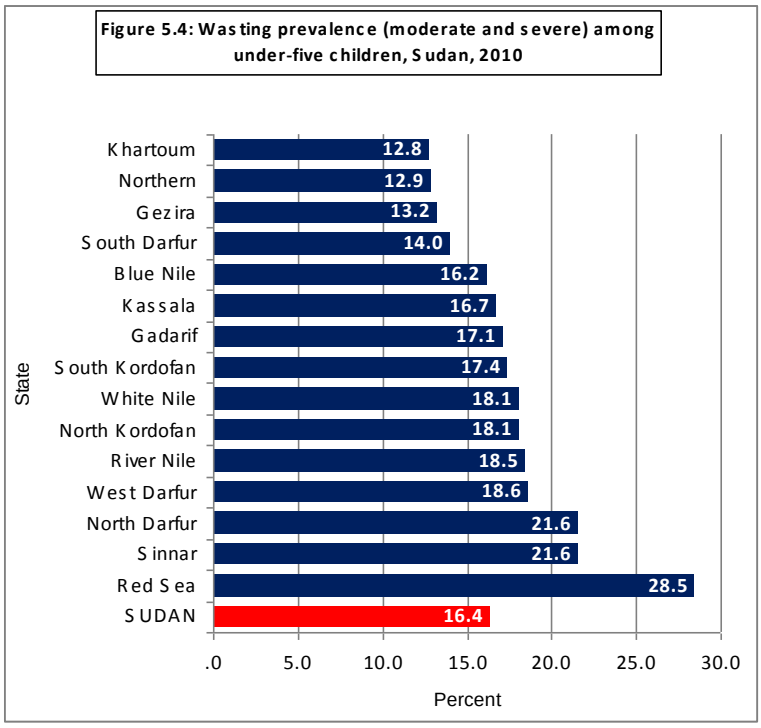
Stunting prevalence (Severe): The SHHS2 findings indicated that about 15.7 per cent of children under age five in Sudan were severely stunted (Table 5.1). There was some difference between boys (17.3 per cent) and girls (14.0 per cent) in terms of those who were severely stunted. The proportion of severely stunted children was higher in rural areas (18.0 per cent) than in urban areas (9.5 per cent). The percentage of severely stunted children decreases with increasing levels of education of the mother. For instance, the percentage of severely stunted children was 18.8 among children of mothers with no formal education, 13.1 among children of mothers with primary education, and 9.0 among children of mothers with secondary or higher levels of education. The percentage of children classified as severely stunted also decreases with increasing economic status of the households. The percentage of severely stunted children was 18.6 among those from households in the poorest quintile compared to 5.2 among children belonging to households in the richest quintile.

The proportion of children who were severely stunted was lowest in Khartoum (7.8 per cent) and the highest in Red Sea State (30.6 per cent). (Table 5.1 and Figure 5.1B).

Wasting prevalence

Wasting prevalence (moderate and severe): Approximately one out of six under-five children (16.4 per cent) in Sudan were found to be moderately or severely wasted (too thin for their height) (Table 5.1). Wasting is usually the result of a recent nutritional deficiency related to, for example, recent illness or inadequate diet intake. The prevalence estimate may exhibit significant seasonal shifts associated with changes in the availability of food or disease prevalence. There was some difference in terms of those who were moderately or severely wasted among boys (17.9 per cent) and girls (14.8

per cent). The proportion of moderately or severely wasted children was higher in rural areas (17.3 per cent) than in urban areas (14.0 per cent). The percentage of moderately or severely wasted children was found to decrease with increasing levels of education of the mother. For instance, the percentage of moderately or severely wasted children was 17.4 among children of mothers with no formal education, compared to 15.6 among children of mothers with primary education, and 14.1 among children of mothers with secondary or higher levels of education. The percentage of moderately or severely wasted children also decreases with increasing levels of economic status of the households. The percentage of moderately or severely wasted children was 18.8 among children from households in the poorest quintile compared to 12.7 among children belonging to households in the richest quintile. The proportion of children who were moderately or severely wasted was lowest in Khartoum State (12.8 per cent) and the highest in Red Sea State (28.5 per cent) (Table 5.1 and Figure 5.4).



Wasting prevalence (Severe): Approximately 5.3 per cent of under-five children in Sudan was found to be severely wasted (Table 5.1). There was a difference in terms of those who were severely wasted among boys (5.9 per cent) and girls (4.6 per cent). The proportion of severely wasted children was higher in rural areas (5.6.0 per cent) than in urban areas (4.4 per cent).The percentage of severely wasted children was found to decrease with increasing levels of education of the mother. For instance, the percentage of severely wasted children was 5.9 among children of mothers with no formal education, 4.7 among children of mothers with primary education, and 4.0 among children of mothers with secondary or higher levels of education. The percentage of severely wasted children also decreases with increasing levels of economic status of the households. The percentage of severely wasted children was 5.9 among children from households in the poorest quintile compared to 3.8 for children belonging to households in the richest quintile. The proportion of children who were severely wasted was highest in Red Sea State (14.7 per cent) and the lowest in Khartoum (3.9 per cent). (Table 5.1).

Overweight prevalence

The SHHS2 findings indicated that about 2.9 per cent of under-five children were found to be overweight (Table 5.1) with more boys (3.2 per cent) overweight than girls (2.5 per cent). The percentage of children classified as overweight was highest in Red Sea State (6.2 per cent) and the lowest in Khartoum State (2.2 per cent).

Nutritional status by age group

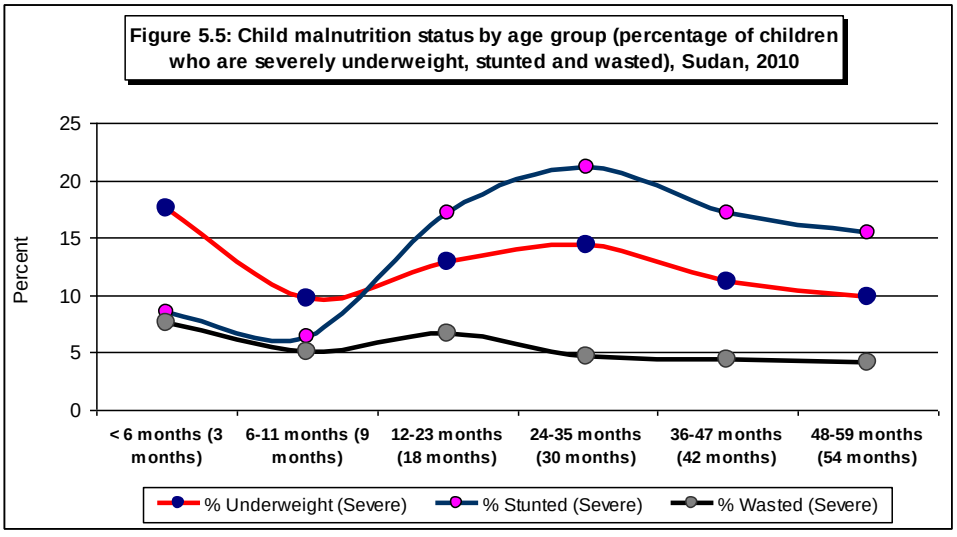
The SHHS2 data (Table 5.1) indicates that the underweight, stunting, and wasting prevalence among under-five children varies with age. The age pattern shows that the underweight prevalence (moderate and severe) was higher among children aged 12-23 months (36.2 per cent) than among those aged 0-5 months (27.2 per cent), 6-11 months (27.0 per cent), 24-35 months (35.4 per cent), 36-47 months (31.6 per cent) and those aged 48-59 months (30.7 per cent). The underweight prevalence (severe) was higher among children aged 24-35 months (14.4 per cent) than those aged 0-5 months (17.5 per cent), 6-11 months (9.7 per cent), 12-23 months (12.9 per cent), 36-47 months (11.2 per cent) and those aged 48-59 months (9.9 per cent).

The stunting prevalence (moderate or severe) was higher among children aged 24-35 months than those aged 0-5 months (16.9 per cent), 6-11 months (20.3 per cent) 12-23 months (38.9 per cent), 36-47 months (40.5 per cent) and those aged 48-59 months (33.4 per cent). The stunting prevalence (severe) was higher among children aged 24-35 months (21.1 per cent) than among those aged 0-5 months (8.5 per cent), 6-11 months (6.4 per cent), 12-23 months (17.2 per cent), 36-47 months (17.2 per cent) and those aged 48-59 months (15.4 per cent).

The wasting prevalence (moderate and severe) was higher among children aged 12-23 months (20.6 per cent) than among those aged 0-5 months (17.6 per cent), 6-11 months (19.9 per cent), 24-35 months (15.4 per cent), 36-47 months (13.1 per cent) and those aged 48-59 months (13.7 per cent). The wasting prevalence (severe) was also higher among children aged 0-5 months (7.6 per cent) than among those aged 6-11 months (5.0 per cent), 12-23 months (6.7 per cent), 24-35 months (4.7 per cent), 36-47 months (4.4 per cent) and those aged 48-59 months (4.1 per cent).

Figure 5.5 presents the status in relation to the proportion of under-five children who were severely underweight, stunted, wasted by different age groups. The figure shows that severe underweight peaks in the age group 24-35 months (14.4 per cent). Severe stunting peaks in the age group 24-35 months (21.1 per cent) while severe wasting peaks in the age category of 0-5 months (7.6 per cent).

Figure 5.5: Child malnutrition status by age group (percentage of children who are severely underweight, stunted and wasted), Sudan, 2010



Breastfeeding and Infant and Young Child Feeding

Breast feeding

Breastfeeding for the first few years of life protects children from infection, provides an ideal source of nutrients, and is economical and safe. However, many mothers stop breastfeeding too soon and there are often pressures to switch to infant formula, which can contribute to growth faltering and micronutrient malnutrition and is unsafe if clean water is not readily available.

WHO/UNICEF have the following feeding recommendations:

- Exclusive breastfeeding for first six months;
- Continued breastfeeding for two years or more;
- Safe, appropriate and adequate complementary foods beginning at 6 months;
- Frequency of complementary feeding: 2 times per day for 6-8 month olds; 3 times per day for 9-11 month olds;

It is also recommended that breastfeeding be initiated within one hour of birth.

- *Minimum meal frequency (6-23 months):* Proportion of infants aged 0-11 months who are appropriately fed: i.e., proportion of infants aged 0-5 months who are exclusively breastfed and proportion of infants aged 6-11 months who are breastfed and ate solid or semi-solid food at least the minimum recommended number of times (two times per day for infants aged 6-8 months, three times per day for infants aged 9-11 months) on the previous day;

- *Milk feeding frequency for non-breastfeeding children (6-23 months):* Proportion of non-breast fed children age 6-23 months who received at least 2 milk feedings during the previous day;

- *Bottle feeding (0-23 months):* Proportion children age 6-23 months who were fed with a bottle during the previous day;

Early initiation of breastfeeding

Table 5.3 provides the proportion of children born in the last two years who were ever breastfed, and those who were first breastfed within one hour and one day of birth. Although a very important step in management of lactation and establishment of a physical and emotional relationship between the baby and the mother, only 73.2 per cent of babies were found to have been breastfed for the first time within one hour of birth, while 92.6 per cent of newborns in Sudan started breastfeeding within one day of birth.

The percentage of babies who were breastfed for the first time within one hour of birth ranged between 87.3 in Kassala State and 63.0 in West Darfur State. The percentage of infants who were first breastfed within one day of birth ranged between 99.2 in Northern State and 76.4 in West Darfur State.

The SHHS2 findings indicate that the percentage of babies who were breastfed for the first time within one hour and one day of birth increases with the increasing level of mother's education. For instance, the percentage of babies who were breastfed for the first time within one hour of birth was 71.7 for babies who had mothers with no formal education compared to 77.4 for babies who had mothers with secondary or higher level of education. The percentage of babies who were breastfed for the first time within one day of birth was 91.4 for babies who had mothers with no formal education compared to 96.4 for babies who had mothers with secondary or higher level of education.

Table 5.3: Initial breastfeeding
Percentage of children born in the 2 years preceding the survey who were ever breastfed and percentage who were breastfed within one hour of birth, Sudan, 2010

Background characteristics	Percentage ever breastfed [1]	Percentage who were first breastfed: Within one hour of birth [2]	Percentage who were first breastfed: Within one day of birth	Number of children born in the two years preceding the survey
State of residence				
Northern	99.2	71.1	99.2	75
River Nile	99.2	85.1	99.2	164
Red Sea	98.3	85.9	96.5	128
Kassala	98.3	87.3	97.9	296
Gadarif	99.0	76.3	97.7	281
Khartoum	98.4	80.0	97.6	741
Gezira	99.6	69.9	96.3	788
White Nile	98.1	68.0	94.3	298
Sinnar	99.6	81.7	91.2	213
Blue Nile	99.8	67.0	86.1	253
North Kordofan	99.1	73.0	91.3	590
South Kordofan	98.2	73.8	91.1	296
North Darfur	98.9	70.8	85.7	357
West Darfur	88.1	63.0	76.4	275
South Darfur	99.7	65.0	89.5	727
Area of residence				
Urban	98.7	75.7	95.5	1478
Rural	98.4	72.3	91.5	4004
None	97.9	71.7	91.4	2955
Education level of mother				
Primary	98.9	73.7	92.9	1710
Secondary	99.6	77.4	96.4	776
Missing/DK	100.0	80.2	93.9	42
Wealth index quintile				
Poorest	98.4	70.4	89.6	1243
Second	98.6	73.0	91.0	1201
Middle	98.0	74.2	92.5	1228
Fourth	98.3	76.1	94.7	1033
Richest	99.4	72.5	97.1	777
SUDAN (TOTAL)	**98.5**	**73.2**	**92.6**	**5482**

[1] SHHS indicator 2.4
[2] SHHS indicator 2.5

The percentage of babies who were breastfed for the first time within one hour of birth or within one day of birth varied between babies belonging to the poorest and richest households. For instance, the percentage of babies who were breastfed for the first time within one hour of birth was 70.4 among babies of mothers belonging to the poorest households as compared to 72.5 among babies of mothers belonging to the richest households. Similarly, the percentage of babies who were breastfed for the first time within one day of birth was 89.6 among babies of mothers belonging to the poorest households compared to 97.1 among children of mothers belonging to the richest households.

Breastfeeding status by age group

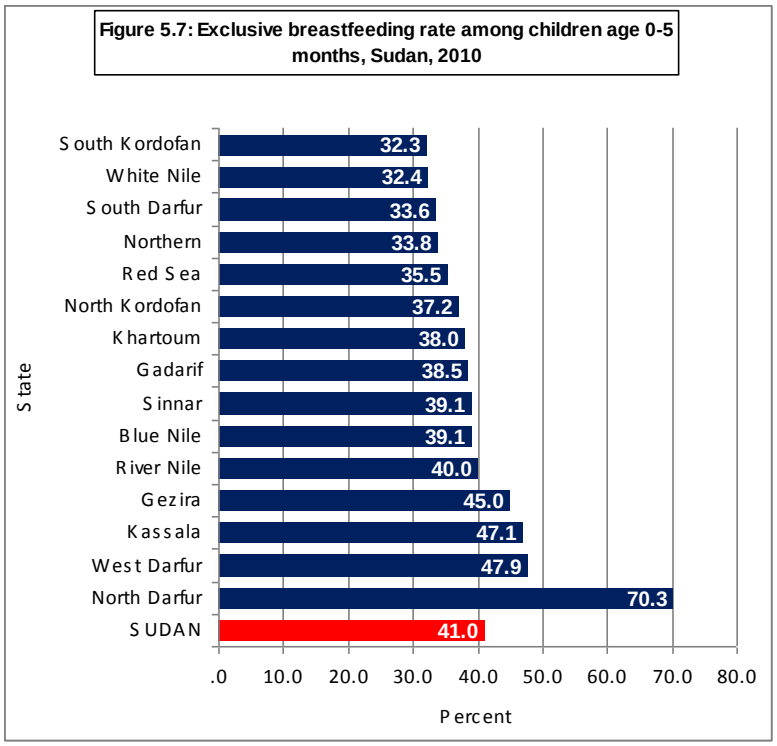
Table 5.4 presents breastfeeding status at selected age groups. The breastfeeding status is based on the reports of mothers/caretakers of children's consumption of food and fluids in the 24 hours prior to the interview. *Exclusively breastfed* refers to infants who received only breast milk (and vitamins, mineral supplements, or medicine). The table shows exclusive breastfeeding of infants during the first six months of life, as well as continued breastfeeding of children at 12-15 and 20-23 months of age.

Table 5.4: Breastfeeding
Percentage of living children according to breastfeeding status at selected age groups, Sudan, 2010

	Children 0-5 months			Children 12-15 months		Children 20-23 months	
	Per cent exclusively breastfed [1]	Per cent predominantly breastfed	Number of children	Per cent breastfed (Continued breastfeeding at 1 year)	Number of children	Per cent breastfed (Continued breastfeeding at 2 years) [4]	Number of children
Sex							
Male	40.3	79.4	775	87.9	526	37.4	358
Female	41.7	80.3	781	87.3	524	43.2	319
State of residence							
Northern	33.8	62.5	21	98.0	15	64.4	9
River Nile	40.0	72.7	46	94.5	30	56.5	22
Red Sea	35.5	82.5	26	90.0	33	59.1	17
Kassala	47.1	83.9	82	92.8	64	52.3	28
Gadarif	38.5	84.8	77	90.7	53	26.7	46
Khartoum	38.0	74.0	206	88.7	146	32.3	75
Gezira	45.0	70.1	222	85.1	143	38.0	105
White Nile	32.4	77.7	79	87.1	60	39.0	48
Sinnar	39.1	85.9	64	90.8	40	34.2	19
Blue Nile	39.1	81.3	67	94.6	35	33.0	42
N. Kordofan	37.2	82.3	179	84.3	102	47.0	82
S. Kordofan	32.3	79.2	83	86.9	51	30.3	42
North Darfur	70.3	87.7	106	88.9	85	47.3	32
West Darfur	47.9	79.8	84	78.3	57	23.4	34
South Darfur	33.6	88.0	214	85.5	137	51.1	75
Area of residence							
Urban	40.2	73.8	391	90.8	307	38.6	173
Rural	41.3	81.9	1165	86.3	743	40.6	505
Mother's education							
None	37.7	80.5	847	87.0	602	40.7	351
Primary	44.2	81.4	501	88.6	305	37.0	224
Secondary	46.8	73.2	199	87.6	139	47.5	90
Missing/DK	54.0	81.9	8	100.0	3	23.5	12
Wealth index quintiles							
Poorest	40.7	86.0	360	87.2	257	47.3	132
Second	38.1	81.6	344	84.2	236	39.0	159
Middle	42.1	81.6	351	89.7	218	39.6	180
Fourth	41.8	75.1	301	87.7	215	39.2	111
Richest	43.7	69.9	200	91.0	123	34.0	95
SUDAN (TOTAL)	**41.0**	**79.8**	**1556**	**87.6**	**1050**	**40.1**	**677**

[1] SHHS indicator 2.6; [2] SHHS indicator 2.9; [3] SHHS indicator 2.7; [4] SHHS indicator 2.8

Exclusive breastfeeding under six months: The SHHS2 data indicated that approximately 41.0 percent of children aged 0-5 months were exclusively breastfed, a level considerably lower than recommended. There was only a marginal difference in the exclusive breastfeeding rates between children aged 0-5 months in urban areas (40.2 per cent) and rural areas (41.3 per cent). The exclusive breastfeeding rates for children aged 0-5 months increases with the increasing level of mother's education. For instance, the exclusive breastfeeding rates for children aged 0-5 months was 37.7 per cent for children of mothers with no education, compared to 44.2 per cent for children of mothers with primary education and 46.8 per cent for children of mothers with secondary or higher level of education. The exclusive breastfeeding rate for children aged 0-5 months was 40.7 per cent among children belonging to households in the poorest compared to 43.7 per cent among children belonging to households in the richest quintile. The exclusive breastfeeding rates for children age 0-5 months ranged between 32.3 per cent in South Kordofan State and 70.3 per cent in North Darfur State (Table 5.4 and Figure 5.7).



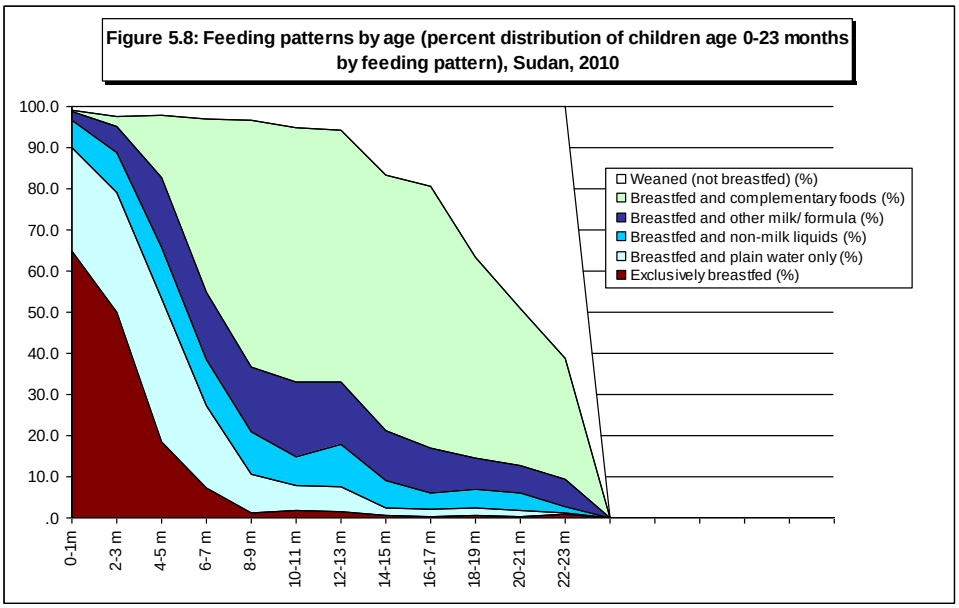
Predominant breastfeeding under six months: The SHHS2 data indicated that about four in five (79.8 per cent) infants aged 0-5 months were predominantly breastfed (Table 5.4).The percentage of children aged 0-5 months who were predominantly breastfed was higher among children in rural areas (81.9 per cent) than those in urban areas (73.8 per cent). The percentage of children aged 0-5 months who were predominantly breastfed declined from 80.5 for children of mothers with no education to 73.2 for children with mothers with secondary or higher level of education. The percentage of children aged 0-5 months who were predominantly breastfed also declined from 86.0 among children belonging to households in the poorest quintile to 69.9 among children belonging to households in the richest quintile. The percentage of children age 0-5 months who were predominantly breastfed ranged between 62.5 in Northern State and 88.0 in South Darfur State.

Continued breastfeeding rate at one year*:* The SHHS2 data indicated that about 87.6 percent of children age 12-15 months received continued breastfeeding at one year. The percentage of children age 12-15 months who received continued breastfeeding was higher in urban areas (90.8 per cent) than that of children in rural areas (86.3 per cent). The percentage of children aged 12-15 months who received continued breastfeeding at one year was 87.0 for children of mothers with no education compared to 88.6 for children of mothers with primary education and 87.6 for children of mothers with secondary or higher level of education. The percentage of children aged 12-15 months who received continued breastfeeding at one year was 87.2 for children belonging to households in the poorest quintile compared to 91.0 for children belonging to households in the richest quintile. The percentage of children age 12-15 months who received continued breastfeeding at one year ranged between 98.0 in Northern State and 78.3 in West Darfur State.

Continued breastfeeding rate at two years*:* The SHHS2 data also indicated that about 40.1 percent of children age 20-23 months received continued breastfeeding at two years. Girls aged 20-23 months were more likely to be breastfed (continued breastfeeding at 2 years) than boys. The percentage of girls age 20-23 months who received continued breastfeeding was 43.2 per cent as compared to 37.4 per cent for boys age 20-23 months. There was also some difference in the

percentage of children aged 20-23 months in urban areas (38.6 per cent) and rural areas (40.6 per cent) who received continued breastfeeding at two years. The percentage of children age 20-23 months who received continued breastfeeding at two years was 40.7 per cent for children of mothers with no education, compared to 37.0 for children of mothers with primary education and 47.5 per cent for children of mothers with secondary or higher level of education. The percentage of children age 20-23 months who received continued breastfeeding at two years was 47.3 for children belonging to households in the poorest quintile compared to 34.0 for children belonging to households in the richest quintile. The percentage of children age 20-23 months who received continued breastfeeding at two years ranged between 64.4 in Northern State and 23.4 in West Darfur State.

The SHHS2 findings indicated that about 65.0 per cent of 0-1 month old children were exclusively breastfed in North Sudan. Even at the earliest ages, a large proportion of children were receiving liquids or foods other than breast milk. Among children who were 2-3 months, the percentage of children that were exclusively breastfed declined to 49.9 per cent while about 47.6 per cent received liquids or foods along with breastfeeding. About 2.5 per cent of children aged 2-3 months were weaned (not breastfed). The percentage of children that were exclusively breastfed was only 18.3 per cent among children aged 4-5 months, though exclusive breastfeeding is considered as adequate feeding up to six months. Few mothers continued breastfeeding up to 23 months. In all, only about 29.4 percent of children aged 22-23 months were receiving breast milk. (Figure 5.8)



Duration of breastfeeding

Table 5.6 shows the median duration of breastfeeding by selected background characteristics. Among children under age 3, the median duration was 20.2 months for any breastfeeding, 1.8 months for exclusive breastfeeding, and 5.4 months for predominant breastfeeding. The mean for all children in the age group 0-35 months was 18.9 months for any breastfeeding, 2.6 months for exclusive breastfeeding, and 6.2 months for predominant breastfeeding.

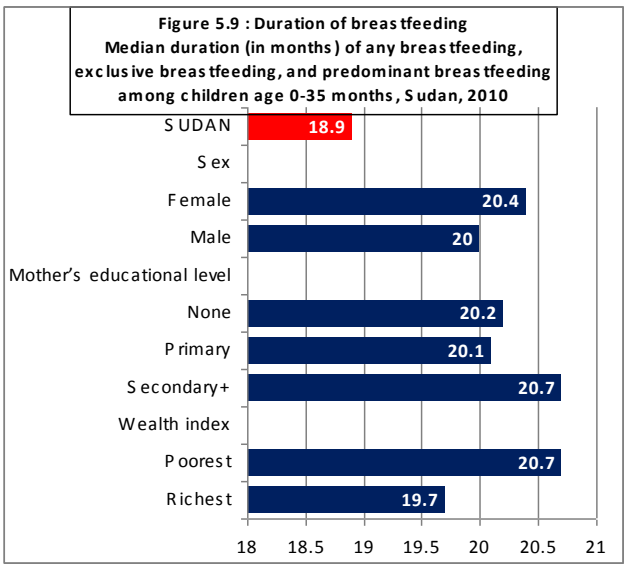
Table 5.6: Duration of breastfeeding
Median duration (in months) of any breastfeeding, exclusive breastfeeding, and predominant breastfeeding among children age 0-35 months, 2010

Background characteristics	Median duration (in months) of			Number of children age 0-35 months
	Any breastfeeding [1]	Exclusive breastfeeding	Predominant breastfeeding	

Sex				
Male	20.0	1.6	5.3	4222
Female	20.4	1.9	5.5	4117
Area of residence				
Urban	20.3	1.7	4.8	2309
Rural	20.2	1.8	5.6	6031
Mother's education level				
None	20.2	1.4	5.7	4556
Primary	20.1	2.1	5.3	2587
Secondary+	20.7	2.3	4.5	1136
Wealth index quintiles				
Poorest	20.7	1.7	6.1	1933
Second	20.2	1.7	6.2	1808
Middle	19.7	1.7	5.2	1812
Fourth	20.6	1.9	4.7	1597
Richest	19.7	2.2	4.4	1189
Median	**20.2**	**1.8**	**5.4**	**8339**
Mean for all children (0-35 months)	**18.9**	**2.6**	**6.2**	**8339**

[1] SHHS indicator 2.10

Among male children under age 3, the median duration was 20.0 months for any breastfeeding, 1.6 months for exclusive breastfeeding, and 5.3 months for predominant breastfeeding, while among female children under age 3, the median duration was 20.4 months for any breastfeeding, 1.9 months for exclusive breastfeeding, and 5.5 months for predominant breastfeeding. Among children under age 3 in urban areas, the median duration was 20.3 months for any breastfeeding, 1.7 months for exclusive breastfeeding, and 4.8 months for predominant breastfeeding, while among children under age 3 in rural areas, the median duration was 20.2 months for any breastfeeding, 1.8 months for exclusive breastfeeding, and 5.6 months for predominant breastfeeding.



There was very little impact of educational status of mothers on the duration of breast feeding. Among children (under age 3) of mothers with no education, the median duration was 20.2 months for any breastfeeding, 1.4 months for exclusive breastfeeding, and 5.7 months for predominant breastfeeding, while among children (under age 3) of mothers with secondary education or more, the median duration was 20.7 months for any breastfeeding, 2.3 months for exclusive breastfeeding, and 4.5 months for predominant breastfeeding. Among children (under age 3) belonging to the poorest households, the median duration was 20.7 months for any breastfeeding, 1.7 months for exclusive

breastfeeding, and 6.1 months for predominant breastfeeding, while among children (under age 3) belonging to the richest households, the median duration was 19.7 months for any breastfeeding, 2.2 months for exclusive breastfeeding, and 4.4 months for predominant breastfeeding.

Age-appropriate breastfeeding

The adequacy of infant feeding in children under age 24 months is provided in Table 5.7. It presents the proportion of children age 0-23 months who were appropriately breastfed on the day before the SHHS2.

Different criteria of adequate feeding are used depending on the age of the child. For infants aged 0-5 months, exclusive breastfeeding is considered as adequate feeding, while infants aged 6-23 months are considered to be adequately fed if they are receiving breast milk and solid, semi-solid or soft food. According to these feeding patterns, only 41.0 per cent children aged 0-5 months were being adequately fed at the time of the SHHS. There was very little difference between male and female children aged 0-5 months in terms of adequacy of feeding (i.e. those exclusively breastfed), the proportion of male and female children adequately fed being 40.3 per cent and 41.7 per cent respectively. Similarly, there was only a marginal difference between children aged 0-5 months in rural and urban areas in terms of adequacy of feeding, the proportion of male and female children exclusively breastfed being 40.2 per cent and 41.3 per cent respectively.

Table 5.7: Age-appropriate breastfeeding
Percentage of children age 0-23 months who were appropriately breastfed during the previous day of SHHS2, Sudan, 2010

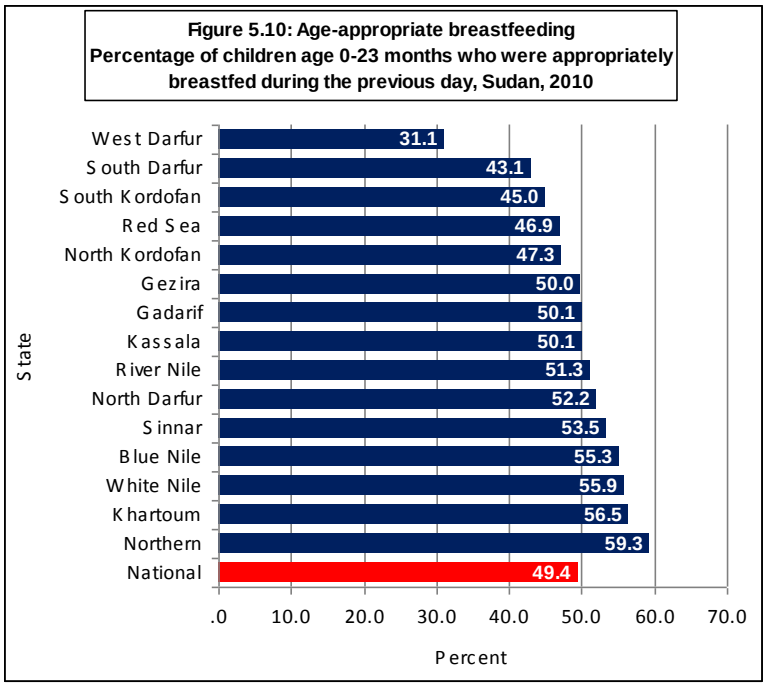
	Children age 0-5 months		Children age 6-23 months		Children age 0-23 months	
	Percent exclusively breastfed [1]	Number of children	Percent currently breastfeeding and receiving solid, semi-solid or soft	Number of children	Percent appropriately breastfed	Number of children
Sex						
Male	40.3	775	52.7	2034	49.3	2809
Female	41.7	781	52.6	1987	49.5	2768
State of residence						
Northern	33.8	21	69.1	55	59.3	76
River Nile	40.0	46	55.6	120	51.3	166
Red Sea	35.5	26	49.8	103	46.9	129
Kassala	47.1	82	51.3	217	50.1	299
Gadarif	38.5	77	54.4	204	50.1	281
Khartoum	38.0	206	63.4	545	56.5	750
Gezira	45.0	222	51.9	581	50.0	804
White Nile	32.4	79	64.1	227	55.9	305
Sinnar	39.1	64	59.6	151	53.5	215
Blue Nile	39.1	67	60.9	191	55.3	258
North Kordofan	37.2	179	51.6	425	47.3	604
South Kordofan	32.3	83	49.8	223	45.0	305
North Darfur	70.3	106	44.9	263	52.2	369
West Darfur	47.9	84	24.0	198	31.1	282
South Darfur	33.6	214	46.9	518	43.1	732
SUDAN (TOTAL)	**41.0**	**1556**	**52.6**	**4021**	**49.4**	**5577**
Area of residence						
Urban	40.2	391	59.4	1119	54.4	1510
Rural	41.3	1165	50.0	2902	47.5	4067
Mother's education level						
None	37.7	847	49.6	2160	46.2	3008
Primary	44.2	501	54.5	1234	51.6	1736
Secondary	46.8	199	60.1	593	56.8	792
Missing/DK	54.0	8	44.5	34	46.3	42

Wealth index quintiles						
Poorest	40.7	360	46.4	910	44.8	1271
Second	38.1	344	49.1	872	45.9	1216
Middle	42.1	351	53.3	900	50.2	1251
Fourth	41.8	301	60.7	758	55.3	1059
Richest	43.7	200	56.2	580	53.0	780
[1] SHHS indicator 2.6 [2] SHHS indicator 2.14						

The proportion of adequately fed children aged 0-5 months varied between children of mothers with no education and children of mothers with secondary and higher level of education. The SHHS data indicated that proportion of adequately fed children aged 0-5 was only 37.7 per cent who had mothers with no education compared to 43.7 per cent among children who had mothers with secondary education or higher level of education. The SHHS data also indicated that there was some difference in the proportion of adequately fed children (aged 0-5 months) between children from the poorest and richest households. About 43.7 per cent of children (aged 0-5 months) belonging to the richest households were adequately fed compared to 40.7 per cent of children from the poorest households. The percentage of children age 0-5 months that were being adequately fed ranged between 70.3 per cent in North Darfur State and 32.4 per cent in White Nile State (Table 5.7).

The SHHS findings indicated that according to the feeding patterns, only 52.6 percent of children aged 6-23 months were being adequately fed at the time of the SHHS. There was no difference between male and female children aged 6-23 months in terms of adequacy of feeding the proportion of male and female children adequately fed being 52.7 per cent and 52.6 per cent respectively. There was, however, a significant difference between children aged 6-23 months in rural and urban areas in terms of adequacy of feeding, the proportion of male and female children exclusively breastfed being 59.4 per cent and 50.0 per cent respectively. The proportion of adequately fed children aged 6-23 months varied between children of mothers with no education and children of mothers with secondary and higher level of education. The SHHS data indicated that proportion of adequately fed children aged 6-23 months was only 49.6 per cent who had mothers with no education compared to 60.1 per cent among children who had mothers with secondary or higher level of education. The SHHS data also indicated that there was some difference in the proportion of adequately fed children (aged 6-23 months) between children from the poorest and richest households. About 56.2 per cent of children (aged 6-23 months) belonging to the richest households were adequately fed compared to 46.4 per cent of children from the poorest households.
The percentage of children aged 6-23 months who were being adequately fed ranged between 69.1 per cent in Northern State and 24.0 per cent in West Darfur State.

The SHHS findings also indicated that according to the feeding patterns, only 49.4 per cent of children aged 0-23 months were being appropriately breastfed. There was no difference between male and female children aged 0-23 months who were appropriately breastfed, the proportion of male and female children appropriately breastfed being 49.3 per cent and 49.5 per cent respectively. There was, however, a significant difference between children aged 0-23 months in rural (47.5 per cent) and urban areas (54.4 per cent) who were appropriately breastfed The proportion of appropriately breastfed children aged 6-23 months varied between children of mothers with no education and children of mothers with secondary and higher level of education. The SHHS data indicated that proportion of appropriately breastfed fed children aged 6-23 months was only 46.2 per cent who had mothers with no education compared to 56.8 per cent among children who had mothers with secondary or higher level of education. There was some difference in the proportion of appropriately breastfed children (aged 0-23 months) between children from the poorest and richest households. About 53.0 per cent of children belonging to the richest households were adequately fed compared to 44.8 per cent of children from the poorest households. The percentage of children aged 0-23 months who were being appropriately breastfed fed ranged between 59.3 per cent in Northern State and 31.1 per cent in West Darfur State (Table 5.7 and Figure 5.10)



Complementary feeding

Adequate complementary feeding of children from 6 months to two years of age is particularly important for growth and development and the prevention of under nutrition. Continued breastfeeding beyond six months should be accompanied by consumption of nutritionally adequate, safe and appropriate complementary foods that help meet nutritional requirements when breast milk is no longer sufficient. This requires that for breastfed children, two or more meals of solid, semi-solid or soft foods are needed if they are six to eight months old, and three or more meals if they are 9-23 months of age. For children 6-23 months and older who are not breastfed, four or more meals of solid, semi-solid or soft foods or milk feeds are needed.

Table 5.8 indicates information related to the introduction of solid, semi-solid or soft food. Overall, 51.1 percent of children aged 6-8 months received solid, semi-solid, or soft foods. Among currently breastfeeding children, this percentage was 51.5 while it was 22.2 among children currently not breastfeeding.

Table 5.8: Introduction of solid, semi-solid or soft food Percentage of infants age 6-8 months who received solid, semi-solid or soft foods during the previous day, Sudan, 2010					
	Currently breastfeeding		Currently not breastfeeding	All	
	Percent receiving solid, semi-solid or soft foods	Number of children age 6-8 months	Number of children age 6-8 months	Percent receiving solid, semi-solid or soft foods [1]	Number of children age 6-8 months
Sex					
Male	56.4	348	7	55.7	360
Female	46.9	363	3	46.5	369
Area of residence					
Urban	59.9	185	6	58.6	191
Rural	48.6	526	4	48.4	538
SUDAN (TOTAL)	**51.5**	**711**	**10**	**51.1**	**729**

Overall, 55.7 per cent of male children aged 6-8 months and 46.5 per cent of female children received solid, semi-solid, or soft foods, while of the total number of children aged 6-8 months surveyed in urban and rural areas, 58.6 per cent of children in urban areas and 48.4 per cent of children in rural areas received solid, semi-solid, or soft foods. The percentage of male children aged 6-8 months currently breastfeeding and receiving solid, semi-solid or soft foods was 56.4 as compared to 46.9 for female children. This percentage for male children currently not breastfeeding was 24.6 compared to 16.6 for female children. The percentage of children aged 6-8 months in urban areas currently breastfeeding and receiving solid, semi-solid or soft foods was 59.9 compared to 48.6 for children in rural areas. The percentage of children in urban areas currently not breast feeding and receiving solid, semi-solid or soft foods was 18.0 compared to 28.2 for children in rural areas.

Minimum meal frequency

Table 5.9 presents the minimum meal frequency of children aged 6-23 months, i.e. proportion of children aged 6-23 months who received solid, semi-solid or soft foods (and milk feeds for non-breastfeeding children) the minimum number of times or more during the previous day, according to breastfeeding status.

Among currently breastfeeding children aged 6-23 months, nearly one-fourth (24.9 percent) of them had the minimum meal frequency and were receiving solid, semi-solid and soft foods the minimum number of times and this proportion was slightly higher among females (25.1 percent) than among males (24.7 per cent). A higher proportion of currently breast feeding children aged 6-23 months in urban areas (27.6 percent) were enjoying the minimum meal frequency compared to children in rural areas (23.8 percent).

Table 5.9: Minimum meal frequency (NU7)
Percentage of children age 6-23 months who received solid, semi-solid, or soft foods (and milk feeds for non-breastfeeding children) the minimum number of times or more during the previous day, according to breastfeeding status, Sudan, 2010

Background characteristics	Currently breastfeeding		Currently not breastfeeding			All	
	Percent receiving solid, semi-solid and soft foods the minimum number of times	Number of children age 6-23 months	Percent receiving at least 2 milk feeds [1]	Percent receiving solid, semi-solid and soft foods or milk feeds 4 times or more	Number of children age 6-23 months	Percent with minimum meal frequency [2]	Number of children age 6-23 months
Sex							
Male	24.7	1578	55.3	49.0	456	30.1	2034
Female	25.1	1602	56.4	52.4	385	30.4	1987
Age group							
6-8 months	33.4	711	53.7	32.5	18	33.4	729
9-11 months	15.6	647	69.7	48.9	33	17.2	680
12-17 months	23.5	1301	65.3	54.7	216	27.9	1517
18-23 months	28.3	521	51.5	49.7	574	39.5	1095
State of residence							
Northern	33.3	46	57.2	43.3	9	34.9	55
River Nile	27.9	101	62.7	56.0	19	32.3	120
Red Sea	14.5	87	62.5	56.3	16	20.8	103
Kassala	22.1	187	49.3	53.6	30	26.4	217
Gadarif	40.6	153	61.5	76.6	51	49.6	204
Khartoum	34.0	440	65.8	68.3	104	40.6	545
Gezira	19.2	464	63.7	45.2	117	24.5	581
White Nile	26.3	171	73.3	68.3	55	36.6	227
Sinnar	28.9	122	42.8	41.7	29	31.3	151
Blue Nile	42.2	144	39.3	51.6	47	44.5	191
North Kordofan	20.0	331	38.4	36.0	94	23.5	425
South Kordofan	31.9	172	51.1	48.6	50	35.7	223
North Darfur	16.2	218	43.0	35.8	46	19.6	263
West Darfur	17.6	124	51.0	37.4	74	25.0	198
South Darfur	17.6	419	62.7	46.0	99	23.1	518
SUDAN (TOTAL)	**24.9**	**3180**	**55.8**	**50.5**	**841**	**30.3**	**4021**
Area of residence							
Urban	27.6	900	58.3	57.2	219	33.4	1119
Rural	23.8	2280	54.9	48.2	622	29.0	2902
Mother's education level							
None	25.1	1694	50.3	47.0	466	29.8	2160
Primary	26.9	968	62.8	54.6	267	32.9	1234
Secondary	20.0	494	66.6	59.7	98	26.6	593
Missing/DK	29.7	24	17.0	17.0	10	26.0	34
Wealth index quintiles							
Poorest	20.1	731	47.0	40.0	179	24.0	910
Second	25.1	677	50.0	47.8	195	30.2	872
Middle	30.7	687	58.4	55.4	214	36.6	900
Fourth	22.6	621	56.4	49.6	137	27.5	758
Richest	26.5	464	73.6	63.4	116	33.9	580

[1] SHHS indicator 2.15
[2] SHHS indicator 2.13

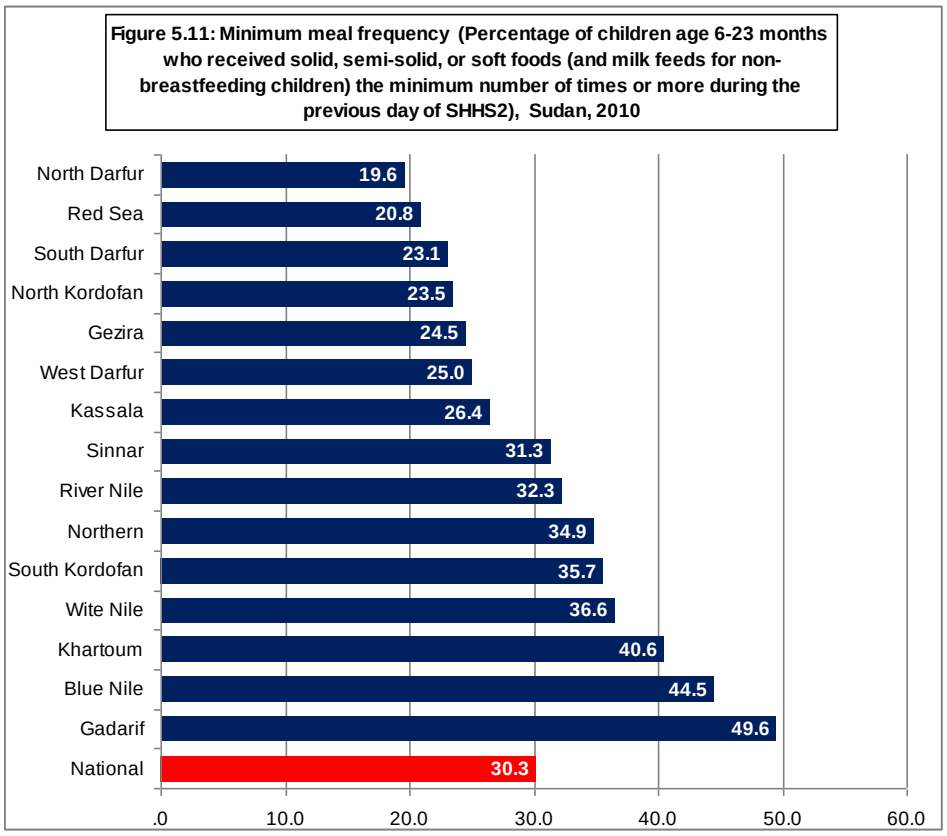
The proportion of currently breastfeeding children aged 6-23 months who received solid, semi-solid and soft foods the minimum number of times varied between children belonging to the poorest and richest households. While only 20.1 per cent of currently breastfeeding children aged 6-23 months belonging to the poorest households received solid, semi-solid and soft foods the minimum number of times, this percentage was higher (26.5 per cent) among children belonging to the richest households. The proportion of currently breastfeeding children aged 6-23 months who received solid, semi-solid and soft foods the minimum number of times ranged between 42.2 per cent in Blue Nile State and 14.5 per cent in Red Sea State.

The SHHS data indicated that among children aged 6-23 months currently not breastfeeding, nearly half (50.5 per cent) of them received solid, semi-solid and soft foods or milk feeds 4 times or more a day. This proportion was higher among female children (52.4 per cent) than among male children (49.0 per cent). A higher proportion of currently not breastfeeding children in urban areas (57.2 per cent) received solid, semi-solid and soft foods or milk feeds 4 times or more a day compared to children in rural areas (48.2 per cent). The proportion of currently not breastfeeding children aged 6-23 months who received solid, semi-solid and soft foods or milk feeds 4 times or more a day varied between children belonging to the poorest and richest households. While only 47.0 per cent of currently not breastfeeding children aged 6-23 months from the poorest households received solid, semi-solid and soft foods or milk feeds 4 times or more a day, this percentage was significantly higher (63.4 per cent) among children belonging to the richest households. The SHHS findings also indicated that mother's education level had an influence on the proportion of children aged 6-23 months currently not breastfeeding who received solid, semi-solid and soft foods or milk feeds 4 times or more. The proportion of children aged 6-23 months currently not breastfeeding who received solid, semi-solid and soft foods or milk feeds 4 times or more was only 47.0 per cent among children of mothers who had no education compared to 59.7 per cent among children of mothers who had secondary or higher level of education.

The SHHS data also indicated that among children aged 6-23 months currently not breastfeeding, more than half (55.8 per cent) of them received at least two milk feeds a day. This percentage was slightly higher among female children (56.4 per cent) than among male children (55.3 per cent). A higher proportion of currently not breastfeeding children in urban areas (58.3 per cent) received at least two milk feeds a day compared to children in rural areas (54.9 per cent). The proportion of children aged 6-23 months currently not breastfeeding and who received at least two milk feeds a day ranged between 73.3 per cent in White Nile State and 38.4 per cent in North Kordofan State (Table NU.6). The SHHS findings also indicated that the proportion of children aged 6-23 months currently not breastfeeding and received at least two milk feeds a day varied between children belonging to the poorest and richest households. While only 47.0 per cent of the children aged 6-23 months (currently not breastfeeding) belonging to the poorest households received at least two milk feeds a day, this proportion was quite higher (73.6 per cent) among children belonging to the richest households.

Table 5.9 also provides information on the percentage of children aged 6-23 months who enjoyed the minimum meal frequency. Overall, less than one-third (30.3 per cent) of the children age 6-23 months enjoyed the minimum meal frequency. A slightly higher proportion of females (30.4 per cent) enjoyed the minimum meal frequency compared to males (30.1 per cent). A higher proportion of children aged 6-23 months in urban areas (33.4 percent) enjoyed the minimum meal frequency compared to children in rural areas (29.0 percent). Similarly, of all children aged 6-23 months, while 33.9 per cent of them belonging to the richest households enjoyed the minimum meal frequency, this proportion was only 24.0 per cent in the case of children belonging to the poorest households.

The proportion of children aged 6-23 months who enjoyed the minimum meal frequency ranged between 49.6 per cent in Gedarif State and 19.6 per cent in North Darfur State. (Table 5.9 and Figure 5.11).



Bottle feeding

Table 5.10 indicates the percentage of children age 0-23 months that were fed with a bottle with a nipple during the previous day of the SHHS. The continued practice of bottle-feeding is a concern because of the possible contamination due to unsafe water and lack of hygiene in preparation. The practice of bottle feeding tends to substitute breastfeeding resulting in adverse effects on the child, such as diarrheal diseases.

Table 5.10 shows that bottle-feeding is still prevalent in North Sudan. The SHHS findings indicate that 5.1 percent of children aged 0-23 months were fed using a bottle with a nipple on the previous day of the SHHS. The percentage of children aged 0-23 months that were fed with a bottle with a nipple was slightly higher for male children (5.6 per cent) than that for female children (4.5 per cent). Similarly, the percentage of children aged 0-23 months that were fed with a bottle with a nipple was higher for children in urban areas (10.7 per cent) than for children in rural areas (3.0 per cent). The percentage of children aged 0-23 months that were fed with a bottle with a nipple decreased from 7.4 per cent in the case of children aged 0-5 months to 5.5 per cent in the case of children aged 6-11 months and to 3.5 per cent in the case of children aged 12-23 months.

The percentage of children age 0-23 months that were fed with a bottle with a nipple showed an increasing trend with the level of mother's educational status and the economic status of the households. The percentage of children that were fed with a bottle with a nipple was only 4.5 per cent for children of mothers with no education compared to 8.5 per cent for children with mothers with

secondary or higher level of education. Similarly, the percentage of children aged 0-23 months that were fed with a bottle with a nipple was only 0.8 per cent for children from the poorest households compared to 15.3 per cent for children from the richest households.

Table 5.10: Bottle feeding
Percentage of children age 0-23 months who were fed with a bottle with a nipple during the previous day, Sudan, 2010

	Percentage of children age 0-23 months fed with a bottle with a nipple [1]	Number of children age 0-23 months:
Sex		
Male	5.6	2809
Female	4.5	2768
Age group		
0-5 months	7.4	1556
6-11 months	5.5	1408
12-23 months	3.5	2613
State of residence		
Northern	10.6	76
River Nile	11.8	166
Red Sea	6.7	129
Kassala	7.7	299
Gadarif	2.3	281
Khartoum	15.2	750
Gezira	5.6	804
Wite Nile	5.3	305
Sinnar	2.0	215
Blue Nile	.5	258
North Kordofan	2.1	604
South Kordofan	2.1	305
North Darfur	1.3	369
West Darfur	1.7	282
South Darfur	1.2	732
SUDAN (TOTAL)	5.1	5577
Area of residence		
Urban	10.7	1510
Rural	3.0	4067
Mother's education level		
None	4.5	3008
Primary	4.8	1736
Secondary	8.5	792
Missing/DK	.0	42
Wealth index quintiles		
Poorest	.8	1271
Second	1.1	1216
Middle	4.7	1251
Fourth	7.8	1059
Richest	15.3	780
[1] SHHS indicator 2.11		

The percentage of children aged 0-23 months that were fed with a bottle with a nipple ranged from 0.5 per cent in Blue Nile state to 15.2 per cent in Khartoum state.

Micronutrients

While data is limited, available information suggests that the micronutrient status of the population in Sydan is unsatisfactory. Localised surveys have reported night blindness in some parts of Sudan, due

to Vitamin A deficiency. Although Vitamin A deficiency has declined significantly due to repeated supplementation during National polio immunisation days, it still remains high in several parts of Sudan. Intake of iodised salt by the households, which is a key intervention to prevent iodine deficiency disorders, remains quite low. A large proportion of the population are moderately and severely anaemic due to iron deficiency.

Iodized Salt Consumption

Iodine Deficiency Disorders (IDD) is the world's leading cause of preventable mental retardation and impaired psychomotor development in young children. In its most extreme form, iodine deficiency causes cretinism. It also increases the risks of stillbirth and miscarriage in pregnant women. Iodine deficiency is most commonly and visibly associated with goitre. IDD takes its greatest toll in impaired mental growth and development, contributing in turn to poor school performance, reduced intellectual ability, and impaired work performance. The international goal is to achieve sustainable elimination of iodine deficiency by 2005. The indicator is the percentage of households consuming adequately iodized salt (≥15 parts per million).

Table 5.11 indicates the percent distribution of households by consumption of iodized salt. In about 97.6 percent of households, salt used for cooking was tested for iodine content by using salt test kits.

Table 5.11: Iodized salt consumption
Percent distribution of households by consumption of iodized salt, Sudan, 2010

	Percent of households in which salt was tested	Number of household	Percent of households with salt test result			Total	Number of household
			Not iodized 0 PPM	>0 and <15 PPM	15+ PPM [1]		
State of residence							
Northern	99.2	279	96.7	2.3	1.0	100.0	277
River Nile	99.1	528	96.3	2.1	1.7	100.0	524
Red Sea	98.9	455	98.5	.4	1.1	100.0	451
Kassala	98.6	935	97.8	.5	1.7	100.0	922
Gadarif	97.5	734	92.9	4.8	2.3	100.0	715
Khartoum	98.0	2167	91.8	5.4	2.8	100.0	2124
Gezira	99.1	2160	99.4	.4	.2	100.0	2141
White Nile	99.6	745	98.3	.9	.8	100.0	742
Sinnar	95.7	619	82.4	10.4	7.3	100.0	592
Blue Nile	95.8	493	99.2	.6	.2	100.0	473
North Kordofan	98.9	1620	98.0	.6	1.4	100.0	1602
South Kordofan	96.3	682	95.9	2.5	1.6	100.0	656
North Darfur	99.0	907	67.1	11.1	21.8	100.0	898
West Darfur	98.8	711	58.4	1.4	40.1	100.0	703
South Darfur	92.0	1742	33.4	23.3	43.2	100.0	1604
SUDAN (TOTAL)	**97.6**	**14778**	**85.3**	**5.3**	**9.5**	**100.0**	**14423**
Area of residence							
Urban	97.6	4359	82.1	7.5	10.5	100.0	4256
Rural	97.6	10419	86.6	4.3	9.1	100.0	10167
Wealth index quintiles							
Poorest	95.3	3115	74.3	7.7	17.9	100.0	2970
Second	97.7	3184	85.8	3.9	10.3	100.0	3109
Middle	98.1	2987	88.9	4.1	7.0	100.0	2930
Fourth	98.7	2777	89.6	5.4	5.0	100.0	2741
Richest	98.4	2715	88.3	5.3	6.5	100.0	2673

[1] SHHS indicator 2.16

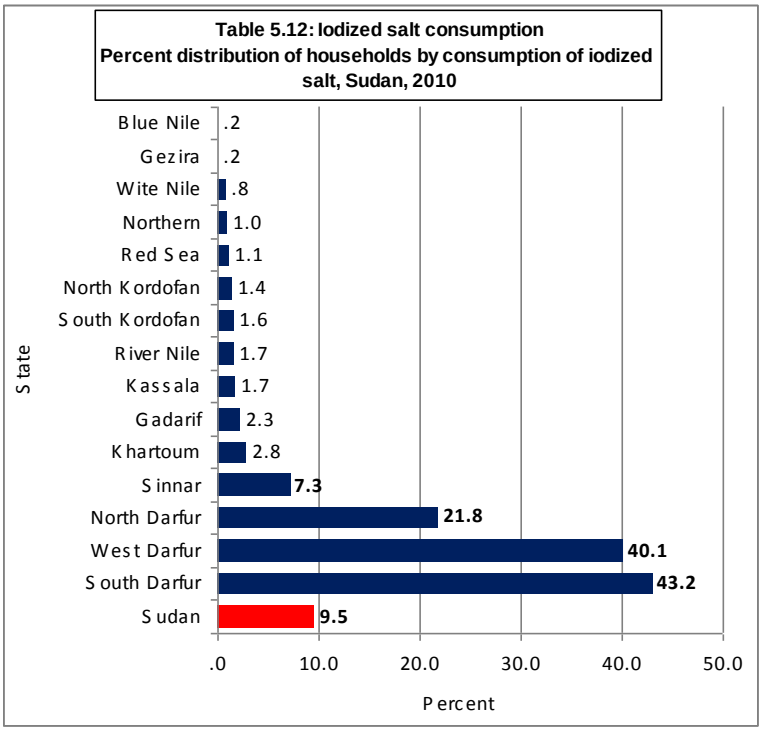
In Sudan the salt iodization programme targeting universal coverage was started in 1994. The programme has been reviewed in order to identify the gaps and to initiate affirmative actions in terms of legislative measures, salt production and social mobilization. Based on international standards the country is committed to achieve the use of iodized salt by 90 per cent of households; process of

iodized salt production from the main sources was initiated to cover 100 per cent of households and the banning of production of non-iodized salt after a six-month grace period. The machines and materials (including potassium iodate) required for the production of iodized salt have already been procured and iodized salt production commenced in June 2007.

Table 5.11 shows that in a very small proportion of households (2.4 per cent), there was no salt available at the time of the survey. The SHHS2 findings indicated that only a very small proportion of households (14.7 per cent) were found to be using iodized salt. In only 9.5 percent of households, salt was found to contain 15 parts per million (ppm) or more of iodine, while in the case of 5.3 percent of households, salt was found to contain less than the required 15 parts per million (ppm). About 10.5 per cent of urban households were found to be consuming adequately iodized salt as compared to 9.1 per cent in rural areas. Interestingly, the consumption of adequately iodised salt was higher among the poorest households (17.9 per cent) than among the richest households (6.5 per cent).

Consumption of adequately iodized salt was lowest in Blue Nile State (0.8 percent) and highest in South Darfur State (66.6 per cent). (Table 5.11 and Figure 5.12).

Table 5.12: Iodized salt consumption
Percent distribution of households by consumption of iodized salt, Sudan, 2010



Children's Vitamin A Supplementation

Vitamin A is essential for eye health and proper functioning of the immune system. It is found in foods such as milk, liver, eggs, red and orange fruits, red palm oil and green leafy vegetables, although the amount of vitamin A readily available to the body from these sources varies widely. In developing areas of the world, where Vitamin A is largely consumed in the form of fruits and vegetables, daily per capita intake is often insufficient to meet dietary requirements. Inadequate intakes are further compromised by increased requirements for the vitamin as children grow or during periods of illness, as well as increased losses during common childhood infections. As a result, Vitamin A deficiency is quite prevalent in the developing world and particularly in countries with the highest burden of under-five deaths.

The 1990 World Summit for Children set the goal of virtual elimination of Vitamin A deficiency and its consequences, including blindness, by the year 2000. This goal was also endorsed at the Policy Conference on Ending Hidden Hunger in 1991, the 1992 International Conference on Nutrition, and the UN General Assembly's Special Session on Children in 2002. The critical role of Vitamin A for child health and immune function also makes control of deficiency a primary component of child survival efforts, and therefore critical to the achievement of the fourth Millennium Development Goal: a two-thirds reduction in under-five mortality by the year 2015.

For countries with Vitamin A deficiency problems, current international recommendations call for high-dose Vitamin A supplementation every four to six months, targeted to all children between the ages of six to 59 months living in affected areas. Providing young children with two high-dose Vitamin A capsules a year is a safe, cost-effective, efficient strategy for eliminating Vitamin A deficiency and improving child survival. Giving Vitamin A to new mothers who are breastfeeding helps protect their children during the first months of life and helps to replenish the mother's stores of Vitamin A, which are depleted during pregnancy and lactation. For countries with Vitamin A supplementation programs, the definition of the indicator is the percent of children 6-59 months of age receiving at least one high dose Vitamin A supplement in the last six months.

Based on UNICEF/WHO guidelines, the Federal Ministry of Health recommends that children aged 6-11 months be given a high dose Vitamin A capsules every six months. Since 2007, Vitamin A capsule supplementation has been provided to children aged 6-11 months in Sudan as a part of the child health week (previously referred to as ACSD which stands for accelerated child survival days) organised on a six-monthly basis as part of the strategy adopted by the Federal Ministry of Health to reduce vitamin A deficiency among children. It is also recommended that mothers take a Vitamin A supplement within six weeks of giving birth due to increased Vitamin A requirements during lactation and replete loss during pregnancy.

Table 5.12 indicates the percent distribution of children aged 6-23 months who received Vitamin A during the last six months preceding the SHHS. Within the six months prior to the SHHS, 60.5 percent of children aged 6-23 months received a high dose Vitamin A supplement. The percentage of children aged 6-23 months that received a high dose Vitamin A supplement was slightly higher for male children (61.2 per cent) than that for female children (59.7 per cent). Similarly, the percentage of children aged 6-23 months that received a high dose Vitamin A supplement was slightly higher for children in urban areas (60.7 per cent) than that for children in rural areas (60.4 per cent).

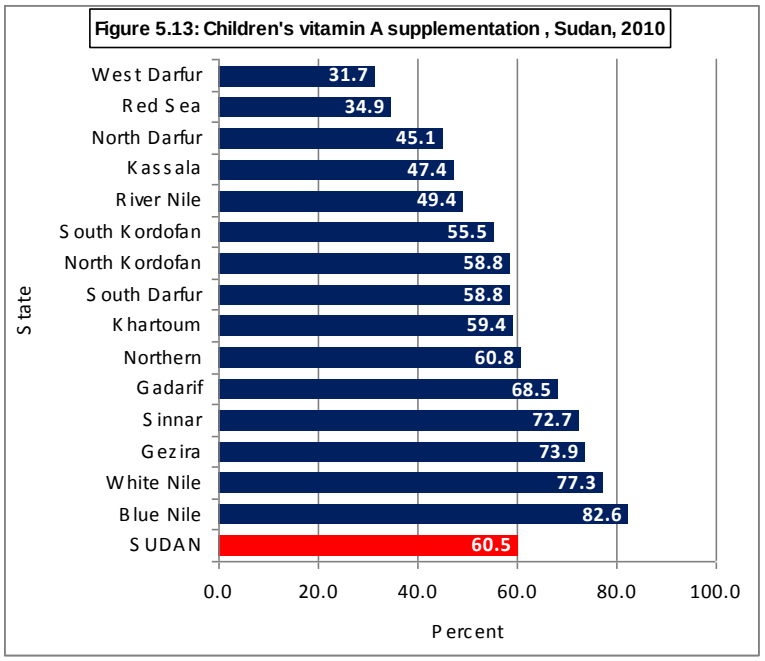
The SHHS findings indicate that the mother's level of education has an influence on the likelihood of Vitamin A supplementation. The percentage of children aged 6-23 months who received a Vitamin A supplement in the last six months increases from 55.8 percent among children whose mothers had no education to 64.5 percent of those whose mothers have primary education and 69.2 percent among children of mothers with secondary or higher levels of education. The economic status of the households was found to have some influence on the likelihood of Vitamin A supplementation. The percentage of children aged 6-23 months who received Vitamin A supplement in the last six months showed an increasing trend from 50.1 percent among children from the poorest households to 66.2 percent among children from the richest households.

Table 5.12: Children's Vitamin A supplementation
Percent distribution of children age 6-23 months by receipt of a high dose Vitamin A supplement in the last 6 months preceding SHHS2, Sudan, 2010

	Percentage of children who received Vitamin A during the last 6 months [1]	Number of children age 6-23 months
Sex		
Male	61.2	1331
Female	59.7	1280
State of residence		
Northern	60.8	37
River Nile	49.4	79
Red Sea	34.9	75

Kassala	47.4	138
Gadarif	68.5	138
Khartoum	59.4	349
Gezira	73.9	377
White Nile	77.3	158
Sinnar	72.7	95
Blue Nile	82.6	120
North Kordofan	58.8	290
South Kordofan	55.5	136
North Darfur	45.1	161
West Darfur	31.7	124
South Darfur	58.8	334
Area of residence		
Urban	60.7	745
Rural	60.4	1866
Age group		
12-23	60.5	2612
Mother's education level		
None	55.8	1421
Primary	64.5	807
Secondary	69.2	365
Missing/DK	72.6	19
Wealth index quintile		
Wealth index quintile		
Poorest	50.1	579
Second	58.6	577
Middle	65.3	589
Fourth	64.9	503
Richest	66.2	363
SUDAN (TOTAL)	**60.5**	**2612**
[1] SHHS indicator 2.17 Results are based on mother's report		

Vitamin A supplementation coverage ranged from 31.7 per cent in West Darfur State and 34.9 per cent in Red Sea State to 77.3 in White Nile state and 82.6 per cent in Blue Nile State (Table 5.12 and Figure 5.13)



Post-partum Mother's Vitamin A Supplementation

Table 5.13 indicates the status relating to post-partum mother's Vitamin A supplementation. It shows the percentage of women aged 15-49 years with a birth in the last two years preceding the SHHS2 whether they received a high dose Vitamin A supplement.

The SHHS2 findings indicate that about 22.1 per cent of women aged 15-49 years with a birth in the 2 last years preceding the SHHS received Vitamin A supplement. The percentage of women that received Vitamin A supplement was higher in urban areas (31.3 per cent) than that for women in rural areas (18.6 per cent).

The SHHS2 data indicates that the woman's level of education is related to the likelihood of Vitamin A supplementation for women aged 15-49 years with a birth in the 2 last years preceding the SHHS. The percentage of women aged 15-49 years with a birth in the 2 last years who received Vitamin A supplement showed an increasing trend from 16.9 per cent among women who had no education to 24.9 per cent among women who had primary education and 32.0 percent among women who had secondary or higher level of education. The economic status of the households is also related to the likelihood of Vitamin A supplementation. The percentage of women aged 15-49 years with a birth in the 2 last years preceding the SHHS who received Vitamin A supplement increased from 11.0 per cent among women belonging to the poorest households to 34.1 per cent among women belonging to the richest households.

Table 5.13: Post-partum mother's Vitamin A supplementation (NU10M)
Percentage of women aged 15-49 years with a birth in the 2 last years preceding the survey whether they received a high dose Vitamin A supplement, Sudan, 2010

	Received Vitamin A supplement*	Not sure if received Vitamin A	Number of women aged 15-49 years with live birth in two years preceding the survey
State of residence			
Northern	32.2	1.2	83
River Nile	22.3	2.0	164
Red Sea	23.9	8.3	134
Kassala	16.6	5.4	318
Gadarif	25.0	3.3	283
Khartoum	46.7	5.7	752
Gezira	21.7	4.8	759
Wite Nile	23.1	2.7	316
Sinnar	19.2	1.0	217
Blue Nile	13.9	1.8	261
North Kordofan	17.7	.9	615
South Kordofan	16.0	2.8	307
North Darfur	21.3	4.2	387
West Darfur	15.3	6.1	278
South Darfur	10.3	3.5	772
Area of residence			
Urban	31.3	3.5	1559
Rural	18.6	3.8	4087
Age group			
15-19	24.7	3.7	419
20-24	24.2	3.7	1288
25-29	20.7	3.5	1622
30-34	20.8	3.0	952
35-39	22.9	3.4	940
40-44	19.7	7.7	333
45-49	18.6	5.3	93
Education level			
None	16.9	3.5	2487
Primary	24.9	3.3	1912
Secondary +	32.0	4.7	974
Adult education/Khalwa/Sunday education	14.6	5.4	273
Wealth index quintile			
Poorest	11.0	3.8	1287
Second	18.9	3.6	1245
Middle	20.8	3.3	1255
Fourth	31.8	4.1	1073
Richest	34.1	4.2	787
SUDAN (TOTAL)	**22.1**	**3.7**	**5646**

Vitamin A supplementation coverage among women aged 15-49 years with a birth in the 2 last years preceding the SHHS ranged from 10.3 per cent in South Darfur State to 46.7 per cent in Khartoum State. The National Nutrition Policy (2008) includes a strategy to improve maternal nutrition status, specifying working with Reproductive Health Section of FMoH and other partners to increase availability and access to existing antenatal and postnatal care, including iron/folate and vitamin A supplementation. Accordingly, Vitamin A is administered to post-partum women at their first post-natal contact with a health facility.

Prevalence of Anaemia among under-five children: Table 5.14 indicates the proportion of under-five children who were anaemic at the time of the SHHS2. Almost six out of ten children (60.3 per cent) under age five in Sudan were found to be moderately anaemic while four out of ten children (30.6 per cent) were found to be severely anaemic. There was a slight difference in terms of those who were moderately anaemic between boys (58.5 per cent) and girls (62.2 per cent). The proportion of severely anaemic children was higher among boys (39.9 per cent) than among girls (36.8.2 per cent).The proportion of severely anaemic children was higher in rural areas (39.6 per cent) than in urban areas (32.8 per cent). The percentage of children classified as severely anaemic was higher among children from households in the poorest quintile (39.0) than those belonging to households in the richest quintile (26.8). The proportion of children who were severely anaemic ranged from 19.2 per cent in North Darfur to 87.4 per cent in Red Sea State (Table 5.14).

Table 5.14: Prevalence of anaemia among under-five children
Proportion of under-five children who were found to be anaemic at the time of the SHHS2, Sudan, 2010

Background characteristics	Percentage of under-five children who were classified as mildly, moderately and severely anaemic								Number of children
	Non-anaemic		Mild –anaemia		Moderate anaemia		Severe anaemia		
	Number of children	%	Number of children	%	Number of children	%	Number of children	%	
Sex									
Male	7	.4	20	1.2	979	58.5	668	39.9	1674
Female	8	.5	9	.6	1018	62.2	603	36.8	1638
State of residence									
Northern	0	.4	0	1.0	14	45.7	16	53.0	31
River Nile	0	.3	0	.0	42	38.7	67	61.0	110
Red Sea	0	.0	0	.0	1	12.6	4	87.4	4
Gadarif	0	.0	1	.5	91	50.9	87	48.5	179
Khartoum	0	.0	4	10.6	21	48.9	17	40.6	42
Gezira	5	.8	6	1.0	401	63.3	221	34.9	634
Wite Nile	1	.3	0	.0	103	58.1	74	41.6	178
Sinnar	0	.2	0	.3	87	58.8	60	40.6	147
Blue Nile	0	.3	0	.0	103	58.5	73	41.3	176
North Kordofan	2	.5	5	1.3	256	61.7	151	36.5	415
South Kordofan	1	.6	2	1.1	96	57.2	69	41.1	168
North Darfur	4	1.9	7	3.1	158	75.8	40	19.2	208
West Darfur	0	.1	1	.3	175	64.7	95	35.0	271
South Darfur	1	.2	2	.3	449	59.9	296	39.6	749
Area of residence									
Urban	6	1.0	8	1.3	395	64.9	200	32.8	610
Rural	9	.3	21	.8	1602	59.3	1071	39.6	2702
Wealth index quintiles									
Poorest	1	.1	6	.6	613	60.3	397	39.0	1017
Second	5	.7	3	.4	457	60.2	294	38.7	759
Middle	5	.7	5	.7	389	56.9	285	41.7	684
Fourth	1	.1	4	.6	342	60.6	218	38.6	564
Richest	4	1.3	11	3.9	196	68.0	77	26.8	288
SUDAN (TOTAL)	**15**	**.5**	**29**	**.9**	**1997**	**60.3**	**1271**	**38.4**	**3312**

Prevalence of Anaemia among women age 15-49 years: Table 5.15 indicates the proportion of women age 15-49 years who were anaemic at the time of the SHHS2. Approximately three-fourths (76 per cent) of women age 15-49 years in Sudan were found to be moderately anaemic while one out of four (23 per cent) were found to be severely anaemic. There was not much difference in terms of those who were severely anaemic between urban (24 per cent) and rural areas (23 per cent). There was also not much difference in severely anaemic women from households in the poorest

quintile (21) and those from households in the richest quintile (23). The percentage of severely anaemic women was lower among pregnant women (14 per cent) than women who were not pregnant (24 per cent) at the time of the SHH2.The proportion of women age 15-49 years who were severely anaemic ranged from 13 per cent in West Darfur to 38 per cent in Gadarif State (Table 5.15).

Table 5.15: Prevalence of anaemia among women age 15-49 years
Proportion of women age 15-49 years who were found to be anaemic at the time of the SHHS2, Sudan, 2010

Background characteristics	Percentage of women age 15-49 years who were classified as mildly, moderately and severely anaemic								Number of women
	Non-anaemic		Mild –anaemia		Moderate anaemia		Severe anaemia		
	Number of women	%	Number of women	%	Number of women	%	Number of women	%	
State of residence									
Northern	0	0	1	1	68	76	21	23	89
River Nile	0	0	0	0	129	74	46	26	174
Red Sea	0	0	1	1	115	62	68	37	185
Gadarif	0	0	3	1	307	71	121	28	431
Khartoum	0	0	24	3	522	59	332	38	877
Gezira	2	0	2	0	888	77	258	22	1150
Wite Nile	0	0	2	0	475	81	109	19	586
Sinnar	2	0	1	0	268	78	74	21	345
Blue Nile	0	0	1	0	202	81	48	19	251
North Kordofan	0	0\	4	0	710	79	186	21	900
South Kordofan	0	0	0	0	165	78	45	21	210
North Darfur	2	1	7	3	186	77	48	20	243
West Darfur	2	1	7	2	272	84	41	13	322
South Darfur	3	0	19	2	883	80	200	18	1105
SUDAN (Total)	**11**	**0**	**72**	**1**	**5190**	**76**	**1595**	**23**	**6868**
Area of residence									
Urban	3	0	30	2	1451	74	475	24	1959
Rural	8	0	41	1	3739	76	1120	23	4909
Pregnancy status									
Pregnant	3	0	32	4	591	81	102	14	729
Not pregnant	8	0	39	1	4599	75	1493	24	6139
Wealth index quintiles									
Poorest	2	0	23	2	1080	77	296	21	1401
Second	1	0	14	1	1028	77	283	21	1326
Middle	2	0	5	0	1108	76	351	24	1465
Fourth	3	0	12	1	990	72	369	27	1374
Richest	2	0	18	1	984	76	297	23	1301

VI. Child Health

Vaccinations

The Millennium Development Goal (MDG) 4 is to reduce child mortality by two thirds between 1990 and 2015. Immunization plays a key part in this goal. Immunizations have saved the lives of millions of children in the three decades since the launch of the Expanded Programme on Immunization (EPI) in 1974. Worldwide there are still 27 million children overlooked by routine immunization and as a result, vaccine-preventable diseases cause more than 2 million deaths every year.

A World Fit for Children goal is to ensure full immunization of children under one year of age at 90 percent nationally, with at least 80 percent coverage in every district or equivalent administrative unit.

According to UNICEF and WHO guidelines, a child should receive a Bacillis-Cereus-Geuerin (BCG) vaccination to protect against tuberculosis, three doses of DPT to protect against diphtheria, pertussis, and tetanus, three doses of polio vaccine, and a measles vaccination by the age of 12 months.

During the SHHS2, mothers were asked to provide vaccination cards for children under the age of five. Interviewers copied vaccination information from the cards onto the SHHS questionnaire. If the child did not have a card, the mother was asked to recall whether or not the child had received each of the vaccinations and, for DPT and Polio, how many times. Overall, 40.6 per cent of children had health cards (Table 6.2).

Table 6.1 indicates the percentage of children aged 12 to 23 months who received each of the vaccinations. The denominator for the table is comprised of children age 12-23 months so that only children who are old enough to be fully vaccinated are counted. In the top panel, the numerator includes all children who were vaccinated at any time before the survey according to the vaccination card or the mother's report. In the bottom panel, only those who were vaccinated before their first birthday, as recommended, are included. For children without vaccination cards, the proportion of vaccinations given before the first birthday is assumed to be the same as for children with vaccination cards.

Table 6.1: Vaccinations in first year of life
Percentage of children age 12-23 months immunized against childhood diseases at any time before the survey and before the first birthday, Sudan, 2010

	Vaccinated at any time before the survey according to: Vaccination card	Vaccinated at any time before the survey according to: Mother's report	Vaccinated at any time before the survey according to: Either	Vaccinated by 12 months of age
BCG [1]	39.4	37.4	76.8	74.6
Polio 0	26.1	15.3	41.4	40.2
Polio 1	40.3	45.9	86.2	83.3
Polio 2	38.5	41.8	80.3	77.4
Polio 3 [2]	37.0	27.8	64.8	62.0
DPT HB HIB 1	40.5	38.2	78.7	74.8
DPT HB HIB 2	38.7	32.4	71.1	68.3
DPT HB HIB 3 [3]	37.3	24.0	61.3	58.4
Measles [4]	37.6	32.5	70.1	62.3
All vaccinations	35.5	13.9	49.4	39.3
No vaccinations	.0	8.0	8.0	8.8
Number of children age 12-23 months	2612	2612	2612	2612

[1] SHHS indicator 3.1
[2] SHHS indicator 3.2
[3] SHHS indicator 3.3
[4] SHHS indicator 3.4; MDG indicator 4.3

Approximately 74.6 per cent of children age 12-23 months received BCG vaccination by 12 months of age. The first dose of DPT HB HIB was given to 74.8 per cent. The percentage declined for subsequent doses of DPT HB HIB to 68.3 per cent for the second dose, and 58.4 per cent for the third dose (Figure 6.1). Similarly, 83.3 per cent of children received Polio 1 by 12 months of age and this declined to 77.4 per cent for the second dose and 62.0 per cent by the third dose. The coverage for measles vaccine by 12 months of age was lower than for the other vaccines at 62.3 per cent. This is primarily because, although 70.1 per cent of children received the vaccine, only 62.3 per cent received it by their first birthday. As a result, the percentage of children who had all the recommended vaccinations by their first birthday was low at only 39.3 per cent. Important to mentioned that approx. 9 per cent of children had not received any vaccinations i.e have not been reached by health services

Figure CH.1: Vaccinations in the first year of life (Percentage of children aged 12-23 months vaccinated by 12 months of age), Sudan, 2010

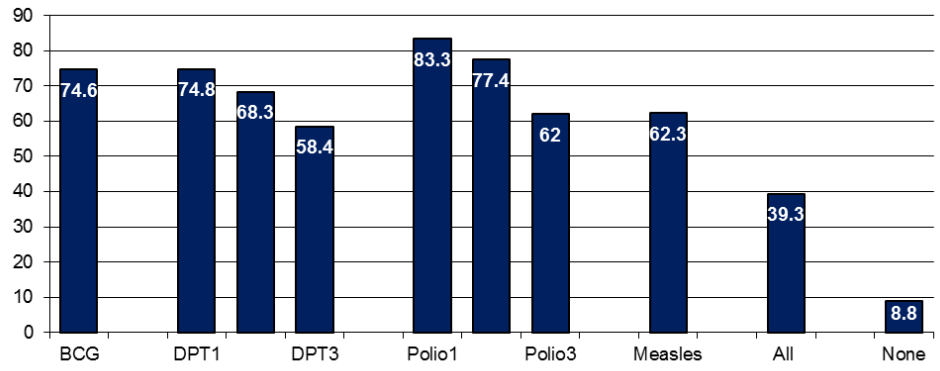


Table CH.2 shows vaccination coverage rates among children 12-23 months by background characteristics. The Table indicates the percentage of children age 12-23 months vaccinated against childhood diseases at any time up to the date of the survey. The figures are based on information from both the vaccination cards and mothers'/caretakers' reports.

Table 6.2: Vaccinations by background characteristics
Percentage of children age 12-23 months currently vaccinated against childhood diseases, Sudan, 2010

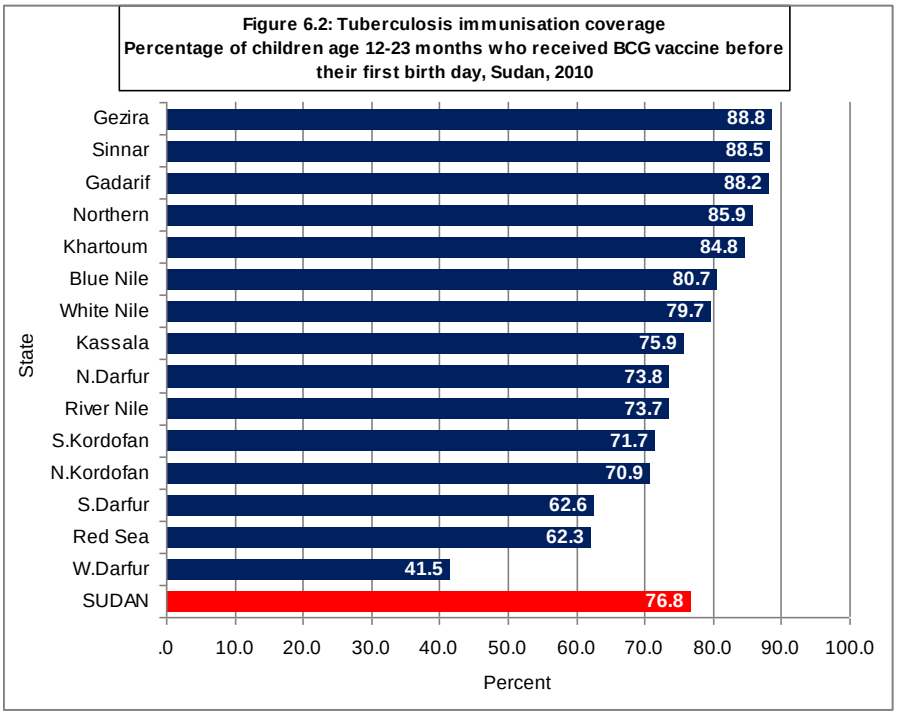
Background characteristics	Percentage of children who received:											Percentage with vaccination card seen	Number of children age 12-23 months
	BCG	Polio at birth	Polio 1	Polio 2	Polio 3	DPT HB HIB 1	DPT HB HIB 2	DPT HB HIB 3	Measles	None	All		
Sex													
Male	77.4	44.0	85.3	79.2	63.6	78.6	70.2	60.8	70.2	8.0	48.5	41.3	1331
Female	76.2	38.8	87.2	81.4	66.0	79.0	72.1	61.7	70.1	8.0	50.3	39.9	1280
State of residence													
Northern	85.9	44.4	87.2	85.1	71.3	85.1	75.3	73.0	82.7	7.1	60.4	38.5	37
River Nile	73.7	37.9	79.9	74.9	55.3	76.3	69.3	55.1	72.1	13.8	40.0	27.2	79
Red Sea	62.3	40.6	69.3	64.9	47.8	62.3	60.2	56.0	57.1	22.3	35.1	18.3	75
Kassala	75.9	49.0	83.8	70.4	54.6	75.1	70.8	58.3	64.5	13.8	40.6	31.4	138
Gadarif	88.2	66.0	92.9	90.2	74.6	84.9	80.1	69.4	80.5	4.8	58.8	46.3	138
Khartoum	84.8	60.6	86.2	82.4	70.1	87.1	83.8	79.0	78.4	6.1	60.9	56.7	349
Gezira	88.8	36.6	93.3	90.5	72.9	92.0	85.5	79.3	85.7	2.8	62.6	36.6	377
White Nile	79.7	44.4	88.8	85.8	70.7	82.8	79.4	72.6	73.8	8.2	54.9	43.6	158
Sinnar	88.5	41.5	87.4	84.9	73.0	87.0	83.2	74.0	78.9	8.6	65.1	47.6	95
Blue Nile	80.7	35.4	84.1	80.2	73.4	80.5	77.7	72.6	74.3	11.3	64.7	51.7	120
North Kordofan	70.9	30.5	84.9	74.7	58.2	75.6	63.9	48.1	56.1	9.0	37.0	41.6	290
South Kordofan	71.7	31.2	83.3	73.1	59.4	72.4	64.2	51.9	64.3	7.5	42.7	42.3	136
North Darfur	73.8	29.3	78.2	76.1	62.6	74.0	62.5	48.6	73.4	13.2	43.4	34.1	161
West Darfur	59.4	29.3	71.5	64.0	52.8	56.3	49.3	45.8	54.4	16.5	38.6	21.6	124
South Darfur	62.6	39.5	92.8	82.6	60.8	68.9	52.5	36.0	56.3	3.6	34.1	39.6	334
Area of residence													
Urban	82.8	51.3	85.4	80.6	66.4	84.1	78.3	70.3	75.9	7.8	56.2	49.7	745
Rural	74.4	37.5	86.6	80.1	64.1	76.6	68.3	57.6	67.8	8.1	46.6	37.0	1866
Education level													
None	69.7	36.5	82.4	75.7	59.2	71.1	63.1	52.3	60.5	11.2	41.3	36.2	1421
Primary	83.9	45.9	90.9	85.9	71.8	86.6	79.3	71.5	79.5	5.0	58.4	46.2	807
Secondary	88.5	51.9	91.0	85.7	71.0	90.6	84.0	73.7	86.8	2.2	60.8	45.2	365
Missing/DK	85.1	25.6	85.1	85.1	65.1	85.1	77.1	55.2	71.5	13.1	52.2	49.9	19
Wealth index quintiles													
Poorest	61.4	34.0	83.6	74.0	54.8	64.9	53.2	41.8	52.7	10.7	35.3	33.9	579
Second	71.7	34.6	82.9	76.8	60.8	73.2	64.3	50.8	64.2	10.9	40.5	36.1	577
Middle	78.0	36.3	85.6	79.8	68.3	80.2	72.1	63.8	69.1	9.2	49.8	38.3	589
Fourth	88.1	47.3	90.4	85.9	70.7	89.0	84.3	74.5	82.4	5.0	61.8	48.8	503

Table 6.2: Vaccinations by background characteristics Percentage of children age 12-23 months currently vaccinated against childhood diseases, Sudan, 2010													
Richest	91.6	64.6	90.9	88.9	73.3	93.0	90.8	86.3	92.2	1.7	67.9	51.0	363
SUDAN (TOTAL)	**76.8**	**41.4**	**86.2**	**80.3**	**64.8**	**78.7**	**71.1**	**61.3**	**70.1**	**8.0**	**49.4**	**40.6**	**2612**

Major state differentials exist in regard to the percentage of children aged 12-23 months who received BCG, Polio, DPT, and measles vaccinations at any time up to the date of the survey.

Tuberculosis immunisation coverage: The SHHS2 data indicated that 76.8 per cent of children age 12-23 months had received BCG vaccination at any time up to the date of the survey. There was only a slight difference in BCG vaccination coverage rate by gender, the BCG vaccination coverage for males and females respectively being 77.4 and 76.2 per cent. The BCG vaccination coverage was higher for children in urban areas (82.8 per cent) than among children in rural areas (74.4 per cent). The BCG vaccination coverage rate, as expected, seems to have a close link with the level of mothers' education. The BCG vaccination coverage ranged from 69.7 per cent for children of mothers with no education to 83.9 per cent for children of mothers with primary education, and to 88.5 per cent for children of mothers with secondary or higher education. The BCG vaccination coverage rate also has a close link with the economic status of the household. The BCG vaccination coverage was 61.4 per cent in the case of children belonging to households in the poorest quintile compared to 91.6 per cent for children from households in the richest quintile. The BCG vaccination coverage rate ranged from 88.8 per cent in Gezira State to 59.4 per cent in West Darfur. The vaccination coverage rate was more than 80 per cent in six States (Northern, Gedarif, Khartoum, Gezira, Sinnar and Blue Nile) and below 70 percent in three States (Red Sea, West Darfur and South Darfur).(Table CH.2)

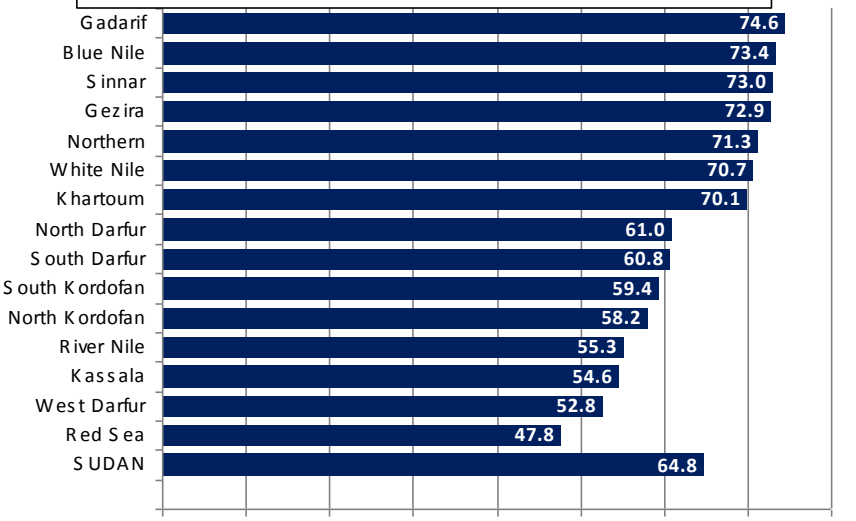
Figure 6.2: Tuberculosis immunisation coverage
Percentage of children age 12-23 months who received BCG vaccine before their first birth day, Sudan, 2010



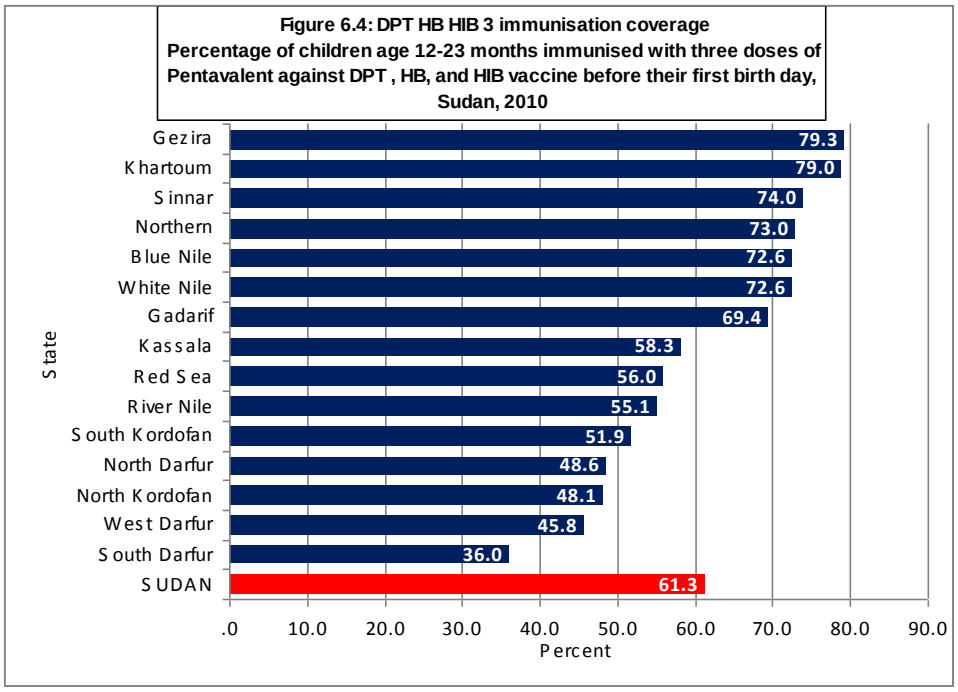
Polio immunisation coverage: The SHHS2 data indicated that 41.4 per cent of children age 12-23 months had received Oral Polio Vaccine (OPV) at birth, 86.2 per cent received OPV 1, 80.3 per cent received OPV 2 and 64.8 per cent received OPV 3 at any time up to the date of the survey. There was only a slight difference in polio vaccine coverage rate by gender, the polio3 vaccine coverage for males and females respectively being 63.6 per cent and 66.0 per cent. The polio3 vaccine coverage was slightly higher among children in urban areas (66.4 per cent) than among children in rural areas (64.1 per cent). The polio vaccine coverage rate was only 59.2 per cent for children of mothers with no education compared to 71.8 per cent for children of mothers with primary education, and 71.0 per cent for children of mothers with secondary or higher education. The polio vaccine coverage rate also has a close link with the economic status of the household, the coverage rate being 54.8 per cent in the case of children belonging to households in the poorest quintile compared to 73.3 per cent for children from households in the richest quintile. The Polio3 vaccination coverage rate ranged from

74.6 per cent in Gedarif State to 47.8 per cent in Red Sea State. The polio3 vaccination coverage rate was more than 70 per cent in seven States (Northern, Kassala, Gedarif, Khartoum, Gezira, White Nile, Sinnar and Blue Nile) and below 60 percent in six States (River Nile, Red Sea, Kassala, North Kordofan, South Kordofan and West Darfur). (Table CH.1)

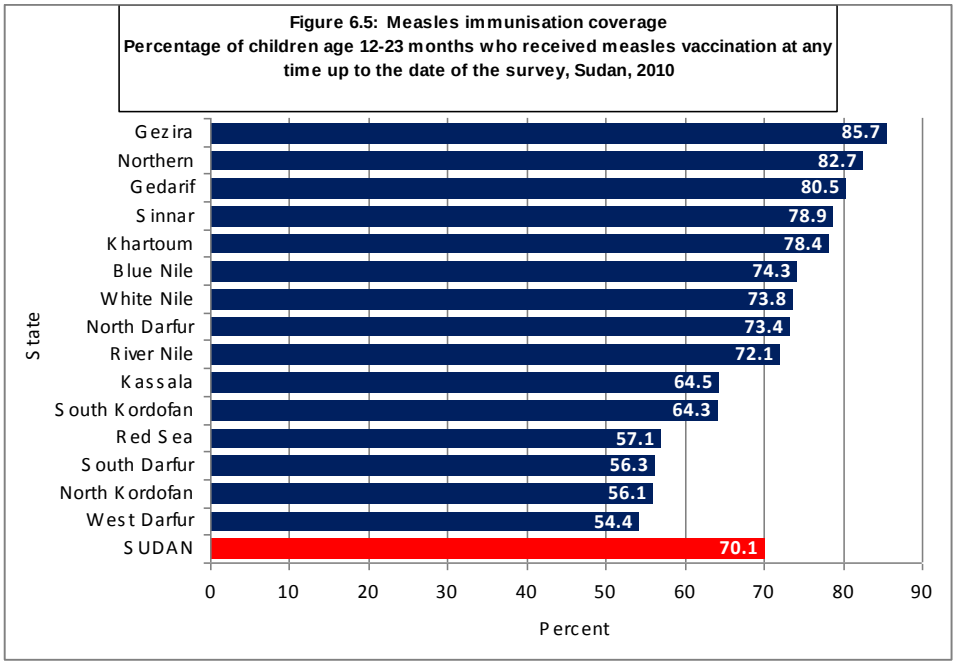
Figure 6.3: Polio immunisation coverage
Percentage of children age 12-23 months who received three doses of polio vaccine before their first birth day, Sudan, 2010



DPT HB HIB (Pentavalent vaccine) immunisation coverage: The SHHS2 data indicated that 78.7 per cent of children age 12-23 months had received DPT HB HIB1 vaccine, 71.1 per cent received DPT HB HIB 2, and 61.3 per cent received DPT HB HIB 3 at any time up to the date of the survey. There was only a slight difference in DPT HB HIB 3 vaccination coverage rate by gender, the DPT HB HIB 3 vaccination coverage for males and females respectively being 60.8 per cent and 61.7 per cent. The DPT HB HIB 3 vaccination coverage was higher among children in urban areas (70.3 per cent) than among children in rural areas (57.6 per cent). The DPT HB HIB 3 vaccination coverage rate was only 52.3 per cent for children of mothers with no education compared to 71.5 per cent for children of mothers with primary education, and 73.7 per cent for children of mothers with secondary or higher education. The DPT HB HIB 3 vaccination coverage rate also has a close link with the economic status of the household, the coverage rate being only 41.8 per cent in the case of children belonging to households in the poorest quintile compared to 86.3 per cent for children from households in the richest quintile. The DPT HB HIB 3 vaccination coverage rate ranged from 79.3 per cent in Gezira State to 36.0 per cent in South Darfur State. The DPT HB HIB 3 vaccination coverage rate was more than 70 per cent in six States (Northern, Khartoum, Gezira, White Nile, Sinnar and Blue Nile) and below 50 percent in four States (North Kordofan, North Darfur, West Darfur and South Darfur).



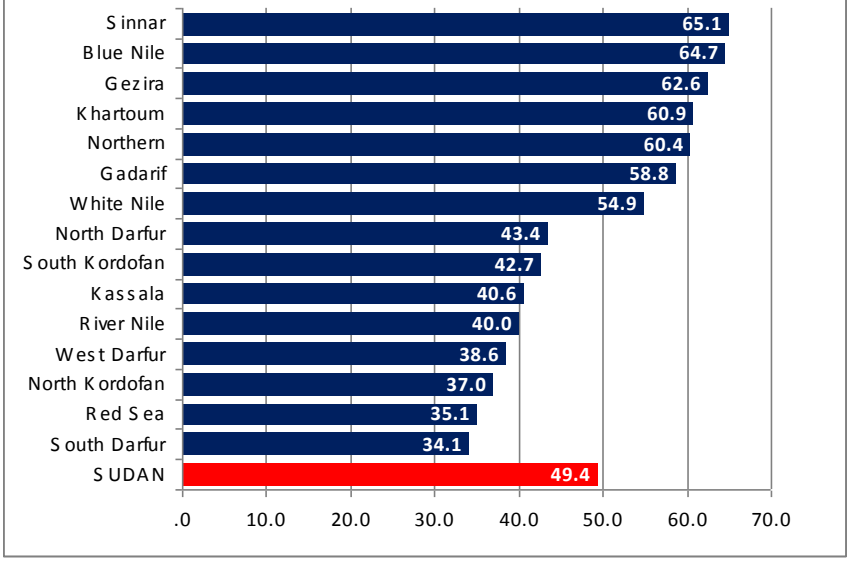
Measles immunisation coverage: The SHHS2 data indicated that 70.1 per cent of children age 12-23 months had received measles vaccination at any time up to the date of the survey. There was no difference in measles vaccination coverage rate by gender, the BCG vaccination coverage for males and females respectively being 70.2 and 70.1 per cent. The measles vaccination coverage was higher for children in urban areas (75.9 per cent) than among children in rural areas (67.8 per cent).



The measles vaccination coverage rate ranged from 60.5 per cent for children of mothers with no education to 79.5 per cent for children of mothers with primary education, and to 86.8 per cent for children of mothers with secondary or higher education. The measles vaccination coverage was only 52.7 per cent in the case of children belonging to households in the poorest quintile compared to 92.2 per cent for children from households in the richest quintile. The Measles vaccination coverage rate ranged from 85.7 per cent in Gezira State to 56.1 per cent in North Kordofan State. The Measles vaccination coverage rate was more than 80 per cent in three States (Northern, Gedarif, and Gezira) and below 60 percent in four States (Red Sea, North Kordofan, West Darfur and South Darfur). (Table CH.2

Fully immunised children: The SHHS2 data indicated that only half (49.4 per cent) of Sudan's children age 12-23 months were fully immunised with BCG vaccine against tuberculosis, three doses of polio vaccine against polio, three doses of Pentavalent against DPT (diphtheria, pertusis and tetanus), Hepatitis B (HB), and Haemophilus inflenzae (HIB) and measles vaccine before their first birthday. This leaves the rest of the children age 12-23 months unprotected against life-threatening diseases. The percentage of fully immunised children was slightly higher among females (50.3 per cent) than that among male children (48.5 per cent). The percentage of fully immunised children was higher for children in urban areas (56.2 per cent) than among children in rural areas (46.6 per cent). The percentage of fully immunised children ranged from 41.3 per cent for children of mothers with no education to 58.4 per cent for children of mothers with primary education, and to 60.8 per cent for children of mothers with secondary or higher education. The percentage of fully immunised children was only 35.3 per cent in the case of children belonging to households in the poorest quintile compared to 67.9 per cent for children from households in the richest quintile. The percentage of fully immunised children at any time up to the date of the survey ranged from 65.1 per cent in Sinnar State to 34.1 per cent in South Darfur State. The percentage of fully immunised children was more than 60 per cent in five States (Northern, Khartoum, Gezira, Sinnar, and Blue Nile) and below 40 percent in four States (Red Sea, North Kordofan, West Darfur and South Darfur). (Table CH.2)

Figure 6.6: Fully immunised children
Percentage of children age 12-23 months fully immunised against tuberculosis, polio, DPT, HB, HIB and measles before their first birth day, Sudan, 2010



Neonatal Tetanus Protection

One of the MDGs is to reduce by three quarters the maternal mortality ratio, with one strategy to eliminate maternal tetanus. In addition, another goal is to reduce the incidence of neonatal tetanus to less than 1 case of neonatal tetanus per 1000 live births in every district. A World Fit for Children goal is to eliminate maternal and neonatal tetanus by 2005.

Prevention of maternal and neonatal tetanus is to assure all pregnant women receive at least two doses of tetanus toxoid vaccine. However, if women have not received two doses of the vaccine during the pregnancy, they (and their newborn) are also considered to be protected if they had (i) received at least two doses of tetanus toxoid vaccine, the last within the prior 3 years; (ii) received at least 3 doses, the last within the prior 5 years; (iii) received at least 4 doses, the last within 10 years; and (iv) received at least 5 doses during lifetime.

Table 6.3 shows the protection status from tetanus of women aged 15-49 years who have had a live birth within the last 2 years.

Table 6.3: Neonatal tetanus protection
Percentage of women age 15-49 years with a live birth in the last 2 years protected against neonatal tetanus, Sudan, 2010

Background characteristics	Percentage of women who received at least 2 doses during last	Percentage of women who did not receive two or more doses during last pregnancy but received:				Protected against tetanus [1]	Number of women with a live birth in the last 2 years
		2 doses, the last within prior 3 years	3 doses, the last within prior 5 years	4 doses, the last within prior 10 years	5 or more doses during lifetime		
Area of residence							
Urban	34.9	20.8	2.4	3.0	1.0	62.2	1559
Rural	33.7	14.9	2.0	1.1	.2	51.9	4087
State of residence							
Northern	35.3	14.5	1.5	.7	.3	52.4	83
River Nile	34.4	20.8	2.3	1.6	.0	59.1	164
Red Sea	25.4	15.3	1.2	.8	.0	42.7	134
Kassala	36.5	14.9	1.5	.9	.0	53.7	318
Gadarif	28.5	13.6	2.0	1.2	.3	45.5	283
Khartoum	35.2	23.2	2.6	4.6	1.6	67.2	752
Gezira	36.4	26.2	2.5	2.4	.0	67.5	759
White Nile	28.8	15.9	2.6	1.3	.4	49.0	316
Sinnar	32.0	13.8	2.4	1.4	.2	49.9	217
Blue Nile	30.6	6.3	2.6	1.9	.3	41.5	261
North Kordofan	36.9	11.8	1.0	.3	.3	50.3	615
South Kordofan	38.4	16.2	1.2	.2	.2	56.3	307
North Darfur	27.2	17.4	3.1	1.6	.3	49.6	387
West Darfur	33.2	11.4	1.8	.2	.0	46.5	278
South Darfur	36.6	11.5	2.1	1.0	.5	51.7	772
Mother's education level							
None	28.5	10.6	1.6	.9	.3	41.8	2487
Primary	38.7	20.0	2.8	2.2	.6	64.3	1912
Secondary +	41.4	25.9	2.2	2.2	.1	71.8	974
Adult education/Khalwa/Sunday education	26.2	12.7	2.0	2.4	.9	44.2	273
Wealth index quintiles							
Poorest	28.7	9.9	1.8	.6	.1	41.1	1287
Second	33.7	12.4	1.2	.5	.3	48.1	1245
Middle	35.5	15.7	2.4	1.5	.4	55.4	1255
Fourth	36.1	23.5	3.1	3.0	1.1	66.8	1073
Richest	38.4	25.5	2.5	3.4	.3	70.0	787
SUDAN (TOTAL)	**34.1**	**16.5**	**2.1**	**1.6**	**.4**	**54.7**	**5646**

[1] SHHS indicator 3.7

The SHHS2 data indicates that the percentage of women aged 15-49 years with a live birth in the last two years protected against neonatal tetanus was only 54.7. The percentage of women who received at least two doses of tetanus toxoid (TT) vaccine during last pregnancy was only 34.1 per cent.

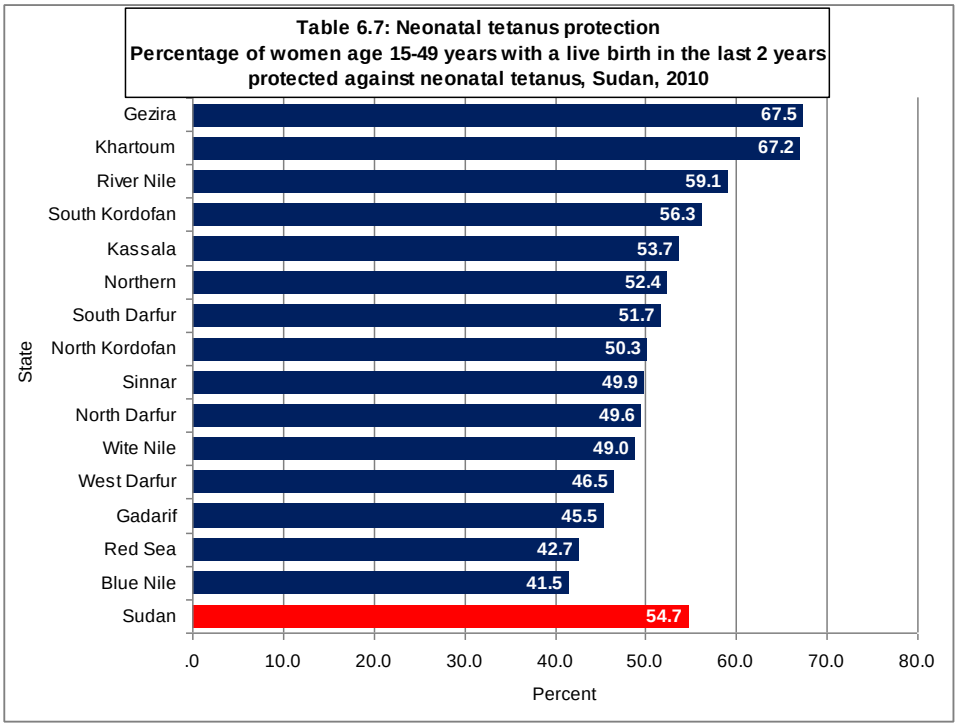
The percentage of women aged 15-49 years with a live birth in the last two years protected against neonatal tetanus was higher among women in urban areas (62.2 per cent) than those in rural areas (51.9 per cent). However, there was only a marginal difference in the percentage of women who received at least two doses of tetanus toxoid (TT) vaccine during last pregnancy between those living in urban areas (34.9 per cent) and those living in rural areas (33.7 per cent).

The level of education of the woman is related to the likelihood of neonatal tetanus protection. For instance, the percentage of women aged 15-49 years who were protected against neonatal tetanus was only 41.8 per cent for women with no education, compared to 64.3 per cent for women with primary education and 71.8 per cent for women with secondary and higher levels of education. Similarly, the percentage of women aged 15-49 years who received at least two doses of tetanus toxoid (TT) vaccine during last pregnancy was only 28.5 per cent for women with no education, compared to 38.7 per cent for women with primary education and 41.4 per cent for women with secondary and higher levels of education.

The economic status of the women also plays a key role; the percentage of women age 15-49 years with a live birth in the last two years protected against neonatal tetanus was 70.0 for those from households in the richest quintile compared to 41.1 for those belonging to households in the poorest quintile. Similarly, the percentage of women aged 15-49 years who received at least two doses of tetanus toxoid (TT) vaccine during last pregnancy was 38.4 for those from households in the richest quintile compared to 28.7 for those belonging to households in the poorest quintile.

The percentage of women aged 15-49 years who have had a live birth within the last 2 years protected against neonatal tetanus varied significantly by State. The proportion of women protected against neonatal tetanus ranged from 67.5 per cent in Gezira State to 41.5 per cent in Blue Nile State.

Table 6.7: Neonatal tetanus protection
Percentage of women age 15-49 years with a live birth in the last 2 years protected against neonatal tetanus, Sudan, 2010



The percentage of women aged 15-49 years who received at least two doses of tetanus toxoid (TT) vaccine during last pregnancy also varied by State. The percentage of women aged 15-49 years who received at least two doses of tetanus toxoid (TT) vaccine during last pregnancy was highest in North Kordofan State (36.9 per cent) and the lowest in Red Sea State (25.4 per cent).

Care of Illness

Management/treatment of diarrhoea

Diarrhoea is the second leading cause of death among children under five worldwide. Most diarrhoea-related deaths in children are due to dehydration from loss of large quantities of water and electrolytes from the body in liquid stools. Management of diarrhoea – either through oral rehydration salts (ORS) or a recommended home fluid (RHF) - can prevent many of these deaths. Preventing dehydration and malnutrition by increasing fluid intake and continuing to feed the child are also important strategies for managing diarrhoea.

A key goal is to reduce by one half deaths due to diarrhoea among children under five by 2010 compared to 2000 (A World Fit for Children). In addition, the World Fit for Children calls for a reduction in the incidence of diarrhoea by 25 percent.

In the SHHS2 questionnaire, mothers (or caretakers) were asked to report whether their child had had diarrhoea in the two weeks prior to the survey. If so, the mother was asked a series of questions about what was given to the child to drink and eat during the episode of diarrhoea and whether this was more or less than the child usually drank and ate.

Incidence of diarrhoea: The SHHS2 data indicated that overall, 26.8 percent of under-five children had diarrhoea in the two weeks preceding the survey (Table CH.4). The peak of diarrhoea prevalence (36.3 per cent) was observed among children aged 12-23 months. There was slight difference in the proportion of under-five children who had diarrhoea in the two weeks preceding the survey in rural and urban areas. The diarrhoea prevalence rate was lower among children in urban areas (22.7 per cent) than that among children in rural areas (28.3 per cent). The level of education of the mothers appears to be related to the likelihood of diarrhoea among children aged 0-59 months. For instance, the percentage of children aged 0-59 years with diarrhoea in the last two weeks was 27.6 per cent among children of mothers with no education compared to 21.9 per cent for children of mothers with secondary and higher levels of education. Diarrhoea prevalence was reported from all regions, the percentage of children aged 0-59 months who had diarrhoea ranged from 33.9 per cent in South Darfur State to 17.5 per cent in River Nile State.

Management/treatment of diarrhoea with oral rehydration solutions and recommended homemade fluids

Table CH.4 also shows the percentage of children age 0-59 months with diarrhea who received treatment with oral rehydration solutions and recommended homemade fluids during the episode of diarrhoea. Since mothers were able to name more than one type of liquid, the percentages do not necessarily add to 100.

Table 6.4: Oral rehydration solutions and recommended homemade fluids
Percentage of children age 0-59 months with diarrhoea in the last two weeks, and treatment with oral rehydration solutions and recommended homemade fluids, Sudan, 2010

	Had diarrhoea in last two weeks	Number of children age 0-59 months	Children with diarrhoea who received:		ORS or any recommended homemade fluid	Number of children aged 0-59 months with diarrhoea
			ORS (Fluid from ORS packet, ORADEX)	Any recommended homemade fluid		
Sex						
Male	26.8	6742	22.1	26.9	40.7	1806

Table 6.4: Oral rehydration solutions and recommended homemade fluids
Percentage of children age 0-59 months with diarrhoea in the last two weeks, and treatment with oral rehydration solutions and recommended homemade fluids, Sudan, 2010

	Had diarrhoea	Number of	Children with diarrhoea who received:		ORS or any recommende	Number of children
Female	26.8	6540	21.9	24.5	39.4	1750
State of residence						
Northern	25.6	170	20.6	46.0	54.8	43
River Nile	17.5	404	26.6	32.7	51.0	71
Red Sea	20.8	281	35.1	18.0	41.3	58
Kassala	26.5	780	29.8	17.7	35.8	207
Gadarif	28.2	678	27.8	23.4	40.7	191
Khartoum	24.0	1868	17.5	39.3	50.7	449
Gezira	20.8	1750	10.5	28.5	33.1	364
White Nile	32.0	675	19.4	36.8	45.6	216
Sinnar	26.5	517	14.6	21.8	34.0	137
Blue Nile	33.6	595	33.3	17.0	41.3	200
North Kordofan	25.7	1425	24.2	24.0	40.8	366
South Kordofan	29.4	681	22.8	22.7	36.0	200
North Darfur	24.2	947	24.1	18.4	33.9	229
West Darfur	29.7	682	32.4	15.0	36.8	202
South Darfur	33.9	1829	19.2	24.4	38.4	621
Area of residence						
Urban	22.7	3669	23.2	30.0	46.3	833
Rural	28.3	9613	21.6	24.5	38.1	2723
Age group						
0-11	32.7	2964	18.7	20.0	34.4	970
12-23	36.3	2613	24.9	28.4	43.4	949
24-35	27.2	2762	24.5	28.1	43.9	750
36-47	19.8	2811	20.2	28.4	40.1	557
48-59	15.4	2131	20.5	25.0	38.2	329
Mother's education level						
None	27.6	7359	23.0	23.4	38.0	2028
Primary	27.4	4044	19.9	29.1	42.8	1109
Secondary	21.9	1785	23.3	29.7	44.2	390
Missing/DK	30.0	94	11.2	10.0	18.8	28
Wealth index quintiles						
Poorest	33.2	3213	21.1	22.8	36.3	1068
Second	29.2	2901	25.3	18.4	35.8	847
Middle	25.3	2800	22.6	30.3	43.7	709
Fourth	23.4	2490	21.7	31.5	46.3	582
Richest	18.6	1878	15.7	33.7	43.8	349
SUDAN (TOTAL)	**26.8**	**13282**	**22.0**	**25.8**	**40.0**	**3555**

Treatment of diarrhoea with oral rehydration salt (ORS): About 22.0 per cent of children age 0-59 months with diarrhoea (in the last two weeks preceding the survey) received ORS (i.e. fluid from ORS packet, ORADEX). Very little difference was noticed between boys (40.7 per cent) and girls (39.4 per cent) in terms of those who received ORS. The percentage of under-five children with diarrhoea and received ORS increases from 18.7 per cent in the case of children aged below 12 months to 24.9 per

cent for children aged 12-23 months and then decreases to 24.5 per cent for children aged 24-35 months, to 20.2 per cent to children aged 36-47 months and to 20.5 per cent for children aged 48-59 months. The percentage of children who had diarrhoea in the two weeks preceding the survey and received ORS was slightly higher among those in urban areas (23.2 per cent) than that for children in rural areas (21.6 per cent). The education level of the mother did not have any influence of children with diarrhoea who received ORS. However, the percentage of children who received fluid from ORS packet was found to be higher among children from households in the second wealth index quintile (25.3 per cent) than those from households in the poorest quintile (21.1 per cent) and those from households in the richest quintile (15.7 per cent).

Treatment of diarrhoea with any recommended homemade fluid (home management of diarrhoea*):* The SHHS data shows that about 25.8 per cent of children age 0-59 months with diarrhoea (in the last two weeks preceding the survey) received recommended homemade fluids. The percentage of children who received recommended homemade fluid increases from 20.0 in the case of children aged below 12 months to 28.4 for children aged 12-23 months, and then decreases to 25.0 for children aged 48-59 months. The percentage of children who had diarrhoea in the two weeks preceding the survey and received any recommended homemade fluid was higher among those in urban areas (30.0 per cent) than that for children in rural areas (24.5 per cent). The level of education of the mothers appears to be related to the likelihood of treatment for children aged 0-59 months with diarrhoea. For instance, the percentage of children aged 0-59 years with diarrhoea who received any recommended homemade fluid was 23.4 per cent for children of mothers with no education, compared to 29.1 per cent for children of women with primary education and 29.7 per cent for children of women with secondary and higher levels of education. The percentage of children who received homemade fluid was higher among children belonging to households in the richest quintile (33.7 per cent) than that among children from households in the poorest quintile (22.8 per cent).

Treatment of diarrhoea with ORS or any recommended homemade fluid*:* Approximately 40.0 per cent of children with diarrhoea received one or more of the recommended home treatments (i.e., they were treated with ORS or any recommended homemade fluid), while 60 per cent received no treatment. Very little difference was noticed between boys (40.7 per cent) and girls (39.4 per cent) in terms of those who received ORS or any recommended homemade fluid. The percentage of under-five children who had diarrhoea in the two weeks preceding the survey and received ORS or any recommended homemade fluid was higher among those in urban areas (46.3 per cent) than that for children in rural areas (38.1 per cent). The percentage of children with diarrhoea who received ORS or any recommended homemade fluid increases from 34.4 per cent for children aged below 12 months to 43.4 per cent for children aged 12-23 months, to 43.9 per cent to children aged 24-35 months, and then declines to 40.1 per cent for children aged 36-47 months and to 38.2 per cent for children aged 48-59 months. The percentage of under-five children who had diarrhoea in the two weeks preceding the survey and received ORS or any recommended homemade fluid was higher among those in urban areas (46.3 per cent) than that for children in rural areas (38.1 per cent). The level of education of the mothers appears to be related to the likelihood of treatment for children aged 0-59 months with diarrhoea. For instance, the percentage of children aged 0-59 years with diarrhoea who received ORS or any recommended homemade fluid was 38.0 per cent for children of mothers with no education, compared to 42.8 per cent for children of women with primary education and 44.2 per cent for children of women with secondary and higher levels of education. The percentage of children aged 0-59 years with diarrhoea in the last two weeks who received ORS or any recommended homemade fluid was higher among children from households in the richest quintile (43.8) than that for those belonging to households in the poorest quintile (36.3). The percentage of under-five children who had diarrhoea in the two weeks preceding the survey and received ORS or any recommended homemade fluid ranged from 54.8 per cent in Northern State to 33.9 per cent in North Darfur State.

Feeding practices during diarrhoea

Table CH.5 presents the feeding practices during diarrhea, i.e. percent distribution of children aged 0-59 months with diarrhoea in the last two weeks by amount of liquids and food given during episode of diarrhea. The SHHS2 data related to drinking practices of children during diarrhoea indicates that about 42.2 per cent of children with diarrhoea were given less than usual to drink, 30.7 per cent of them were given about the same to drink and 21.9 per cent of them were given more than usual to drink while 4.5 per cent of children were given nothing to drink during the episode of diarrhoea. Very little difference was noted between boys (41.5 per cent) and girls (42.9 per cent) in terms of those who were given less liquid than usual to drink while there was some difference between boys (32.4 per cent) and girls (29.0 per cent) who were given about the same amount to drink. There was also a slight difference between boys (20.8 per cent) and girls (23.0 per cent) who were given more than usual amount of liquid to drink. Very little difference was noticed between boys (4.7 per cent) and girls (4.4 per cent) who were given nothing to drink.

The percentage of children who were given less than usual to drink during the episode of diarrhoea increases from 36.5 in the case of children aged below 12 months to 46.1 among children aged 12-23 months and then decreases to 40.7 for children aged 24-35 months, then increases to 40.7 among aged 36-47 months and to 47.1 among children aged 48-59 months. The percentage of children who were given about the same to drink during the episode of diarrhoea decreases from 32.6 in the case of children aged below 12 months to 28.3 for children aged 12-23 months and then increases to 31.8 for children aged 24-35 months, then increases to 30.9 for children aged 36-47 months and to 29.3 per cent for children aged 48-59 months. The percentage of children who were given more than usual to drink during the episode of diarrhoea increases from 16.6 in the case of children aged below 12 months to 23.4 for children aged 12-23 months and to 26.4 for children aged 24-35 months, then decreases to 22.4 for children aged 36-47 months and to 21.9 for children aged 48-59 months.

There is little influence of educational levels of mothers on the drinking practices during diarrhoea among children aged 0-59 months. However, there is some impact of economic levels of mothers on the drinking practices of children during diarrhoea. The proportion of children who were given less than usual amount of liquids to drink declined from 43.6 per cent for children of mothers from households in the poorest quintile to 39.2 per cent for children of mothers from households in the richest quintile. The proportion of children who were given about the same amount of liquids increased from 27.4 per cent for children of mothers from households in the poorest quintile to 31.4 per cent for children of mothers from households in the richest quintile. The proportion of children who were given more than the usual to drink decreased from 25.3 per cent for children of mothers from households in the poorest quintile to 22.8 per cent for children of mothers from households in the richest quintile.

The SHHS2 data related to eating practices during diarrhoea indicates that about 59.1 per cent of children with diarrhoea were given less than usual to eat, while 25.3 per cent of them were given about the same to eat and 1.8 per cent of them were given more than usual to eat and 4.0 per cent of children with diarrhoea were given nothing to eat during the episode of diarrhoea. The percentage of children who were given less than usual/required amount of food to eat during episode of diarrhoea increases from 40.3 in the case of children aged below 12 months to 66.6 among children aged 12-23 months and then decreases to 65.9 for children aged 24-35 months, and to 65.2 among aged 36-47 months and then increases to 67.1 among children aged 48-59 months. The percentage of children who were given about the same amount of required food to eat during episode of diarrhoea increases from 19.1 in the case of children aged below 12 months to 30.6 for children in the age group 36-47 months and then decreases to 28.1 for children age 48-59 months. There is little influence of educational levels of mothers on the eating practices of children during diarrhoea. However, there is some impact of economic levels of mothers on the eating practices of children during diarrhoea. The proportion of children who were given less than usual to eat during the episode of diarrhoea declined from 63.4 per cent for children of mothers from households in the poorest quintile to 53.7 per cent for children of mothers from households in the richest quintile. The proportion of children who were given about the same to eat during the episode of diarrhoea increased from 21.3 per cent for children of mothers from households in the poorest quintile to 32.7 per cent for children of mothers from households in the richest quintile.

Table 6.5: Feeding practices during diarrhoea

Percent distribution of children age 0-59 months with diarrhoea in the last two weeks by amount of liquids and food given during episode of diarrhoea, Sudan, 2010

			Drinking practices during diarrhoea:						Eating practices during diarrhoea:							Number of children aged 0-59 months with diarrhoea
	Had diarrhoea in last two weeks	Number of children age 0-59 months	Given less than usual to drink	Given about the same to drink	Given more than usual to drink	Given nothing to drink	Missing/DK	Total	Given less than usual to eat	Given about the same to eat	Given more to eat	Stopped food	Exclusively breast fed	Missing/ DK	Total	
Sex																
Male	26.8	6742	41.5	32.4	20.8	4.7	.6	100.0	58.9	25.9	1.9	4.2	8.5	.6	100.0	1806
Female	26.8	6540	42.9	29.0	23.0	4.4	.7	100.0	59.3	24.6	1.8	3.7	10.2	.5	100.0	1750
State of residence																
Northern	25.6	170	55.9	29.2	12.5	.9	1.5	100.0	68.5	21.7	.0	7.8	2.0	.0	100.0	43
River Nile	17.5	404	41.7	38.2	16.6	3.6	.0	100.0	56.0	28.7	4.2	4.7	5.4	.9	100.0	71
Red Sea	20.8	281	50.3	27.6	16.9	2.8	2.4	100.0	55.5	32.4	1.9	3.0	3.8	3.3	100.0	58
Kassala	26.5	780	48.1	37.3	9.3	4.4	1.0	100.0	56.3	27.9	.5	7.0	7.6	.8	100.0	207
Gadarif	28.2	678	43.5	37.2	11.9	6.5	.8	100.0	51.5	31.7	4.4	1.8	10.2	.4	100.0	191
Khartoum	24.0	1868	39.4	32.6	23.7	2.7	1.6	100.0	57.4	28.6	.1	7.3	6.2	.4	100.0	449
Gezira	20.8	1750	33.2	38.9	20.2	7.7	.0	100.0	46.6	37.5	.9	4.4	10.6	.0	100.0	364
White Nile	32.0	675	43.8	34.8	16.2	5.2	.0	100.0	59.1	28.1	3.0	1.2	8.6	.0	100.0	216
Sinnar	26.5	517	47.7	31.4	17.4	2.1	1.4	100.0	60.8	23.4	2.1	1.9	10.5	1.2	100.0	137
Blue Nile	33.6	595	29.9	42.5	25.0	2.4	.2	100.0	50.4	35.6	3.0	3.2	7.8	.0	100.0	200
North Kordofan	25.7	1425	42.6	26.0	26.3	4.1	1.0	100.0	68.4	15.9	1.6	4.2	9.4	.5	100.0	366
South Kordofan	29.4	681	43.7	26.9	21.3	8.1	.0	100.0	57.6	25.9	.8	3.9	11.8	.0	100.0	200
North Darfur	24.2	947	37.8	31.7	22.3	7.6	.6	100.0	52.3	25.9	4.5	3.6	13.4	.4	100.0	229
West Darfur	29.7	682	55.2	23.3	16.1	4.3	1.1	100.0	63.0	24.1	3.2	.7	7.8	1.1	100.0	202
South Darfur	33.9	1829	44.4	20.7	31.8	3.0	.0	100.0	69.6	13.5	1.4	3.4	11.4	.8	100.0	621
SUDAN (Total)	**26.8**	**13282**	**42.2**	**30.7**	**21.9**	**4.5**	**.6**	**100.0**	**59.1**	**25.3**	**1.8**	**4.0**	**9.3**	**.5**	**100.0**	**3555**
Area of residence																
Urban	22.7	3669	41.6	31.0	21.1	5.1	1.2	100.0	57.2	27.3	.8	5.8	8.2	.7	100.0	833
Rural	28.3	9613	42.4	30.7	22.1	4.4	.4	100.0	59.7	24.6	2.1	3.4	9.7	.5	100.0	2723
Age group																
0-11	32.7	2964	36.5	32.6	16.6	14.0	.3	100.0	40.3	19.1	1.6	4.9	33.0	1.1	100.0	970
12-23	36.3	2613	46.1	28.3	23.4	1.7	.5	100.0	66.6	25.6	2.1	4.4	1.1	.3	100.0	949
24-35	27.2	2762	40.7	31.8	26.4	.4	.7	100.0	65.9	27.5	2.3	3.5	.1	.6	100.0	750
36-47	19.8	2811	44.8	30.9	22.4	1.2	.7	100.0	65.2	30.6	1.7	2.3	.0	.2	100.0	557
48-59	15.4	2131	47.1	29.3	21.9	.0	1.7	100.0	67.1	28.1	1.2	3.5	.0	.0	100.0	329
Mother's education level																
None	27.6	7359	42.7	31.1	21.6	3.9	.7	100.0	59.0	25.4	2.1	3.6	9.2	.7	100.0	2028
Primary	27.4	4044	41.2	29.8	22.7	5.6	.6	100.0	60.2	24.0	1.2	4.8	9.4	.3	100.0	1109
Secondary	21.9	1785	42.3	32.2	20.2	5.1	.2	100.0	56.8	28.7	1.5	3.0	9.8	.1	100.0	390
Missing/DK	30.0	94	46.4	17.6	33.8	2.2	.0	100.0	53.5	17.6	12.9	7.7	8.3	.0	100.0	28
Wealth index quintile																
Poorest	33.2	3213	43.6	27.4	25.3	3.5	.3	100.0	63.4	21.3	2.4	3.4	8.8	.7	100.0	1068
Second	29.2	2901	45.4	30.8	19.4	4.0	.3	100.0	60.7	24.4	1.7	3.1	9.6	.4	100.0	847
Middle	25.3	2800	40.3	31.8	20.8	5.9	1.2	100.0	55.7	26.0	1.9	4.6	11.2	.6	100.0	709
Fourth	23.4	2490	39.2	35.1	20.1	5.0	.6	100.0	56.1	28.4	1.0	5.4	8.8	.2	100.0	582
Richest	18.6	1878	39.2	31.4	22.8	5.4	1.3	100.0	53.7	32.7	1.6	3.9	7.4	.6	100.0	349

There are differences among states in terms of feeding practices (both drinking and eating practices) during diarrhoea. The proportion of children (age 0-59 months) who were given less than usual to drink during the episode of diarrhoea ranged from 55.9 per cent in Northern State to 29.9 per cent in Blue Nile State. The proportion of children who were given about the same to drink during episode of diarrhoea ranged from 42.5 per cent in Blue Nile State to 20.7 per cent in South Darfur State. The proportion of children who were given more than usual to drink during episode of diarrhoea ranged from 9.3 per cent in Kassala to 31.8 per cent in South Darfur.

There are also differences among states in terms of eating practices during diarrhoea. The proportion of children (age 0-59 months) who were given less than usual to eat during episode of diarrhoea ranged from 69.6 per cent in South Darfur State to 50.4 per cent in Blue Nile State. The proportion of children who were given about the same to eat during episode of diarrhoea ranged from 13.5 per cent in South Kordofan State to 37.5 per cent in Gezira State. The proportion of children who were given more than usual to eat during episode of diarrhoea ranged from 4.5 per cent in North Darfur to 0.1 per cent in Khartoum.

Oral rehydration therapy with continued feeding and other treatments

Table CH.6 presents information on oral rehydration therapy with continued feeding and other treatments for children with diarrhoea. It indicates the percentage of children age 0-59 months with diarrhoea in the last two weeks preceding the survey who received ORS or increased fluid, oral rehydration therapy (ORT), and oral rehydration therapy with continued feeding, percentage of children with diarrhoea who received other treatments, and percentage of children who were not given any treatment or drug. Very little difference was noticed between boys and girls with diarrhoea who received oral rehydration therapy with continued feeding and other treatments. However, there was noticeable difference between children of different age groups who received oral rehydration therapy with continued feeding and other treatments. The education level of the mothers was found to impact the proportion of children age 0-59 months with diarrhoea who received oral rehydration therapy with continued feeding. The economic status of the household was found to have some impact on the proportion of children (age 0-59 months) with diarrhoea who received oral rehydration therapy with continued feeding and other treatments. The education level of the mothers was found to impact the proportion of children age 0-59 months with diarrhoea who received oral rehydration therapy with continued feeding. The economic status of the household was found to have some impact on the proportion of children (age 0-59 months) with diarrhoea who received oral rehydration therapy with continued feeding and other treatments. About a quarter of children (24.9 per cent) were not given any treatment or drug during the episode of diarrhoea.

Children with diarrhoea who received ORS or increased fluid: The SHHS2 data indicated that overall 38.6 per cent of children with diarrhoea received ORS or increased fluids during the episode of diarrhoea. Very little difference was noticed between boys and girls with diarrhoea who received ORS or increased fluids. About 37.9 per cent of boys with diarrhoea received ORS or increased fluid compared to 39.4 per cent of girls. Very little difference was also noticed between children with diarrhoea in rural and urban areas who received ORS or increased fluids. About 38.1 per cent of children in urban areas received ORS or increased fluid compared to 38.8 per cent of children in rural areas. The proportion of children with diarrhoea who received ORS or increased fluids increased from 31.8 per cent among children aged 0-11 months to 41.9 per cent among those aged 12-23 months, and to 44.4 per cent among children aged 24-35 months, and then declined to 38.0 among those aged 36-47 months and to 37.5 per cent among those aged 48-59 months. The proportion of children with diarrhoea who received ORS or increased fluids was higher among children of mothers with no education (39.4 per cent) than that for children of mothers with secondary or higher level of education (36.4 per cent). The proportion of children with diarrhoea who received ORS or increased fluids showed a declining trend from 41.3 per cent among children from households in the poorest quintile to 35.3 per cent among children from households in the richest quintile. The proportion of children with diarrhoea who received who received ORS or increased fluids during the episode of diarrhoea ranged from 28.2 per cent in Northern State to 48.5 per cent in Blue Nile State.

Children with diarrhoea who received ORT: The SHHS2 data indicates that overall 52 per cent received ORT (ORS or recommended homemade fluids or increased fluids) during the episode of diarrhoea. Very little difference was noticed between boys and girls with diarrhoea who received oral

Table 6.6: Oral rehydration therapy with continued feeding and other treatments
Percentage of children age 0-59 months with diarrhoea in the last two weeks who received oral rehydration therapy with continued feeding, and percentage of children with diarrhoea who received other treatments, Sudan, 2010

	Children with diarrhoea who received:			Other treatment:												
	ORS or increased fluids	ORT (ORS or recommended homemade fluids or increased fluids)	ORT with continued feeding [1]	Pill or syrup: Antibiotic	Pill or syrup: Antimotility	Pill or syrup: Zinc	Pill or syrup: Other	Pill or syrup: Unknown	Injection: Antibiotic	Injection: Non-antibiotic	Injection: Unknown	Intravenous	Home remedy/ Herbal medicine	Other	Not given any treatment or drug	Number of children aged 0-59 months with diarrhoea
Sex																
Male	37.9	52.1	12.4	41.0	4.1	1.0	.3	2.7	1.2	.1	.1	.1	3.9	3.0	25.3	1806
Female	39.4	51.8	11.2	40.7	3.7	.3	.4	4.3	.6	.1	.2	.0	4.6	3.6	24.5	1750
State of residence																
Northern	28.2	60.8	8.4	40.0	.9	.0	.0	1.2	.6	.0	.0	.0	8.4	6.6	23.9	43
River Nile	38.5	55.0	15.8	41.5	1.5	.0	.0	1.4	.0	.7	.0	.0	6.0	6.5	25.1	71
Red Sea	41.3	47.5	16.8	38.1	2.5	.8	.9	1.9	.8	.0	.0	.0	4.0	5.6	35.6	58
Kassala	35.3	41.0	11.3	39.8	2.5	.4	1.1	6.3	1.5	.0	1.8	.0	3.5	1.5	29.6	207
Gadarif	36.0	46.1	15.4	55.9	1.5	.4	.4	.9	.0	.0	.0	.0	4.4	1.3	23.5	191
Khartoum	36.1	58.9	12.4	43.4	1.0	3.0	.9	1.4	2.0	.0	.0	.0	2.9	3.1	20.8	449
Gezira	26.5	44.0	15.5	33.5	10.3	.0	.0	2.8	1.1	.0	.5	.0	3.0	3.2	29.6	364
White Nile	33.3	53.0	13.7	24.1	30.1	.0	.3	.0	1.2	.0	.0	.0	3.3	4.1	23.1	216
Sinnar	29.5	45.8	10.0	53.4	1.0	.7	.0	5.9	1.3	.0	.6	.0	1.9	2.3	23.6	137
Blue Nile	48.5	53.9	19.4	41.5	2.6	.6	.2	3.0	1.6	.0	.0	.0	6.3	4.7	23.6	200
North Kordofan	46.1	54.8	8.5	33.8	1.7	.7	.5	10.6	1.4	.0	.0	.4	2.8	1.5	25.4	366
S. Kordofan	38.5	49.0	9.1	44.8	1.6	.3	.0	2.7	.5	.4	.3	.3	8.6	5.6	21.6	200
North Darfur	39.6	46.7	13.0	47.2	.4	.3	.5	2.7	.0	.6	.0	.0	3.0	4.4	28.0	229
West Darfur	40.3	43.4	11.8	37.6	.7	.5	.0	.9	.3	.0	.0	.0	2.7	9.5	30.8	202
South Darfur	45.5	60.9	7.4	43.5	.4	.2	.0	3.6	.4	.0	.0	.0	6.2	1.2	22.1	621
SUDAN	**38.6**	**52.0**	**11.8**	**40.8**	**3.9**	**.7**	**.3**	**3.5**	**.9**	**.1**	**.2**	**.1**	**4.2**	**3.3**	**24.9**	**3555**
Area of residence																
Urban	38.1	54.3	12.6	39.9	5.5	2.0	.6	1.8	1.6	.0	.1	.0	3.8	3.1	23.4	833
Rural	38.8	51.3	11.6	41.1	3.4	.3	.2	4.0	.7	.1	.2	.1	4.4	3.3	25.4	2723
Age																
0-11	31.8	44.7	8.1	36.9	2.3	.9	.2	2.8	1.0	.0	.1	.0	3.6	2.7	33.0	970
12-23	41.9	55.6	12.7	42.4	5.3	.6	.2	2.5	1.3	.0	.2	.0	3.7	3.0	21.4	949
24-35	44.4	57.5	13.9	41.5	3.4	1.0	.3	5.1	.4	.2	.0	.2	4.6	3.6	21.6	750
36-47	38.0	51.6	14.5	41.9	4.9	.1	.4	3.7	.8	.1	.7	.1	6.0	3.1	22.2	557
48-59	37.5	50.6	11.1	44.4	4.2	.2	1.2	4.0	1.1	.0	.3	.0	3.9	5.3	23.1	329
Mother's education level																
None	39.4	50.1	11.5	41.1	2.9	.6	.3	4.0	.9	.1	.3	.1	4.8	2.9	26.4	2028

Table 6.6: Oral rehydration therapy with continued feeding and other treatments

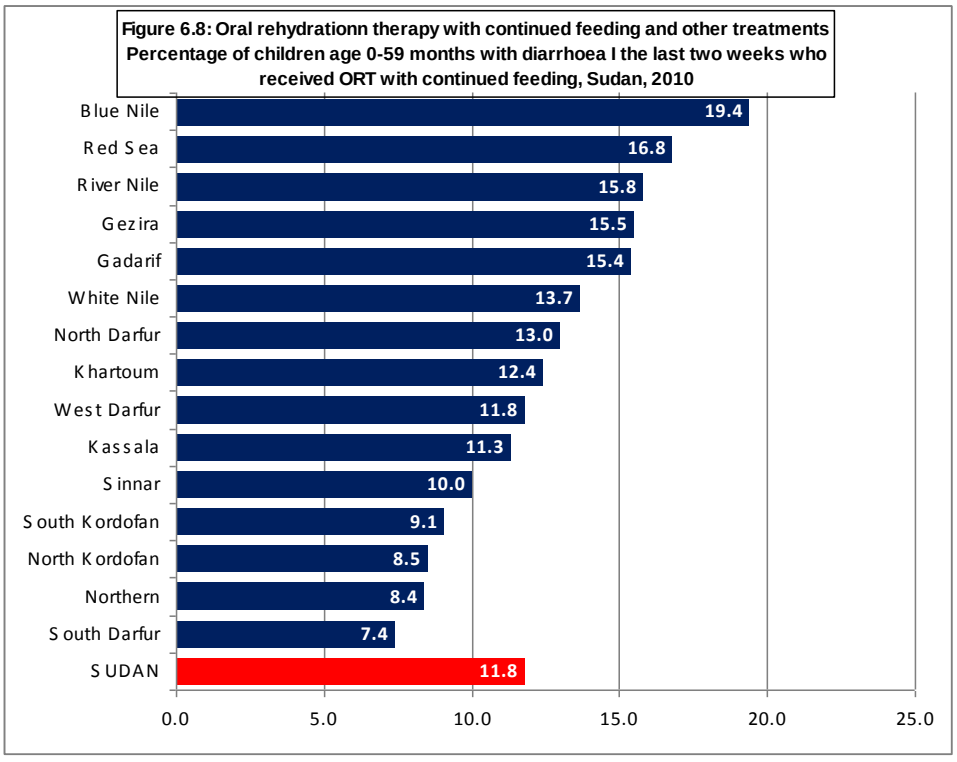
Percentage of children age 0-59 months with diarrhoea in the last two weeks who received oral rehydration therapy with continued feeding, and percentage of children with diarrhoea who received other treatments, Sudan, 2010

	Children with diarrhoea who received:			Other treatment:												
	ORS or increased fluids	ORT (ORS or recommended homemade fluids or increased fluids)	ORT with continued feeding [1]	Pill or syrup: Antibiotic	Pill or syrup: Antimotility	Pill or syrup: Zinc	Pill or syrup: Other	Pill or syrup: Unknown	Injection: Antibiotic	Injection: Non-antibiotic	Injection: Unknown	Intravenous	Home remedy/ Herbal medicine	Other	Not given any treatment or drug	Number of children aged 0-59 months with diarrhoea
Primary	37.9	54.6	11.6	39.5	5.5	.5	.1	2.5	.7	.0	.1	.0	3.8	4.0	23.4	1109
Secondary	36.9	54.4	13.2	42.7	4.9	1.5	1.2	2.3	1.7	.1	.2	.0	3.1	3.2	21.8	390
Missing/DK	38.4	45.9	23.0	43.9	.0	.0	.0	17.7	.0	.0	.0	.0	.0	2.2	16.7	28
Wealth index quintiles																
Poorest	41.3	52.4	10.9	40.0	.6	.3	.2	4.4	.7	.0	.4	.1	5.3	2.6	26.9	1068
Second	39.3	48.0	10.4	41.8	2.3	.3	.3	4.5	.9	.1	.2	.2	4.2	3.5	27.2	847
Middle	38.5	53.4	12.9	41.3	6.9	.4	.1	2.5	1.1	.3	.1	.0	4.1	2.6	22.9	709
Fourth	34.9	55.1	11.4	43.0	7.3	.0	1.0	2.2	.8	.0	.1	.0	3.2	3.0	22.9	582
Richest	35.3	52.1	16.8	36.2	6.4	4.3	.2	2.1	1.9	.0	.0	.0	3.4	6.5	20.9	349
SUDAN	**38.6**	**52.0**	**11.8**	**40.8**	**3.9**	**.7**	**.3**	**3.5**	**.9**	**.1**	**.2**	**.1**	**4.2**	**3.3**	**24.9**	**3555**

[1] SHHS indicator 3.8

rehydration therapy. About 52.1 per cent of boys received ORT compared to 51.8 per cent of girls. Very little difference was also noticed between children with diarrhoea in rural and urban areas who received ORT during the episode of diarrhoea. About 54.3 per cent of children in urban areas received ORT compared to 51.3 per cent of children in rural areas. The proportion of children with diarrhoea who received ORT increased from 44.7 per cent among children aged 0-11 months to 55.6 per cent among those aged 12-23 months, and to 57.5 per cent among children aged 24-35 months, and then declined to 51.6 per cent among those aged 36-47 months and to 50.6 per cent among those aged 48-59 months. The proportion of children with diarrhoea who received ORT was lower among children of mothers with no education (50.1 per cent) than that for children of mothers with secondary or higher level of education (54.4 per cent). There was no difference in the proportion of children with diarrhoea who received ORT among those from households in the poorest quintile (52.4 per cent) and those from households in the richest quintile (52.1 per cent). The proportion of children with diarrhoea who received who received ORT ranged from 41.0 per cent in Kassala State to 60.9 per cent in South darfur State.

Children with diarrhoea who received ORT with continued feeding: The SHHS2 data indicated that overall 11.8 per cent received ORT with continued feeding. The proportion of children with diarrhoea who received ORT with continued feeding ranged from 7.4 per cent in South Darfur State to 19.4 per cent in Blue Nile State (Figure 6.8).



Very little difference was noticed between boys and girls with diarrhoea who received ORT with continued feeding. About 12.4 per cent of boys received ORT with continued feeding compared to 11.2 per cent of girls. Very little difference was also noticed between children with diarrhoea in rural and urban areas who received oral rehydration therapy with continued feeding. About 12.6 per cent of children in urban areas received ORT with continued feeding compared to 11.6 per cent of children in rural areas. The proportion of children with diarrhoea who received ORT with continued feeding

increased from 8.1 per cent among children aged 0-11 months to 12.7 per cent among those aged 12-23 months, to 13.9 per cent among children aged 24-35 months, and to 14.5 per cent among those aged 36-47 months and then declined to 11.1 per cent among those aged 48-59 months. The proportion of children with diarrhoea who received ORT with continued feeding was slightly lower among children of mothers with no education (11.5 per cent) than that for children of mothers with secondary or higher level of education (13.2 per cent). The proportion of children with diarrhoea who received ORT with continued feeding showed an increasing trend from 10.9 per cent among children from households in the poorest quintile to 16.8 per cent among children from households in the richest quintile. The proportion of children with diarrhoea who received ORT with continued feeding ranged from 7.4 per cent in South Darfur State to 19.4 per cent in Blue Nile State (Figure 6.8).

Children with diarrhoea who received other treatment: The SHHS2 data indicated that overall 58.8 per cent of children with diarrhoea received other treatment, the most common treatment being the use of antibiotic (pill or syrup). About 40.8 per cent of children with diarrhoea received antibiotic (pill or syrup). There was hardly ant difference between boys and girls with diarrhoea who received antibiotic (pill or syrup). About 41.0 per cent of boys received antibiotic treatment compared to 40.7 per cent of girls. Very little difference was also noticed between children with diarrhoea in rural and urban areas who received antibiotic (pill or syrup). About 39.9 per cent of children in urban areas received antibiotic (pill or syrup) compared to 41.1 per cent of children in rural areas. The proportion of children with diarrhoea who received antibiotic (pill or syrup) increased from 36.9 per cent among children aged 0-11 months to 42.4 per cent among those aged 12-23 months, then declined to 41.5 per cent among children aged 24-35 months, and then increased to 41.9 per cent among those aged 36-47 months and to 44.4 per cent among those aged 48-59 months. The proportion of children with diarrhoea who received antibiotic (pill or syrup) was slightly lower among children of mothers with no education (41.1 per cent) than that for children of mothers with secondary or higher level of education (43.9 per cent). The proportion of children with diarrhoea who received antibiotic (pill or syrup) declined from 40.0 per cent among children from households in the poorest quintile to 43.9 per cent among children from households in the richest quintile. The proportion of children with diarrhoea who received antibiotic (pill or syrup) ranged from 24.1 per cent in White Nile State to 55.9 per cent in Gadarif State.

Care Seeking and Antibiotic Treatment of Pneumonia

Pneumonia is the leading cause of death in children and the use of antibiotics for treatment of Under-five children with suspected pneumonia is a key intervention. Children with suspected pneumonia are those who had an illness with a cough, accompanied by rapid or difficult breathing and whose symptoms were NOT due to a problem in the chest and a blocked nose. A World Fit for Children goal is to reduce by one-third the deaths due to acute respiratory infections.

Table CH.7 presents the prevalence of suspected pneumonia among children age 0-59 months and, if care was sought outside the home, the site of care. It also provides information relating to the percentage of children age 0-59 months with suspected pneumonia in the last two weeks preceding the survey who were taken to a health provider and percentage of children who were given antibiotics.
Prevalence of suspected pneumonia: The SHHS2 data indicates that about 18.7 percent of children aged 0-59 months were reported to have had symptoms of pneumonia during the two weeks preceding the survey. Very little difference between boys (18.9 per cent) and girls (18.5 per cent) was observed with regard to suspected pneumonia. There was slight difference with regard to suspected pneumonia between children from urban areas (17.6 per cent) and children from rural areas (19.1 per cent). There was slight difference with regard to suspected pneumonia between children of mothers with no education (18.7 per cent), children of mothers with primary education (19.8 per cent) and children of mothers with secondary or higher levels of education (16.3 per cent). There was also some difference with regard to suspected pneumonia between children from households in the poorest quintile (24.7 per cent) and children from households in the richest quintile (17.2 per cent).

Table 6.7: Care seeking for suspected pneumonia and antibiotic use during suspected pneumonia
Percentage of children age 0-59 months with suspected pneumonia in the last two weeks who were taken to a health provider and percentage of children who were given antibiotics, Sudan, 2010

	Had suspected pneumonia in the last two weeks	Number of children age 0-59 months	Children with suspected pneumonia who were taken to:				
			Public sector: Government hospital	Public sector: Government health center	Public sector: Government health unit	Public sector: Village health worker	Public sector: Mobile / Outreach clinic
Sex							
Male	18.9	6742	14.2	21.9	5.7	3.8	1.6
Female	18.5	6540	15.2	21.3	6.3	4.7	1.2
State of residence							
Northern	16.4	170	32.3	33.1	1.4	1.5	.0
River Nile	8.6	404	13.4	27.9	1.1	7.5	2.7
Red Sea	12.9	281	34.1	35.6	2.8	3.7	.0
Kassala	20.0	780	17.0	31.7	11.9	4.6	1.3
Gadarif	14.3	678	18.0	18.5	11.4	2.7	.0
Khartoum	19.2	1868	23.8	33.8	2.5	.0	.6
Gezira	11.3	1750	17.8	38.6	2.3	2.7	1.1
Wite Nile	27.1	675	11.1	24.4	7.1	7.3	2.7
Sinnar	17.3	517	17.3	18.9	4.9	4.9	4.1
Blue Nile	15.3	595	8.3	17.0	24.5	7.4	.0
North Kordofan	15.5	1425	14.1	16.7	10.6	8.8	1.6
South Kordofan	23.2	681	12.3	10.1	3.8	5.9	3.1
North Darfur	15.9	947	14.6	23.6	3.2	9.6	1.6
West Darfur	16.8	682	19.5	6.8	9.8	1.0	1.3
South Darfur	31.2	1829	6.3	11.8	3.2	3.0	1.0
Urban	17.6	3669	22.4	26.3	1.8	1.1	.1
Rural	19.1	9613	11.9	19.9	7.5	5.4	1.8
Age group							
0-11	18.6	2964	14.4	20.5	4.4	3.9	1.7
12-23	19.6	2613	14.0	25.1	6.9	4.6	1.0
24-35	21.1	2762	17.8	21.0	5.3	4.3	1.3
36-47	18.1	2811	13.1	18.6	7.9	4.5	1.2
48-59	15.5	2131	12.9	23.7	5.5	3.5	1.7
Mother's education level							
None	18.7	7359	13.0	17.4	7.0	5.0	2.1
Primary	19.8	4044	15.2	26.0	4.9	3.8	.7
Secondary	16.3	1785	22.2	30.4	3.6	.9	.0
Missing/DK	22.1	94	2.3	8.0	10.5	15.3	.0
Wealth index quintile							
Poorest	24.7	3213	7.8	13.7	5.8	6.5	1.8
Second	17.5	2901	11.9	17.8	11.6	4.7	1.6
Middle	16.4	2800	19.8	24.1	6.7	3.8	1.6
Fourth	16.1	2490	19.6	34.3	2.1	3.1	.6
Richest	17.2	1878	22.5	27.6	1.4	.0	.6
SUDAN (TOTAL)	**18.7**	**13282**	**14.7**	**21.6**	**6.0**	**4.2**	**1.4**

There was some difference between children of different age groups who were reported to have had suspected pneumonia during the two weeks preceding the survey. The proportion of children with suspected pneumonia increased from 18.6 per cent among children aged 0-11 months to 19.6 per cent among those aged 12-23 months and to 21.1per cent among children aged 24-35 months, and then declined to 18.1 among those aged 36-47 months and to 15.5 per cent among those aged 48-59 months. The proportion of children aged 0-59 months reported to have had symptoms of pneumonia during the two weeks preceding the survey ranged from 8.6 per cent in River Nile State to 31.2 per cent in South Darfur State.

Table 6.7 (continued): Care seeking for suspected pneumonia and antibiotic use during suspected pneumonia (Percentage of children age 0-59 months with suspected pneumonia in the last two weeks who were taken to a health provider and percentage of children who were given antibiotics, Sudan, 2010)

	Children with suspected pneumonia who were taken to:						
	Public sector: Other	Private hospital / clinic	Private physician	Other private medical	Private pharmacy	Mobile clinic (private)	Other private medical
Sex							
Male	.6	3.4	5.0	.5	3.7	.6	.5
Female	.5	1.0	3.5	.4	6.2	1.3	.4
State of residence							
Northern	.0	.0	.7	.0	5.6	.0	.0
River Nile	1.8	2.4	17.4	.0	1.2	.0	.0
Red Sea	.0	1.2	2.2	.0	.0	.0	.0
Kassala	.0	.6	6.9	.0	1.4	.0	.0
Gadarif	1.0	.0	10.0	.0	.7	.0	.0
Khartoum	.0	7.2	5.3	.6	2.0	.0	.6
Gezira	.0	1.1	7.8	.0	.0	.0	.0
Wite Nile	.8	1.4	5.6	.6	3.7	.0	.6
Sinnar	2.1	1.5	3.1	.0	.6	.8	.0
Blue Nile	3.3	.1	1.1	.7	1.1	.0	.7
North Kordofan	1.5	1.5	3.1	.8	4.1	.0	.8
South Kordofan	.0	1.0	.0	1.0	4.7	2.7	1.0
North Darfur	.0	.0	2.3	.0	2.7	2.0	.0
West Darfur	1.3	11.9	1.2	.7	3.8	.7	.7
South Darfur	.0	.3	3.1	.7	13.4	2.6	.7
SUDAN (TOTAL)	**.5**	**2.2**	**4.2**	**.5**	**4.9**	**1.0**	**.5**
Area of residence							
Urban	.2	5.2	9.3	1.1	6.5	.1	1.1
Rural	.6	1.1	2.5	.2	4.3	1.3	.2
Age							
0-11	.8	1.4	5.2	1.3	4.6	1.0	1.3
12-23	.2	2.6	3.4	.0	4.8	2.0	.0
24-35	.6	2.9	4.1	.3	4.0	1.0	.3
36-47	.3	1.9	5.3	.5	6.1	.5	.5
48-59	.7	2.0	2.7	.0	5.4	.0	.0
Mothers education level							
None	.6	2.3	1.9	.4	4.5	1.5	.4
Primary	.6	2.1	5.3	.4	4.2	.4	.4
Secondary	.2	2.2	12.9	.9	6.5	.2	.9
Missing/DK	.0	.0	.0	.0	35.1	.0	.0
Wealth index quintiles							
Poorest	.5	1.1	.6	.3	7.5	2.0	.3
Second	.8	.9	1.6	.3	4.8	1.3	.3
Middle	.7	1.9	5.3	.9	3.5	.3	.9
Fourth	.3	2.5	6.2	.5	3.7	.0	.5
Richest	.2	6.9	13.4	.6	2.2	.0	.6

Table 6.7 (continued): Care seeking for suspected pneumonia and antibiotic use during suspected pneumonia (Percentage of children age 0-59 months with suspected pneumonia in the last two weeks who were taken to a health provider and percentage of children who were given antibiotics), Sudan,

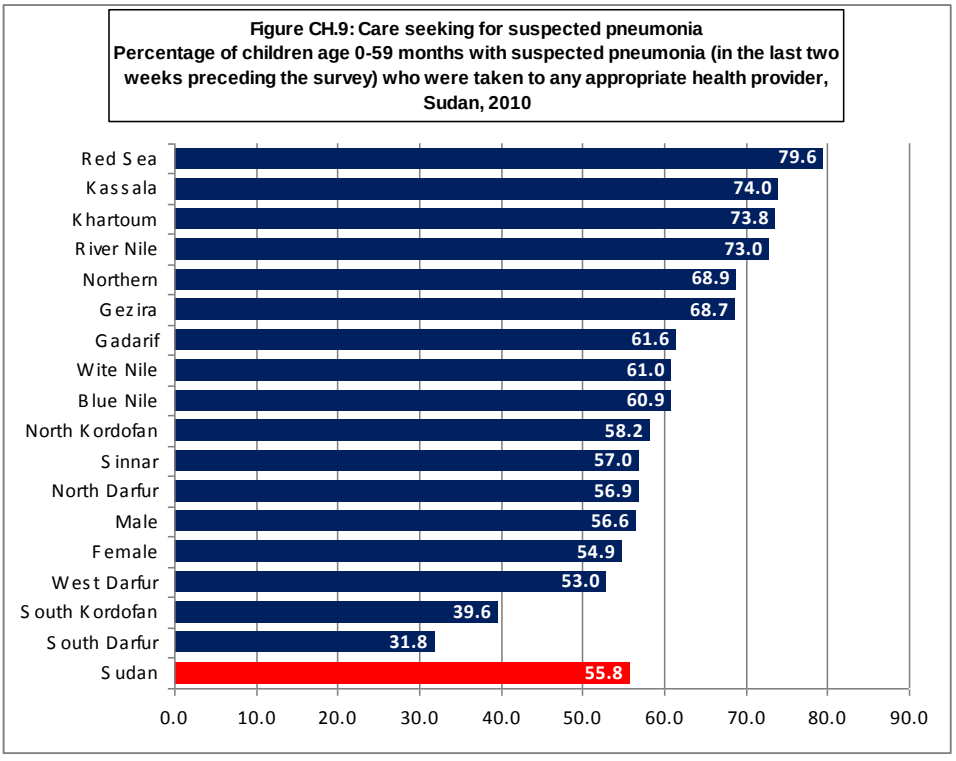
	Children with suspected pneumonia who were taken to:						
	Religious healer	Traditional healer	Relative or friend	Other	Any appropriate provider	Percentage of children with suspected pneumonia who received antibiotics in the last two weeks	Number of children age 0-59 months with suspected pneumonia in the last two
Sex							
Male	.2	.7	.9	1.2	56.6	65.7	1277
Female	.0	2.1	1.0	.6	54.9	66.5	1207
State of residence							
Northern	.0	1.3	.4	.0	68.9	63.9	28
River Nile	.0	1.2	.9	2.4	73.0	69.0	35
Red Sea	.0	.0	.0	.0	79.6	76.5	36
Kassala	.0	.0	.6	.0	74.0	80.9	156
Gadarif	.8	.9	1.7	.0	61.6	65.8	97
Khartoum	.0	.0	.0	1.3	73.8	74.3	358
Gezira	.0	1.2	1.2	.8	68.7	74.7	198
Wite Nile	.0	.6	.5	.7	61.0	69.0	183
Sinnar	.0	1.0	.8	.0	57.0	72.3	90
Blue Nile	.0	2.0	.0	.6	60.9	61.9	91
North Kordofan	.0	.9	1.6	.0	58.2	73.7	221
South Kordofan	.0	.8	5.0	.7	39.6	65.2	158
North Darfur	.8	.4	.7	.9	56.9	65.3	150
West Darfur	.0	.0	.0	5.0	53.0	60.6	114
South Darfur	.0	3.9	.7	1.0	31.8	50.8	570
SUDAN (TOTAL)	**.1**	**1.4**	**1.0**	**.9**	**55.8**	**66.1**	**2485**
Area of residence							
Urban	.0	.0	.8	.8	66.8	72.5	646
Rural	.1	1.8	1.0	1.0	51.9	63.9	1838
Age							
0-11	.0	1.4	.9	.9	54.3	61.3	552
12-23	.0	.2	.4	.7	59.4	70.0	513
24-35	.1	2.5	.9	.9	58.5	67.5	582
36-47	.2	1.0	1.1	.6	53.0	66.0	508
48-59	.1	1.6	1.7	1.8	52.0	66.1	330
Mother's education level							
None	.1	1.2	.9	.9	50.8	61.2	1374
Primary	.2	1.8	.8	.9	58.7	69.8	799
Secondary	.0	.1	1.7	.4	72.7	78.8	291
Missing/DK	.0	8.0	2.3	10.7	29.8	69.5	21
Wealth index quintiles							
Poorest	.2	1.9	1.1	1.0	40.1	55.2	795
Second	.0	2.6	.9	.8	52.1	66.1	509
Middle	.2	.4	1.3	.3	64.8	72.5	458
Fourth	.0	.1	.8	1.9	68.8	72.5	400
Richest	.0	.9	.3	.5	71.2	76.2	323

[1] MICS indicator 3.9
[2] MICS indicator 3.10

Care seeking for suspected pneumonia: Of the children with suspected pneumonia during the two weeks preceding the survey, 55.8 per cent of them were taken to an appropriate health provider. The percentage of children with suspected pneumonia taken to public sector health facilities (government hospital, government health centre and government health unit), village health worker and mobile/outreach clinic and other public health facility was 48.4 per cent. The percentage of children

with suspected pneumonia taken to private facilities such as private hospital/clinic, private physician, pharmacy, mobile clinic and other private medical facilities was 13.3 per cent. Very little difference between boys (56.6 per cent) and girls (54.9 per cent) was observed with regard to children with suspected pneumonia taken to an appropriate health provider. The proportion of children age 0-59 years with suspected pneumonia who were taken to an appropriate health provider was higher among children from urban areas (66.8 per cent) that for children from rural areas (51.9 per cent). There was also noticeable difference (with regard to those who were taken to an appropriate health provider) between children of mothers/caretakers with no education (50.8 per cent), children of mothers/caretakers with primary education (58.7 per cent) and children of mothers/caretakers with secondary or higher levels of education (72.7 per cent) who were taken to an appropriate health provider. There was also significant difference (with regard to those who were taken to an appropriate health provider) between children from households in the poorest quintile (40.1 per cent) and children from the households in the richest quintile (71.2 per cent). The proportion of children with suspected pneumonia and who were taken to an appropriate health provider increased from 54.3 per cent among children aged 0-11 months to 59.4 per cent among those aged 12-23 months, and then declined to 58.5 per cent among children aged 24-35 months to 53.0 per cent among those aged 36-47 months and to 52.0 per cent among those aged 48-59 months. The proportion of children aged 0-59 months reported to have had symptoms of pneumonia during the two weeks preceding the survey and taken to an appropriate provider ranged from 79.6 per cent in Red Sea State to 31.8 per cent in South Darfur State.

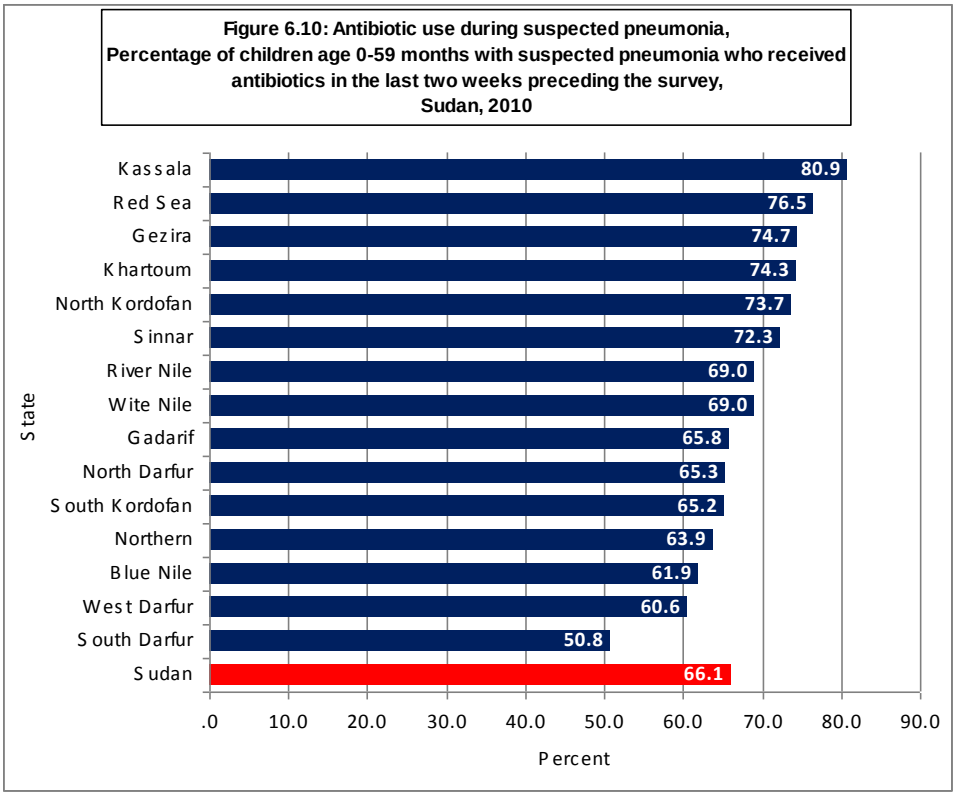
Figure CH.9: Care seeking for suspected pneumonia
Percentage of children age 0-59 months with suspected pneumonia (in the last two weeks preceding the survey) who were taken to any appropriate health provider, Sudan, 2010



***Antibiotic treatment for suspected pneumonia*:** Table CH.7 presents the use of antibiotics for the treatment of suspected pneumonia in under-five children by sex, age, region, residence, age, and socioeconomic factors. In Sudan, 66.1 per cent of under-five children with suspected pneumonia during the last two weeks preceding the survey had received an antibiotic. Very little difference between boys (65.7 per cent) and girls (66.5 per cent) was observed with regard to children who had received antibiotics. The percentage of under-five children with suspected pneumonia who had received an antibiotic in the last two weeks preceding the survey was considerably higher in urban

areas (72.5 per cent) than that for children in rural areas (63.9 per cent). The proportion of children with suspected pneumonia and who received an antibiotic increased from 61.3 per cent among children aged 0-11 months to 70.0 per cent among those aged 12-23 months, and then declined to 67.5 per cent among children aged 24-35 months and to 66.0 per cent among those aged 36-47 months and then marginally increased to 66.1 per cent among those aged 48-59 months. There was also significant difference (with regard to those who received antibiotics) between children of mothers/caretakers with no education (61.2 per cent), children of mothers/caretakers with primary education (69.8 per cent) and children of mothers/caretakers with secondary or higher levels of education (78.8 per cent). The proportion of under-five children with suspected pneumonia during the last two weeks preceding the survey who had received an antibiotic was higher for children belonging to households in the poorest quintile (55.2 per cent) than that for children from households in the richest quintile (76.2 per cent). The proportion of children aged 0-59 months reported to have had symptoms of pneumonia during the two weeks preceding the survey and had received antibiotics ranged from 50.8 per cent in South Darfur State to 80.9 per cent in Kassala State.

Figure 6.10: Antibiotic use during suspected pneumonia, Percentage of children age 0-59 months with suspected pneumonia who received antibiotics in the last two weeks preceding the survey, Sudan, 2010



The symptoms that would cause mothers/caretakers to take a child immediately to a health facility

Table 6.8 indicates the percentage of mothers and caretakers of children age 0-59 months by symptoms that would cause them to take the child immediately to a health facility, and percentage of mothers who recognise fast and difficult breathing as signs for seeking care immediately.

Table 6.8: Knowledge of the two danger signs of pneumonia
Percentage of mothers and caretakers of children age 0-59 months by symptoms that would cause them to take the child immediately to a health facility, and percentage of mothers who recognize fast and difficult breathing as signs for seeking care immediately, Sudan, 2010

	Percentage of mothers/caretakers who think that a child should be taken immediately to a health facility if the child:								Mothers/caretakers who recognize the two danger signs of pneumonia	Number of mothers/caretakers of children age 0-59 months
	Is not able to drink or breastfeed	Becomes sicker	Develops a fever	Has fast breathing	Has difficulty breathing	Has blood in stool	Is drinking poorly	Has other symptoms		
State of residence										
Northern	4.7	44.9	73.9	22.1	18.6	3.1	.9	29.3	4.5	123
River Nile	19.5	52.4	76.1	14.0	13.6	3.8	3.8	22.1	1.5	265
Red Sea	12.5	47.6	66.0	23.0	17.3	10.8	6.3	21.3	8.0	197
Kassala	8.5	50.8	72.7	12.6	16.0	6.3	2.0	11.5	2.5	487
Gadarif	4.3	40.0	80.9	9.2	11.9	1.6	1.2	44.1	1.1	405
Khartoum	9.1	42.4	81.2	23.1	30.4	6.4	4.5	28.4	14.7	1205
Gezira	6.0	41.5	78.2	17.6	20.0	6.1	4.0	21.7	4.6	1105
White Nile	11.0	36.6	87.3	25.1	29.9	4.5	6.0	35.7	10.3	426
Sinnar	11.5	42.9	79.8	11.3	15.7	5.7	1.0	29.3	1.7	323
Blue Nile	14.0	45.7	73.4	7.4	14.6	5.1	5.3	40.0	.5	354
North Kordofan	6.0	32.7	68.6	11.0	22.9	6.7	3.0	29.5	2.8	868
South Kordofan	9.1	31.0	77.9	10.0	15.0	5.4	2.9	33.9	.2	412
North Darfur	13.8	53.4	64.9	7.8	11.8	9.0	3.0	26.2	1.0	540
West Darfur	22.3	59.1	62.0	10.1	15.1	16.4	7.0	17.1	1.7	402
South Darfur	9.3	46.4	64.3	7.2	16.9	10.6	2.7	48.4	1.3	1131
Area of residence										
Urban	10.6	40.2	78.4	19.0	26.9	7.9	5.2	28.8	9.5	2391
Rural	9.5	44.8	71.8	11.9	16.6	6.9	3.0	30.9	2.5	5852
Mother's education level										
None	10.0	45.5	70.2	10.4	16.0	7.3	3.5	29.8	2.0	3681
Primary	8.0	42.6	76.0	16.3	21.8	7.0	3.1	30.4	6.2	2738
Secondary +	13.4	39.3	79.8	20.5	26.2	7.8	5.3	30.6	8.6	1431
Adult education/Khalwa	7.5	46.3	69.4	6.7	12.5	3.5	1.8	33.3	1.7	393
Wealth index quintiles										
Poorest	10.3	46.1	66.5	7.6	17.0	9.8	3.2	35.7	1.3	1882
Second	10.3	42.9	71.0	11.2	14.4	6.4	2.4	31.7	2.3	1769
Middle	9.0	42.1	76.7	13.5	18.7	5.0	3.4	27.1	3.4	1735
Fourth	8.2	43.4	77.4	19.2	22.6	7.1	4.6	26.8	7.1	1562
Richest	11.5	42.4	79.7	21.4	27.8	7.2	4.9	28.9	10.8	1295
SUDAN (TOTAL)	**9.8**	**43.5**	**73.7**	**14.0**	**19.6**	**7.1**	**3.6**	**30.3**	**4.5**	**8243**

The mothers/caretakers interview during SHHS2 indicated several symptoms that would lead them to take a child to a health facility. About 73.7 per cent of the mothers indicated that they would take a child immediately to a healthy facility if the child was not able to drink or breast feed. About 43.5 per cent of mothers/caretakers identified becoming sicker as the symptom for taking children immediately to a health care provider. The percentages of mothers/caretakers who thought that a child should be taken to a health facility if the child showed the following symptoms were as follows: develops a fever (73.7 per cent); has fast breathing (14.0 per cent); has difficulty breathing (19.6 per cent); has blood in stool (7.1 per cent); is drinking poorly (3.6 persons).

Knowledge of the two danger signs of pneumonia

Mothers' knowledge of the danger signs of pneumonia is an important determinant of care-seeking behaviour. Overall, only 4.5 per cent of women knew of the two danger signs of pneumonia – fast and difficult breathing. The percentage of mothers/caretakers who recognise the two danger signs of pneumonia was higher among mothers in urban areas (9.5 per cent) than among mothers in rural areas (2.5 per cent). The percentage of mothers/caretakers who recognised the two danger signs of pneumonia was higher among mothers with secondary or higher education (8.6 per cent) that among mothers with primary education (6.2 per cent) and mothers with no education (2.0 per cent). Similarly, the percentage of mothers/caretakers who recognised the two danger signs of pneumonia was higher among mothers from the households in the richest quintile (10.8 per cent) than those belonging to the poor households in the poorest quintile (1.3 per cent). The percentage of mothers/caretakers who recognised the two danger signs of pneumonia was highest in Khartoum (14.7 per cent) and the lowest in South Kordofan (0.2 per cent).

Solid Fuel Use

More than three billion people around the world rely on solid fuels (biomass and coal) for their basic energy needs, including cooking and heating. Cooking and heating with solid fuels leads to high levels of indoor smoke, a complex mix of health-damaging pollutants. The main problem with the use of solid fuels is products of incomplete combustion, including carbon monoxide (CO), polyaromatic hydrocarbons, sulphur dioxide (SO_2) and other toxic elements. Use of solid fuels increases the risks of acute respiratory illness, pneumonia, chronic obstructive lung disease, cancer, and possibly tuberculosis, low birth weight, cataracts, and asthma.

The primary indicator used in SHHS is Solid fuel use, i.e. the proportion of household members in households that use solid fuels as the primary source of domestic energy to cook. Table 6.9 shows the percent distribution of household members according to type of cooking fuel used by the household, and percentage of household members living in households using solid fuels for cooking. Overall, approximately two-thirds (63.2 percent) of all households in Sudan were found to be using solid fuels for cooking. The table also clearly shows that the overall percentage was high due to high level of use of wood (42.7 per cent) for cooking purposes, followed by use of charcoal (18.9 per cent). In all about 36.5 per cent of the households were found to use gas for cooking purposes (
Use of solid fuels is significantly lower in urban areas (43.3 percent) than in rural areas where almost three-fourths of the households (72.4 percent) are using solid fuels. Differentials with respect to educational level of the household head are also significant. The proportion of household members living in households using solid fuels for cooking was 74.8 per cent among households with household head with no education compared to 37.0 per cent among households with household heads with secondary or higher level of education. Differentials with respect to household wealth are also significant. The findings show that use of solid fuels is very uncommon among the households in the richest quintile (7.4 per cent) while it is very common among households in the poorest quintile (100.0 per cent)

Table 6.9: Solid fuel use

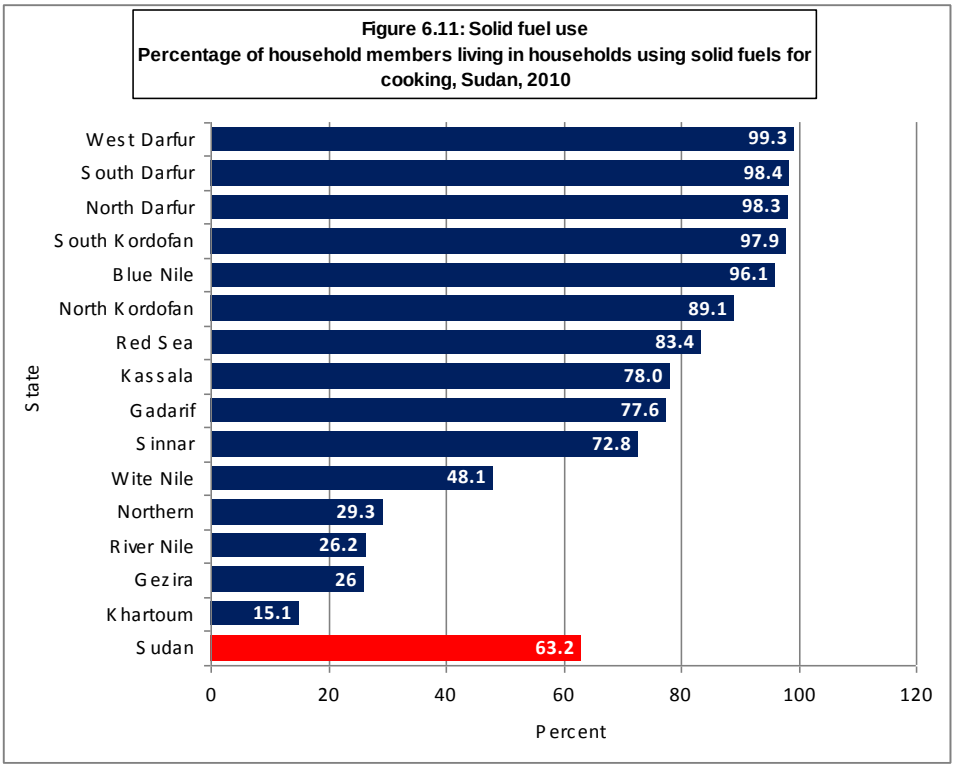
Percent distribution of household members according to type of cooking fuel used by the household, and percentage of household members living in households using solid fuels for cooking, Sudan, 2010

	Percentage of household members in households using::													Solid fuels for cooking [1]	Number of households
	Electricity	Gas	Biogas	Kerosene	Charcoal	Wood	Straw / Shrubs / Grass	Animal dung	Agricultural crop residue	No food cooked in household	Other	Missing	Total		
State of residence															
Northern	.0	70.2	.5	.0	1.2	26.8	1.3	.0	.0	.0	.0	.0	100.0	29.3	1538
River Nile	.3	73.1	.0	.4	2.0	21.7	2.5	.0	.0	.0	.0	.0	100.0	26.2	3005
Red Sea	.0	16.4	.0	.2	52.7	30.5	.2	.0	.0	.0	.0	.0	100.0	83.4	2249
Kassala	.0	21.6	.3	.0	23.1	53.0	1.6	.3	.0	.1	.0	.0	100.0	78.0	5133
Gadarif	.0	22.3	.1	.0	31.9	43.4	2.3	.1	.0	.0	.0	.0	100.0	77.6	3978
Khartoum	.0	84.5	.0	.3	12.5	2.5	.0	.0	.1	.0	.0	.0	100.0	15.1	13474
Gezira	.1	73.6	.2	.1	14.8	8.3	1.4	1.3	.3	.0	.0	.0	100.0	26.0	12614
Wite Nile	.7	50.8	.1	.0	25.2	17.9	2.7	2.3	.0	.0	.3	.0	100.0	48.1	4367
Sinnar	.0	26.7	.1	.1	30.7	40.7	1.2	.2	.0	.0	.0	.2	100.0	72.8	3486
Blue Nile	.0	3.9	.0	.0	27.4	67.5	1.0	.1	.1	.0	.0	.0	100.0	96.1	3026
North Kordofan	.0	10.6	.0	.1	25.0	63.6	.6	.0	.0	.1	.0	.0	100.0	89.1	8659
South Kordofan	.3	1.4	.0	.1	24.6	73.0	.2	.0	.0	.0	.3	.1	100.0	97.9	3800
North Darfur	.1	1.5	.0	.0	11.6	85.6	1.1	.0	.0	.0	.0	.1	100.0	98.3	5355
West Darfur	.0	.3	.0	.0	6.4	84.6	8.3	.0	.0	.0	.0	.3	100.0	99.3	3616
South Darfur	.0	1.6	.0	.0	16.9	81.5	.0	.0	.0	.0	.0	.0	100.0	98.4	10230
Area of residence															
Urban	.2	56.2	.1	.2	34.0	8.9	.2	.0	.1	.0	.0	.0	100.0	43.3	26672
Rural	.0	27.4	.1	.1	11.9	58.3	1.7	.5	.0	.0	.0	.0	100.0	72.4	57858
Mother's education level															
None	.0	24.9	.1	.0	18.0	54.5	1.7	.5	.1	.0	.0	.1	100.0	74.8	47719
Primary	.2	44.4	.0	.1	21.2	33.0	.8	.2	.0	.0	.0	.0	100.0	55.3	21475
Secondary +	.1	62.4	.1	.3	18.3	18.2	.4	.0	.0	.0	.1	.0	100.0	37.0	14750
Missing/DK	.0	29.6	.0	.0	14.7	55.6	.0	.0	.0	.0	.0	.0	100.0	70.4	587
Wealth index quintiles															
Poorest	.0	.0	.0	.0	.9	97.1	1.7	.3	.0	.0	.0	.0	100.0	100.0	16906
Second	.0	1.3	.0	.0	14.0	81.0	2.9	.8	.0	.0	.0	.0	100.0	98.7	16907
Middle	.0	23.8	.0	.2	44.1	29.2	1.7	.6	.1	.0	.1	.1	100.0	75.7	16907
Fourth	.2	65.1	.2	.2	28.5	5.7	.1	.0	.1	.0	.0	.0	100.0	34.3	16905
Richest	.2	92.1	.2	.0	6.8	.5	.0	.0	.1	.0	.0	.0	100.0	7.4	16906
SUDAN (TOTAL)	**.1**	**36.5**	**.1**	**.1**	**18.9**	**42.7**	**1.3**	**.3**	**.1**	**.0**	**.0**	**.0**	**100.0**	**63.2**	**84530**

[1] SHHS indicator 3.11

The SHHS2 data shows that the use of solid fuels is very uncommon among households in Khartoum (15.1 per cent) (since most of the households in Khartoum have access to cooking gas) while it was very common in Blue Nile State (96.1 per cent), South Kordofan State (97.9 per cent), North Darfur State (98.3 per cent), West Darfur State (99.3 per cent) and South Darfur State (98.4 per cent) (Figure 6.11)

Figure 6.11: Solid fuel use
Percentage of household members living in households using solid fuels for cooking, Sudan, 2010



Solid fuel use by place of cooking

Solid fuel use alone is a poor proxy for indoor air pollution, since the concentration of the pollutants is different when the same fuel is burnt in different stoves or fires. Use of closed stoves with chimneys minimizes indoor pollution, while open stove or fire with no chimney or hood means that there is no protection from the harmful effects of solid fuels. Solid fuel use by place of cooking is depicted in Table 6.10.

Table 6.10 presents the percent distribution of household members in households using solid fuels by place of cooking. Overall, approximately less than one-half (47.0 percent) of all households in North Sudan were found to be cooking in a separate room used as kitchen while 19.3 per cent of household members were cooking elsewhere in the house, 22.0 per cent in a separate building and 9.4 per cent outdoors.

Table 6.10: Solid fuel use by place of cooking
Percent distribution of household members in households using solid fuels by place of cooking, Sudan, 2010

	Place of cooking:							Number of household members in households using solid fuels for cooking
	In a separate room used as kitchen	Elsewhere in the house	In a separate	Outdoors	Other	Missing	Total	
State of residence								
Northern	98.2	.7	.0	.2	.8	.0	100.0	450
River Nile	30.9	15.0	43.9	8.9	1.3	.0	100.0	789
Red Sea	36.3	53.4	.0	9.4	.9	.0	100.0	1875
Kassala	38.6	41.8	4.9	12.6	2.1	.0	100.0	4003
Gadarif	47.6	31.8	1.7	16.8	2.1	.0	100.0	3087
Khartoum	66.6	26.6	1.3	2.2	3.4	.0	100.0	2036
Gezira	63.5	24.3	.0	11.3	.9	.0	100.0	3284
Wite Nile	56.9	29.1	4.2	5.0	4.8	.0	100.0	2102
Sinnar	51.8	30.9	2.9	8.9	5.4	.0	100.0	2538
Blue Nile	4.5	2.1	43.3	49.3	.9	.0	100.0	2907
North Kordofan	59.3	26.9	11.0	2.0	.8	.0	100.0	7718
South Kordofan	68.6	20.4	2.3	6.1	2.5	.1	100.0	3719
North Darfur	89.1	7.0	.0	3.3	.5	.0	100.0	5265
West Darfur	77.5	7.6	.9	13.6	.4	.0	100.0	3590
South Darfur	.5	2.5	86.6	5.3	5.0	.1	100.0	10066
Area of residence								
Urban	50.8	16.9	22.1	7.5	2.8	.0	100.0	11546
Rural	46.0	20.0	21.9	9.9	2.2	.0	100.0	41884
Mother's education level								
None	45.2	20.3	20.3	11.7	2.5	.0	100.0	35696
Primary	49.6	18.1	24.3	5.8	2.3	.0	100.0	11867
Secondary +	53.4	15.8	27.1	2.7	1.0	.0	100.0	5454
Missing/DK	48.3	12.5	33.9	3.8	1.5	.0	100.0	413
Wealth index quintiles								
Poorest	33.6	17.3	35.1	10.7	3.2	.0	100.0	16901
Second	49.3	22.1	15.7	11.0	1.9	.0	100.0	16680
Middle	53.3	21.7	13.6	8.8	2.7	.0	100.0	12792
Fourth	63.3	14.4	17.4	4.1	.8	.0	100.0	5801
Richest	57.0	6.3	34.5	2.3	.0	.0	100.0	1257
SUDAN (Total)	**47.0**	**19.3**	**22.0**	**9.4**	**2.3**	**.0**	**100.0**	**53430**

Cooking in a separate room used as kitchen was found to be significantly higher in urban areas (50.8 percent) than in rural areas (46.0 percent). Differentials with respect to educational level of the household head are also significant. The proportion of household members cooking in a separate room used as kitchen was higher (50.8 per cent) among households with household head with no education compared to 49.6 per cent among households with households head with primary education and 53.4 per cent among households with household head with secondary or higher education levels.

Differentials with respect to household wealth are also significant. The findings show that the proportion of household members cooking in a separate room used as kitchen was more common among the households in the richest quintile (57.0 per cent) compared to households (33.6 per cent) in the poorest quintile.

The SHHS2 findings show that cooking in a separate room used as kitchen was more common among households in Northern State (98.2 per cent), North Darfur (89.1 per cent), West Darfur (77.5 per cent), Soth Kodofan (68.6 per cent) and Khartoum State (66.6 per cent), while it was very uncommon in Blue Nile State (4.5 per cent) and South Darfur (0.5per cent).

Malaria Prevention and Control

Malaria is a leading cause of death of children under age five in Sudan. It also contributes to anaemia in children and is a common cause of school absenteeism. Preventive measures, especially the use of mosquito nets treated with insecticide (ITNs), can dramatically reduce malaria mortality rates among children. In areas where malaria is common, international recommendations suggest treating any fever in children as if it were malaria and immediately giving the child a full course of recommended anti-malarial tablets. Children with severe malaria symptoms, such as fever or convulsions, should be taken to a health facility. Also, children recovering from malaria should be given extra liquids and food and, for younger children, should continue breastfeeding. In Sudan the program strategy is to increase coverage and use of the most effective, available, and evidence-based interventions that meet international standards to achieve high impact. The key strategic interventions for this concept note are:

- Arthemisene-based combination treatment (ACT) rollout in all health facilities, and through home-based malaria management in unreachable communities
- Improve malaria diagnosis through training and using microscopy and RDTs at Health facilities
- Distribution of bed nets (LLINs) for disease prevention through mass campaigns and routine distribution

Significant investments have been made over the past five years in malaria control including the distribution of over 6 million long lasting insecticide treated nets, the supply of artemesinin combination therapies to over 90% of government health facilities; the scaling up of insecticidal spraying in several areas; and the training of large number of health workers in appropriate malaria case management

LLITNs distribution is focused mainly in Darfur states, Kordofan states, Blue Nile, White Nile, Gadaref and Kassala states based on the prevalence of the vector and the disease

Questions on the prevalence (proportion of children 0-59 months of age who were ill with fever in the last two weeks) and treatment of fever were asked for all children under age five. The questionnaire for SHHS2 incorporated questions relating to anti-malarial treatment. Mothers were asked to report all of the medicines given to a child to treat the fever, including both medicines given at home and medicines given or prescribed at a health facility.

What about ITN usage?

Antimalarial treatment (Children under age five)

The SHHS data indicated that slightly less than one in ten (8.4 per cent) of under five children were ill with fever in the two weeks prior to the survey. The SHHS data indicated that fever prevalence peaked at 12-23 months of age. It increased from 7.6 per cent among children aged 0-11 months to 9.6 per cent among children aged 12-23 moths and the declined with increasing age to 9.3 per cent among children aged 24-35 months, to 7.8 per cent among children aged 36-47 months, and to 7.7 per cent among children aged 48-59 months. Fever prevalence was found to be higher in rural areas (9.2 per cent) than in urban areas (6.3 per cent). No difference in fever prevalence was observed between boys and girls.

Fever prevalence was found to be less among children whose mothers had secondary or higher education (6.5 per cent) than among children whose mothers had primary education (8.5 per cent) and among children whose mothers had no education (8.8 per cent). Fever is also more common among children belonging to the poorest households (9.2 per cent) than among those belonging to the richest households (6.0 per cent). State differences in fever prevalence were not large, ranging from 14.2 per cent in North Kordofan to 3.2 percent in Khartoum.

The SHHS2 data indicated that overall, 65.0 per cent of children with fever in the last two weeks were treated with an "appropriate" anti-malarial drug. However, only 43.0 per cent received anti-malarial drugs on the same or next day (within 24 hours of onset of symptoms). "Appropriate" anti-malarial drugs include chloroquine, SP (sulfadoxine-pyrimethamine), artimisine combination drugs, etc. In Sudan, 29.5 percent of children with fever were given chloroquine (3.8 per cent of children with fever were given chloroquine tablet, 4.6 per cent were given Chloroquinine injection and 21.1 per cent were given chloroquinine syrup) while 12.7 per cent were given SP/Fansidar tablet. Only 21.4 per cent received artemisinin combination therapy. A large percentage of children (25.9 per cent) were given other types of medicines that are not anti-malarials, including anti-pyretics such as paracetemol, panadol, acetaminophen, aspirin, or ibuprofen.

Table 6.12: Anti-malarial treatment of children with anti-malarial drugs
Percentage of children age 0-59 months who had fever in the last two weeks who received anti-malarial drugs, Sudan, 2010

			Children with a fever in the last two weeks who were treated with:							
	Had a fever in last two weeks	Number of children age 0-59 months	Anti-malarials: SP/Fansidar tablet	Anti-malarials: Chloroquine tablet	Anti-malarials: Chloroquine injection	Anti-malarials: Chloroquine syrup	Anti-malarials: Amodiaquine tablet	Other medications: Antibiotic injection	Anti-malarials: Metacalfin tablet	Anti-malarials: Quinine pills
Sex										
Male	8.3	6742	12.2	3.5	6.0	21.9	.1	2.2	.8	1.7
Female	8.5	6540	13.2	4.1	3.2	20.3	.3	1.7	.0	1.2
State of residence										
Northern	6.6	170	12.7	9.1	2.2	21.6	.0	.0	.0	.0
River Nile	5.3	404	38.2	15.1	8.1	6.5	.0	3.8	.0	2.0
Red Sea	3.3	281	9.0	13.4	18.7	36.1	.0	2.1	6.1	.0
Kassala	10.2	780	15.3	4.2	10.4	18.4	.0	1.2	.0	1.1
Gadarif	7.6	678	18.8	2.4	2.3	14.8	.0	.0	.0	5.2
Khartoum	3.2	1868	11.5	.0	.0	30.9	.0	.0	2.5	.0
Gezira	10.1	1750	22.3	3.1	6.6	5.9	.0	3.7	.0	.0
Wite Nile	11.0	675	22.1	2.1	2.5	13.8	.0	.7	.7	1.9
Sinnar	11.6	517	.8	.0	1.2	12.4	2.5	4.2	.0	9.8
Blue Nile	8.1	595	21.5	.0	4.0	17.5	.0	.0	.0	1.9
North Kordofan	14.2	1425	4.9	3.9	3.8	25.2	.0	3.1	.6	.6
South Kordofan	11.8	681	4.7	4.3	4.5	36.1	.7	.7	.8	.7
North Darfur	4.7	947	11.9	6.1	7.2	25.4	.0	4.8	.0	.0
West Darfur	13.3	682	12.4	8.8	3.6	31.0	.0	1.2	.0	.0
South Darfur	5.8	1829	5.5	3.2	3.8	29.4	.0	.0	.0	1.8
Area of residence										
Urban	6.3	3669	17.3	4.2	4.8	18.7	.2	1.8	.9	2.3
Rural	9.2	9613	11.5	3.7	4.5	21.7	.2	2.0	.3	1.2
Age										
0-11	7.6	2964	7.9	5.4	2.2	21.2	.0	3.5	.3	.9
12-23	9.6	2613	14.1	2.9	5.8	23.6	.0	.8	.8	.8
24-35	9.3	2762	12.6	3.9	3.8	21.8	.6	2.1	.7	2.5
36-47	7.8	2811	13.5	3.8	7.2	20.9	.2	1.7	.0	1.3
48-59	7.7	2131	15.9	2.8	3.6	16.1	.0	1.6	.0	1.6
Mother's education level										
None	8.8	7359	10.5	2.8	5.2	24.9	.1	1.6	.7	1.5
Primary	8.5	4044	14.6	4.0	3.9	17.9	.2	2.4	.0	.7
Secondary	6.5	1785	19.8	9.2	3.6	7.9	.5	2.8	.0	3.2
Missing/DK	9.2	94	8.2	.0	.0	34.8	.0	.0	.0	.0
Wealth index quintiles										
Poorest	9.2	3213	7.0	4.1	5.0	24.8	.2	.8	.4	1.0
Second	9.3	2901	8.7	2.3	6.6	26.6	.0	2.2	.0	1.9
Middle	8.8	2800	15.6	3.5	3.3	21.5	.3	1.3	.5	1.3
Fourth	7.7	2490	14.7	5.3	4.7	15.5	.3	4.7	.0	1.2
Richest	6.0	1878	27.3	4.7	1.2	6.8	.0	1.1	1.8	2.1
SUDAN (TOTAL)	**8.4**	**13282**	**12.7**	**3.8**	**4.6**	**21.1**	**.2**	**1.9**	**.4**	**1.4**

Table 6.12 (continued): Anti-malarial treatment of children with anti-malarial drugs
Percentage of children age 0-59 months who had fever in the last two weeks who received anti-malarial drugs, Sudan, 2010

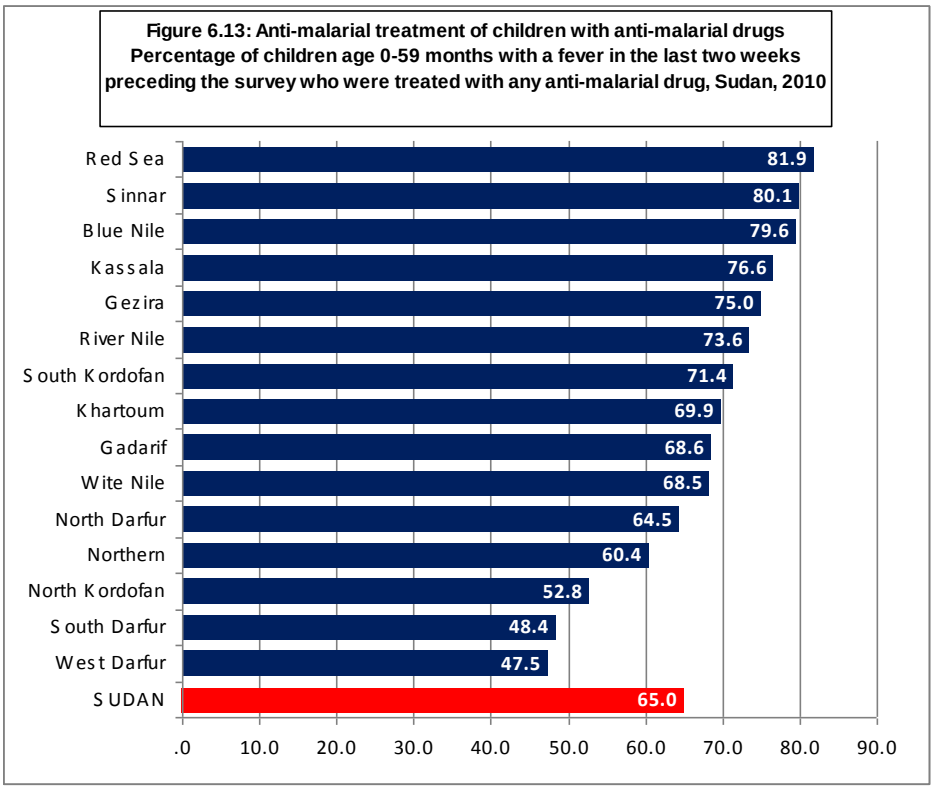
Background characteristics	Children with a fever in the last two weeks who were treated with:								Percentage who took an anti-malarial drug same or next day [2]	Number of children with fever in last two weeks
	Anti-malarials: Quinine injection	Anti-malarials: Artemisinin-based combinations	Anti-malarials: Any anti-malarial drug [1]	Other medications: Paracetamol/ Panadol/ Acetaminophan	Other medications: Asprin	Other medications: Ibuprofen	Other medications: Others	Don't know		
Sex										
Male	1.5	21.7	67.2	21.4	1.9	.1	13.6	3.4	45.4	558
Female	.2	21.1	62.7	25.3	2.6	.7	11.2	3.1	40.7	558
State of residence										
Northern	.0	14.9	60.4	37.0	10.6	.0	16.2	.0	50.6	11
River Nile	.0	9.8	73.6	21.3	2.0	.0	19.9	9.8	49.5	21
Red Sea	.0	10.7	81.9	23.4	.0	.0	7.3	.0	50.6	9
Kassala	1.1	30.6	76.6	11.2	1.2	1.1	10.6	5.7	56.6	79
Gadarif	.0	25.7	68.6	39.2	.0	.0	11.8	5.2	44.6	52
Khartoum	.0	24.9	69.9	41.9	3.2	.0	6.8	2.9	49.9	59
Gezira	2.3	33.3	75.0	24.7	.0	.0	11.4	4.9	52.8	176
Wite Nile	.0	25.4	68.5	21.8	2.1	.0	22.5	2.8	58.6	74
Sinnar	4.5	47.3	80.1	28.5	2.4	.0	9.3	2.4	47.3	60
Blue Nile	.0	34.8	79.6	25.7	2.7	2.1	11.2	1.0	60.0	48
North Kordofan	.0	14.0	52.8	22.7	3.2	1.3	16.9	.0	31.5	203
South Kordofan	1.6	18.5	71.4	32.3	7.5	.0	11.6	4.3	43.7	80
North Darfur	.0	16.3	64.5	22.5	.0	.0	4.3	3.3	49.0	44
West Darfur	.8	.0	47.5	5.0	2.1	.0	7.3	4.2	22.9	90
South Darfur	.0	7.7	48.4	18.4	1.6	.0	12.2	3.5	24.8	107
Area of residence										
Urban	.5	26.9	73.3	35.1	2.7	.4	11.8	1.4	60.0	230
Rural	1.0	19.9	62.8	20.2	2.1	.4	12.6	3.7	38.7	885
Age										
0-11	.4	26.7	65.6	27.6	1.4	.4	13.5	5.2	44.3	225
12-23	1.6	21.3	68.3	21.1	1.9	.5	10.5	3.1	45.7	251
24-35	.6	20.1	66.4	25.6	2.0	.5	12.0	1.4	40.2	256
36-47	1.5	19.0	62.8	27.8	1.9	.5	14.1	4.2	43.4	219
48-59	.0	19.4	59.6	11.3	4.6	.0	12.4	2.3	41.1	165
Mother's education level										
None	.4	18.5	62.5	19.8	2.2	.1	10.5	3.0	40.0	649
Primary	.8	23.2	64.8	27.1	3.1	1.0	12.5	4.5	42.3	342
Secondary	4.1	31.7	79.1	31.5	.0	.4	21.6	1.4	60.4	116
Missing/DK	.0	25.9	68.9	25.9	.0	.0	31.1	.0	68.9	9
Wealth index quintiles										
Poorest	.8	12.0	52.0	13.9	2.6	.0	9.6	2.8	24.1	294
Second	.7	12.6	58.1	26.1	1.3	.5	13.6	4.0	37.0	269
Middle	.5	24.0	68.9	22.6	3.9	1.1	11.8	5.4	47.6	247
Fourth	1.5	37.9	81.9	26.7	2.2	.0	15.7	1.5	58.5	193
Richest	1.4	32.9	77.7	37.1	.0	.5	12.5	.9	70.8	112
SUDAN (TOTAL)	.9	21.4	65.0	23.3	2.2	.4	12.4	3.2	43.0	1115

The SHHS2 data indicated that the proportion of children who were treated with an appropriate anti-malarial drug was higher for children in urban areas (73.3 per cent) than that of those in rural areas (62.8 per cent). The proportion of boys who were treated with an appropriate anti-malarial drug was higher (67.2 per cent) than that of girls who were treated with an appropriate anti-malarial drug (62.7 per cent). The proportion of children who were treated with an appropriate anti-malarial drug increased from 65.6 per cent among children aged 0-11 months to 68.3 per cent among children aged 12-23 moths and then declined with increasing age to 66.4 per cent among children aged 24-35 months, to 62.8 per cent among children aged 36-47 months, and to 59.6 per cent among children aged 48-59 months.

The proportion of children who were treated with an appropriate anti-malarial drug increased from 62.5 per cent among children whose mothers had no education to 64.8 per cent among children whose mothers had primary education and to 79.5 per cent among children whose mothers had secondary or higher levels of education. The proportion of children who were treated with an appropriate anti-malarial drug was also much higher among children belonging to households in the richest quintile (77.7 per cent) than that for children from households in the poorest quintile (52.0 per cent).

Overall, children with fever in the States where malaria is known to be most prevalent, are the most likely to have received an appropriate anti-malarial drug while those in other States are the least likely to receive an appropriate drug. The proportion of children who were treated with an appropriate anti-malarial drug ranged from 47.5 per cent in West Darfur State to 81.9 per cent in Red Sea State. (Figure 6.13).

Figure 6.13: Anti-malarial treatment of children with anti-malarial drugs
Percentage of children age 0-59 months with a fever in the last two weeks preceding the survey who were treated with any anti-malarial drug, Sudan, 2010



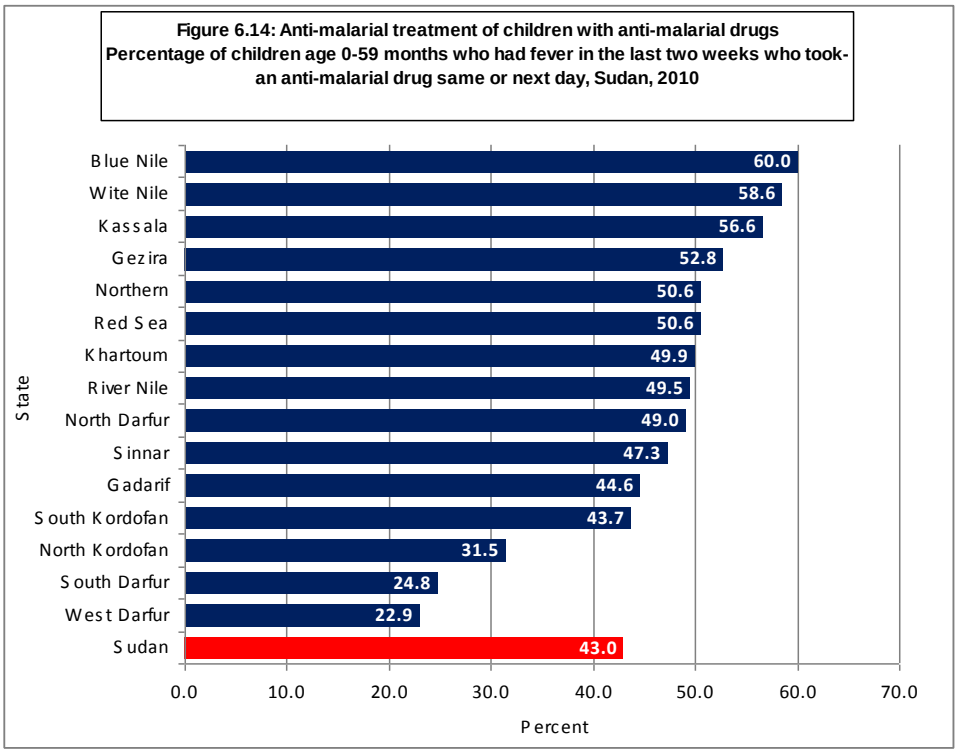
Antimalarial treatment (Children under age five) within 24 hours of onset of symptoms or on the next day

The SHHS2 data also indicated that the proportion of children who were treated with an appropriate anti-malarial drug the same or next day was higher in urban area (60.0 per cent) than in rural areas (38.7 per cent). The proportion of boys who were treated with an appropriate anti-malarial drug the same or next day was slightly higher (45.4per cent) than that of girls who were treated with an appropriate anti-malarial drug (40.7 per cent). The proportion of children who were treated with an appropriate anti-malarial drug the same or next day increased from 44.3 per cent among children aged 0-11 months to 45.7 per cent among children aged 12-23 months and then declined to 40.2 per cent among children aged 24-35 months, increased to 43.4 per cent among children aged 36-47 months, and then declined to 41.1 per cent among children aged 48-59 months.

The proportion of children who were treated with an appropriate anti-malarial drug the same or next day increased from 40.0 per cent among children whose mothers had no education to 42.3 per cent among children whose mothers had primary education and to 60.4 per cent among children whose mothers had secondary or higher levels of education. The proportion of children who were treated with an appropriate anti-malarial drug was also much higher among children belonging to households in the richest quintile (70.8 per cent) than among children from households in the poorest quintile (24.1 per cent).

The proportion of children who were treated with an appropriate anti-malarial drug the same or next day ranged from 60.0 per cent in Blue Nile to 22.9 per cent in West Darfur State.

Figure 6.14: Anti-malarial treatment of children with anti-malarial drugs
Percentage of children age 0-59 months who had fever in the last two weeks who took- an anti-malarial drug same or next day, Sudan, 2010



Malaria diagnostic usage

Table 6.15 provides information relating to children age 0-59 months who had a fever in the last two weeks. Questions on the prevalence (proportion of children 0-59 months of age who were ill with fever

in the last two weeks prior to the SHHS2) and treatment of fever were asked for all children under age five.

Table 6.15 also provides information relating to malaria diagnostic usage, i.e. the proportion of children under age five reported to have had fever in the previous 2 weeks who had a finger or heel stick for malaria testing. Overall, 57.4 per cent of children with a fever in the last two weeks prior to the SHHS2 had a finger or heel stick for malaria testing.

Table 6.15: Malaria diagnostics usage
Percentage of children age 0-59 months who had a fever in the last two weeks and who had a finger or heel stick for malaria testing, Sudan, 2010

	Had a finger or heel stick [1]	Number of children age 0-59 months with fever in the last two weeks
Sex		
Male	62.0	558
Female	52.8	558
State of residence		
Northern	72.6	11
River Nile	84.2	21
Red Sea	72.2	9
Kassala	85.7	79
Gadarif	62.8	52
Khartoum	82.1	59
Gezira	76.4	176
White Nile	80.5	74
Sinnar	60.5	60
Blue Nile	53.2	48
North Kordofan	43.2	203
South Kordofan	40.1	80
North Darfur	48.3	44
West Darfur	33.1	90
South Darfur	28.7	107
Urban	81.1	230
Rural	51.2	885
Age		
0-11	67.7	225
12-23	60.9	251
24-35	53.5	256
36-47	53.3	219
48-59	49.3	165
Mother's education level		
None	49.0	649
Primary	64.5	342
Secondary	83.6	116
Missing/DK	52.4	9
Wealth index quintile		
Poorest	29.7	294
Second	45.7	269
Middle	67.1	247
Fourth	81.7	193
Richest	95.0	112

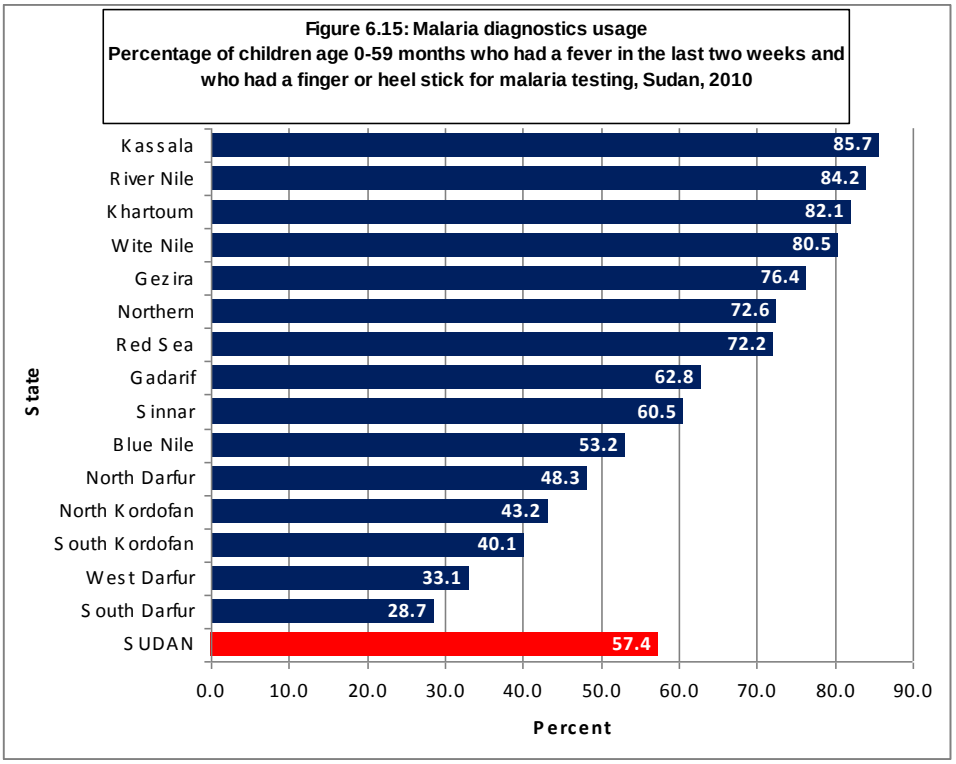
[1] SHHS indicator 3.16

The SHHS2 data indicated that the proportion of children aged 0-59 months Percentage of children age 0-59 months who had a fever in the last two weeks and who had a finger or heel stick for malaria testing in urban areas (81.1 per cent) than in rural areas (51.2 per cent). The proportion of boys who aged 0-59 months who had a fever in the last two weeks and who had a finger or heel stick for malaria testing was higher (62.0 per cent) than that of girls who had a finger or heel stick for malaria testing (52.8 per cent). The proportion of children who had a finger or heel stick for malaria testing decreased from 67.7 per cent among children aged 0-11 months to 60.9 per cent among children aged 12-23 moths, and to 53.5 per cent among children aged 24-35 months, and then declined to 53.3 per cent among children aged 36-47 months, and to 49.3 per cent among children aged 48-59 months.

The proportion of children aged 0-59 months who had a fever in the last two weeks prior to SHHS and who had a finger or heel stick for malaria testing increased from 49.0 per cent among children whose mothers had no education to 64.5 per cent among children whose mothers had primary education and to 83.6 per cent among children whose mothers had secondary or higher levels of education. The proportion of children who had a finger or heel stick for malaria testing increased was also much higher among children belonging to households in the richest quintile (95.0 per cent) than among children belonging to households in the poorest quintile (29.7 per cent).

The proportion of children aged 0-59 months who had a fever in the last two weeks prior to SHHS2 and who had a finger or heel stick for malaria testing ranged from 85.7 per cent in Kassala State to 28.7 per cent in Red Sea State (Figure 6.15).

Figure 6.15: Malaria diagnostics usage
Percentage of children age 0-59 months who had a fever in the last two weeks and who had a finger or heel stick for malaria testing, Sudan, 2010



VII. Water and Sanitation

Safe drinking water is a basic necessity for good health. Unsafe drinking water can be a significant carrier of diseases such as trachoma, cholera, typhoid, and schistosomiasis. Drinking water can also be tainted with chemical, physical and radiological contaminants with harmful effects on human health. In addition to its association with disease, access to drinking water may be particularly important for women and children, especially in rural areas, who bear the primary responsibility for carrying water, often for long distances.

The MDG goal is to reduce by half, between 1990 and 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation. The World Fit for Children goal calls for a reduction in the proportion of households without access to hygienic sanitation facilities and affordable and safe drinking water by at least one-third.

For more details on water and sanitation and to access some reference documents, please visit the UNICEF childinfo website http://www.childinfo.org/wes.html.

Sources of drinking water

Table 7.1 indicates the percent distribution of household members/population according to main source of drinking water. It also shows the percentage of household population using improved drinking water sources. The population using *improved sources* of drinking water are those using any of the following types of supply: piped water (into dwelling, compound, yard or plot, public tap/standpipe), tube well/borehole, protected well, protected spring, and rainwater collection. Bottled water is considered as an improved water source only if the household is using an improved water source for other purposes, such as hand washing and cooking. Water sources such as unprotected well, unprotected spring, unfiltered water, water transported by tanker/carts from improved/unimproved sources are considered as unimproved sources of drinking water.

Table 7.1: Use of improved water sources

Percent distribution of household population according to main source of drinking water and percentage of household population using improved drinking water sources, Sudan, 2010

	Main sources of drinking water (Improved sources)								Percentage using improved drinking water source [1]	Number of household members
	Piped into dwelling	Piped into compound, yard or plot	Public tap / standpipe	Water yard/hand pump	Protected/ covered well	Protected spring	Filtered (river, stream, dam, hafir, lake, pond, canal or rain water	Bottled water		
State of residence										
Northern	14.5	66.9	3.1	5.1	.3	.0	1.1	.1	91.0	1538
River Nile	9.1	56.2	.2	8.0	4.0	.1	.4	.0	78.0	3018
Red Sea	3.1	4.3	4.0	4.3	11.7	.0	.1	.0	27.4	2249
Kassala	1.5	27.1	2.2	12.4	3.9	.0	.9	.0	48.0	5135
Gadarif	1.0	12.2	1.1	13.0	.2	.0	.5	.0	27.9	3994
Khartoum	29.0	40.4	.7	2.5	.0	.0	.0	.0	72.7	13494
Gezira	17.0	50.0	9.7	1.5	.2	.0	.8	.0	79.2	12569
Wite Nile	8.2	22.2	.1	7.5	.0	.0	.5	.0	38.5	4391
Sinnar	11.3	23.5	7.6	17.9	.0	.0	.3	.0	60.7	3474
Blue Nile	1.8	10.3	.8	26.5	.0	.0	.5	.0	39.9	3018
North Kordofan	2.4	4.3	.6	37.3	4.4	.1	4.0	.7	53.8	8638
South Kordofan	.0	.2	.4	47.9	.3	.0	1.0	.0	49.7	3816
North Darfur	1.0	2.4	1.3	51.8	2.8	.2	.3	.0	59.8	5352
West Darfur	2.4	2.3	3.4	33.6	2.2	.5	.0	.0	44.5	3615
South Darfur	.4	8.0	.6	58.3	1.9	.2	.0	.0	69.4	10231
Area of residence										
Urban	20.5	39.0	2.0	4.6	.4	.0	.1	.0	66.6	26714
Rural	4.2	16.5	2.9	30.5	2.3	.1	1.1	.1	57.7	57818
Education level of household head										
None	7.3	16.6	2.8	25.9	2.1	.1	.9	.0	55.8	47717
Primary	8.7	28.7	2.5	20.5	1.3	.1	1.0	.0	62.9	21474
Secondary +	17.4	38.8	2.2	12.8	1.0	.0	.1	.3	72.7	14753
Missing/DK	1.5	21.1	2.8	32.6	.0	.0	.0	.0	57.9	587
Wealth index quintile										
Poorest	.0	.0	.6	56.4	3.3	.3	.8	.1	61.5	16892
Second	.2	1.0	3.3	34.4	2.7	.0	1.8	.1	43.5	16907
Middle	2.3	15.0	6.4	15.4	1.7	.0	1.0	.2	41.9	16909
Fourth	8.8	46.1	2.3	4.9	.7	.0	.2	.0	63.0	16910
Richest	35.6	56.0	.6	.4	.1	.0	.1	.0	92.8	16915
SUDAN (TOTAL)	**9.4**	**23.6**	**2.6**	**22.3**	**1.7**	**.1**	**.8**	**.1**	**60.5**	**84532**

[1] SHHS indicator4.1; MDG indicator 7.8

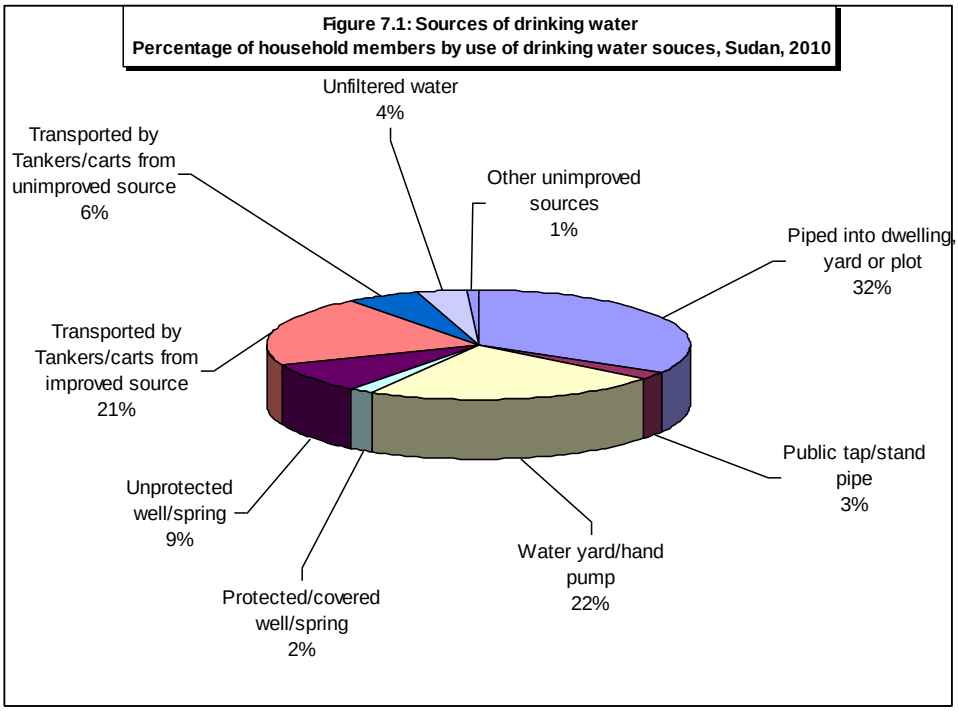
Table 7.1 (continued): Use of improved water sources
Percent distribution of household population according to main source of drinking water and percentage of household population using improved drinking water sources, Sudan, 2010

	Main sources of drinking water (unimproved sources)								Total	Percentage using improved drinking water source [1]	Number of household members
	Unprotected well	Unprotected spring	Unfiltered (river, stream, dam, hafir, lake, pond, canal or rain) water	Transported by tankers/carts from improved source	Transported by tankers/carts from unimproved source	Bottled water	Other	Missing			
State of residence											
Northern	.6	.0	5.5	2.2	.2	.0	.4	.0	100.0	91.0	1538
River Nile	6.9	.5	4.7	3.1	5.7	.0	1.1	.0	100.0	78.0	3018
Red Sea	9.2	1.2	.0	58.2	3.6	.0	.4	.0	100.0	27.4	2249
Kassala	2.0	.1	16.2	20.5	12.7	.0	.4	.0	100.0	48.0	5135
Gadarif	7.5	.0	11.3	33.3	19.5	.0	.4	.0	100.0	27.9	3994
Khartoum	.2	.0	.0	23.6	1.7	.0	1.8	.0	100.0	72.7	13494
Gezira	.1	.0	1.5	18.4	.6	.0	.1	.0	100.0	79.2	12569
White Nile	.8	.0	8.9	25.8	24.3	.1	1.6	.0	100.0	38.5	4391
Sinnar	.0	2.3	3.3	21.7	10.8	.0	1.1	.1	100.0	60.7	3474
Blue Nile	4.8	3.2	22.8	14.1	13.8	.0	1.4	.0	100.0	39.9	3018
North Kordofan	12.0	.2	2.0	25.1	5.6	.2	1.2	.0	100.0	53.8	8638
South Kordofan	15.3	.6	7.1	23.1	4.1	.0	.0	.1	100.0	49.7	3816
North Darfur	15.7	3.3	.0	18.5	.6	.0	1.9	.1	100.0	59.8	5352
West Darfur	39.3	4.4	.0	10.0	1.5	.0	.0	.3	100.0	44.5	3615
South Darfur	16.5	.4	.0	13.3	.3	.0	.2	.0	100.0	69.4	10231
Area of residence											
Urban	.6	.0	.8	27.7	2.5	.0	1.7	.0	100.0	66.6	26714
Rural	11.1	1.1	5.4	17.3	6.8	.0	.4	.0	100.0	57.7	57818
Education level of household head											
None	10.9	1.0	5.1	19.9	6.4	.0	.9	.0	100.0	55.8	47717
Primary	4.9	.6	3.1	22.6	5.0	.0	1.0	.0	100.0	62.9	21474
Secondary +	2.1	.3	1.6	19.7	2.9	.0	.6	.0	100.0	72.7	14753
Missing/DK	7.3	.2	1.6	25.0	8.0	.0	.0	.0	100.0	57.9	587
Wealth index quintile											
Poorest	23.1	2.0	3.5	7.0	2.6	.1	.3	.0	100.0	61.5	16892
Second	12.3	1.4	8.8	22.5	10.8	.0	.7	.0	100.0	43.5	16907
Middle	3.1	.4	5.8	37.4	9.8	.0	1.4	.1	100.0	41.9	16909
Fourth	.6	.0	1.4	29.7	3.6	.0	1.8	.0	100.0	63.0	16910
Richest	.1	.0	.3	6.2	.6	.0	.0	.0	100.0	92.8	16915
SUDAN (TOTAL)	7.8	.8	4.0	20.6	5.5	.0	.8	.0	100.0	60.5	84532

[1] SHHS indicator4.1; MDG indicator 7.8

The SHHS2 data indicated that of about 9.4 per cent of the overall household population used drinking water that was piped into dwelling and 23.6 per cent used drinking water that was piped into their compound, yard or plot while 2.6 per cent used drinking water that was piped into public tap/standpipe. In all more than one third (35.6 per cent) of the household members used drinking water that was piped into their dwelling or into their compound, yard or plot or into public tap/standpipe. Other improved sources of drinking water used by the household members include water yard/hand pump (22.3 per cent), protected/covered well 91.7 per cent, and spring (0.1 per cent), filtered water (0.8 per cent) and bottled water (0.1 per cent). The other sources of drinking water used by the household members include unprotected well (7.8 per cent), unprotected spring (0.8 per cent), unfiltered water (4.0 per cent), water transported by tanker/carts from improved source (20.6 per cent), water transported by tanker/carts from unimproved source (5.5 per cent), and other unimproved sources (0.8 per cent). (Figure 7.1.)

Figure 7.1: Sources of drinking water
Percentage of household members by use of drinking water souces, Sudan, 2010



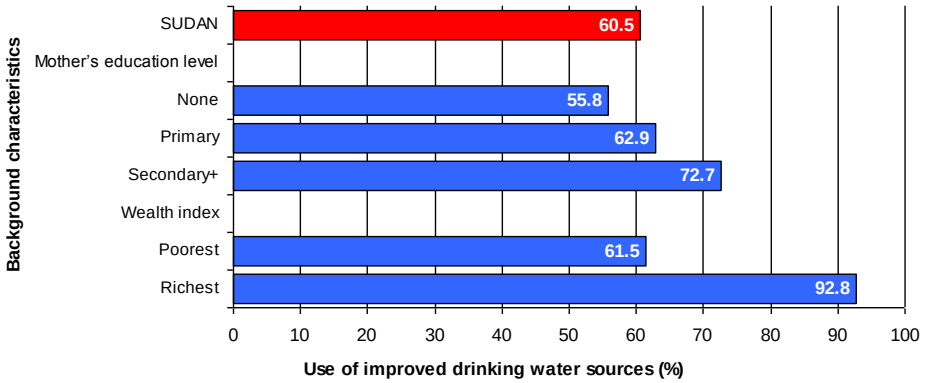
The source of drinking water for the population varied widely by State of residence (Table WS.1). More than four-fifths (81.4 per cent) in Northern State and about two-thirds (69.4 per cent) of household population in Khartoum State (69.4 per cent), Gezira State (67.0 per cent) and River Nile State (65.3 per cent) used drinking water that was piped into their dwelling or into their compound, yard or plot. About one-third of household population in Sinnar State (34.8 per cent) and White Nile State (30.4 per cent) used drinking water that was piped into their dwelling or into their compound, yard or plot. Water Yard/hand pump was found to be a main source of drinking water in States like South Darfur (58.3 per cent), North Darfur (51.8 per cent), South Kordofan (47.9 per cent), North Kordofan (37.3 per cent) and West Darfur (33.6 per cent).

Water transported by tankers/carts from improved/unimproved sources was found to be the main source of drinking water for several States like Northern State (61.8 per cent), Red Sea (52.8 per cent), Khartoum (50.1 per cent), River Nile (32.7 per cent), Gezira State (32.5 per cent), Sinnar State (30.7 per cent) and White Nile State (27.9 per cent). A significant proportion of household population in West Darfur (39.3 per cent), South Darfur (16.5 per cent), North Darfur (15.7 per cent) and North Kordofan (12.0 per cent) used water from unprotected well (an unimproved drinking water source). River or stream water (an unimproved source) was found to be a main source of drinking water in States like Kassala (16.2 per cent) and Blue Nile (22.8 per cent).

Use of Improved Sources of Drinking Water

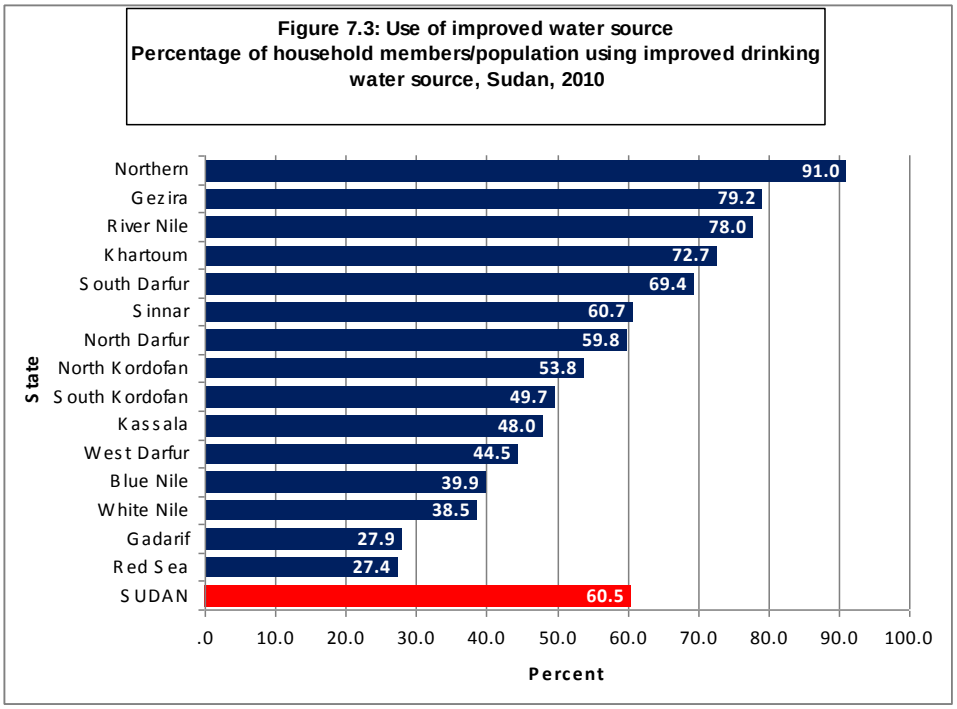
The SHHS2 findings indicated that overall, 60.5 per cent of the population was using an improved source of drinking water at the time of the survey. The percentage of household population using an improved source of drinking water was higher for household members in urban areas (66.6 per cent) than that for household members in rural areas (57.7 per cent). The percentage of household population using improved sources of drinking water increases with the educational level of the household head. The percentage of household population using improved sources of drinking water showed an increasing trend from 55.8 per cent in the case of households which had household heads with no education to 62.9 per cent in the case of households which had household heads with primary education and to 72.7 per cent in the case of households which had household heads with secondary or higher level of education. The percentage of household population using improved sources of drinking water also increases with the family wealth. The percentage of household population using improved sources of drinking water showed an increasing trend from 61.5 per cent in the case of households in the poorest quintile to 92.8 per cent in the case of households in the richest quintile.

Figure 7.2: Use of improved drinking water sources by education level of household head and by wealth index quintile, Sudan, 2006



The percentage of household population using improved sources of drinking water varied widely by State, ranging from 79.2 per cent in Gedarif State and 72.7 per cent in Kassala to 44.5 per cent in West Darfur.(Figure 7.2).

Figure 7.3: Use of improved water source
Percentage of household members/population using improved drinking water source, Sudan, 2010



Household water treatment

Use of in-house water treatment is presented in Table 7.2. Household members were asked of ways they may be treating water at home to make it safer to drink – boiling, adding bleach or chlorine, using a water filter, and using solar disinfection were considered as proper treatment of drinking water.

The table shows water treatment by all households and the percentage of household members/population using unimproved water sources but using appropriate water treatment methods.

The SHHS2 findings indicated that only 0.9 per cent of household members using unimproved drinking water sources used an appropriate water treatment method. Nationwide, about 4.1 household members used strain through a cloth, 4.1 per cent used water filter and 8.2 per cent allowed letting water stand and settle. The percentage of household members in households using unimproved drinking water sources and using an appropriate water treatment method were above the national average in Gedarif State (4.6 per cent), Sinnar State (1.5 per cent), and White Nile (1.1 per cent). The percentage of household members in households who used none of the water treatment method was lowest in Northern State (34.9 per cent) and highest in North Darfur State (97.7 per cent) (Table 7.2). The percentage of household members who used none of the water treatment method was lower among household members in urban areas (82.8 per cent) than that for household members in rural areas (88.0 per cent). The percentage of household members who used none of the water treatment method was found to be lower among those from households in the richest quintile (83.4 per cent) than among those from households in the poorest quintile (92.8 per cent).

Table 7.2: Household water treatment

Percentage of household population by drinking water treatment method used in the household, and for household members living in households where an unimproved drinking water source is used, the percentage who are using an appropriate treatment method, Sudan, 2010

	Water treatment method used in the household											
	None	Boil	Add bleach / chlorine	Strain through a cloth	Use water filter	Solar disinfection	Let it stand and settle	Other	Don't know	Number of household members	Percentage of household members using an appropriate water treatment method [1]	Number of household members in households using unimproved drinking water sources
State of residence												
Northern	34.9	.0	.8	3.8	.5	.1	60.5	.1	.0	1538	1.8	138
River Nile	77.7	.0	.2	1.0	.2	.0	21.0	.0	.0	3018	.1	665
Red Sea	76.1	.6	.1	22.1	.3	.0	.5	.2	.2	2249	.8	1633
Kassala	96.2	.4	.3	2.3	.1	.0	.2	.3	.1	5135	.4	2669
Gadarif	88.2	.1	3.4	4.6	.2	.3	3.9	.1	.0	3994	4.6	2878
Khartoum	75.7	.1	.0	.5	3.8	.0	19.9	.2	.0	13494	.4	3687
Gezira	96.4	.0	.1	1.8	.0	.0	1.5	.2	.0	12569	.5	2616
White Nile	75.5	.0	.9	21.7	.1	.0	2.3	.0	.0	4391	1.1	2700
Sinnar	95.6	.0	.6	2.8	.1	.0	.7	.2	.0	3474	1.5	1366
Blue Nile	42.6	.1	.1	1.9	.0	.0	53.4	2.5	.1	3018	.4	1813
North Kordofan	91.6	.0	.4	6.5	.0	.0	1.0	.5	.1	8638	.1	3995
South Kordofan	92.9	.2	.0	5.8	.2	.1	1.0	.0	.1	3816	.8	1919
North Darfur	97.7	.0	.0	1.6	.3	.0	.3	.1	.0	5352	.6	2149
West Darfur	95.5	.0	.1	.4	.0	.2	3.6	.1	.0	3615	.3	2006
South Darfur	93.5	.0	.3	3.1	.0	.0	2.6	.3	.1	10231	.0	3134
Area of residence												
Urban	82.8	.2	.3	3.3	2.0	.0	11.3	.3	.1	26714	.7	8914
Rural	88.0	.0	.4	4.5	.1	.0	6.7	.3	.0	57818	.9	24452
Education level of household head												
None	86.4	.0	.5	4.1	.8	.0	7.8	.3	.1	47717	.8	21110
Primary	87.1	.1	.2	4.4	.1	.1	8.1	.1	.0	21474	.6	7975
Secondary +	85.1	.3	.3	3.7	1.1	.0	9.3	.3	.0	14753	1.8	4034
Missing/DK	85.4	.0	.6	2.0	.0	.0	12.0	.0	.0	587	.8	247
Wealth index quintile												
Poorest	92.8	.0	.2	3.5	.0	.0	3.2	.3	.1	16892	.0	6511
Second	88.1	.0	.5	5.4	.0	.0	5.6	.6	.0	16907	.7	9552
Middle	84.6	.1	.5	6.9	.1	.1	7.8	.2	.1	16909	1.3	9828
Fourth	83.2	.1	.3	3.4	.1	.0	12.8	.2	.0	16910	1.2	6252
Richest	83.4	.1	.3	1.5	3.3	.0	11.4	.2	.0	16915	1.2	1222
SUDAN (TOTAL)	86.4	.1	.4	4.1	.7	.0	8.2	.3	.0	84532	.9	33366

[1] SHHS indicator 4.2: Percentage of household members in households using unimproved drinking water sources and using an appropriate water treatment method

Time to source of drinking water

The amount of time it takes to obtain water is presented in Table 7.3. It may be noted that these results refer to one round trip from home to drinking water source. Information on the number of trips made in one day was not collected.

Table 7.3 shows that for users of improved drinking water sources, about one-third (33.0 per cent) of them had a drinking water source was on the premises of their residence. For about 13.6 per cent of all households using an improved drinking water source, it took less than 30 minutes to get to the water source and bring water, while 13.2 per cent of households spent 30 minutes or more for this purpose. In rural areas, for users of improved drinking water sources, only 20.7 per cent of them had a drinking water source on the premises compared to 59.5 per cent for those in urban areas. The proportion of the household population which spend more than 30 minutes to get to the water source and return was 18.3 per cent for those in rural areas compared to 2.3 per cent for those in urban areas.

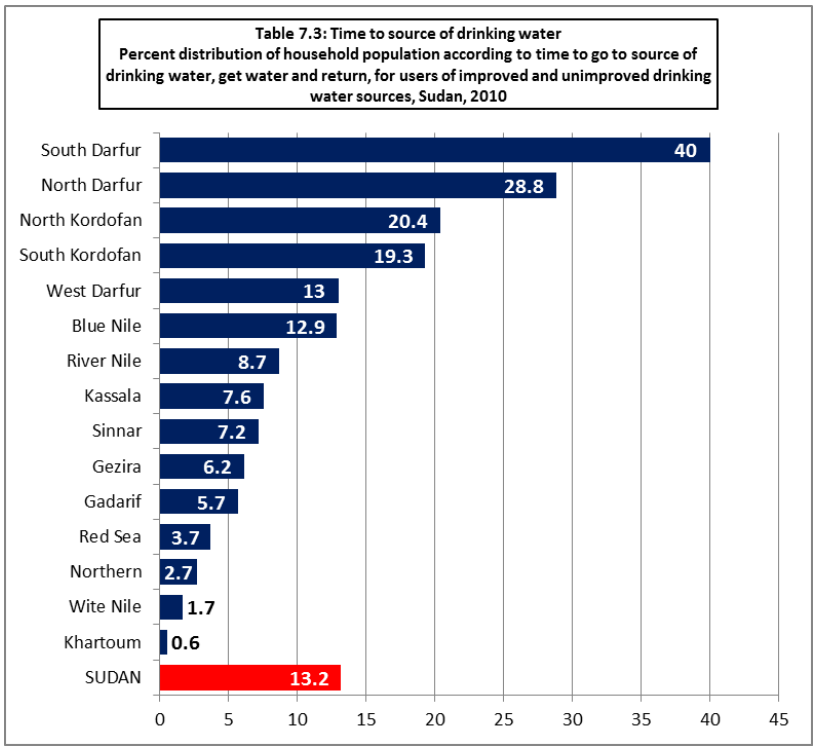
Table 7.3 also shows that for users of unimproved drinking water sources, about one-fourth (26.1 per cent) of them used water transported by tankers/carts. For about 4.9 per cent of all households using an unimproved drinking water source, it took less than 30 minutes to get to the water source and bring water, while 8.2 per cent of households spent 30 minutes or more for this purpose. In urban areas, for users of unimproved drinking water sources, about 30.2 per cent of them used water transported by tankers/carts compared to 24.1 per cent of those in rural areas. The proportion of the household population which spend more than 30 minutes to get to the water source and return was 11.6 per cent in rural areas compared to 1.1 per cent in urban areas.

The SHHS2 data indicated that for users of improved drinking water sources, the proportion of household members who had a drinking water source on the premises of their residence ranged from 23.9 per cent in the case of household members who had household head with no education to 37.4 per cent in the case of household members who had household head with primary education and 56.3 per cent in the case of household members who had household head with secondary or higher level of education. The proportion of household members who spent 30 minutes or more to go to the source of drinking water and return home was lower among household members from households in the richest quintile (7.8 per cent) than that for household members from households in the poorest quintile (15.5 per cent).

The SHHS2 data also indicated that for users of improved drinking water sources, the proportion of household members who had a drinking water source on the premises of their residence varied from 0.0 per cent in the case of household members belonging to households in the poorest quintile to 91.5 per cent in the case of household members belonging to households in the richest quintile. The household members who spent 30 minutes or more to go to the source of drinking water and return home was 34.5 per cent in the case of household members belonging to households in the poorest quintile compared to only 0.4 per cent in the case of those belonging to households in the richest quintile. For the users of unimproved drinking water sources, the household members who spent 30 minutes or more to go to the source of drinking water and return home was 20.8 per cent in the case of household members belonging to households in the poorest quintile compared to only 0.3 per cent in the case of those belonging to households in the richest quintile.

Table 7.3: Time to source of drinking water
Percent distribution of household population according to time to go to source of drinking water, get water and return, for users of improved and unimproved drinking water sources, Sudan, 2010

	Time to source of drinking water									
	Users of improved drinking water sources				Users of unimproved drinking water sources					
	Water on premises	Less than 30 minutes	30 minutes or more	Missing/DK	Transported water by tankers/carts	Less than 30 minutes	30 minutes or more	Missing/DK	Total	Number of household members
State of residence										
Northern	81.4	6.1	2.7	.7	2.4	1.1	5.5	.0	100.0	1538
River Nile	65.2	3.9	8.7	.1	8.8	5.4	6.6	1.2	100.0	3018
Red Sea	7.3	6.0	3.7	10.3	61.8	3.8	6.5	.5	100.0	2249
Kassala	28.7	10.6	7.6	1.2	33.2	7.8	10.7	.3	100.0	5135
Gadarif	13.2	8.8	5.7	.2	52.8	9.3	9.9	.1	100.0	3994
Khartoum	69.4	2.1	.6	.6	25.3	1.2	.6	.2	100.0	13494
Gezira	67.0	5.6	6.2	.5	19.1	1.3	.5	.0	100.0	12569
Wite Nile	30.4	6.4	1.7	.0	50.2	4.8	6.4	.0	100.0	4391
Sinnar	34.9	17.4	7.2	1.2	32.5	4.7	1.9	.2	100.0	3474
Blue Nile	12.2	14.8	12.9	.0	27.9	11.9	17.8	2.5	100.0	3018
North Kordofan	6.7	26.5	20.4	.2	30.7	7.8	7.7	.1	100.0	8638
South Kordofan	.2	28.8	19.3	1.4	27.3	6.4	16.3	.3	100.0	3816
North Darfur	3.4	26.6	28.8	1.1	19.1	5.6	15.0	.5	100.0	5352
West Darfur	4.7	26.3	13.0	.5	11.5	14.8	28.3	.9	100.0	3615
South Darfur	8.4	21.0	40.0	.0	13.6	2.7	14.3	.0	100.0	10231
Area of residence										
Urban	59.5	4.2	2.3	.7	30.2	1.9	1.1	.2	100.0	26714
Rural	20.7	17.9	18.3	.8	24.1	6.2	11.6	.4	100.0	57818
Education level of household head										
None	23.9	15.4	15.5	.9	26.3	6.0	11.5	.4	100.0	47717
Primary	37.4	13.2	11.7	.6	27.6	4.2	5.0	.3	100.0	21474
Secondary +	56.3	8.0	7.8	.6	22.7	2.1	2.5	.0	100.0	14753
Missing/DK	22.6	16.7	17.1	1.5	33.0	4.0	5.0	.0	100.0	587
Wealth index quintile										
Wealth index quintile										
Poorest	.0	26.2	34.5	.7	9.6	7.9	20.8	.3	100.0	16892
Second	1.2	21.8	19.2	1.4	33.3	8.8	13.7	.6	100.0	16907
Middle	17.2	14.2	9.7	.8	47.3	5.2	5.3	.4	100.0	16909
Fourth	54.9	4.8	2.4	.9	33.2	2.3	1.2	.2	100.0	16910
Richest	91.5	.8	.4	.0	6.8	.1	.3	.0	100.0	16915
SUDAN (TOTAL)	**33.0**	**13.6**	**13.2**	**.8**	**26.1**	**4.9**	**8.2**	**.3**	**100.0**	**84532**



The SHHS2 data indicated that for users of improved drinking water sources, the proportion of household members who had a drinking water source on the premises of their residence varied widely by State. The proportion of household members who had an improved drinking water source on the premises of their residence ranged from 0.2 per cent in South Kordofan State to 69.4 per cent in Khartoum State. The household members who spent 30 minutes or more to go to the source of drinking water and return home ranged from 0.6 per cent in Khartoum State to 40.0 per cent in South Darfur State. Similarly, in the case of users of unimproved drinking water sources, the household members who spent 30 minutes or more to go to the source of drinking water and return home ranged from 0.5 per cent in Gezira State to 28.3 per cent in West Darfur State.

Person collecting water

Table 7.4 shows the proportion of persons usually collecting drinking water used in the household when the source of drinking water is not on the premises of the residence. The SHHS2 findings indicated that for the majority of households, this was usually an adult woman (49.5 per cent). Adult man collected water in only 25.8 per cent of the households, female children under age 15 years collected water in about 13.3 per cent of the households, while male children under age 15 years collected water in about 10.3 per cent of the households,

The SHHS findings indicated that the practice of adult woman collecting drinking water for the household showed a declining trend with increase in the education level of the household head. The proportion of adult woman collecting drinking water for the household was higher (50.2 per cent) among households which had a household head with no education than that among households which had a household head with secondary or higher level of education (41.5 per cent). Similarly, the proportion of female child collecting drinking water for the household was higher (15.0 per cent)

among households which had a household head with no education compared to 9.7 per cent in the case of households which had a household head with secondary or higher level of education. The proportion of adult man collecting drinking water for the household was lower at 23.1 per cent among households which had a household head with no education compared to 34.6 per cent in the case of households which had a household head with secondary or higher level of education.

Table 7.4: Person collecting water

Percentage of households without drinking water on premises, and percent distribution of households without drinking water on premises according to the person usually collecting drinking water used in the household, Sudan, 2010

	Percentage of households without drinking water on premises or delivered by tankers/carts	Number of households	Person usually collecting drinking water							Number of households without drinking water on premises
			Adult woman (age 15+ years)	Adult man (age 15+ years)	Female child (under 15)	Male child (under 15)	DK	Missing	Total	
State of residence										
Northern	14.8	279	55.5	37.5	2.3	2.2	.0	2.5	100.0	41
River Nile	28.0	530	50.9	23.8	13.3	11.6	.0	.5	100.0	148
Red Sea	32.2	455	6.1	84.1	3.9	2.0	3.5	.4	100.0	146
Kassala	39.2	936	33.8	35.2	13.4	14.7	2.5	.5	100.0	367
Gadarif	37.0	737	21.8	23.9	23.7	28.7	1.1	.7	100.0	273
Khartoum	5.8	2170	56.2	22.4	10.6	4.4	1.9	4.6	100.0	126
Gezira	15.8	2152	66.1	22.8	3.6	6.7	.0	.8	100.0	340
Wite Nile	19.5	750	29.4	31.2	15.4	22.9	.8	.3	100.0	146
Sinnar	34.5	617	60.0	12.9	19.2	7.2	.4	.3	100.0	213
Blue Nile	61.0	492	61.4	17.1	11.9	9.6	.0	.0	100.0	300
North Kordofan	64.6	1616	38.9	39.3	8.3	12.7	.0	.8	100.0	1044
South Kordofan	73.4	685	61.7	21.2	11.7	4.5	.6	.4	100.0	503
North Darfur	77.7	907	52.5	30.7	9.5	6.2	.7	.4	100.0	704
West Darfur	85.3	711	68.1	4.8	17.1	8.3	.5	1.2	100.0	606
South Darfur	79.7	1742	50.6	19.9	19.1	10.4	.0	.0	100.0	1389
Area of residence										
Urban	10.9	4365	45.8	33.0	9.1	7.9	1.5	2.7	100.0	474
Rural	56.4	10413	49.8	25.2	13.7	10.5	.4	.4	100.0	5872
Education level of household head										
None	51.6	8523	50.2	23.1	15.0	10.7	.5	.5	100.0	4394
Primary	37.4	3703	50.4	31.0	9.5	8.3	.4	.4	100.0	1386
Secondary +	21.3	2455	41.5	34.6	9.7	12.2	1.1	.8	100.0	524
Missing/DK	43.4	98	51.6	22.1	15.6	4.0	.0	6.7	100.0	43
Wealth index quintile										
Poorest	90.2	3113	51.1	22.4	16.0	9.7	.5	.3	100.0	2807
Second	65.6	3184	51.1	25.2	11.9	10.8	.5	.5	100.0	2089
Middle	36.1	2987	45.4	31.3	10.7	11.3	.3	1.0	100.0	1080
Fourth	11.9	2778	40.7	38.2	9.4	9.0	1.3	1.5	100.0	331
Richest	1.5	2717	43.7	40.4	4.9	7.5	1.4	2.2	100.0	40
SUDAN (TOTAL)	**42.9**	**14778**	**49.5**	**25.8**	**13.3**	**10.3**	**.5**	**.6**	**100.0**	**6346**

The SHHS findings also indicated that the practice of adult woman collecting drinking water for the household showed a declining trend with increase in the family wealth. The proportion of adult woman collecting drinking water for the household was higher (51.1 per cent) among households in the poorest households than that among households in the richest quintile (43.7 per cent). Similarly, the proportion of female child collecting drinking water for the household was higher (16.0 per cent) among households in the poorest quintile than that among households in the richest quintile (4.9 per cent). The proportion of adult man collecting drinking water for the household was lower at 22.4 per cent for households in the poorest households compared to 40.4 per cent in the case of households in the richest quintile.

The percentage of adult woman collecting drinking water for the household varied widely by State, ranging from 6.1 per cent in Red Sea State to 68.1 per cent in West Darfur State. The percentage of adult man collecting drinking water for the household ranged from 4.8 per cent in West Darfur State to 84.1 per cent in Red Sea State. The percentage of female child collecting drinking water for the household ranged from 2.3 per cent in Northern State to 23.7 per cent in Gedarif State. The percentage of male child collecting drinking water for the household ranged from 2.2 per cent in Northern State to 28.7 per cent in Gedarif State.

Table 7.4 also shows the percentage of households without drinking water on premises of the residence or delivered by tankers/carts. The percentage of households without drinking water on premises or delivered by tankers/carts was 42.9 per cent. In urban areas, the percentage of households without drinking water on premises of the residence or delivered by tankers/carts was only 10.9 per cent compared to 56.4 per cent of those in rural areas. The percentage of households without drinking water on premises of the residence or delivered by tankers/carts was only 1.5 per cent among household members belonging to households in the richest quintile compared to 90.2 per cent among household members belonging to households in the poorest quintile. The percentage of households without drinking water on premises of the residence or delivered by tankers/carts varied widely by State, ranging from 5.8 per cent in Khartoum State to 85.3 per cent in West Darfur State.

Use of Improved Sanitation Facilities

Inadequate disposal of human excreta and personal hygiene is associated with a range of diseases including diarrhoeal diseases and polio. An improved sanitation facility is defined as one that hygienically separates human excreta from human contact. Improved sanitation can reduce diarrhoeal disease by more than a third, and can significantly lessen the adverse health impacts of other disorders responsible for death and disease among millions of children in developing countries. Improved sanitation facilities for excreta disposal include flush or pour flush to a piped sewer system, septic tank, or latrine; ventilated improved pit latrine, pit latrine with slab, and composting toilet.

Table 7.5 shows the types of sanitation facilities (i.e. percent distribution of household population according to type of toilet facility used by the household). The SHHS2 findings indicated that 35.1 per cent of the population of Sudan was living in households using improved sanitation facilities. This percentage was 60.2 per cent in urban areas compared to 23.4 per cent in rural areas. The proportion of household members using improved sanitation facilities was highest in Khartoum State (67.9 percent) and the lowest in Blue Nile State (5.7 per cent)

Table 7.5 also shows that a significant proportion of the household members used Pit latrines, including Ventilated Improved Pit (VIP) latrines (7.6 per cent) and pit latrine with slab (19.1per cent) both of which are considered to be an improved sanitation facility. The states where more than one-third of the household members using pit latrine with slab (an improved sanitation facility) include Northern (71.4 per cent), River Nile (40.6 per cent), Khartoum (36.0 per cent), and Gezira (33.6 per cent).

About 29.1 per cent of the household members used pit latrines without slab, i.e. open pit (an unimproved sanitation facility).The states where more than one-third of the household members used pit latrine without slab/open pit include White Nile (36.0 per cent), Blue Nile (61.7 per cent), North Kordofan (52.6 per cent), and South Darfur (53.3 per cent).

Table 7.5: Types of sanitation facilities
Percent distribution of household population according to type of toilet facility used by the household, Sudan, 2010

	Improved sanitation facility							Unimproved sanitation facility							Total	Number of household members
	Flush to piped sewer system	Flush to septic tank	Flush to pit (latrine)	Flush to unknown place / Not sure / DK where	Ventilated Improved Pit latrine (VIP)	Pit latrine with slab	Composting toilet	Flush to somewhere else	Pit latrine without slab / Open pit	Bucket	Hanging toilet, Hanging latrine	Other	Missing	No facility, Bush, Field		
State of residence																
Northern	.2	2.3	4.2	.0	5.8	71.4	.1	.4	5.4	.0	.0	4.0	.0	6.1	100.0	1538
River Nile	.0	2.7	3.1	.0	6.8	40.6	.4	.2	22.7	.0	.1	3.0	.0	20.4	100.0	3018
Red Sea	.2	1.6	5.4	.6	9.6	9.0	1.6	6.7	3.6	.0	.0	1.8	.0	59.8	100.0	2249
Kassala	.0	4.8	5.7	.0	7.9	9.1	.3	.0	24.1	.2	.2	1.4	.0	46.4	100.0	5135
Gadarif	.0	.9	5.3	.0	22.3	9.7	.0	.0	9.9	.0	.0	7.5	.0	44.4	100.0	3994
Khartoum	5.8	9.7	8.6	.0	6.9	36.0	.9	.0	24.6	.0	.0	1.6	.0	5.9	100.0	13494
Gezira	.1	1.2	.4	.0	10.0	33.6	.2	.0	16.1	.0	.1	2.8	.0	35.6	100.0	12569
Wite Nile	.0	5.5	2.5	.0	7.1	12.3	1.0	.2	36.0	.0	.1	1.3	.0	34.0	100.0	4391
Sinnar	.0	1.0	2.0	.1	7.0	12.4	.3	1.6	29.3	.0	.0	1.0	.2	45.1	100.0	3474
Blue Nile	.0	1.5	.7	.2	.3	3.0	.3	1.4	61.7	.0	.0	.7	.0	30.1	100.0	3018
N.Kordofan	.0	1.5	1.1	.0	6.1	7.6	6.4	.4	52.6	.3	.0	3.3	.0	20.8	100.0	8638
S.Kordofan	.0	.0	1.2	.0	16.4	7.8	.2	.1	24.9	.0	.1	2.9	.1	46.3	100.0	3816
N.Darfur	.0	.0	3.2	.0	7.2	11.6	.4	.2	13.7	.3	.0	29.7	.1	33.6	100.0	5352
W.Darfur	.3	.3	2.6	.0	7.1	19.8	.8	.0	16.6	.0	.6	2.5	.3	49.1	100.0	3615
S.Darfur	.0	.8	2.9	.0	.6	3.2	.2	.1	53.3	.0	.0	.1	.0	39.0	100.0	10231
Area of residence																
Urban	3.0	8.2	9.2	.1	10.6	28.3	.8	1.1	28.0	.0	.0	2.5	.0	8.2	100.0	26714
Rural	.0	.4	.8	.0	6.2	14.8	1.2	.1	29.5	.1	.1	4.6	.0	42.2	100.0	57818
Education																
None	.9	2.3	2.7	.0	6.5	13.8	1.2	.3	27.9	.0	.1	3.6	.1	40.6	100.0	47717
Primary	.4	2.2	3.5	.0	8.4	22.7	1.0	.3	31.7	.1	.1	4.5	.0	25.2	100.0	21474
Sec +	1.9	5.8	5.8	.0	9.9	30.9	.9	.9	28.9	.1	.0	4.1	.0	10.7	100.0	14753
Missing/DK	.0	.0	.3	.0	8.8	18.6	.0	.0	31.0	.0	.0	8.5	.0	32.7	100.0	587
Wealth index quintile																
Poorest	.0	.0	.0	.0	.3	.2	1.8	.0	25.4	.0	.0	4.3	.0	68.0	100.0	16892
Second	.0	.0	.4	.0	4.9	5.2	1.8	.0	35.6	.1	.1	6.6	.0	45.2	100.0	16907
Middle	.0	.1	1.3	.0	10.2	11.8	.4	.1	36.1	.1	.2	4.8	.1	34.8	100.0	16909
Fourth	.0	.9	4.2	.1	12.3	34.0	.8	.5	34.5	.1	.0	3.7	.0	9.0	100.0	16910
Richest	4.8	13.4	11.2	.1	10.2	44.2	.6	1.3	13.7	.0	.0	.3	.0	.3	100.0	16915
SUDAN	**1.0**	**2.9**	**3.4**	**.0**	**7.6**	**19.1**	**1.1**	**.4**	**29.1**	**.1**	**.1**	**3.9**	**.0**	**31.4**	**100.0**	**84532**

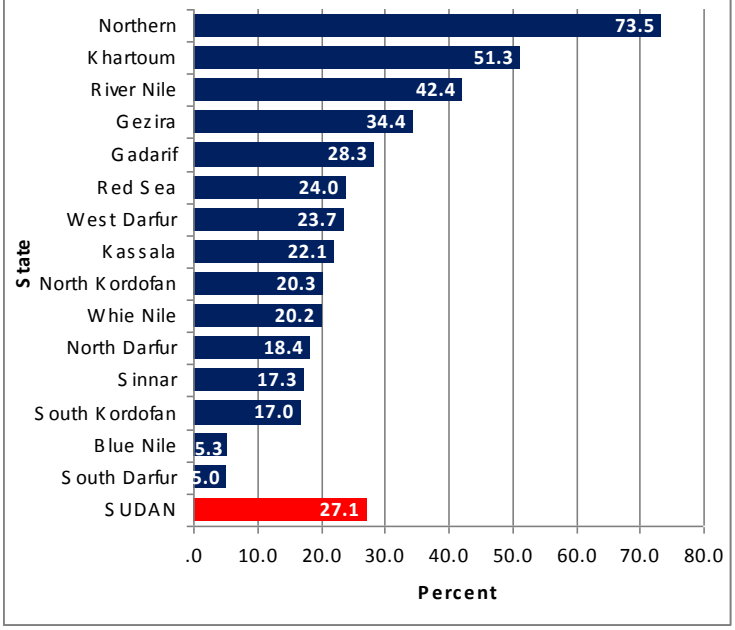
Nationwide, about 31.4 per cent of the households had no sanitation facilities. The proportion of household members who had no sanitary means of excreta disposal was highest in South Kordofan State (46.3 per cent) and the lowest in Khartoum State (5.9per cent)

The SHHS2 findings indicated that the use of improved sanitation facilities varied widely between urban and rural areas. The proportion of households using improved sanitation facilities was much higher in urban areas (60.2 per cent) than in rural areas (23.4 per cent).

The education level of the household head had an influence on the use of improved sanitation facilities by the household population. The proportion of household members using improved sanitation facilities was much higher (54.3 per cent) among household members who had household head with secondary or higher level of education than household members who had household head with no education (26.2 per cent). The proportion of household members who had no sanitation facility was only 10.7 per cent in the case of household members who had household head with secondary or higher level of education compared to 40.6 per cent among household members who had household head with no education.

The SHHS2 findings also indicated that the use of improved sanitation facilities had a strong correlation with family wealth. The proportion of households using improved sanitation facilities was much higher in the case of households in the richest quintile (35.1 per cent) than that in the case of households in the poorest quintile (2.3 per cent).

Figure 7.5: Use of improved sanitation facilities
Percent distribution of household population by users of improved sanitation facilities, Sudan, 2010



Access to safe drinking-water and to basic sanitation is measured by the proportion of population using an improved sanitation facility. MDGs and WHO / UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation classify households as using an unimproved sanitation facility if they are using otherwise acceptable sanitation facilities but sharing a facility between two or more households or using a public toilet facility.

Table 7.6: Use and sharing of sanitation facilities
Percent distribution of household population by use of private and public sanitation facilities and use of shared facilities, by users of improved and unimproved sanitation facilities, Sudan, 2010

	Users of improved sanitation facilities				Users of unimproved sanitation facilities						
	Not shared [1]	Public facility	Shared by other households (not public)	Missing/DK	Not shared	Public facility	Shared by other households (not public)	Missing/DK	Open defacation (no facility, bush field)	Total	Number of household members
State of residence											
Northern	73.5	1.3	9.3	.0	4.7	.3	4.8	.0	6.1	100.0	1538
River Nile	42.4	.7	10.5	.0	17.6	1.9	6.5	.0	20.4	100.0	3018
Red Sea	24.0	1.3	2.8	.0	9.8	.0	2.3	.0	59.8	100.0	2249
Kassala	22.1	.2	5.4	.0	17.2	.7	7.7	.2	46.4	100.0	5135
Gadarif	28.3	.0	9.8	.1	12.9	.0	4.5	.0	44.4	100.0	3994
Khartoum	51.3	1.1	14.3	1.1	18.2	.7	7.2	.1	5.9	100.0	13494
Gezira	34.4	.4	10.6	.1	11.9	.0	7.1	.0	35.6	100.0	12569
Wite Nile	20.2	.1	8.1	.0	22.0	.0	15.5	.1	34.0	100.0	4391
Sinnar	17.3	.4	5.0	.1	23.5	.4	8.1	.0	45.1	100.0	3474
Blue Nile	5.3	.0	.8	.0	49.5	.1	14.3	.0	30.1	100.0	3018
North Kordofan	20.3	.3	2.1	.0	44.6	1.4	10.4	.2	20.8	100.0	8638
South Kordofan	17.0	.5	8.2	.0	21.0	.2	6.8	.1	46.3	100.0	3816
North Darfur	18.4	.2	4.0	.0	41.2	.2	2.3	.2	33.6	100.0	5352
West Darfur	23.7	.6	6.4	.1	16.4	.5	3.0	.0	49.1	100.0	3615
South Darfur	5.0	.1	2.4	.0	41.0	1.2	11.3	.0	39.0	100.0	10231
Area of residence											
Urban	46.9	.6	12.4	.4	23.4	.5	7.8	.0	8.2	100.0	26714
Rural	17.9	.4	5.0	.1	25.7	.6	8.0	.1	42.2	100.0	57818
Education level of household head											
None	21.2	.4	5.7	.2	24.4	.4	7.0	.1	40.6	100.0	47717
Primary	29.1	.4	8.5	.2	25.1	.9	10.5	.1	25.2	100.0	21474
Secondary +	43.2	.7	11.2	.2	26.0	.6	7.4	.1	10.7	100.0	14753
Missing/DK	24.3	.0	3.5	.0	32.2	.0	7.3	.0	32.7	100.0	587
Wealth index quintile											
Poorest	2.0	.2	.1	.0	23.4	.5	5.8	.0	68.0	100.0	16892
Second	9.0	.3	3.0	.0	32.3	.8	9.2	.2	45.2	100.0	16907
Middle	15.5	.5	7.6	.2	28.4	.6	12.4	.0	34.8	100.0	16909
Fourth	38.8	.8	12.1	.5	28.1	.9	9.9	.0	9.0	100.0	16910
Richest	69.8	.4	13.7	.4	12.6	.2	2.5	.1	.3	100.0	16915
SUDAN (TOTAL)	**27.1**	**.4**	**7.3**	**.2**	**25.0**	**.6**	**7.9**	**.1**	**31.4**	**100.0**	**84532**

[1] MICS indicator 4.3; MDG indicator 7.9

As shown in Table 7.6, overall 27.1 per cent of the users of improved sanitation facilities did not share sanitation facility with others. There was not much difference in the users of a shared sanitation facility between household population using an improved sanitation facility (7.3 per cent) and household population using an unimproved sanitation facility (7.9 per cent). The percentage of users of a shared improved sanitation facility was higher among household population in urban areas (12.4 per cent) than that for users of a shared improved sanitation facility in rural areas (5.0 per cent). There was a significant difference between rural and urban areas in the proportion of users of improved sanitation facilities who used a facility not shared by other households. The proportion of users of improved sanitation facilities who used a facility not shared by other households was 46.9 per cent in urban areas compared to 17.9 per cent in rural areas. There was also a significant difference between household population in the richest and poorest quintiles who used an improved sanitation facility not shared by other households. The proportion of users of improved sanitation facilities not shared by other households was 69.8 per cent among those from households in the richest quintile compared to only 2.0 per cent among those from households in the poorest quintile.

Table 7.6 also shows that about 31.4 per cent of users of unimproved sanitation facility resorted to open defecation. Overall 25.0 per cent of the users of unimproved sanitation facilities did not share sanitation facility with others. There was hardly any difference in the percentage of users of a shared unimproved sanitation facility between household population in urban areas (7.8 per cent) and in rural areas (8.0 per cent). The proportion of users of unimproved sanitation facilities who used a facility not shared by other households was 25.7 per cent in urban areas compared to 23.4 per cent in rural areas. The proportion of household population who resorted to open defecation was 40.6 per cent among those with no education compared to 25.2 per cent among those with primary education and 10.7 per cent among those with secondary or higher level of education. There was a significant difference between household population in the richest and poorest quintiles who practiced open defecation. The proportion of household population who resorted to open defecation was 68.0 per cent among those from households in the poorest quintile compared to only 0.3 per cent among those from households in the richest quintile.

Disposal of child's faeces

Safe disposal of a child's faeces is disposing of the stool, by the child using a toilet or by rinsing the stool into a toilet or latrine. Disposal of faeces of children 0-2 years of age is presented in Table 7.7. Overall, the percentage of children whose stools were disposed of safely was 46.5 per cent. The percentages of children whose stools were disposed of safely using an improved and unimproved sanitation facility in the dwelling were 69.2 per cent and 65.7 per cent respectively. There was significant difference between rural and urban areas in the proportion of children whose stools were disposed of safely. The proportion of children whose stools were disposed of safely was 67.0 per cent in urban areas compared to 38.7 per cent in rural areas. There was also a significant difference between the proportion of children whose stools were disposed of safely among children whose mothers had no education (35.7 per cent) and among children whose mothers had secondary or higher level of education (75.7 per cent). Significant difference between those in households in the richest and poorest quintiles was noticed in terms of the proportion of children whose stools were disposed of safely. The proportion of children whose stools were disposed of safely was 75.7 per cent among those from households in the richest quintile compared to only 26.1 per cent among those from households in the poorest quintile.

Table 7.7: Disposal of child's faeces

Percent distribution of children age 0-2 years according to place of disposal of child's faeces, and the percentage of children age 0-2 years whose stools were disposed of safely the last time the child passed stools, Sudan, 2010

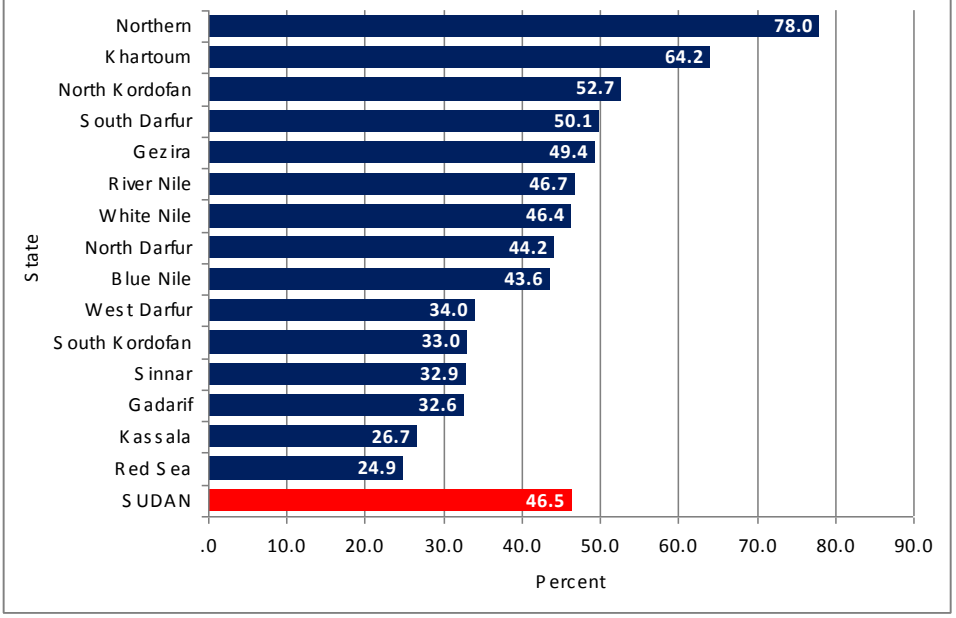
	Place of disposal of child's faeces									Total	Percentage of children whose stools were disposed of safely [1]	Number of children age 0-2 years
	Child used toilet / latrine	Put / Rinsed into toilet or latrine	Put / Rinsed into drain or ditch	Thrown into garbage (solid waste)	Buried	Left in the open	Other	DK	Missing			
Type of sanitation facility in the dwelling												
Improved	9.8	59.4	3.6	15.2	4.7	3.6	1.6	1.3	.8	100.0	69.2	2489
Unimproved	6.4	59.3	2.6	11.3	9.6	7.0	2.1	.8	.9	100.0	65.7	2840
Open defacation	.6	7.7	1.9	19.2	22.5	40.6	5.5	1.2	1.0	100.0	8.3	2915
State of residence												
Northern	19.7	58.3	1.4	9.8	3.4	5.1	.9	1.5	.0	100.0	78.0	106
River Nile	5.0	41.7	3.2	20.2	9.4	19.1	1.1	.3	.0	100.0	46.7	256
Red Sea	4.5	20.5	3.7	30.6	9.7	26.8	2.6	.9	.7	100.0	24.9	175
Kassala	3.7	23.0	1.8	22.0	15.6	31.3	2.0	.4	.0	100.0	26.7	475
Gadarif	.9	31.7	1.9	25.6	16.1	11.6	8.7	2.3	1.2	100.0	32.6	415
Khartoum	13.7	50.5	1.3	25.6	1.9	4.0	1.3	1.2	.6	100.0	64.2	1140
Gezira	1.9	47.5	3.8	18.8	9.1	16.4	1.1	.3	1.0	100.0	49.4	1161
White Nile	4.2	42.2	10.6	7.9	6.6	25.9	1.5	.4	.7	100.0	46.4	433
Sinnar	2.9	30.0	6.6	11.2	18.5	25.3	3.1	2.0	.4	100.0	32.9	323
Blue Nile	.7	42.9	2.2	17.9	7.4	25.6	2.6	.7	.0	100.0	43.6	375
North Kordofan	7.7	45.0	1.1	6.5	18.2	11.0	7.1	1.3	2.1	100.0	52.7	880
South Kordofan	4.8	28.2	2.0	13.0	14.9	28.9	5.1	2.1	1.0	100.0	33.0	438
North Darfur	4.0	40.2	1.6	13.1	22.9	11.5	3.0	2.0	1.6	100.0	44.2	537
West Darfur	2.1	31.9	2.9	1.1	25.5	24.6	8.3	1.4	2.2	100.0	34.0	412
South Darfur	4.6	45.5	1.0	8.5	14.4	23.4	1.4	.7	.5	100.0	50.1	1117
Area of residence												
Urban	11.2	55.8	2.8	17.1	4.0	5.7	1.5	1.2	.7	100.0	67.0	2270
Rural	3.1	35.5	2.6	14.6	15.9	22.5	3.8	1.0	1.0	100.0	38.7	5974
Education level of the household head												
None	4.0	31.7	1.7	15.6	15.8	25.2	3.9	1.2	.9	100.0	35.7	4495
Primary	6.0	49.5	3.7	14.8	10.8	10.9	2.4	.9	.9	100.0	55.6	2564
Secondary	9.2	59.1	4.0	15.8	4.2	4.2	1.8	.9	.8	100.0	68.3	1126
Missing/DK	9.2	42.0	.0	4.7	17.2	20.6	2.8	2.7	.9	100.0	51.2	60
Wealth index quintile												
Poorest	2.0	24.2	1.1	11.3	22.4	32.0	4.9	1.1	1.1	100.0	26.1	1908
Second	2.9	31.3	1.7	14.3	17.3	25.5	4.4	1.5	1.2	100.0	34.2	1792
Middle	4.3	39.6	4.2	18.1	12.0	17.4	2.8	.9	.8	100.0	43.8	1789
Fourth	8.2	57.9	3.4	15.9	5.3	5.5	2.0	1.1	.7	100.0	66.1	1573
Richest	12.4	63.3	3.2	17.8	.7	.7	.6	.8	.5	100.0	75.7	1183
SUDAN (TOTAL)	**5.4**	**41.1**	**2.6**	**15.3**	**12.7**	**17.9**	**3.1**	**1.1**	**.9**	**100.0**	**46.5**	**8245**

[1] SHHS indicator 4.4

Comment [SAM1]: 46.4?

The proportion of children whose stools were disposed of safely varied widely by State, ranging from 24.9 per cent in Red Sea State to 78.0 per cent in Northern State (Figure 7.6.)

Figure 7.6: Disposal of child's faeces
Percentage of children age 0-2 years whose stools were disposed of safely the last time the child passed stools, Sudan, 2010



Drinking water and sanitation ladders

In its 2008 report[4], the JMP developed a new way of presenting the access figures, by disaggregating and refining the data on drinking-water and sanitation and reflecting them in "ladder" format. This ladder allows a disaggregated analysis of trends in a three rung ladder for drinking-water and a four-rung ladder for sanitation. For sanitation, this gives an understanding of the proportion of population with no sanitation facilities at all, of those reliant on technologies defined by JMP as "unimproved," of those sharing sanitation facilities of otherwise acceptable technology, and those using "improved" sanitation facilities.

Table 7.8 presents the percentages of household population by drinking water and sanitation ladders. The table also shows the percentage of household members using improved sources of drinking water and sanitary means of excreta disposal. The SHHS findings indicated that overall, 20.8 per cent of the household population was using both improved drinking water sources and improved sanitation facilities at the time of the survey. The percentage of household population using both improved drinking water sources and improved sanitation facilities was 36.3 per cent in urban areas compared to 13.6 per cent in rural areas.

[4] *WHO/UNICEF JMP (2008), MDG assessment report* - http://www.wssinfo.org/download?id_document=1279

Table 7.8: Drinking water and sanitation ladders
Percentage of household population by drinking water and sanitation ladders, Sudan, 2010

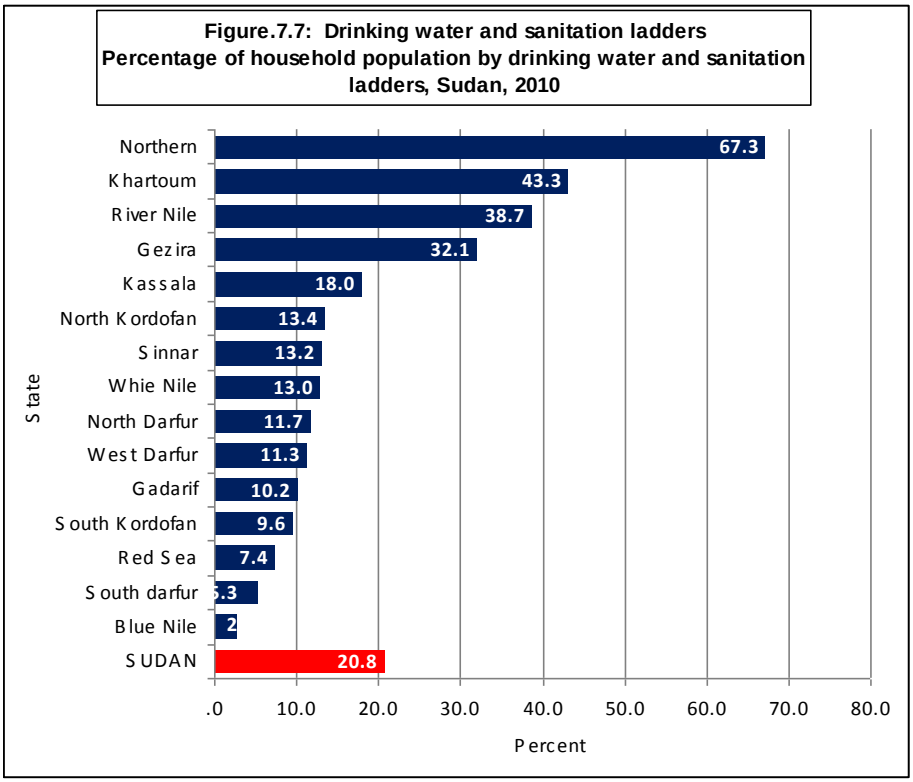
	Percentage of household population using:										Number of households
	Improved drinking water [1]					Unimproved sanitation					
	Piped into dwelling, plot or yard	Other improved	Unimproved drinking water	Total	Improved sanitation [2]	Shared improved facilities	Unimproved facilities	Open defecation	Total	Improved drinking water sources and improved sanitation	
State of residence											
Northern	81.4	9.6	9.0	100.0	73.5	10.6	9.8	6.1	100.0	67.3	1538
River Nile	65.2	12.7	22.0	100.0	42.4	11.2	26.0	20.4	100.0	38.7	3018
Red Sea	7.3	20.1	72.6	100.0	24.0	4.1	12.1	59.8	100.0	7.4	2249
Kassala	28.7	19.4	52.0	100.0	22.1	5.6	25.9	46.4	100.0	18.0	5135
Gadarif	13.2	14.7	72.1	100.0	28.3	9.9	17.4	44.4	100.0	10.2	3994
Khartoum	69.4	3.3	27.3	100.0	51.3	16.5	26.2	5.9	100.0	43.3	13494
Gezira	67.0	12.2	20.8	100.0	34.4	11.1	18.9	35.6	100.0	32.1	12569
Wite Nile	30.4	8.1	61.5	100.0	20.2	8.2	37.6	34.0	100.0	13.0	4391
Sinnar	34.9	25.8	39.3	100.0	17.3	5.5	32.1	45.1	100.0	13.2	3474
Blue Nile	12.2	27.8	60.1	100.0	5.3	.8	63.8	30.1	100.0	2.7	3018
North Kordofan	6.7	47.1	46.2	100.0	20.3	2.4	56.5	20.8	100.0	13.4	8638
South Kordofan	.2	49.5	50.3	100.0	17.0	8.6	28.1	46.3	100.0	9.6	3816
North Darfur	3.4	56.5	40.2	100.0	18.4	4.2	43.9	33.6	100.0	11.7	5352
West Darfur	4.7	39.8	55.5	100.0	23.7	7.1	20.0	49.1	100.0	11.3	3615
South Darfur	8.4	61.0	30.6	100.0	5.0	2.6	53.5	39.0	100.0	3.4	10231
Area of residence											
Urban	59.5	7.2	33.4	100.0	46.9	13.3	31.6	8.2	100.0	36.3	26714
Rural	20.7	37.0	42.3	100.0	17.9	5.5	34.4	42.2	100.0	13.6	57818
Education level of household head											
None	23.9	31.8	44.2	100.0	21.2	6.3	31.9	40.6	100.0	15.5	47717
Primary	37.4	25.5	37.1	100.0	29.1	9.1	36.6	25.2	100.0	22.7	21474
Secondary +	56.3	16.4	27.3	100.0	43.2	12.1	34.0	10.7	100.0	35.3	14753
Missing/DK	22.6	35.4	42.1	100.0	24.3	3.5	39.5	32.7	100.0	17.1	587
Wealth index quintile											
Poorest	.0	61.5	38.5	100.0	2.0	.3	29.7	68.0	100.0	1.7	16892
Second	1.2	42.3	56.5	100.0	9.0	3.3	42.4	45.2	100.0	4.9	16907
Middle	17.2	24.6	58.1	100.0	15.5	8.3	41.4	34.8	100.0	7.2	16909
Fourth	54.9	8.1	37.0	100.0	38.8	13.5	38.8	9.0	100.0	25.6	16910
Richest	91.5	1.2	7.2	100.0	69.8	14.5	15.4	.3	100.0	64.6	16915
SUDAN (TOTAL)	**33.0**	**27.5**	**39.5**	**100.0**	**27.1**	**8.0**	**33.5**	**31.4**	**100.0**	**20.8**	**84532**

[1] MICS indicator 4.1; MDG indicator 7.8;
[2] MICS indicator 4.3; MDG indicator 7.9

The percentage of household population using both improved drinking water sources and improved sanitation facilities showed an increasing trend with the educational level of the household head. The percentage of household population using both improved drinking water sources and improved sanitation facilities was only 15.5 per cent in the case of households which had household head with no education compared to 22.7 per cent in the case of households which had head of households with primary education and 35.3 per cent in the case of households which had household head with secondary or higher level of education. The percentage of household population using both improved drinking water sources and improved sanitation facilities varied significantly with increase in household wealth. The percentage of household population using both improved drinking water sources and improved sanitation facilities was only 1.7 per cent in the case of the poorest households compared to 64.6 per cent in the case of the richest households.

The percentage of household population using both improved drinking water sources and improved sanitation facilities varied widely by State, ranging from 1.7 per cent in South Darfur to 67.3 per cent in Northern State. (Table 7.8 and Figure 7.7)

Figure.7.7: Drinking water and sanitation ladders
Percentage of household population by drinking water and sanitation ladders, Sudan, 2010



VIII. Reproductive Health

The SHHS2 included some key indicators required to assess situation of reproductive health (RH) services that contribute to reproductive health and wellbeing of people by preventing and solving RH problems. The key topics covered by the SHHS2 included early child bearing, contraceptive prevalence rate, unmet need for family planning, antenatal care, content of antenatal care, assistance at delivery, place of delivery, maternal mortality. The key SHHS2 indicators include the following:

Early childbearing

Sexual activity and childbearing early in life carry significant risks for young people all around the world. Table 8.1 presents some early childbearing indicators for women age 15-19 years and 20-24 years while Table 8.2 presents the trends for early childbearing. The SHHS2 data indicated that 13.4 per cent of women age 15-19 years have already had a birth, 2.9 per cent were pregnant with their first child, 16.3 per cent have begun childbearing and 1.2 per cent has had a live birth before age 15. The SHHS findings also indicated that 14.0 per cent of women aged 20-24 have had a live birth before age 18.

Table 8.1: Early childbearing
Percentage of women age 15-19 years who have had a live birth or who are pregnant with the first child, percentage of women age 15-19 years who have begun childbearing before age 15, and the percentage of women age 20-24 years who have had a live birth before age 18, Sudan, 2010

	Number of women age 15-19						
	Have had a live birth	Are pregnant with first child	Have begun childbearing	Have had a live birth before age 15	Number of women age 15-19	Percentage of women age 20-24 who have had a live birth before age 18 [1]	Number of women age 20-24
State of residence							
Northern	6.4	1.5	7.9	.0	63	2.7	55
River Nile	13.5	3.1	16.5	.2	117	7.8	124
Red Sea	8.5	3.5	12.0	.9	78	10.2	85
Kassala	12.0	1.9	14.0	1.2	181	13.6	186
Gadarif	18.2	2.8	21.0	1.0	176	18.3	157
Khartoum	7.7	1.8	9.5	.0	613	10.1	596
Gezira	9.8	3.4	13.2	1.2	612	9.0	573
Wite Nile	14.8	3.5	18.2	.8	190	16.6	175
Sinnar	11.0	4.2	15.2	.8	138	14.2	155
Blue Nile	23.7	4.0	27.7	4.6	118	26.9	110
North Kordofan	15.4	1.7	17.1	.6	363	16.3	362
South Kordofan	15.0	3.8	18.8	1.8	152	17.9	136
North Darfur	13.5	2.1	15.6	2.0	184	19.0	162
West Darfur	20.8	9.3	30.1	1.8	129	16.3	135
South Darfur	19.5	2.8	22.2	2.4	447	20.4	310
Area of residence							
Urban	8.9	2.0	10.9	.6	1240	9.6	1153
Rural	15.8	3.4	19.2	1.5	2319	16.3	2169
Education level							
None	28.4	4.5	32.8	3.4	712	22.8	904
Primary	14.0	2.9	17.0	.9	1411	19.0	1091
Secondary +	3.6	1.7	5.3	.0	1315	2.7	1192
Adult education/Khalwa/Sunday education	23.1	7.9	31.0	3.6	120	15.3	134
Wealth index quintile							
Poorest	20.3	1.6	21.9	3.2	558	23.6	489
Second	18.2	5.0	23.2	1.4	661	18.7	626
Middle	17.5	4.3	21.8	1.3	739	17.1	711
Fourth	10.0	2.1	12.1	.7	778	11.8	767
Richest	4.2	1.7	6.0	.0	822	2.9	729
SUDAN (TOTAL)	**13.4**	**2.9**	**16.3**	**1.2**	**3559**	**14.0**	**3321**

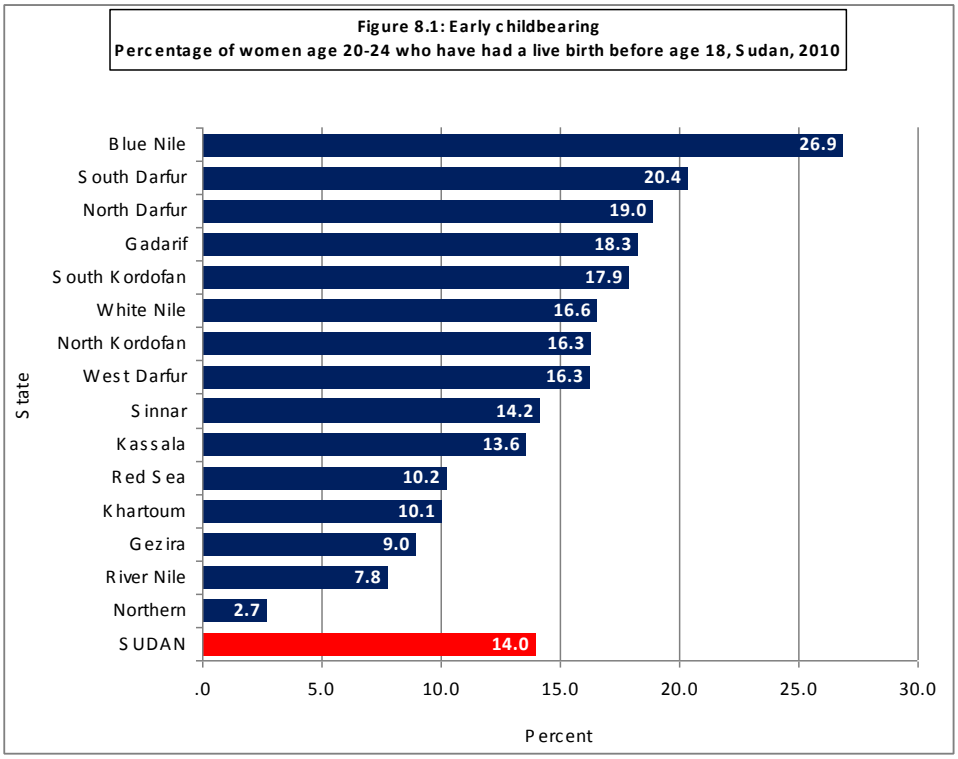
[1] SHHS indicator 5.1

There were some differences in percentage of women age 20-24 years in urban and rural areas who have had a live birth before age 18. The percentage of women age 20-24 years who have had a live birth before age 18 was 9.6 per cent in urban areas compared to 16.3 per cent in rural areas. The level of education of the woman appears to have an influence on the likelihood of a live birth before age 18. For instance, the percentage of women age 20-24 years who have had a live birth before age18 was only 2.7 per cent for women with secondary or higher level of education, compared to 19.0 per cent for women with primary education and 22.8 per cent for women with no education.

The level of household wealth also appears to have an influence on the likelihood of a live birth before age 18. The percentage of women age 20-24 years who have had a live birth before age 18 was only 2.9 per cent for those from households in the richest quintile compared to 23.6 per cent for those belonging to households in the richest lowest quintile.

The percentage of women (age 20-24 years) who have had a live birth before age 18 varied significantly by State. The percentage of women (age 20-24 years) who have had a live birth before age 18 ranged from 2.7 per cent in Northern State to 26.9 per cent in Blue Nile State (Figure 8.1).

Figure 8.1: Early childbearing
Percentage of women age 20-24 who have had a live birth before age 18, Sudan, 2010



Trends in early childbearing

Table 8.2 provides information relating to the trends in early childbearing. It indicates the percentage of women who have had a live birth by age 15 and 18, by age groups.

Percentage of women with a live birth before age 15 years: The SHHS2 findings indicated that about 1.2 per cent of women have had a live birth before age 15. There were only marginal differences in percentage of women in urban and rural areas who have had a live birth by age 15. The percentage

of women who have had a live birth before age 15 was 0.6 per cent in urban areas compared to 1.5 per cent in rural areas. The percentage of women who have had a live birth before age 15 was highest (2.1 per cent) among women age 35-39 years and the lowest (1.2 per cent) among women age 15-19 years. The percentage of women in urban areas who have had a live birth before age 15 was highest (2.7 per cent) among women age 30-34 years and the lowest (0.6 per cent) among women age 15-19 years. The percentage of women in rural areas who have had a live birth before age 15 was highest (2.2 per cent) among women aged 35-39 years and the lowest (1.4 per cent) among women aged 45-49 years

Percentage of women with a live birth before age 18 years: The SHHS2 findings indicated that about 14.0 per cent of women have had a live birth before age 18. There were some differences in percentage of women in urban and rural areas who have had a live birth by age 18. The percentage of women who have had a live birth before age 18 was 9.6 per cent in urban areas compared to 16.3 per cent in rural areas. The percentage of women who have had a live birth before age 18 was highest (14.0 per cent) among women age 20-24 years and the lowest (8.3 per cent) among women age 45-49 years. The percentage of women in urban areas who have had a live birth before age 18 was highest (14.3 per cent) among women age 30-34 years and the lowest (9.6 per cent) among women age 20-24 years. The percentage of women in rural areas who have had a live birth before age 18 was highest (16.3 per cent) among women aged 20-24 years and the lowest (6.6 per cent) among women aged 45-49 years.

Table 8.2: Trends in early childbearing
Percentage of women who have had a live birth by age 15 and 18, by age groups, Sudan, 2010

	Urban				Rural				All			
Age	Percentage of women with a live birth before age 15	Number of women	Percentage of women with a live birth before age 18	Number of women	Percentage of women with a live birth before age 15	Number of women	Percentage of women with a live birth before age 18	Number of women	Percentage of women with a live birth before age 15	Number of women	Percentage of women with a live birth before age 18	Number of women
15-19	.6	1240	.	0	1.5	2319	.	0	1.2	3559	.	0
20-24	.8	1153	9.6	1153	2.0	2169	16.3	2169	1.6	3321	14.0	3321
25-29	1.5	991	9.4	991	2.1	2185	12.5	2185	1.9	3176	11.5	3176
30-34	2.7	748	14.3	748	1.7	1391	10.8	1391	2.0	2139	12.0	2139
35-39	1.9	811	9.8	811	2.2	1635	11.0	1635	2.1	2446	10.6	2446
40-44	2.9	526	13.4	526	1.5	940	9.9	940	2.0	1466	11.2	1466
45-49	1.4	373	11.3	373	1.4	693	6.6	693	1.4	1067	8.3	1067
Total	1.5	5842	10.9	4602	1.8	11332	12.2	9013	1.7	17174	11.7	13615

Contraception

Appropriate family planning is important to the health of women and children by: (i) preventing pregnancies that are too early or too late; (ii) extending the period between births; and (iii) limiting the number of children. Access by all couples to information and services to prevent pregnancies that are too early, too closely spaced, too late or too many is critical.

Table 8.3 provides information on the use of contraception. It indicates the percentage of women age 15-49 years currently married who are using (or whose partner is using) a contraceptive method. Current use of contraception was reported by 9.0 per cent of women currently married. The most popular method is the pill which is used by 6.3 per cent of married women in Sudan. The next most popular method was the use of injectables, which accounted for 0.9 per cent of married women. About 0.5 per cent of women reported use of the IUD. The other methods used include female sterilisation (0.3 per cent), Lactational Amenorrhoea Method (LAM) (0.3 per cent) and periodic abstinence/rhythm (0.3 per cent). Only 0.1 per cent reported the use of male condom. In all about 8.1 per cent of women reported the use of any modern method while about 0.9 per cent reported the use of any traditional method.

There was some differences in percentage of women age 15-49 years in urban and rural areas currently married who were using (or whose partner was using) a method of contraception**.** About 17.4 per cent of women in urban areas reported the use of a contraceptive method (any method) compared to only 5.4 per cent of women in rural areas. Adolescents are far less likely to use contraception than older women. Only about 4.8 per cent of married women aged15-19 currently use a method of contraception compared to 9.2 per cent of 25-29 year olds and 11.4 per cent of 40-44 year old women.

Women's education level was found to be associated with contraceptive prevalence. For instance, the percentage of women age 15-49 years currently married and who were using (or whose partner was using) any method of contraception was only 2.4 per cent for women with no education compared to 11.6 per cent among women with primary education and 21.4 per cent among women with secondary or higher level of education. In addition to differences in contraceptive prevalence, the method mix varies by education. The percentage of women who were using (or whose partner was using) any modern method of contraception was only 2.4 per cent for women with no education compared to 10.4 per cent among women with primary education and 19.5 per cent among women with secondary or higher level of education. About 1.8 per cent of contraceptive users with no education used the pill while 14.5 per cent of contraceptive users with secondary or higher level of education used the pill.

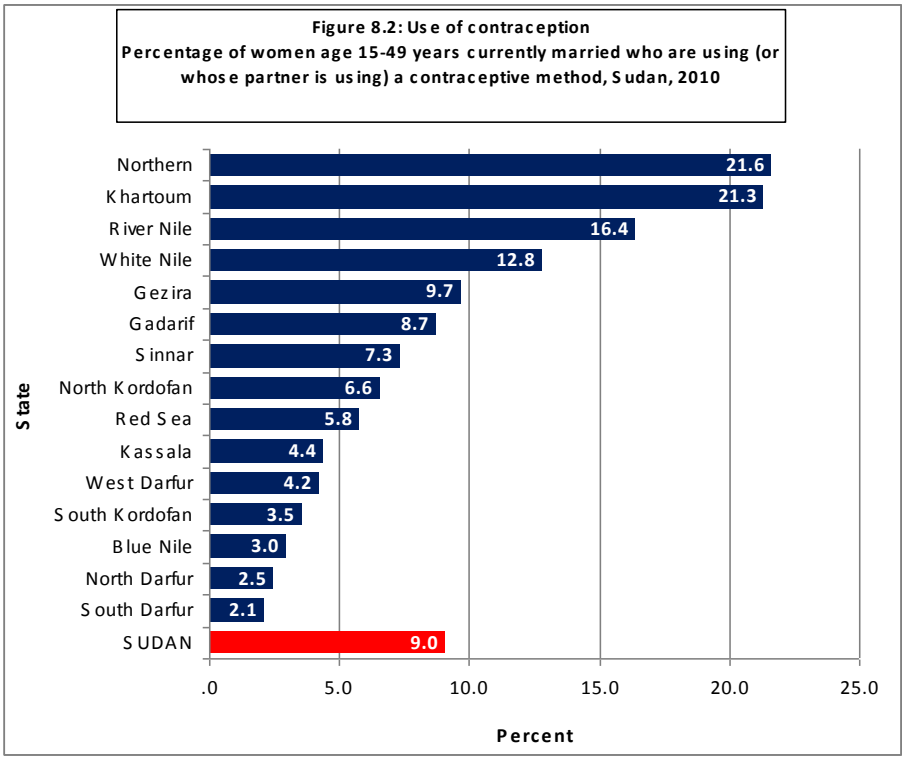
The household wealth also appears to have an influence on the likelihood of the use of a contraceptive method. The percentage of women age 15-49 years currently married and who were using (or whose partner was using) a method of contraception was only 1.4 per cent among women belonging to households in the poorest households compared to 23.5 per cent for those belonging to households in the richest households. In addition to differences in contraceptive prevalence, the method mix varies by the household wealth. The percentage of women who were using (or whose partner was using) any modern method of contraception was only 1.2 per cent among women belonging to households in the poorest quintile compared to 21.8 per cent among women from households in the richest quintile. About 1.0 per cent of contraceptive users from households in the poorest quintile used the pill while 16.7 per cent of contraceptive users from households in the richest quintile used the pill.

Table 8.3: Use of contraception

Percentage of women age 15-49 years currently married who are using (or whose partner is using) a contraceptive method, Sudan, 2010

State/other background characteristics	Percent of women (currently married or in union) who are using:														Any modern method	Any traditional method	Any method [1]	Number of women currently married or in union
	Not using any method	Female sterilization	Male sterilization	*IUD*	Injectables	Implants	Pill	Male condom	Female condom	Diaphragm/ foam/jelly	Lactational amenorrhoea method (LAM)	Periodic abstinence/ Rhythm	Withdrawal	Other				
Northern	78.4	.6	.0	1.7	1.4	.0	14.2	.0	.0	.1	1.1	2.2	.2	.0	18.1	3.5	21.6	208
River Nile	83.6	.8	.0	.9	2.1	.0	11.8	.0	.0	.0	.6	.0	.1	.2	15.6	.8	16.4	386
Red Sea	94.2	.1	.0	.3	1.4	.0	3.8	.0	.0	.0	.2	.0	.0	.0	5.6	.2	5.8	331
Kassala	95.6	.2	.0	.1	.6	.0	2.9	.1	.0	.0	.3	.1	.0	.0	4.0	.4	4.4	684
Gadarif	91.3	.6	.0	1.0	1.1	.1	4.0	.0	.0	.0	1.2	.5	.0	.3	6.7	2.0	8.7	530
Khartoum	78.7	.8	.0	2.1	1.6	.1	14.4	.4	.0	.0	.6	.8	.1	.3	19.5	1.8	21.3	1718
Gezira	90.3	.2	.0	.1	.9	.0	7.9	.0	.0	.0	.2	.4	.0	.1	9.0	.6	9.7	1574
W. Nile	87.2	.1	.0	.0	1.6	.0	10.9	.0	.0	.0	.1	.1	.0	.0	12.6	.2	12.8	569
Sinnar	92.7	.2	.0	.0	1.3	.0	4.8	.0	.0	.0	.9	.2	.0	.0	6.3	1.1	7.3	418
Blue Nile	97.0	.1	.0	.2	.5	.0	1.7	.0	.0	.0	.1	.1	.0	.2	2.5	.5	3.0	425
N. Kordofan	93.4	.4	.0	.0	.4	.0	4.3	.0	.0	.0	.1	.5	.0	.9	5.1	1.5	6.6	1106
S. Kordofan	96.5	.3	.0	.1	.4	.0	2.3	.0	.0	.0	.2	.1	.0	.1	3.1	.4	3.5	511
N. Darfur	97.5	.0	.0	.0	.1	.0	1.6	.0	.0	.0	.5	.0	.0	.2	1.8	.7	2.5	669
W. Darfur	95.8	.0	.0	.0	.4	.0	3.6	.0	.0	.0	.0	.0	.0	.2	4.0	.2	4.2	513
S. Darfur	97.9	.1	.0	.0	.4	.0	1.3	.0	.0	.0	.0	.0	.0	.2	1.9	.2	2.1	1364
Area of residence																		
Urban	82.6	.6	.0	1.3	1.5	.1	12.1	.2	.0	.0	.4	.6	.1	.4	15.9	1.5	17.4	3351
Rural	94.6	.2	.0	.1	.6	.0	3.8	.0	.0	.0	.3	.2	.0	.1	4.7	.7	5.4	7654
Age group																		
15-19	95.2	.0	.0	.0	.5	.1	3.6	.0	.0	.0	.3	.0	.0	.4	4.1	.7	4.8	838
20-24	92.4	.0	.0	.2	.8	.1	6.0	.0	.0	.0	.4	.0	.0	.1	7.1	.5	7.6	1844
25-29	90.8	.0	.0	.3	.6	.0	7.1	.1	.0	.0	.3	.5	.0	.2	8.2	1.0	9.2	2414
30-34	89.7	.3	.0	.3	1.1	.0	7.4	.0	.0	.0	.5	.4	.0	.3	9.1	1.2	10.3	1739
35-39	89.2	.5	.0	.4	1.2	.0	7.4	.1	.0	.0	.5	.3	.1	.3	9.6	1.3	10.8	2054
40-44	88.6	.8	.0	1.3	1.7	.0	6.2	.3	.0	.0	.1	.7	.0	.2	10.4	1.0	11.4	1240
45-49	94.1	1.0	.0	1.2	.4	.0	3.0	.0	.0	.0	.1	.2	.0	.1	5.5	.4	5.9	878
0	99.4	.0	.0	.0	.0	.0	.3	.0	.0	.0	.0	.0	.0	.3	.3	.3	.6	1169
1	91.2	.0	.0	.1	.5	.2	7.3	.0	.0	.0	.3	.3	.0	.3	7.9	.9	8.8	1531
2	89.3	.1	.0	.4	.9	.0	7.9	.1	.0	.0	.6	.6	.1	.0	9.4	1.3	10.7	1691
3	88.7	.5	.0	.6	1.3	.0	7.9	.2	.0	.0	.3	.3	.0	.2	10.6	.8	11.3	1513
4+	90.2	.5	.0	.7	1.1	.0	6.4	.1	.0	.0	.4	.3	.0	.3	8.8	1.0	9.8	5103
Education level of women																		
None	97.2	.1	.0	.1	.4	.1	1.8	.0	.0	.0	.2	.1	.0	.1	2.4	.4	2.8	4870
Primary	88.4	.5	.0	.2	1.0	.0	8.6	.1	.0	.0	.5	.3	.1	.3	10.4	1.1	11.6	3569
Secondary	78.6	.6	.0	2.2	1.9	.0	14.5	.2	.0	.0	.5	.8	.0	.5	19.5	1.9	21.4	2016
Wealth index quintile																		
Poorest	98.6	.1	.0	.0	.2	.0	1.0	.0	.0	.0	.0	.0	.0	.2	1.2	.2	1.4	2252
Second	97.9	.0	.0	.0	.5	.0	1.0	.0	.0	.0	.3	.1	.0	.1	1.6	.5	2.1	2296
Middle	94.1	.2	.0	.0	.6	.0	4.3	.0	.0	.0	.3	.4	.0	.2	5.1	.8	5.9	2269
Fourth	86.1	.6	.0	.4	1.5	.1	9.8	.0	.0	.0	.7	.4	.0	.4	12.4	1.5	13.9	2114
Richest	76.5	.8	.0	2.1	1.8	.0	16.7	.4	.0	.0	.4	.7	.1	.4	21.8	1.6	23.5	2075
SUDAN	**91.0**	**.3**	**.0**	**.5**	**.9**	**.0**	**6.3**	**.1**	**.0**	**.0**	**.3**	**.3**	**.0**	**.2**	**8.1**	**.9**	**9.0**	**11006**

Contraceptive prevalence was highest in Northern State at 21.6 per cent followed by Khartoum State at 21.3 per cent and lowest in South Darfur State at 2.1 per cent.



Unmet Need for Contraception

Unmet need for contraception refers to fecund women who are not using any method of contraception, but who wish to postpone the next birth (spacing) or who wish to stop childbearing altogether (limiting). Unmet need is identified in SHH2 by using a set of questions eliciting current behaviours and preferences pertaining to contraceptive use, fecundity, and fertility preferences.

Table 8.4 shows the results of the survey on contraception, unmet need, and the demand for contraception satisfied.

Unmet need for spacing is defined as percentage of women who are not using a method of contraception AND

- are not pregnant and not postpartum amenorrheic[5] and are fecund[6] and say they want to wait two or more years for their next birth OR

[5] A women is postpartum amenorrheic if she had a birth in last two years and is not currently pregnant, and her menstrual period has not returned since the birth of the last child

[6] A women is considered infecund if she is neither pregnant nor postpartum amenorrheic, and
(1a) has not had menstruation for at least six months, or (1b) never menstruated, or (1c) her last menstruation occurred before her last birth, or (1d) in menopause/has had hysterectomy OR
(2) She declares that she has had hysterectomy, or that she has never menstruated or that she is menopausal, or that she has been trying to get pregnant for 2 or more years without result in response to questions on why she thinks she is not physically able to get pregnant at the time of survey OR
(3) She declares she cannot get pregnant when asked about desire for future birth OR
(4) She has not had a birth in the preceding 5 years, is currently not using contraception and is currently married and was continuously married during the last 5 years preceding the survey

- are not pregnant and not postpartum amenorrheic and are fecund and unsure whether they want another child OR
- are pregnant and say that pregnancy was mistimed: would have wanted to wait OR
- are postpartum amenorrheic and say that the birth was mistimed: would have wanted to wait

Unmet need for limiting is defined as percentage of women who are not using a method of contraception AND

- are not pregnant and not postpartum amenorrheic and are fecund and say they do not want any more children OR
- are pregnant and say they didn't want to have a child OR
- are postpartum amenorrheic and say that they didn't want the birth

Total unmet need for contraception is simply the sum of unmet need for spacing and unmet need for limiting.

Table 8.4 shows the unmet need for contraception. It indicates the percentage of women age 15-49 years (currently married) with an unmet need for family planning and percentage of demand for contraception satisfied.

Table 8.4: Unmet need for contraception
Percentage of women aged 15-49 years currently married with an unmet need for family planning and percentage of demand for contraception satisfied, Sudan, 2010

	Met need for contraception - For spacing	Met need for contraception - For limiting	Met need for contraception - Total	Unmet need for contraception - For spacing	Unmet need for contraception - For limiting	Unmet need for contraception - Total [1]	Number of women currently married	Percentage of demand for contraception satisfied	Number of women currently married with need for contraception
State of residence									
Northern	12.4	9.3	21.7	14.8	12.1	26.9	208	44.7	101
River Nile	11.4	5.3	16.8	22.0	10.2	32.2	386	34.2	189
Red Sea	4.9	2.3	7.2	18.7	5.5	24.2	331	22.8	104
Kassala	2.1	2.4	4.5	15.1	8.5	23.6	684	16.1	192
Gadarif	5.9	3.5	9.4	19.1	8.5	27.6	530	25.4	196
Khartoum	14.1	8.3	22.5	16.7	12.8	29.4	1718	43.3	892
Gezira	6.9	3.0	9.9	17.1	11.8	28.9	1574	25.6	611
White Nile	9.7	3.5	13.1	18.6	9.2	27.8	569	32.1	233
Sinnar	5.0	2.7	7.6	20.9	8.0	28.9	418	20.9	153
Blue Nile	2.2	.9	3.1	16.0	7.4	23.4	425	11.7	112
N. Kordofan	6.6	2.0	8.6	21.3	12.3	33.7	1106	20.4	468
S. Kordofan	5.4	1.4	6.8	21.2	7.9	29.1	511	18.9	183
North Darfur	2.8	.7	3.5	18.5	9.1	27.6	669	11.2	208
West Darfur	4.1	1.2	5.3	10.9	4.5	15.4	513	25.5	106
South Darfur	2.7	.8	3.6	22.3	13.4	35.6	1364	9.5	537
Area of residence									
Urban	12.7	6.3	19.0	17.5	11.9	29.3	3351	39.4	1621
Rural	4.2	1.9	6.1	18.8	9.8	28.7	7654	17.6	2665
Age									
15-19	5.7	.3	6.0	17.5	1.9	19.3	838	23.6	212
20-24	7.9	.6	8.4	24.5	2.3	26.8	1844	24.0	649
25-29	8.5	1.5	10.0	23.4	3.2	26.6	2414	27.4	886
30-34	8.2	2.9	11.1	19.9	7.2	27.1	1739	29.0	664
35-39	6.9	5.3	12.1	17.2	14.4	31.6	2054	27.7	899
40-44	4.4	8.3	12.6	9.7	28.4	38.1	1240	24.9	629
45-49	1.5	5.5	7.0	4.9	27.6	32.5	878	17.7	347
Education level									
None	2.3	1.4	3.8	17.0	11.1	28.1	4870	12.0	1553
Primary	8.3	4.2	12.5	21.0	10.7	31.8	3569	28.3	1582
Secondary +	16.1	6.4	22.5	18.2	8.5	26.7	2016	45.7	992
Adult education/ Khalwa/Sunday eductation	2.4	1.5	3.9	15.1	10.0	25.2	550	13.5	160
Wealth index quintile									
Poorest	1.5	.5	2.0	19.1	10.0	29.1	2252	6.6	701
Second	2.4	.9	3.3	18.1	9.5	27.6	2296	10.5	708
Middle	5.5	1.7	7.2	20.4	9.0	29.4	2269	19.7	830
Fourth	10.4	4.7	15.1	19.5	10.0	29.6	2114	33.8	944
Richest	15.3	9.0	24.3	14.8	14.0	28.8	2075	45.7	1103
SUDAN	**6.8**	**3.3**	**10.0**	**18.4**	**10.5**	**28.9**	**11006**	**25.9**	**4286**

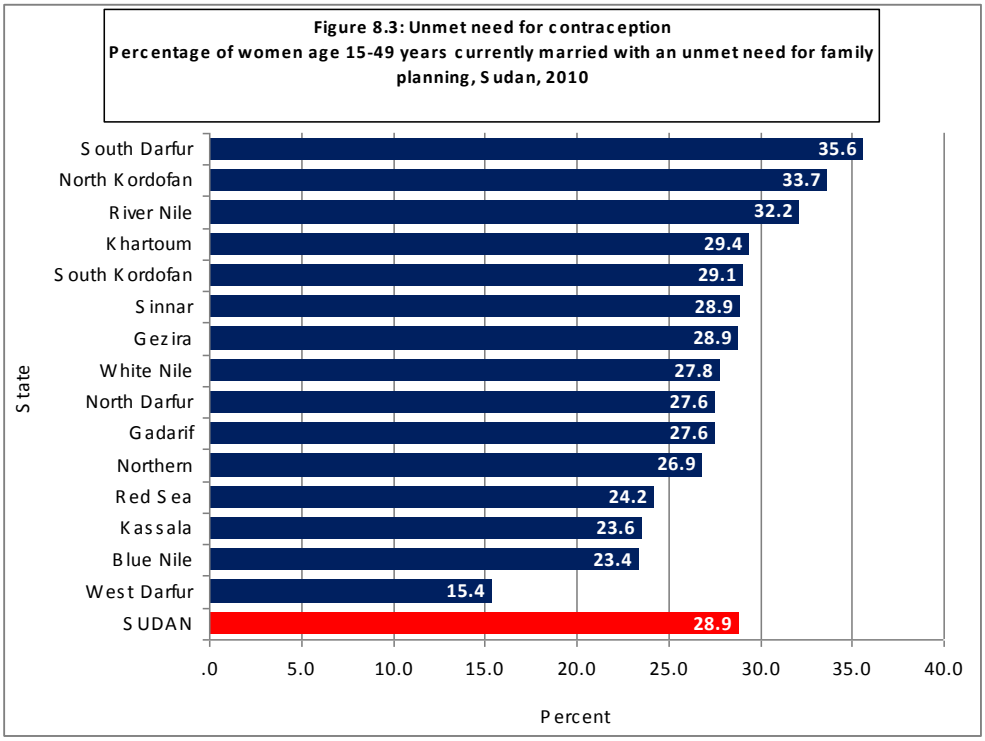
[1] MICS indicator 5.4; MDG indicator 5.6

The SHHS2 findings indicated that the percentage of women age 15 - 49 years (currently married) with unmet need for contraception for spacing and limiting were 18.4 per cent and 10.5 per cent respectively. The unmet need for contraception varied marginally by urban/rural areas. The unmet need for contraception for spacing was 17.5 per cent in the case of women in urban areas compared to 18.8 per cent for women in rural areas. The unmet need for contraception for limiting was 11.9 per cent in the case of women in urban areas compared to 9.8 per cent for women in rural areas.

The unmet need for contraception for spacing was highest (22.3 per cent) among women in South Darfur State and lowest (10.9 per cent) among women in West Darfur State while the unmet need for contraception for limiting was highest in South Darfur State at 13.4 per cent and the lowest in West Darfur State at 4.5 per cent.

The SHHS2 findings indicated that the 28.9.per cent of women age 15 - 49 years (currently married) have an unmet need for contraception for family planning
The unmet need for contraception varied marginally by urban/rural areas, by educational level of women and by household wealth. The unmet need for contraception was 29.3 per cent in the case of women in urban areas compared to 28.7 per cent for women in rural areas, The unmet need for contraception was 28.1 per cent in the case of women with no education compared to 31.8 per cent for women with primary education, and 26.7 per cent for women with secondary or higher level of education. The unmet need was 29.1 per cent among women belonging to households in the poorest quintile compared to 28.8 per cent among women from households in the richest quintile. The unmet need for contraception was highest (38.1 per cent) among women age 40-44 years and lowest (19.3 per cent) among women age 15-19 years.

The unmet need for contraception was highest in South Darfur State at 35.6 per cent and the lowest in West Darfur State at 15.4 per cent. (Figure 8.3)



Met need for contraception

Table 8.4 also shows the met need for contraception for spacing as well as met need for contraception for limiting. Met need for limiting includes women who are using a contraceptive method and who want no more children, are using male or female sterilization or declare themselves as infecund. Met need for spacing includes women who are using a contraceptive method and who want to have another child or undecided whether to have another child. The total of met need for spacing and limiting add up to the total met need for contraception.

The SHHS2 findings indicated that the percentage of women age 15 - 49 years (currently married) with met need for contraception for spacing and limiting were 6.8 per cent and 3.3 per cent respectively. The met need for contraception varied marginally by urban/rural areas, by educational level of women and by the level of household wealth. The met need for contraception for spacing was 12.7 per cent in the case of women in urban areas compared to 4.2 per cent for women in rural areas. The met need for contraception for limiting was 6.3 per cent in the case of women in urban areas compared to 1.9 per cent for women in rural areas.

The met need for contraception for spacing was only 2.3 per cent in the case of women with no education compared to 8.3 per cent for women with primary education, and 16.1 per cent for women with secondary or higher level of education. The met need for contraception for limiting was only 1.4 per cent in the case of women with no education compared to 4.2 per cent for women with primary education, and 6.4 per cent for women with secondary or higher level of education. The met need for contraception for spacing was 1.5 per cent among women belonging to households in the poorest quintile compared to 15.3 per cent among women from households in the richest quintile. The met need for contraception for limiting was 0.5 per cent among women belonging to household in the poorest quintile compared to 9.0 per cent among women from households in the richest quintile. The met need for contraception for spacing was highest (8.5 per cent) among women age 25-29 years and lowest (1.5 per cent) among women age 45-49 years while the met need for contraception for limiting was highest (8.3 per cent) among women age 40-44 years and lowest (0.3 per cent) among women age 15-19 years.

The met need for contraception for spacing was highest (14.1 per cent) among women in Khartoum State and lowest (2.1 per cent) among women in Kassala State. The met need for contraception for limiting was highest in Northern State at 9.3 per cent and the lowest in North Darfur State at 0.7 per cent.

Demand for contraception

Using information on contraception and unmet need, the percentage of demand for contraception satisfied was also estimated from the SHHS2 data. Percentage of demand satisfied is defined as the proportion of women currently married or in a marital union who are currently using contraception, of the total demand for contraception. The total demand for contraception includes women who currently have an unmet need (for spacing or limiting), plus those who are currently using contraception.

The SHHS2 findings indicated that the percentage of demand for contraception satisfied was 25.9 per cent. The percentage of demand for contraception satisfied varied significantly by urban/rural areas, by educational level of women and by the economic status of the households. The percentage of demand for contraception satisfied was 39.4 per cent in the case of women in urban areas compared to 17.6 per cent for women in rural areas.

The percentage of demand for contraception satisfied was only 12.0 per cent in the case of women with no education compared to 28.3 per cent for women with primary education, and 45.3 per cent for women with secondary or higher level of education. The percentage of demand for contraception satisfied was only 6.6 per cent among women belonging to households in the poorest quintile compared to 45.7 per cent among women from households in the richest quintile.

The percentage of demand for contraception satisfied was highest (22.3 per cent) among women in Northern State and the lowest (9.5 per cent) among women in South Darfur State.

Antenatal Care

The antenatal period presents important opportunities for reaching pregnant women with a number of interventions that may be vital to their health and well-being and that of their infants. Better understanding of foetal growth and development and its relationship to the mother's health has resulted in increased attention to the potential of antenatal care as an intervention to improve both maternal and newborn health. For example, if the antenatal period is used to inform women and families about the danger signs and symptoms and about the risks of labour and delivery, it may provide the route for ensuring that pregnant women do, in practice, deliver with the assistance of a skilled health care provider. The antenatal period also provides an opportunity to supply information on birth spacing, which is recognized as an important factor in improving infant survival. Tetanus immunization during pregnancy can be life-saving for both the mother and infant. The prevention and treatment of malaria among pregnant women, management of anaemia during pregnancy and treatment of STIs can significantly improve foetal outcomes and improve maternal health. Adverse outcomes such as low birth weight can be reduced through a combination of interventions to improve women's nutritional status and prevent infections (e.g., malaria and STIs) during pregnancy. More recently, the potential of the antenatal period as an entry point for HIV prevention and care, in particular for the prevention of HIV transmission from mother to child, has led to renewed interest in access to and use of antenatal services.

WHO recommends a minimum of four antenatal visits based on a review of the effectiveness of different models of antenatal care. The WHO guidelines are specific on the content on antenatal care visits, which include: (i) Blood pressure measurement; (ii) Urine testing for bacteriuria and proteinuria; (iii) Blood testing to detect syphilis and severe anemia; and (iv) Weight/height measurement.

Antenatal care providers

Table 8.5: provides details of the antenatal care provider, i.e. the type of personnel providing antenatal care. It indicates the percent distribution of women aged 15-49 who gave birth in the two years preceding the survey by type of personnel providing antenatal care. The findings of the SHHS indicated that 74.3 per cent of women aged 15-49 years who gave birth in the two years preceding the SHHS2 received antenatal care (ANC) at least once by skilled personnel; Doctor, Nurse Midwife, Midwife and Health Visitor.

The percentage of women who received ANC was found to be influenced by the women's education level and the level of household wealth: only 63.3 per cent of women with no formal education received ANC at least once by skilled personnel, while 81.9 per cent of women with primary education and 91.5 per cent of women with secondary or higher level of education received ANC at least once by skilled personnel. The percentage of women who received no ANC was only 8.7 in the case of women with secondary or higher education compared to 34.4 for women with no education. The percentage of women who received ANC was higher among women from households in the richest quintile than those from households in the poorest quintile, being only 62.7 per cent among women from households in the poorest quintile compared to 91.7 per cent among women from households in the richest quintile. The percentage of women who received no ANC was only 8.0 in the case of women from households in the richest quintile compared to 34.9 among women from households in the poorest quintile.

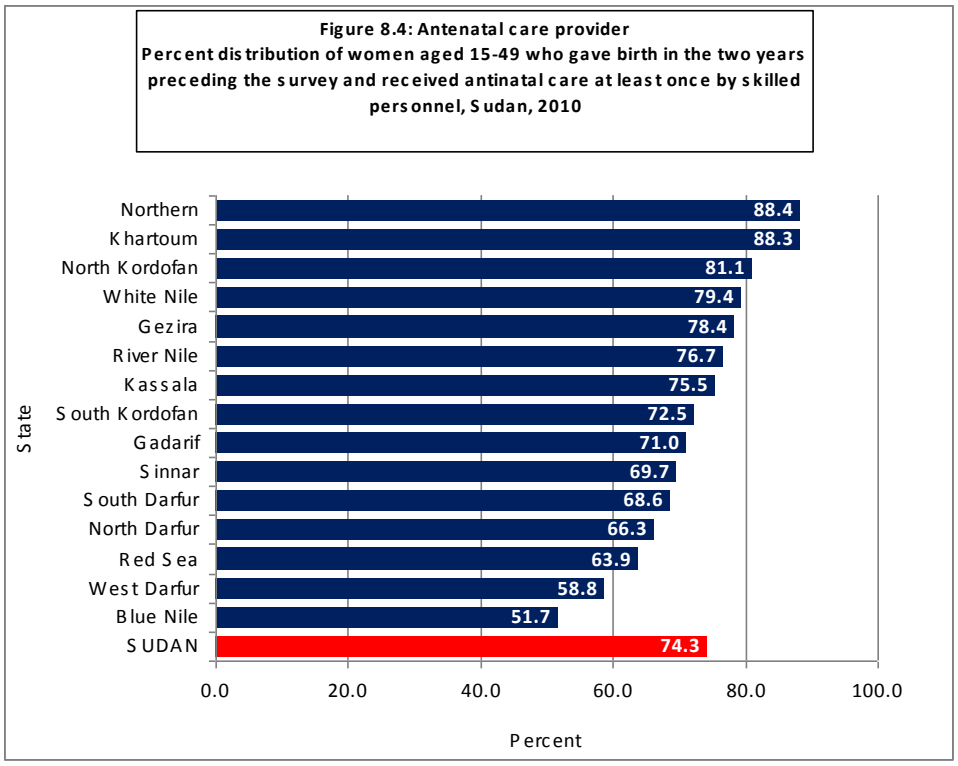
In the country as a whole, about a quarter of women (25.7 per cent) age 15-49 years who gave birth in the two years preceding the survey received no antenatal care from qualified health personnel (a doctor, nurse midwife, health visitor or midwife). About 46.9 per cent of women received ANC from a medical doctor, 3.6 per cent received ANC from a nurse midwife, 5.4 per cent from a health visitor and 18.4 per cent from a midwife.

Table 8.5: Antenatal care provider
Percent distribution of women aged 15-49 who gave birth in the two years preceding the survey by type of personnel providing antenatal care, Sudan, 2010

	Person providing antenatal care					Total	At least once by skilled personnel [1]	Number of women who gave birth in the preceding two
	Doctor	Nurse Midwife	Health Visitor	Midwife	No antenatal care received			
State of residence								
Northern	86.7	.0	.2	1.5	11.6	100	88.4	83
River Nile	70.1	1.7	2.2	2.7	23.3	100	76.7	164
Red Sea	45.7	5.0	8.1	5.1	36.1	100	63.9	134
Kassala	53.4	6.8	8.1	7.2	24.5	100	75.5	318
Gadarif	43.0	1.3	3.5	23.2	29.0	100	71.0	283
Khartoum	67.0	1.9	11.7	7.7	11.7	100	88.3	752
Gezira	68.2	.6	7.1	2.5	21.6	100	78.4	759
Wite Nile	65.1	.3	.8	13.2	20.6	100	79.4	316
Sinnar	48.3	2.9	5.8	12.7	30.3	100	69.7	217
Blue Nile	23.4	2.0	1.6	24.7	48.3	100	51.7	261
North Kordofan	52.2	1.6	3.0	24.4	18.9	100	81.1	615
South Kordofan	24.1	9.6	11.5	27.2	27.5	100	72.5	307
North Darfur	24.7	6.2	3.9	31.5	33.7	100	66.3	387
West Darfur	7.9	2.4	5.2	43.3	41.2	100	58.8	278
South Darfur	26.2	9.0	1.0	32.3	31.4	100	68.6	772
Area of residence								
Urban	63.4	2.3	8.6	10.0	15.7	100	84.3	1559
Rural	40.6	4.1	4.1	21.6	29.6	100	70.4	4087
Mother's age at birth (missing)	46.9	3.6	5.4	18.4	25.7	100	74.3	5646
Education level								
None	30.7	4.2	4.5	23.8	36.7	100	63.3	2487
Primary	54.3	3.7	7.0	16.9	18.1	100	81.9	1912
Secondary +	79.4	1.6	4.4	6.0	8.5	100	91.5	974
Adult education/Khalwa/Sunday eductation	26.5	5.2	5.0	22.9	40.5	100	59.5	273
Wealth index quintile								
Poorest	26.6	5.7	1.8	28.6	37.3	100	62.7	1287
Second	29.6	4.6	4.2	28.3	33.4	100	66.6	1245
Middle	46.9	3.4	7.1	15.0	27.6	100	72.4	1255
Fourth	62.9	2.7	10.0	10.7	13.6	100	86.4	1073
Richest	85.6	.5	3.9	1.8	8.3	100	91.7	787
SUDAN (TOTAL)	**46.9**	**3.6**	**5.4**	**18.4**	**25.7**	**100**	**74.3**	**5646**

[1] SHHS indicator 5.5a; MDG indicator 5.5

Antenatal care coverage was higher in urban areas (84.3 per cent) than in rural areas (70.4 per cent). The percentage of women who received ANC at least once bya skilled personnel was highest in Northern State (88.4 per cent) and lowest in Blue Nile State (51.7 per cent). (Figure 8.4)



Antenatal care visits

Table 8.6: provides information relating to the percentage of women who had a live birth during the last two years preceding the survey by number of antenatal care visits by any provider. It indicates the number of antenatal care visits during the last pregnancy during the two years preceding the survey, regardless of provider. UNICEF and WHO recommend a minimum of at least four antenatal care visits during pregnancy.

The SHHS2 data indicated that almost seven in ten mothers (70.0 per cent) who had a live birth during the last two years preceding the survey received antenatal care more than once by any provider and about half of mothers received antenatal care at least four times (47.1 per cent). Mothers living in urban areas are more likely than those living in rural areas to receive ANC four or more times. The percentage of women who had a birth during the two years preceding the SHHS2 and who had four or more antenatal care visits was only 39.7 per cent in the case of women in rural areas compared to 66.8 per cent among women in urban areas.

Mothers with no formal education and those from households in the poorest quintile are less likely than more advantaged mothers to receive ANC four or more times. For instance, the percentage of women who had a birth during the two years preceding the SHHS2 and who had four or more antenatal care visits was only 34.1 in the case of women with no education compared to 53.4 per cent among women with primary education and 72.1 per cent among women with secondary or higher level of education. Similarly, only 31.7 percent of the women from households in the poorest quintile reported four or more antenatal care visits by any health provider compared to 73.7 per cent among those from households in the richest quintile.

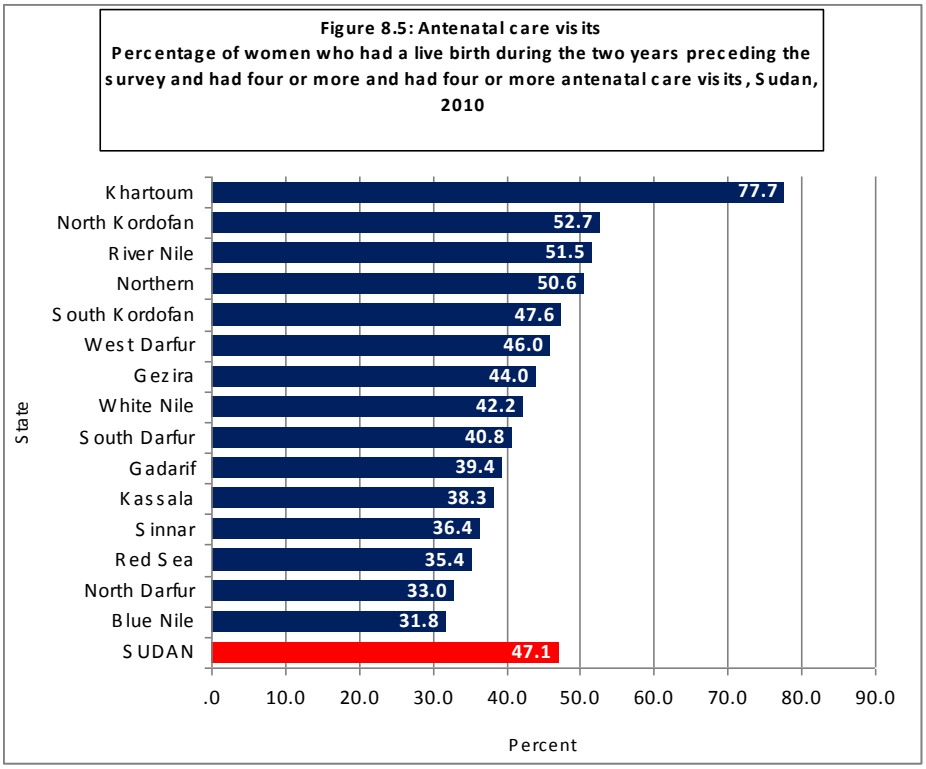
Table 8.6: Number of antenatal care visits
Percentage of women who had a live birth during the two years preceding the survey by number of antenatal care visits by any provider, Sudan, 2010

	Percent of women who had:						Total	Number of women who gave birth in the preceding two
	No antenatal care visits	One visit	Two visits	Three visits	4 or more visits [1]	Missing/DK		
State of residence								
Northern	10.7	8.2	13.6	16.6	50.6	.3	100	83
River Nile	21.6	3.1	8.9	13.2	51.5	1.7	100	164
Red Sea	34.2	6.9	8.6	14.0	35.4	1.1	100	134
Kassala	23.1	9.1	14.0	13.0	38.3	2.5	100	318
Gadarif	27.6	6.4	10.5	14.6	39.4	1.5	100	283
Khartoum	11.5	2.2	3.1	5.5	77.7	.0	100	752
Gezira	21.4	5.4	12.3	16.5	44.0	.5	100	759
Wite Nile	19.4	7.2	14.6	14.8	42.2	1.8	100	316
Sinnar	28.1	8.4	13.4	12.6	36.4	1.2	100	217
Blue Nile	40.7	5.9	8.1	13.6	31.8	.0	100	261
North Kordofan	16.1	2.8	13.8	14.4	52.7	.3	100	615
South Kordofan	23.7	3.7	7.9	16.4	47.6	.7	100	307
North Darfur	30.2	5.4	12.2	17.8	33.0	1.3	100	387
West Darfur	37.2	3.6	4.0	8.1	46.0	1.0	100	278
South Darfur	32.2	6.0	8.4	12.0	40.8	.6	100	772
Area of residence								
Urban	15.2	2.3	5.6	8.8	66.8	1.3	100	1559
Rural	27.5	6.1	11.5	14.7	39.7	.6	100	4087
Mother's age at birth								
Missing	24.1	5.1	9.9	13.0	47.1	.8	100	5646
Education level								
None	34.4	6.2	11.6	13.0	34.1	.8	100	2487
Primary	16.7	4.9	10.2	13.9	53.4	.9	100	1912
Secondary +	8.7	2.0	5.3	11.5	72.1	.4	100	974
Adult education/Khalwa/Sunday eductation	37.0	7.8	7.3	12.7	33.8	1.5	100	273
Wealth index quintile								
Poorest	34.9	7.4	11.0	14.6	31.7	.4	100	1287
Second	29.8	6.1	13.4	13.9	36.1	.7	100	1245
Middle	26.6	5.6	9.3	14.4	43.1	1.1	100	1255
Fourth	13.2	3.1	8.3	10.6	63.7	1.2	100	1073
Richest	8.0	1.8	5.5	10.3	73.7	.7	100	787
SUDAN (TOTAL)	**24.1**	**5.1**	**9.9**	**13.0**	**47.1**	**.8**	**100**	**5646**

[1] MICS indicator 5.5a; MDG indicator 5.5

The percentage of women who had a birth during the two years preceding the SHHS2 and who had four or more antenatal care visits by any provider ranged from 77.7 per cent in Khartoum State to 31.8 per cent in Blue Nile State (Table 8.6 and Figure 8.5).

Figure 8.5: Antenatal care visits
Percentage of women who had a live birth during the two years preceding the survey and had four or more and had four or more antenatal care visits, Sudan, 2010



Content of antenatal care

The types of services pregnant women received are shown in Table 8.8. Among those women who have given birth to a child during the two years preceding the survey, 55.8 per cent reported that a blood sample was taken during antenatal care visits, 57.7 per cent reported that their blood pressure was checked, and 56.7 per cent reported that urine specimen was taken.

Table 8.7: Content of antenatal care
Percentage of women age 15-49 years who had their blood pressure measured, urine sample taken, and blood sample taken as part of antenatal care, Sudan, 2010

	Percent of pregnant women who had:			Blood pressure measured, urine specimen and blood test taken [1]	Number of women who gave birth in two years preceding survey
	Blood pressure measured	Urine specimen taken	Blood test taken		
State of residence					
Northern	84.4	87.9	88.0	84.3	83
River Nile	71.9	70.6	71.2	69.6	164
Red Sea	59.3	59.3	59.6	57.0	134
Kassala	66.6	66.0	67.5	61.9	318
Gadarif	49.3	46.3	47.4	42.6	283
Khartoum	84.4	86.9	85.1	82.9	752
Gezira	71.8	72.5	71.9	69.0	759
Wite Nile	63.1	61.0	61.6	59.0	316
Sinnar	52.7	52.1	52.7	46.0	217
Blue Nile	27.8	25.1	27.3	21.0	261
North Kordofan	56.7	58.4	55.4	51.0	615
South Kordofan	43.0	51.5	43.7	34.0	307
North Darfur	43.1	39.6	37.9	33.7	387
West Darfur	39.8	28.0	29.9	25.1	278
South Darfur	41.0	34.8	34.1	30.0	772
Area of residence					
Urban	76.8	78.7	77.8	73.6	1559
Rural	50.4	48.3	47.4	43.3	4087
Mother's age at birth					
Missing	57.7	56.7	55.8	51.6	5646
Education level					
None	41.4	39.6	38.8	34.3	2487
Primary	66.7	66.4	65.0	60.6	1912
Secondary +	86.1	86.4	85.7	82.8	974
Adult education/Khalwa/Sunday eductation	42.1	38.1	39.5	35.9	273
Wealth index quintile					
Poorest	34.7	30.9	30.1	25.4	1287
Second	42.9	40.4	39.2	34.4	1245
Middle	58.6	58.2	58.1	53.8	1255
Fourth	78.7	81.2	79.5	75.8	1073
Richest	88.9	88.8	88.2	85.3	787
SUDAN (TOTAL)	**57.7**	**56.7**	**55.8**	**51.6**	**5646**

[1] MICS indicator 5.6

The SHHS2 findings indicated that among those women who had given birth to a child during the last two years preceding the survey, only in the case of about one half (51.6 per cent) of them blood pressure was measured, urine sample taken and blood test taken during ANC visits (Table 8.7).

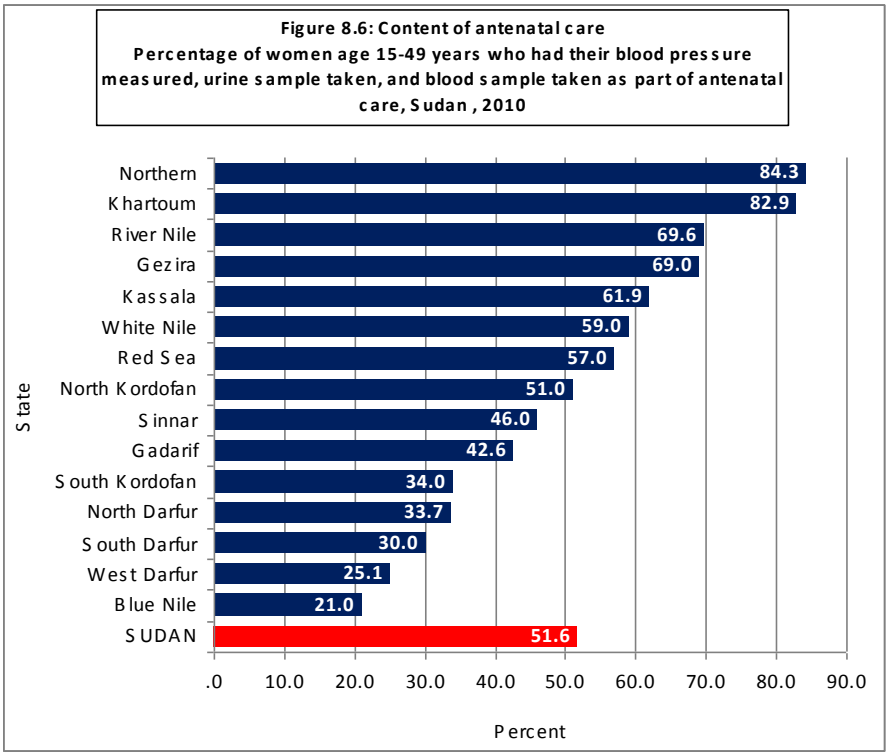
Mothers living in urban areas are more likely than those living in rural areas to receive ANC and have their blood pressure measured, urine sample taken and blood test taken during ANC visits. The percentage of women who had a birth during the last two years preceding the SHHS2 and who had received ANC and had their blood pressure measured, urine sample taken and blood test taken during ANC visits was only 43.3 per cent in the case of women in rural areas compared to 73.6 per cent among women in urban areas.

Mothers with no formal education and those from households in the poorest households are less likely than more advantaged mothers to receive ANC and have their blood pressure measured, urine sample taken and blood test taken during ANC visits. For instance, the percentage of women who had a birth during the last two years preceding the SHHS2 and who had received ANC and had their

blood pressure measured, urine sample taken and blood test taken during ANC visits was only 34.3 in the case of women with no education compared to 60.6 per cent among women with primary education and 82.8 per cent among women with secondary or higher level of education. Similarly, only 25.4 percent of the women from households in the poorest quintile had their blood pressure measured, urine sample taken and blood test taken during ANC visits compared to 85.3 per cent among those from households in the richest quintile.

Northern State had the highest proportion (84.3 per cent) of women who received antenatal care and had their blood pressure measured, urine sample taken and blood test taken during ANC visits. The lowest proportion of women who received antenatal care and had their blood pressure measured, urine sample taken and blood test taken during ANC visits was in Blue Nile State (21.0 per cent) (Figure 8.6).

Figure 8.6: Content of antenatal care
Percentage of women age 15-49 years who had their blood pressure measured, urine sample taken, and blood sample taken as part of antenatal care, Sudan , 2010



Assistance at Delivery

About three quarters of all maternal deaths occur during delivery and the immediate post-partum period. The single most critical intervention for safe motherhood is to ensure that a competent health worker with midwifery skills is present at every birth, and transport is available to a referral facility for obstetric care in case of emergency. A World Fit for Children goal is to ensure that women have ready and affordable access to skilled attendance at delivery. The indicators are the proportion of births with a skilled attendant and proportion of institutional deliveries. The skilled attendant at delivery indicator is also used to track progress toward the Millennium Development target of reducing the maternal mortality ratio by three quarters between 1990 and 2015.

The SHHS included a number of questions to assess the proportion of births attended by a qualified attendant. *A* qualifi*ed attendant* includes a doctor, nurse midwife or village midwife.

Table 8.8 provides information relating to assistance during delivery. It indicates the percent distribution of women age 15-49 that had a live birth in the two years preceding the survey by perso

IX. Literacy and Education

Education is a vital prerequisite for combating poverty, empowering women, protecting children from hazardous and exploitative labour and sexual exploitation, promoting human rights and democracy, protecting the environment, and influencing population growth.

One of the World Fit for Children goals is to assure adult literacy. Adult literacy is also an MDG indicator, relating to both men and women. Universal access to basic education and the achievement of primary education by the world's children is one of the most important Millennium Development Goals and those of A World Fit for Children. The MDG target is to ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling. The WFFC target in support of this MDG target is to reduce the number of primary school-age children who are out of school by 50 per cent and increase net primary school enrolment or participation in alternative, good quality primary education programmes to at least 90 per cent by 2010.

The education system in Sudan comprises of basic/primary, secondary and tertiary education. Basic/primary education for children age 6-13 years consists of eight years of schooling covering grades 1-8 leading to basic/primary education certificate. The general/academic and technical secondary education covers grades 9-11 leading to the Sudan School Certificate. The school education system also includes schools for children with special needs, and technical and vocational education centres which offer two-year vocational courses. The entry qualification required for enrolling in undergraduate courses offered by universities is the Sudan School Certificate. In this report, the term primary education refers to basic education (grades 1-8).

The SHHS2 included some key indicators required to assess situation in regard to literacy among women, pre-school education, and primary and secondary school participation. The key SHHS2 indicators include the following:

Literacy Rate Among Women Age 15-24 Years

In SHHS2, only a women's questionnaire was administered. Therefore, the results are based on women age 15-49 years. Literacy was assessed on the basis of the ability of women to read a short simple statement about everyday life or of school attendance.

Table 9.1 indicates the percentage of young women age 15-24 years who are literate. The SHHS2 data indicated that the literacy rate among young women remains low. Nationwide, only 45.2 per cent of women age 15-24 years was literate. The percentage of literate women age 15-24 years was higher in urban areas (56.6 per cent) than that among women in rural areas (39.0 per cent). Of women who stated that primary school was their highest level of education, only 52.0 per cent of them were actually able to read the statement shown to them while of the women who stated that secondary school was their highest level of education, 71 per cent of them were able to read the statement shown to them.

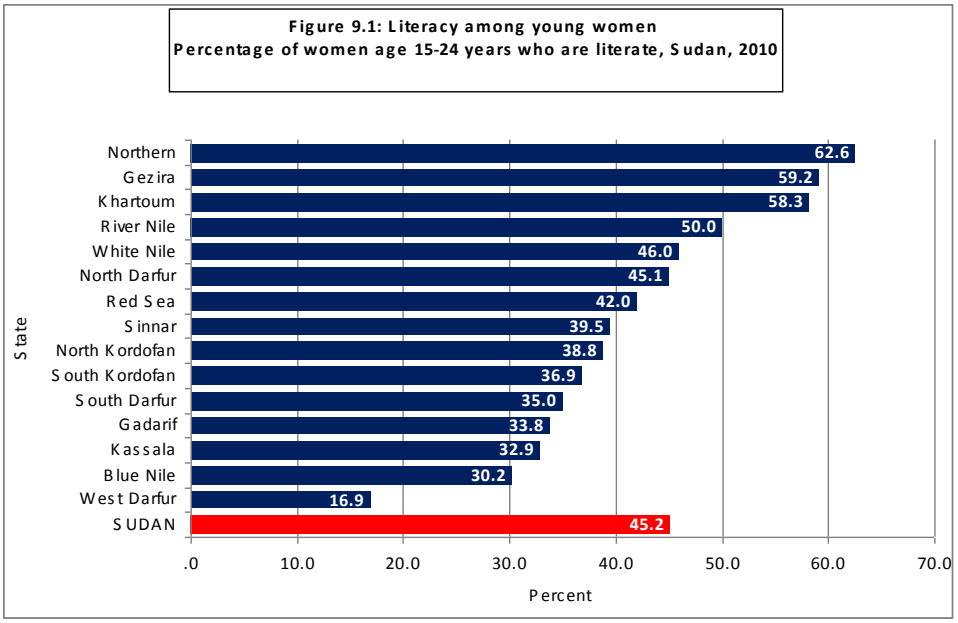
The proportion of literate women varies by age group. The proportion of women who were literate was higher at 53.6 per cent among women age 15-19 years than that among women age 20-24 years (36.1 per cent). The proportion of literate women (aged 15-24 years) also varied by the education level of mothers.The proportion of literate women was higher among those who had mothers with secondary or higher level of education (71.0 per cent) than that for women who had mothers with primary education (52.0 per cent) and that among women who had mothers with no formal education (0.5 per cent).The proportion of literate women (aged 15-24 years) also varied by their household wealth. The proportion of literate women was much higher among those belonging to households in the richest quintile (61.1 per cent) than those belonging to households in the poorest quintile (19.6 per cent).

Table 9.1: Literacy among young women
Percentage of women age 15-24 years who are literate, Sudan, 2010

Background characteristics	Percentage literate [1]	Percent not known	Number of women age 15-24 years
State of residence			
Northern	62.6	.0	117
River Nile	50.0	.0	241
Red Sea	42.0	1.4	163
Kassala	32.9	.0	367
Gadarif	33.8	.5	333
Khartoum	58.3	.4	1211
Gezira	59.2	.2	1181
White Nile	46.0	.0	367
Sinnar	39.5	.3	292
Blue Nile	30.2	.2	228
North Kordofan	38.8	.2	723
South Kordofan	36.9	.0	289
North Darfur	45.1	.4	346
West Darfur	16.9	.3	263
South Darfur	35.0	.2	758
Area of residence			
Urban	56.6	.3	2397
Rural	39.0	.2	4484
Education level			
None	.5	.3	1616
Primary	52.0	.4	2502
Secondary +	71.0	.0	2508
Adult education/Khalwa/ Sunday eductation	7.0	.8	255
Age group			
15-19 years	53.6	.1	3559
20-24 years	36.1	.4	3321
Wealth index quintiles			
Poorest	19.6	.1	1046
Second	24.2	.2	1288
Middle	42.8	.5	1450
Fourth	66.1	.3	1545
Richest	61.1	.1	1552
SUDAN (TOTAL)	**45.2**	**.2**	**6880**

[1] SHHS indicator 6.1; MDG indicator 2.3

The proportion of literate young women varies by State. The percentage of literate women age 15-24 years ranged from 16.9 in West Darfur State to 62.6 in Northern State (Table 9.1 and Figure 9.1).



Early childhood care and education

Participation in an organised learning or child education programme is important for the overall social, emotional and intellectual development of children. Table 9.2 shows the percentage of children age 36-59 months who were attending some form of organized early childhood care and education programme at the time of the SHHS2. The data indicated that only 20.4 per cent of children age 36-59 months was attending some form of organized early childhood care and education programme at the time of SHHS2. The percentage of children age 36-59 months who were attending some form of organized early childhood care and education programme was higher among children in urban areas (37.4 per cent) than that among children in rural areas (13.9 per cent). Very little gender differential exists, the percentage of boys and girls who were attending some form of organized early childhood education programme being 19.9 per cent and 20.9 per cent respectively.

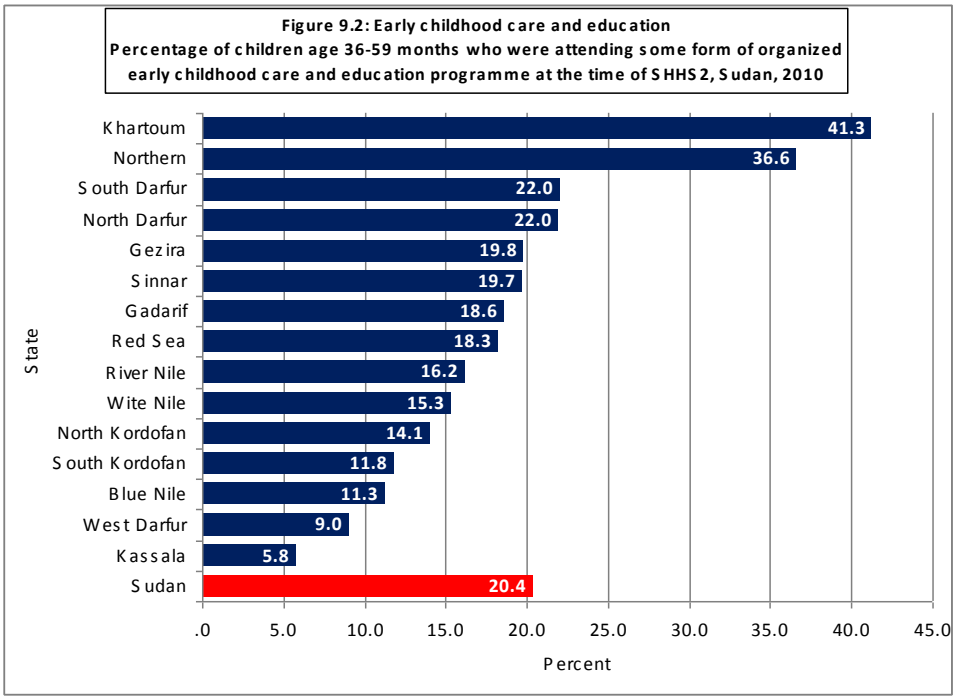
The proportion of children attending some form of organised early childhood care and education programme was lower among children age 36-47 months (14.9 per cent) than that among children age 48-59 months (27.6 per cent). The proportion of children attending some form of organised early childhood care and education programme varies by the education level of mothers. The proportion of children attending some form of organised early childhood care and education programme was higher among children who had mothers with secondary or higher level of education (37.6 per cent) than that for children who had mothers with primary education (23.8 per cent) and that among children who had mothers with no formal education (14.7 per cent).The proportion of children attending some form of organised early childhood care and education programme also varied by their household wealth. The proportion of children attending some form of organised early childhood care and education programme was much higher among those belonging to households in the richest quintile (48.1 per cent) than those belonging to households in the poorest quintile (9.8 per cent).

Table 9.2: Early childhood care and education
Percentage of children age 36-59 months who are attending some form of organized early childhood care and education programme at the time of SHHS2, Sudan, 2010

	Percentage of children age 36-59 months currently attending early childhood education [1]	Number of children aged 36-59 months
Sex		
Male	19.9	2520
Female	20.9	2423
State of residence		
Northern	36.6	64
River Nile	16.2	147
Red Sea	18.3	103
Kassala	5.8	303
Gadarif	18.6	262
Khartoum	41.3	708
Gezira	19.8	587
Wite Nile	15.3	242
Sinnar	19.7	191
Blue Nile	11.3	216
North Kordofan	14.1	531
South Kordofan	11.8	231
North Darfur	22.0	393
West Darfur	9.0	256
South Darfur	22.0	711
Area of residence		
Urban	37.4	1361
Rural	13.9	3582
Age group		
36-47 months	14.9	2811
48-59 months	27.6	2131
Education level of mothers		
None	14.7	2802
Primary	23.8	1457
Secondary	37.6	650
Missing/DK	11.4	34
Wealth index quintiles		
Poorest	9.8	1279
Second	10.5	1093
Middle	16.5	989
Fourth	30.5	893
Richest	48.1	689
SUDAN (TOTAL)	**20.4**	**4943**

[1] SHHS indicator 6.2

The percentage of children age 36-59 months attending some form of organised early childhood care and education programme ranged from 5.8 per cent in Kassala State to 41.3 per cent in Khartoum State (41.3 per cent). (Table 9.2 and Figure 9.2)



School Readiness

Participation in pre-school education programme is considered important for the readiness of children to attend primary school. Pre-school education in Sudan, offered through Kindergartens for children age 4-5 years, is neither free nor compulsory.

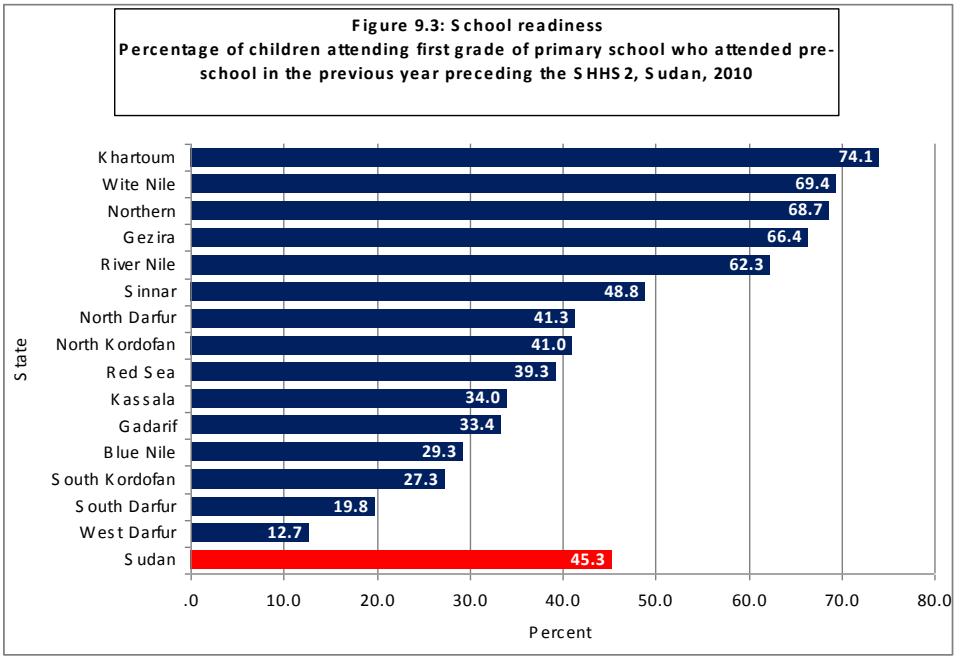
Table 9.3 shows the proportion of children attending the first grade of primary school who attended pre-school in the previous year preceding the SHHS2.

Overall, 45.3 per cent of children who were attending the first grade of primary school at the time of the SHHS had attended pre-school the previous year. The proportion among females was slightly higher (46.5 per cent) than males (44.3 per cent). Almost two-thirds (65.0 per cent) of children in urban areas had attended pre-school the previous year compared to only 36.8 per cent among children living in rural areas. Socio-economic status appears to have a positive impact in terms of the proportion of children who had attended pre-school the previous year. While the percentage of children attending first grade who attended pre-school in the previous year was 75.8 per cent among children living in the richest households, the percentage was only 17.1 per cent among children belonging to the poorest households.

Table 9.3: School readiness
Percentage of children attending first grade of primary school who attended pre-school in the previous year preceding SHHS2, Sudan, 2010

	Percentage of children attending first grade who attended preschool in previous year [1]	Number of children attending first grade of primary school
Sex		
Male	44.3	1417
Female	46.5	1205
State of residence		
Northern	68.7	37
River Nile	62.3	77
Red Sea	39.3	93
Kassala	34.0	181
Gadarif	33.4	114
Khartoum	74.1	382
Gezira	66.4	338
Wite Nile	69.4	139
Sinnar	48.8	90
Blue Nile	29.3	86
North Kordofan	41.0	239
South Kordofan	27.3	144
North Darfur	41.3	168
West Darfur	12.7	102
South Darfur	19.8	432
Area of residence		
Urban	65.0	791
Rural	36.8	1832
Education level of mothers		
None	.0	0
Primary	45.9	2433
Secondary +	22.4	19
Mother not in household	39.9	170
Wealth index quintiles		
Poorest	17.1	594
Second	27.4	527
Middle	48.8	534
Fourth	66.0	520
Richest	75.8	446
SUDAN (TOTAL)	**45.3**	**2623**
[1] SHHS indicator 6.3		

State differentials were found to be very significant. The percentage of children attending first grade who attended pre-school in the previous year was approximately six times (74.1 per cent) as much as their counterparts in West Darfur (12.7 per cent).



Primary School Participation

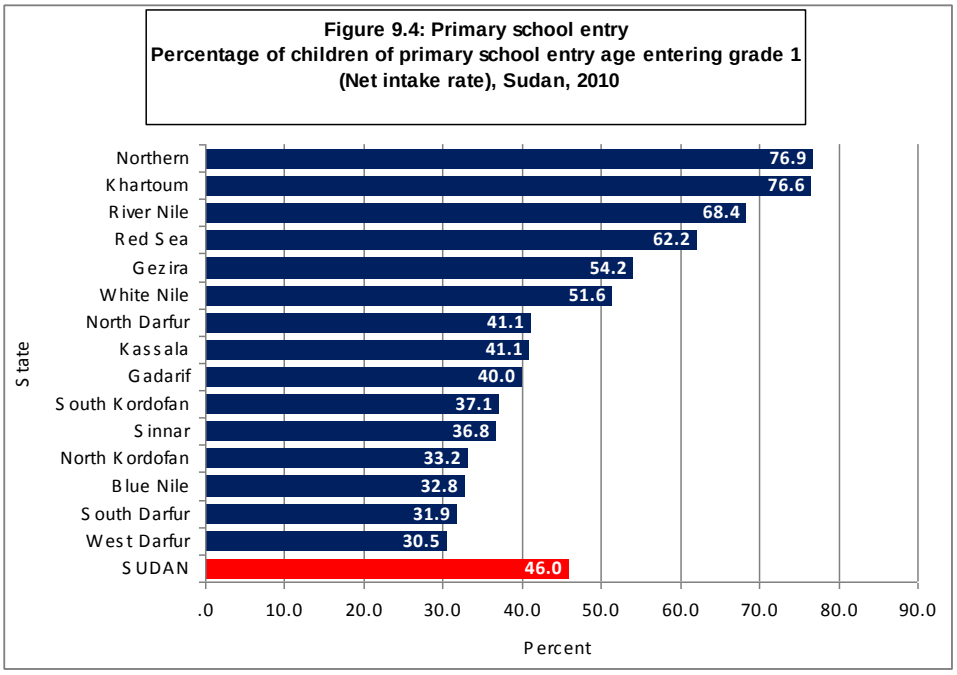
Primary school entry (Net intake rate in primary education): Table 9.4 provides information regarding the net intake rate in primary education, i.e. percentage of children of primary school entry age entering grade I in primary school. Of children who were of primary school entry age (age 6) in Sudan, about 46.0 per cent of them were attending the first grade of primary school at the time of the SHHS2. Of male children who were of primary school entry age, 46.9 per cent of them were attending the first grade of primary school compared to 45.1 per cent of female children of primary school entry age.

Children's participation in primary education was timelier in urban areas than in rural areas. The net intake rate in primary education was 67.1 per cent in urban areas compared to 37.9 per cent in rural areas. While the net intake rate in primary education was 0.0 per cent in the case of children of mothers who had no education, the rates were 90.9 per cent in the case of children whose mothers had primary education, and 93.6 per cent in the case of children whose mothers had secondary or higher levels of education. It was observed that the net intake rates in primary education varied widely with household wealth. The proportion of children of primary school entry age entering grade I in primary school was around 81.8 per cent in the case of children belonging to households in the richest quintile, while it was only 23.2 per cent among children belonging to households in the poorest quintile.

Table 9.4: Primary school entry
Percentage of children of primary school entry age entering grade 1 (net intake rate), Sudan, 2010

	Percentage of children of primary school entry age entering grade 1 [1]	Number of children of primary school entry age
Sex		
Male	46.9	1441
Female	45.1	1388
State of residence		
Northern	76.9	38
River Nile	68.4	76
Red Sea	62.2	65
Kassala	41.1	170
Gadarif	40.0	140
Khartoum	76.6	364
Gezira	54.2	360
Wite Nile	51.6	151
Sinnar	36.8	113
Blue Nile	32.8	109
North Kordofan	33.2	293
South Kordofan	37.1	143
North Darfur	41.1	209
West Darfur	30.5	133
South Darfur	31.9	467
Urban	67.1	783
Rural	37.9	2046
Education level		
None	.0	1290
Primary	90.9	1340
Secondary +	93.6	11
Mother not in household	39.1	188
Missing/DK	.0	0
Wealth index quintile		
Poorest	23.2	752
Second	32.7	633
Middle	47.7	537
Fourth	67.0	521
Richest	81.8	386
SUDAN (TOTAL)	**46.0**	**2829**
[1] SHHS indicator 6.4		

Large differentials in the net intake rates were present by state. The net intake rate ranged from 76.9 per cent in Northern State to 31.9 per cent in South Darfur State. (Table 9.4 and Figure 9.4)



Net primary school attendance ratio

Table 9.5 provides the net primary school attendance ratio, i.e. percentage of children of primary school age who are attending primary or secondary school[7]. The official primary school-age group in Sudan is 6-13 years.

The net primary school attendance ratio shows the extent of participation in education of children belonging to the official primary school-age group. A high net primary school attendance ratio denotes a high degree of participation in education of the primary school-age population while a low net primary school attendance ratio indicates a low degree of participation of the primary school-age population. Achieving a net primary school attendance ratio that is closer to 100 per cent is a key target for achieving the goal of universal primary education. Where the net primary school attendance ratio is less than 100 per cent, the complement (i.e., 100 per cent minus the net primary school attendance ratio value) provides a measure of proportion of out-of-school primary school-age children.

The SHHS2 data indicate that about 71.8 per cent of children of primary school age were attending school at the time of the survey. This means that about 28.2 per cent of the children were out of school when they were expected to be participating in primary education. The percentage of children of primary-school age attending school at the time of the survey was highest (81.9 per cent) among children aged 10 years and lowest among children aged 6 years (49.4 per cent).

Sex differentials in net primary school attendance ratios do exist; the net primary school attendance ratio for boys being 74.2 per cent compared to 69.4 per cent for girls. The net primary school attendance ratio for boys was highest among those aged 10 years (86.3 per cent) and lowest among those aged 6 years (50.8 per cent). In the case of girls also, the net primary school attendance ratio

[7] Ratios presented in this table are "adjusted" since they include not only primary school attendance, but also secondary school attendance in the numerator.

was highest among those aged 10 years (77.6 per cent) and lowest among those aged 6 years (48.0 per cent).

Table 9.5: Primary school attendance
Percentage of children of primary school age attending primary or secondary school (Net primary school attendance ratio), Sudan, 2010

	Male		Female		Total	
	Net attendance ratio (adjusted) [1]	Number of children	Net attendance ratio (adjusted) [1]	Number of children	Net attendance ratio (adjusted) [1]	Number of children
State of residence						
Northern	91.6	144	91.7	150	91.6	294
River Nile	83.4	281	82.6	288	83.0	569
Red Sea	66.5	240	73.7	216	69.9	456
Kassala	61.4	643	48.9	546	55.7	1189
Gadarif	67.3	474	59.1	461	63.3	935
Khartoum	91.1	1359	90.1	1221	90.6	2579
Gezira	83.6	1293	81.8	1381	82.7	2673
Wite Nile	77.1	477	77.6	477	77.4	954
Sinnar	71.0	381	62.5	412	66.6	793
Blue Nile	56.2	340	55.9	354	56.1	694
North Kordofan	69.5	1070	67.4	1046	68.5	2116
South Kordofan	68.6	442	60.9	483	64.6	925
North Darfur	77.0	674	72.7	722	74.8	1396
West Darfur	63.8	471	48.8	450	56.5	922
South Darfur	65.9	1247	56.3	1324	60.9	2571
Area of residence						
Urban	87.2	2763	87.0	2704	87.1	5467
Rural	68.9	6774	62.5	6826	65.7	13600
Age						
6	50.8	1441	48.0	1388	49.4	2829
7	66.0	1210	64.5	1287	65.3	2497
8	79.8	1100	74.0	1031	77.0	2131
9	77.4	1417	74.7	1335	76.1	2752
10	86.3	895	77.6	906	81.9	1802
11	80.8	1358	74.0	1291	77.5	2648
12	80.6	1019	77.6	1038	79.1	2057
13	80.3	1097	71.6	1254	75.7	2351
Education level						
None	.3	1941	.1	2339	.2	4280
Primary	95.4	6756	95.0	6208	95.2	12964
Secondary +	96.2	156	97.2	216	96.8	372
Mother not in household	70.1	683	66.5	763	68.2	1446
Missing/DK	.0	2	.0	4	.0	6
Weath index quintile						
Poorest	56.1	2183	44.4	2244	50.1	4427
Second	61.1	2154	55.7	2015	58.5	4169
Middle	75.7	1863	72.5	1908	74.1	3771
Fourth	91.1	1759	89.3	1836	90.1	3594
Richest	96.6	1579	96.8	1528	96.7	3106
SUDAN (TOTAL)	**74.2**	**9537**	**69.4**	**9530**	**71.8**	**19068**

[1] SHHS indicator 6.5; MDG indicator 2.1

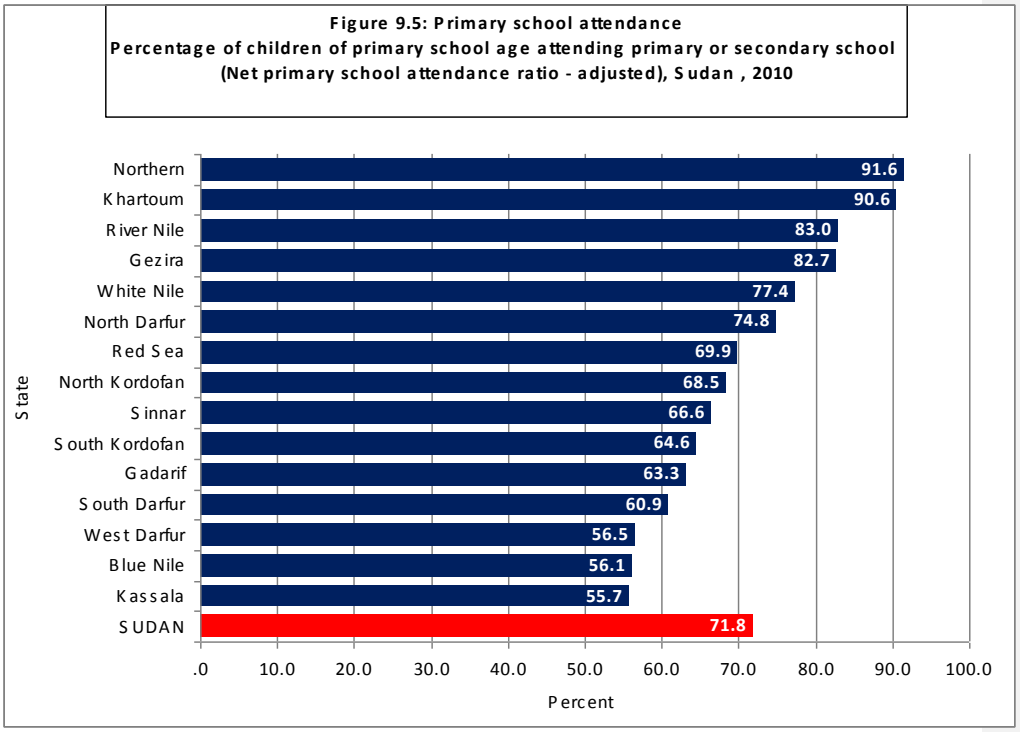
There were also variations in net primary school attendance ratio for children living in urban and rural areas. The net primary school attendance ratio was 87.1 per cent in urban areas compared to 65.7 per cent in rural areas. The net primary school attendance ratio for boys in urban areas was 87.2 per cent compared to 68.9 per cent in the case of boys in rural areas. The net primary school attendance

ratio for girls in urban areas was 87.0 per cent compared to 62.5 per cent in the case of girls in rural areas.

The education level of the mother appears to have an influence on the net primary school attendance ratio. While the net primary school attendance ratio for children whose mothers had no education was only 0.2 per cent, it was 95.2 per cent for children whose mothers had primary education, and 95.2 per cent in the case of children whose mothers had secondary or higher levels of education. Similarly, while the net primary school attendance ratio for male children whose mothers had no education was only 0.3 per cent, it was 95.4 per cent for male children whose mothers had primary education, and 95.0 per cent in the case of male children whose mothers had secondary or higher levels of education. While the net primary school attendance ratio for female children whose mothers had no education was only 0.1 per cent, it was 95.0 per cent for female children whose mothers had primary education, and 97.2 per cent in the case of female children whose mothers had secondary or higher levels of education.

The household wealth also appears to have an influence on the net primary school attendance ratio. The net primary school attendance ratio was only 50.1 per cent among children belonging to households in the poorest quintile compared to 96.7 per cent among children from households in the richest quintile. The net primary school attendance ratio was only 56.1 per cent among boys belonging to households in the poorest quintile compared to 96.6 per cent among those from households in the richest quintile. Similarly, the net primary school attendance ratio was only 44.4 per cent among girls belonging to households in the poorest quintile compared to 97.6 per cent among girls from households in the richest quintile.

There were also considerable variations in the net primary school attendance ratios among states. The net primary school attendance ratio ranged from 91.6 per cent in Northern State to 55.7 per cent in Kassala State. There also exist considerable variations among States in terms of the net primary school attendance ratio of boys, ranging from 91.6 per cent in Northern State to 56.2 per cent in Blue Nile State. Noticeable variations also exist among States in net primary school attendance ratio of girls, ranging from 91.7 per cent in Northern State to 48.8 per cent in West Darfur State.



Secondary School Attendance

The percentage of children of secondary school age attending secondary school or higher level institutions (adjusted net attendance ratio), and percentage of secondary school-age children attending primary school, are presented in Table 9.6[8]. The official secondary school-age group in Sudan is 14-16 years.

Table 9.6: Secondary school attendance
Percentage of children of secondary school age attending secondary school or higher (adjusted net secondary school attendance ratio), and percentage of children attending primary school, Sudan, 2010

	Male			Female			Total		
	Net attendance ratio (adjusted) [1]	Percent attending primary school	Number of children	Net attendance ratio (adjusted) [1]	Percent attending primary school	Number of children	Net attendance ratio (adjusted) [1]	Percent attending primary school	Number of children
Northern	44.3	33.9	42	60.2	20.5	43	52.3	27.1	85
River Nile	45.7	25.6	76	50.7	16.8	75	48.2	21.2	151
Red Sea	16.9	50.5	60	25.5	32.3	49	20.8	42.3	110
Kassala	18.4	36.0	146	18.8	23.2	132	18.6	29.9	278
Gadarif	22.0	50.5	80	12.1	26.4	118	16.1	36.1	198
Khartoum	50.6	29.5	433	58.3	22.5	362	54.1	26.3	795

[8] Ratios presented in this table are "adjusted" since they include not only secondary school attendance, but also attendance to higher levels in the numerator.

Gezira	44.0	29.7	338	50.9	20.8	363	47.6	25.1	701
White Nile	35.4	32.3	112	32.7	25.0	124	33.9	28.5	236
Sinnar	22.2	39.9	96	21.0	28.5	90	21.6	34.4	186
Blue Nile	12.8	41.3	64	14.5	27.7	75	13.7	34.0	138
N.Kordofan	16.8	57.2	200	16.0	31.9	228	16.4	43.7	428
S.Kordofan	16.7	56.1	81	17.8	32.9	102	17.3	43.2	184
N.Darfur	25.5	52.0	150	33.1	30.8	130	29.0	42.2	280
W. Darfur	10.1	60.2	85	10.0	27.2	84	10.1	43.9	169
S.Darfur	17.6	62.6	259	22.0	34.5	258	19.8	48.6	516
Area									
Urban	43.5	36.6	769	53.6	25.7	772	48.5	31.1	1541
Rural	24.1	45.1	1452	22.7	26.9	1459	23.4	36.0	2912
Age									
14	21.2	50.5	746	23.8	38.2	663	22.4	44.7	1409
15	31.4	42.2	775	36.3	28.1	768	33.8	35.2	1543
16	40.4	33.3	701	38.5	15.3	800	39.4	23.7	1501
Education									
None	11.8	.2	234	9.7	.5	388	10.5	.4	622
Primary	.2	74.6	1120	.2	67.0	758	.2	71.6	1878
Secondary +	94.1	1.3	643	96.1	1.2	691	95.1	1.2	1334
Mother not in household	22.2	41.5	223	10.3	18.7	393	14.6	27.0	616
Missing/DK	.0	.0	1	.0	.0	2	.0	.0	3
Wealth index quintile									
Poorest	7.8	56.4	355	5.2	25.2	364	6.5	40.6	719
Second	10.6	54.1	406	8.1	30.9	427	9.3	42.2	833
Middle	18.9	46.3	441	20.0	31.1	449	19.4	38.6	890
Fourth	39.2	37.4	518	46.9	27.7	471	42.8	32.8	989
Richest	65.3	23.8	501	73.1	18.8	521	69.2	21.2	1022
SUDAN	**30.8**	**42.2**	**2221**	**33.4**	**26.5**	**2232**	**32.1**	**34.3**	**4453**

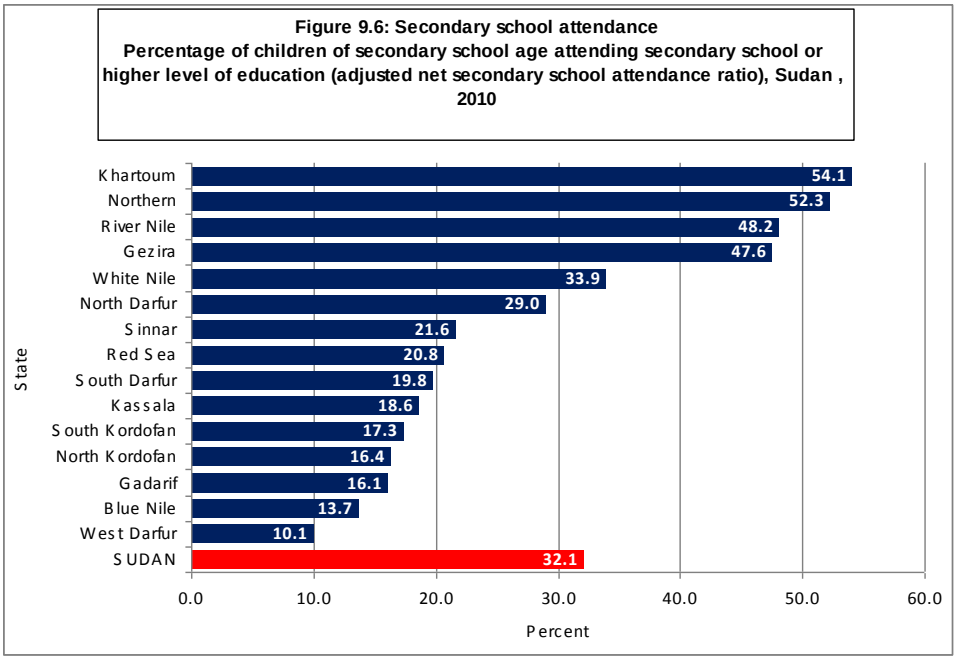
[1] SHHS indicator 6.6

The SHHS2 data indicated that only about one-third (32.1 per cent) of the children of secondary-school age were found to be attending secondary school or higher level of institutions at the time of the survey. Of the remaining secondary school-age children, some of them were either attending primary school or were out of school. Approximately 34.3 per cent of the children of secondary school age were attending primary school when they should be attending secondary school while the remaining 33.6 per cent were not attending school at all.

Sex differentials in net secondary school attendance ratios do exist; the net secondary school attendance ratios for boys being 30.8 per cent compared to 33.4 per cent for girls. The net secondary school attendance ratios was highest (39.4 per cent) among children aged 16 years and lowest (22.4 per cent) among those aged 14 years. In the case of boys, the net attendance rate was highest (40.4 per cent) among those aged 16 years and lowest (21.2 per cent) among boys aged 14 years. In the case of girls also, the net secondary school attendance ratios was highest (38.5 per cent) among those aged 16 years and lowest (23.8 per cent) among those aged 14 years.

There were also variations in net secondary school attendance ratios for children living in urban and rural areas. The net secondary school attendance ratio was 48.5 per cent in urban areas compared to 23.4 per cent in rural areas. The net secondary school attendance ratio for boys in urban areas was 43.5 per cent compared to 24.1 per cent in the case of boys in rural areas. The net secondary school attendance ratio for girls in urban areas was 53.6 per cent compared to 22.7 per cent in the case of girls in rural areas.

Figure 9.6: Secondary school attendance
Percentage of children of secondary school age attending secondary school or higher level of education (adjusted net secondary school attendance ratio), Sudan , 2010



The education level of the mother appears to have an influence on the NAR for secondary school-age children. While the net secondary school attendance ratio for children whose mothers had no education was only 10.5 per cent, it was 95.1 per cent among children whose mothers had secondary or higher level of education. Similarly, while the net secondary school attendance ratio for boys whose mothers had no education was only 11.8 per cent, it was 94.1 per cent among boys whose mothers had secondary or higher levels of education. Similarly, while the net secondary school attendance ratio for girls whose mothers had no education was only 9.7 per cent, it was 96.1 per cent among girls whose mothers had secondary or higher levels of education.

The household wealth also appears to have an influence on the net secondary school attendance ratio. The net secondary school attendance ratio was only 6.5 per cent among children belonging to households in the poorest quintile compared to 69.2 per cent among children from the households in the richest quintile. The net secondary school attendance ratio was only 7.8 per cent among boys belonging to households in the poorest quintile compared to 65.3 per cent among boys from households in the richest quintile. Similarly, the net secondary school attendance ratio for girls was only 8.1 per cent among those belonging to households in the poorest quintile compared to 73.1 per cent among those from households in the richest quintile.

There were also considerable variations in the net secondary school attendance ratios among States. The net secondary school attendance ratios ranged from 54.1 per cent in Khartoum State to 10.9 per cent in West Darfur State. There also exist considerable variations among states in terms of the net secondary school attendance ratios for boys, ranging from 50.6 per cent in Khartoum State to 10.1 per cent in West Darfur State. Noticeable variations also exist among States in net secondary school attendance ratio for girls, ranging from 60.2 per cent in Northern State to 10.0 per cent in West Darfur State.

Secondary school-age children attending primary school

The percentage of secondary school-age children attending primary school is presented in Table .6. About one-third (34.3 per cent) of secondary school age-children were found to be attending primary

school when they should be attending secondary school. The percentage of secondary school-age boys attending primary school was 42.2 per cent compared to 26.5 per cent in the case of girls.

There were considerable variations in the percentage of secondary school-age children attending primary school among States. The percentage of secondary school-age children attending primary school was highest (48.6 per cent) in South Darfur State and the lowest (21.2 per cent) in River Nile State.

Children reaching last grade (grade VIII) of primary school

The percentage of children entering first grade of primary school in a given year and who eventually reach the last grade (grade VIII) of primary school is presented in Table 9.7.

Of all children entering grade I in a given year, about 82.2 per cent of them (83.5 per cent boys and 80.7 per cent girls) eventually reach the last grade (Grade VIII) of primary school. The percentage of children entering first grade who eventually reach grade VIII of primary school was 88.8 in urban areas compared to 78.4 in rural areas.

The percentage of children entering first grade of primary school in a given year and who eventually reach grade VIII seems to be linked to household wealth. The percentage of children reaching grade VIII was 94.1 among children from households in the richest quintile compared to 65.1 among children from households in the poorest quintile. There also exist considerable variations in the percentage of children entering the first grade in primary school in a given year and who eventually reach the last grade of primary school (grade VIII).

Table 9.7: Children reaching last grade of primary school
Percentage of children entering first grade of primary school who eventually reach the last grade of primary school (Survival rate to last grade of primary school), Sudan, 2010

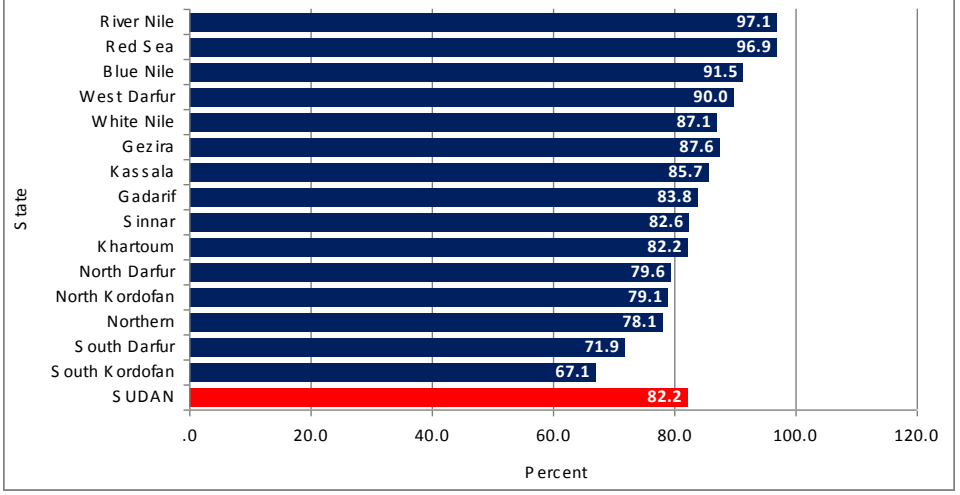
	Percent attending grade 1 last year who are in grade 2 this year	Percent attending grade 2 last year who are attending grade 3 this year	Percent attending grade 3 last year who are attending grade 4 this year	Percent attending grade 4 last year who are attending grade 5 this year	Percent attending grade 5 last year who are attending grade 6 this year	Percent attending grade 6 last year who are attending grade 7 this year	Percent attending grade 7 last year who are attending grade 8 this year	Percent who reach grade 8 of those who enter grade 1 [1]
State of residence								
Male	98.2	98.8	97.1	97.8	98.4	96.1	95.9	83.5
Female	97.9	98.1	97.9	97.6	97.0	95.4	95.0	80.7
Northern	100.0	99.3	99.3	98.7	95.3	92.3	91.3	78.1
River Nile	100.0	100.0	99.2	99.6	98.2	100.0	100.0	97.1
Red Sea	98.8	99.7	100.0	100.0	100.0	99.2	99.1	96.9
Kassala	99.3	99.5	97.5	98.6	98.2	96.9	94.8	85.7
Gadarif	99.4	99.2	98.0	98.2	100.0	93.8	94.1	83.8
Khartoum	98.3	98.5	96.9	97.1	99.6	94.5	95.8	82.2
Gezira	99.3	99.3	98.1	98.6	98.2	96.7	96.7	87.6
White Nile	99.1	99.4	97.8	98.4	98.2	96.7	96.6	87.1
Sinnar	99.5	100.0	100.0	98.0	100.0	92.9	91.2	82.6
Blue Nile	100.0	98.6	98.4	99.2	97.8	98.9	98.3	91.5
North Kordofan	96.5	98.4	98.5	98.1	94.2	95.8	95.5	79.1
South Kordofan	96.1	97.3	94.7	94.5	95.8	92.9	90.1	67.1
North Darfur	98.9	98.6	95.5	96.7	97.8	96.2	94.0	79.6
West Darfur	98.4	99.0	96.4	98.0	98.4	99.7	99.7	90.0
South Darfur	94.7	95.6	96.8	96.5	95.5	95.0	93.8	71.9
Area of residence								
Urban	98.6	99.3	98.5	98.5	98.6	97.3	97.5	88.8
Rural	97.8	98.1	97.0	97.3	97.3	94.8	93.8	78.4
Education level								
None	.0	.	69.7	100.0	86.3	.	.	.0
Primary	98.2	98.8	97.8	98.0	98.5	95.8	95.4	83.7

Secondary +	86.6	90.7	86.8	100.0	77.2	100.0	100.0	52.6
Mother not in household	98.8	96.5	94.5	94.0	91.7	95.5	95.7	71.0
Missing/DK	.	.	.	.	.	.	.	.
Wealth index quintile								
Poorest	96.6	96.5	95.2	95.3	93.9	92.2	88.9	65.1
Second	97.6	98.4	96.5	96.9	98.2	95.8	94.7	80.0
Middle	98.2	99.2	97.3	97.1	97.1	94.7	93.4	79.2
Fourth	98.7	99.4	98.3	99.2	98.1	95.8	95.9	86.2
Richest	99.3	99.0	100.0	99.1	99.8	98.2	98.5	94.1
SUDAN (Total)	**98.1**	**98.5**	**97.5**	**97.7**	**97.8**	**95.8**	**95.4**	**82.2**

[1] MICS indicator 6.7; MDG indicator 2.2

The percentage of children entering first grade who eventually reach the last grade grade VIII was over 90 per cent in four states. The percentage ranged between 67.1 per cent in South Kordofan State and 97.1 per cent in River Nile state.

Figure 9.7: Children reaching grade VIII
Percentage of children entering the first grade of primary school who eventually reach grade VIII, Sudan , 2010



Primary school completion rate

The primary school completion rate, i.e. the percentage of children (of any age) attending the last grade of primary school (excluding repeaters) to total number of children of primary school completion age (age appropriate to final grade of primary school; i.e. age 13 years in the case of Sudan is presented in Table 9.8.

At the time of the SHHS2, the primary school completion rate was 62.7 per cent (71.6 per cent for boys and 54.9 per cent for girls). The primary school completion rate was 92.4 per cent for children in urban areas compared to 49.4 per cent for children in rural areas.

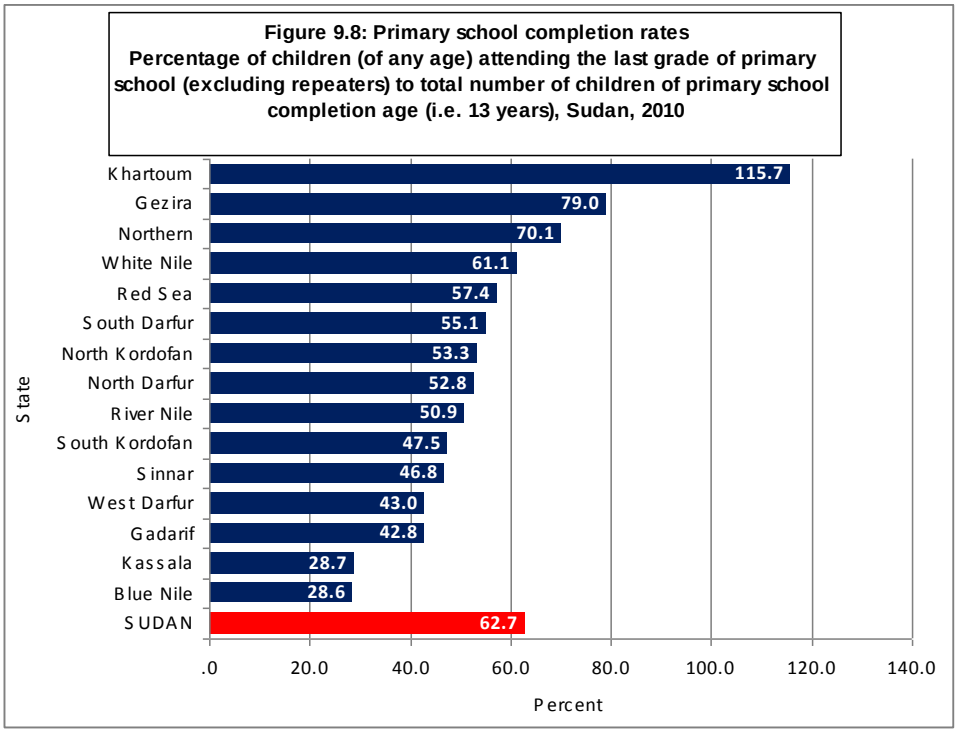
The primary school completion rate seems to increase with the household wealth. The primary completion rate was only 26.1 per cent among children from households in the poorest quintile compared to 111.9 per cent among children from households in the richest quintile.

Table 9.8: Primary school completion and transition to secondary school
Primary school completion rates and transition rate to secondary school, Sudan, 2010

	Primary school completion rate [1]	Number of children of primary school completion age	Transition rate to secondary school [2]	Number of children who were in the last grade of primary school the previous year
Sex				
Male	71.6	1097	74.9	484
Female	54.9	1254	80.9	466
State of residence				
Northern	70.1	43	87.6	25
River Nile	50.9	83	82.6	45
Red Sea	57.4	47	88.0	16
Kassala	28.7	142	90.1	30
Gadarif	42.8	115	73.6	32
Khartoum	115.7	321	73.4	216
Gezira	79.0	356	77.0	203
Wite Nile	61.1	139	80.8	48
Sinnar	46.8	110	93.6	28
Blue Nile	28.6	88	72.8	21
North Kordofan	53.3	274	80.8	74
South Kordofan	47.5	106	59.2	27
North Darfur	52.8	158	81.3	75
West Darfur	43.0	107	82.1	20
South Darfur	55.1	262	75.0	88
Area of residence				
Urban	92.4	726	79.0	417
Rural	49.4	1625	76.9	532
Education level				
None	.0	317	100.0	1
Primary	85.8	1570	.0	186
Secondary +	3.7	243	98.8	716
Mother not in household	52.4	220	66.5	47
Wealth index quintiles				
Poorest	26.1	461	68.0	68
Second	39.6	492	81.4	115
Middle	56.7	482	68.8	151
Fourth	83.5	492	76.8	290
Richest	111.9	424	83.8	326
SUDAN (Total)	**62.7**	**2351**	**77.8**	**950**

[1] SHHS indicator 6.8; [2] SHHS indicator 6.9

There were considerable variations in the primary school completion rate among States. The primary school completion rate ranged from 28.7 per cent in Kassala State to 115.7 per cent in Khartoum State.



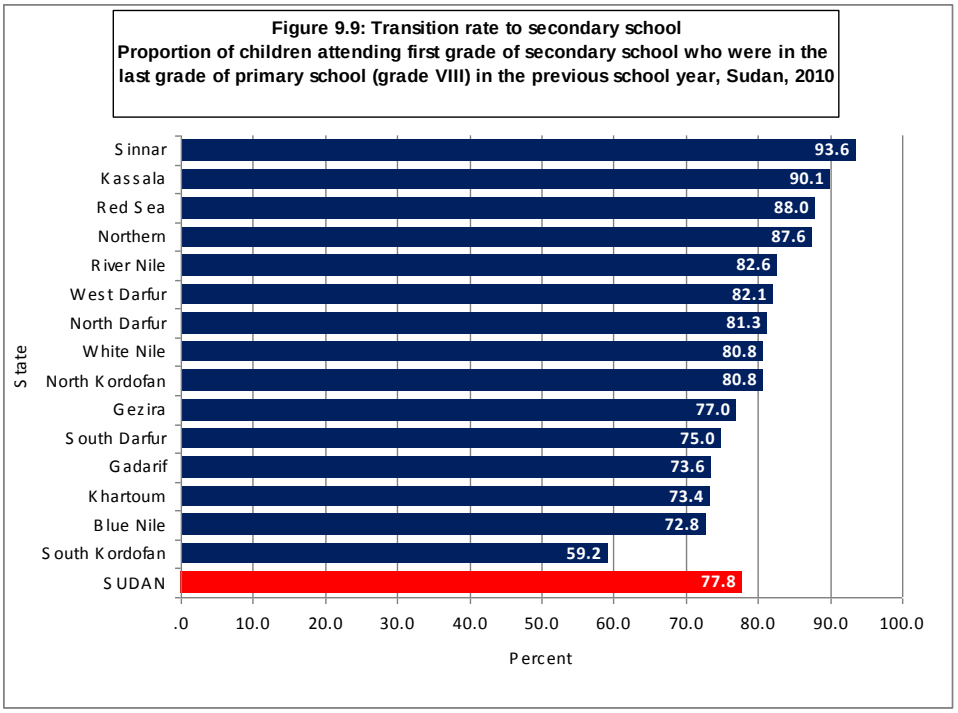
Transition rate to secondary education

The SHHS findings indicated that only 77.8 per cent of the children that completed successfully the last grade of primary school were found at the time of the survey to be attending the first grade of secondary school (Table 9.8). The transition rate to secondary school (percentage of the children that completed successfully the last grade of primary school attending the first grade of secondary school) was 74.9 per cent for boys compared to 80.9 per cent for girls. The transition rate to secondary school was 79.0 per cent for children in urban areas compared to 76.9 per cent for children in rural areas.

The household wealth appears to have a positive impact on the transition rate to secondary school. The transition rate to secondary education was 83.8 per cent for children from households in the richest quintile compared to 68.0 per cent among children from households in the poorest quintile.

There were considerable variations in the transition rates to secondary education among States. The transition rates to secondary education ranged from 90.1 per cent in Kassala State to 59.2 per cent in South Kordofan State.

Figure 9.9: Transition rate to secondary school
Proportion of children attending first grade of secondary school who were in the last grade of primary school (grade VIII) in the previous school year, Sudan, 2010



Education gender parity

The ratio of girls to boys attending primary and secondary education is provided in Table 9.9. These ratios are better known as the Gender Parity Index (GPI). Notice that the ratios included here are obtained from net attendance ratios rather than gross attendance ratios. The last ratios provide an erroneous description of the GPI mainly because in most of the cases the majority of over-aged children attending primary education tend to be boys.

Table 9.9 shows that gender parity at the primary stage of education was 0.94, indicating that there is difference in the net primary school attendance ratios of girls and boys. The disadvantage of girls at the primary stage of education was particularly pronounced in some of the States such as Kassala (GPI: 0.80), Gadarif (GPI: 0.88), Sinnar (GPI: 0.88), West Darfur: 0.77) and South Darfur (GPI: 0.85). The GPI ranged between 1.11 in Red Sea State to 0.77 in West Darfur. The disadvantage of girls at the primary stage of education was also pronounced among children living in rural areas and in households in the poorest quintile. The GPI in rural areas was 0.91 compared to 1.0 in urban areas. The GPI for children belonging to the households in the richest quintile was 1.0 compared to 0.79 for children belonging to households in the poorest quintile.

Table 9.9: Education gender parity
Ratio of adjusted net attendance ratios of girls to boys, in primary and secondary schools, Sudan, 2010

	Primary school adjusted net attendance ratio (NAR), girls	Primary school adjusted net attendance ratio (NAR), boys	Gender parity index (GPI) for primary school adjusted NAR [1]	Secondary school adjusted net attendance ratio (NAR), girls	Secondary school adjusted net attendance ratio (NAR), boys	Gender parity index (GPI) for secondary school adjusted NAR [2]
State of residence						
Northern	91.7	91.6	1.00	60.2	44.3	1.36
River Nile	82.6	83.4	.99	50.7	45.7	1.11
Red Sea	73.7	66.5	1.11	25.5	16.9	1.51
Kassala	48.9	61.4	.80	18.8	18.4	1.02
Gadarif	59.1	67.3	.88	12.1	22.0	.55
Khartoum	90.1	91.1	.99	58.3	50.6	1.15
Gezira	81.8	83.6	.98	50.9	44.0	1.16
Wite Nile	77.6	77.1	1.01	32.7	35.4	.92
Sinnar	62.5	71.0	.88	21.0	22.2	.95
Blue Nile	55.9	56.2	.99	14.5	12.8	1.13
North Kordofan	67.4	69.5	.97	16.0	16.8	.95
South Kordofan	60.9	68.6	.89	17.8	16.7	1.07
North Darfur	72.7	77.0	.94	33.1	25.5	1.30
West Darfur	48.8	63.8	.77	10.0	10.1	1.00
South Darfur	56.3	65.9	.85	22.0	17.6	1.25
Area of residence						
Urban	87.0	87.2	1.00	53.6	43.5	1.23
Rural	62.5	68.9	.91	22.7	24.1	.94
Education level						
None	.1	.3	.49	9.7	11.8	.82
Primary	95.0	95.4	1.00	.2	.2	1.18
Secondary +	97.2	96.2	1.01	96.1	94.1	1.02
Mother not in household	66.5	70.1	.95	10.3	22.2	.47
Missing/DK	.0	.0	.	.0	.0	.
Wealth index quintiles						
Poorest	44.4	56.1	.79	5.2	7.8	.67
Second	55.7	61.1	.91	8.1	10.6	.76
Middle	72.5	75.7	.96	20.0	18.9	1.06
Fourth	89.3	91.1	.98	46.9	39.2	1.20
Richest	96.8	96.6	1.00	73.1	65.3	1.12
SUDAN (TOTAL)	**69.4**	**74.2**	**.94**	**33.4**	**30.8**	**1.08**

[1] SHHS indicator 6.10; MDG indicator 3.1
[2] SHHS indicator 6.11; MDG indicator 3.1

Table 9.9 also shows that gender parity at the secondary stage of education was 1.08, indicating that there is difference in the net enrolment ratios of girls and boys at the secondary stage of education, indicating that overall boys are more disadvantaged than girls at the secondary stage. However, girls living in rural areas and those belonging to households in the poorest quintiles are nore disadvantaged than their male counterparts. The GPI at the secondary stage of education in rural areas was 0.82 compared to 0.94 in urban areas. The GPI at the secondary stage for children belonging to households in the richest quintile was 1.12 compared to 0.67 for children belonging to households in the poorest quintile. The GPI at the secondary stage of education ranged between 0.55 in Gadarif State to 1.51 in Red Sea state.

X. Child Protection

Birth Registration

The International Convention on the Rights of the Child states that every child has the right to a name and a nationality and the right to protection from being deprived of his or her identity. Birth registration is a fundamental means of securing these rights for children. The World Fit for Children states the goal to develop systems to ensure the registration of every child at or shortly after birth, and fulfil his or her right to acquire a name and a nationality, in accordance with national laws and relevant international instruments.

Table 10.1 provides information relating to birth registration. It indicates the percentage of children under age five whose birth is registered with civil authorities and of the children under age five whose birth not registered the percent of children whose mothers/caretakers knew how to register birth. The table also indicates that the percentage of birth certificates seen of those registered is very low(18.7)

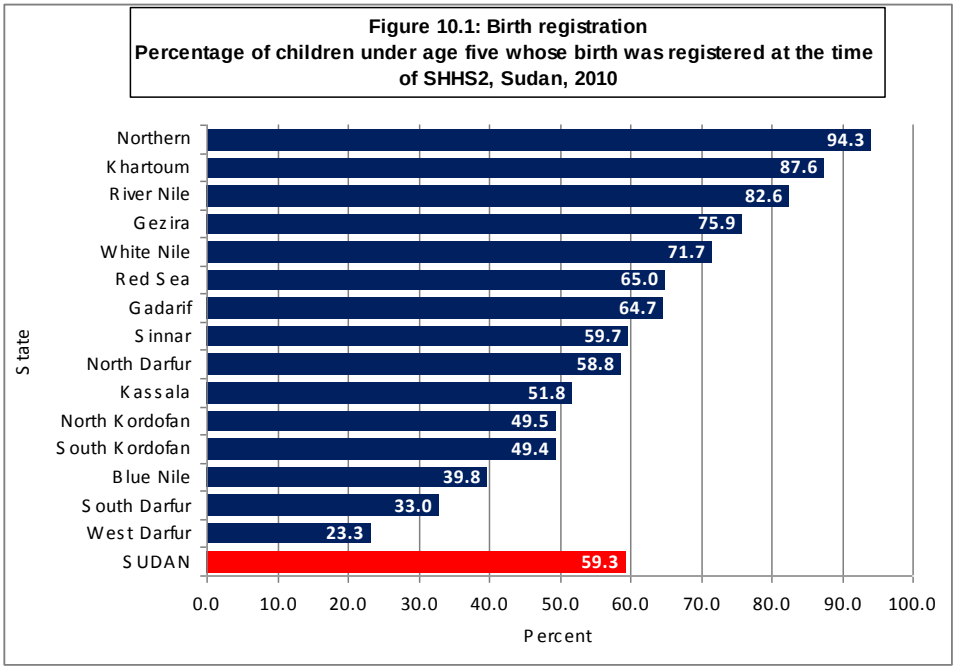
Table 10.1: Birth registration
Percentage of children under age 5 by whether birth is registered and percentage of children not registered whose mothers/caretakers know how to register birth, Sudan, 2010

	Children under age 5 whose birth is registered with civil authorities				Number of children	Children under age 5 whose birth is not registered	
	Has birth certificate		No birth certificate	Total registered [1]		Percent of children whose mother/caretaker knows how to register birth	Number of children without birth registration
Sex	**Seen**	**Not seen**					
Male	19.6	27.0	14.7	61.3	6742	25.4	2607
Female	17.7	24.3	15.2	57.2	6540	27.1	2800
State of residence							
Northern	26.4	51.7	16.2	94.3	170	48.7	10
River Nile	24.3	34.4	23.9	82.6	404	35.5	70
Red Sea	14.7	41.1	9.2	65.0	281	8.7	98
Kassala	12.9	20.7	18.2	51.8	780	14.4	376
Gadarif	22.9	25.0	16.9	64.7	678	22.2	239
Khartoum	30.8	44.2	12.6	87.6	1868	29.3	232
Gezira	33.0	33.7	9.3	75.9	1750	48.0	421
White Nile	18.9	27.8	24.9	71.7	675	42.0	191
Sinnar	25.9	24.0	9.7	59.7	517	41.5	209
Blue Nile	12.8	15.3	11.7	39.8	595	24.9	358
North Kordofan	15.1	18.2	16.1	49.5	1425	37.2	720
South Kordofan	9.7	16.9	22.9	49.4	681	18.5	344
North Darfur	14.5	24.7	19.7	58.8	947	26.5	390
West Darfur	5.8	14.1	3.3	23.3	682	11.0	523
South Darfur	4.9	11.8	16.4	33.0	1829	21.0	1225
Area of residence							
Urban	30.5	39.2	14.8	84.5	3669	34.3	568
Rural	14.1	20.5	15.0	49.7	9613	25.3	4839
Age							
0-11	17.1	23.3	16.7	57.0	2964	28.2	1273
12-23	20.9	26.5	15.3	62.6	2613	24.7	977
24-35	19.4	27.5	14.4	61.3	2762	23.5	1069
36-47	16.9	25.9	13.9	56.8	2811	28.0	1216
48-59	19.5	25.3	14.3	59.1	2131	26.2	872
Education level							
None	11.9	19.8	12.8	44.5	7359	20.6	4082
Primary	24.0	28.8	19.6	72.4	4044	44.0	1116
Secondary	34.5	42.9	13.1	90.5	1785	47.0	170
Missing/DK	15.0	21.6	21.2	57.8	94	25.2	40
Wealth index quintiles							
Poorest	3.0	8.7	14.2	26.0	3213	20.6	2378
Second	8.7	16.3	16.9	41.9	2901	25.2	1687
Middle	20.0	27.1	18.1	65.2	2800	34.1	976
Fourth	34.6	37.1	15.1	86.8	2490	45.9	329
Richest	37.7	51.9	8.4	98.0	1878	63.2	37
SUDAN (TOTAL)	**18.7**	**25.7**	**15.0**	**59.3**	**13282**	**26.3**	**5407**

[1] SHHS indicator 7.1

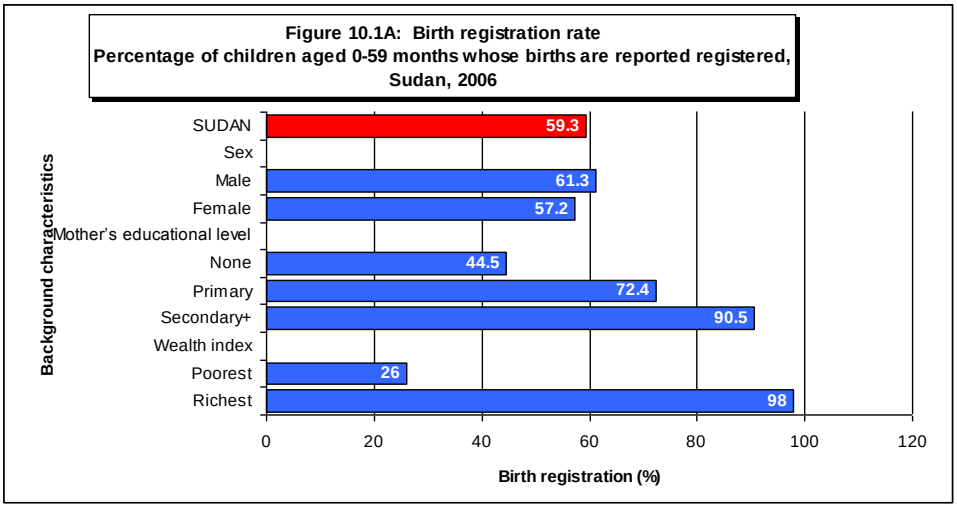
The SHHS2 indicator relating to birth registration is the proportion of children under age five whose birth are reported registered. The SHHS2 data indicated that the births of 59.3 percent of under-five children in Sudan were reported registered on the reference date of the survey. Of the children under age five whose birth was not registered, mothers/caretakers of 26.3 per cent of these children knew how to register birth. The birth registration rates ranged from 94.3 percent in Northern State to 23.3 percent in West Darfur State.

Figure 10.1: Birth registration
Percentage of children under age five whose birth was registered at the time of SHHS2, Sudan, 2010



Birth registration rates were highest among children age 12-23 months at 62.6 per cent and lowest among children age 36-47 months at 56.8 per cent. Birth registration rate among children aged 0-11 months was 57.0 per cent. There were some variations in birth registration between male and female children, the birth registration rate for male and female being 61.3 per cent and 57.2 per cent respectively. However, there were significant variations in birth registration between urban and rural areas; the birth registration rate in rural areas being only 49.7 per cent in rural areas compared to 84.5 per cent in urban areas.

Birth registration appears to increase with mother's educational level and the household wealth: birth registration rate among children of mothers with no education was only 44.5 per cent compared to 72.4 per cent for children of mothers with primary education and 90.5 per cent for children of mothers with secondary or higher level of education. Birth registration rate among children from households in the poorest quintile was only 26.0 per cent compared to 98.0 per cent among those from households in the richest quintile (Figure 10.1A)



Early Marriage and Polygamy

Marriage before the age of 18 is a reality for many young girls. According to UNICEF's worldwide estimates, over 64 million women age 20-24 were married/in union before the age of 18. Factors that influence child marriage rates include: the state of the country's civil registration system, which provides proof of age for children; the existence of an adequate legislative framework with an accompanying enforcement mechanism to address cases of child marriage; and the existence of customary or religious laws that condone the practice.

In many parts of the world parents encourage the marriage of their daughters while they are still children in hopes that the marriage will benefit them both financially and socially, while also relieving financial burdens on the family. In actual fact, child marriage is a violation of human rights, compromising the development of girls and often resulting in early pregnancy and social isolation, with little education and poor vocational training reinforcing the gendered nature of poverty. The right to 'free and full' consent to a marriage is recognized in the Universal Declaration of Human Rights - with the recognition that consent cannot be 'free and full' when one of the parties involved is not sufficiently mature to make an informed decision about a life partner.

The Convention on the Elimination of all Forms of Discrimination against Women mentions the right to protection from child marriage in article 16, which states: "The betrothal and the marriage of a child shall have no legal effect, and all necessary action, including legislation, shall be taken to specify a minimum age for marriage..." While marriage is not considered directly in the Convention on the Rights of the Child, child marriage is linked to other rights - such as the right to express their views freely, the right to protection from all forms of abuse, and the right to be protected from harmful traditional practices - and is frequently addressed by the Committee on the Rights of the Child. Other international agreements related to child marriage are the Convention on Consent to Marriage, Minimum Age for Marriage and Registration of Marriages and the African Charter on the Rights and Welfare of the Child and the Protocol to the African Charter on Human and People's Rights on the Rights of Women in Africa. Child marriage was also identified by the Pan-African Forum against the Sexual Exploitation of Children as a type of commercial sexual exploitation of children.

Young married girls are a unique, though often invisible, group. Required to perform heavy amounts of domestic work, under pressure to demonstrate fertility, and responsible for raising children while still children themselves, married girls and child mothers face constrained decision-making and reduced life choices. Boys are also affected by child marriage but the issue impacts girls in far larger numbers and with more intensity. Cohabitation - when a couple lives together as if married - raises the same human rights concerns as marriage. Where a girl lives with a man and takes on the role of

caregiver for him, the assumption is often that she has become an adult woman, even if she has not yet reached the age of 18. Additional concerns due to the informality of the relationship - for example, inheritance, citizenship and social recognition - might make girls in informal unions vulnerable in different ways than those who are in formally recognized marriages.

Research suggests that many factors interact to place a child at risk of marriage. Poverty, protection of girls, family honour and the provision of stability during unstable social periods are considered as significant factors in determining a girl's risk of becoming married while still a child. Women who married at younger ages were more likely to believe that it is sometimes acceptable for a husband to beat his wife and were more likely to experience domestic violence themselves. The age gap between partners is thought to contribute to these abusive power dynamics and to increase the risk of untimely widowhood.

Closely related to the issue of child marriage is the age at which girls become sexually active. Women who are married before the age of 18 tend to have more children than those who marry later in life. Pregnancy related deaths are known to be a leading cause of mortality for both married and unmarried girls between the ages of 15 and 19, particularly among the youngest of this cohort. There is evidence to suggest that girls who marry at young ages are more likely to marry older men which puts them at increased risk of HIV infection. Parents seek to marry off their girls to protect their honour, and men often seek younger women as wives as a means to avoid choosing a wife who might already be infected. The demand for this young wife to reproduce and the power imbalance resulting from the age differential leads to very low condom use among such couples.
Legislative reform needs to consider the consistency between national laws that protect to rights of children, The definition of the age of responsibility contradicts with the definition of the Child in the National Law of the Child. This is also in discrepancy with the minimum age of marriage in the personal family law stipulated at 10 years while the civil law would not accept a married female under 18 to be a trustee for financial legal responsibility.

Young girls/women married before 15 years of age

One of the SHHS2 indicators relating to early marriage relates to the percentage of women married before 15 years of age. The percentages of women married at various ages are provided in Table 10.2.

The SHHS2 data indicated that about one in ten (9.5 per cent) young women married before age 15. The proportion of young women who were married before age 15 varied between urban and rural areas. The proportion of young women married before age 15 was 7.0 per cent in urban areas compared to 10.8 per cent in rural areas. The educational status of the woman appears to have an influence on the incidence of early marriage. The percentage of women married before 15 years of age declined from 16.1 per cent among women with no formal education to 9.0 per cent among women with primary education and to 1.1 per cent among women who had secondary or higher level of education. The household wealth also appears to have an influence on the incidence of early marriage. The percentage of women married before 15 years of age was 4.0 per cent among women from households in the richest quintile compared to 13.7 per cent among women from households in the poorest quinti

Table 10.2: Early marriage and polygamy

Percentage of women age 15-49 years who first married or entered a marital union before their 15th birthday, percentages of women age 20-49 years who first married before their 15th and 18th birthdays, percentage of women age 15-19 years currently married , and the percentage of women currently married who are in a Polygamous marriage , Sudan, 2010

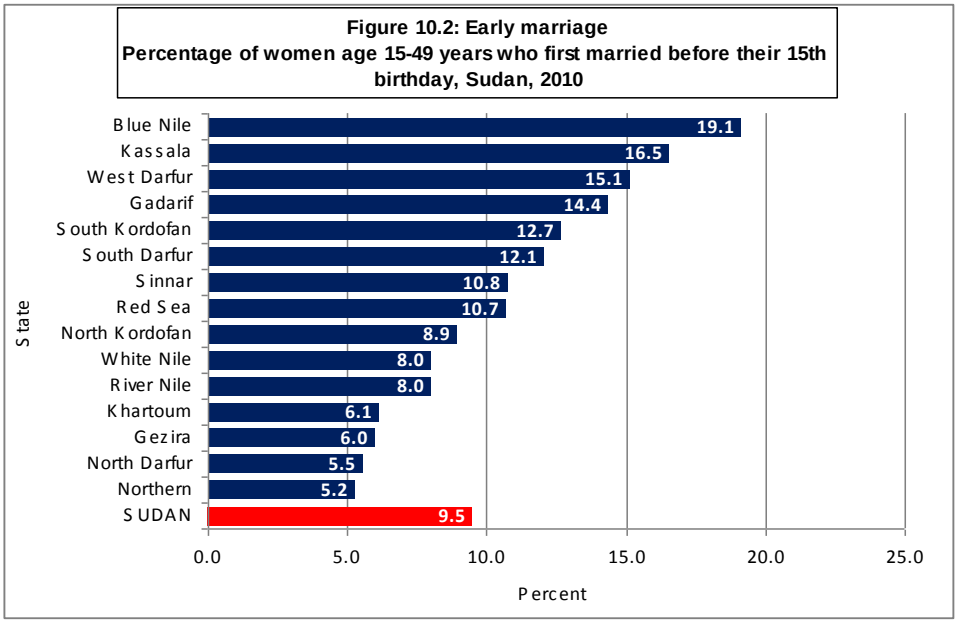
	Percentage married before age 15 [1]	Number of women age 15-49 years	Percentage married before age 15	Percentage married before age 18 [2]	Number of women age 20-49 years	Percentage of women 15-19 years currently married [3]	Number of women age 15-19 years	Percentage of women age 15-49 years in Polygamous marriage [4]	Number of women age 15-49 years currently married
State of residence									
Northern	5.2	351	6.2	20.5	288	9.4	63	5.7	208
River Nile	8.0	637	8.5	27.3	520	22.0	117	7.1	386
Red Sea	10.7	477	10.7	33.2	399	24.9	78	7.4	331
Kassala	16.5	1004	17.8	46.2	823	24.9	181	10.0	684
Gadarif	14.4	773	16.3	48.8	597	27.9	176	22.5	530
Khartoum	6.1	3005	7.6	27.5	2392	13.5	613	11.9	1718
Gezira	6.0	2791	6.8	28.2	2179	17.1	612	13.5	1574

White Nile	8.0	906	8.8	35.7	717	25.0	190	16.5	569
Sinnar	10.8	675	11.9	39.5	537	18.2	138	15.0	418
Blue Nile	19.1	566	21.7	62.2	449	36.3	118	30.8	425
North Kordofan	8.9	1765	10.3	37.1	1402	27.4	363	15.2	1106
South Kordofan	12.7	700	14.7	48.1	548	33.9	152	28.2	511
North Darfur	5.5	930	5.7	33.9	747	19.5	184	28.6	669
West Darfur	15.1	672	16.4	49.4	543	43.3	129	41.8	513
South Darfur	12.1	1923	13.5	53.9	1476	33.0	447	38.9	1364
Area of residence									
Urban	7.0	5842	8.3	29.1	4602	14.6	1240	15.3	3351
Rural	10.8	11332	11.9	42.0	9013	28.3	2319	22.1	7654
Age group									
15-19 yeras	4.9	3559	.	.	0	23.5	3559	10.8	838
20-24 yeras	7.2	3321	7.2	32.9	3321	.	0	12.1	1844
25-29 yeras	10.3	3176	10.3	36.3	3176	.	0	17.7	2414
30-34 yeras	10.6	2139	10.6	37.0	2139	.	0	21.7	1739
35-39 yeras	12.6	2446	12.6	40.6	2446	.	0	26.1	2054
40-44 yeras	13.2	1466	13.2	43.1	1466	.	0	26.0	1240
45-49 yeras	15.5	1067	15.5	43.2	1067	.	0	25.7	878
Education level									
None	16.1	6062	16.5	53.8	5350	47.4	712	27.5	4870
Primary	9.0	5570	10.6	39.0	4159	25.1	1411	14.9	3569
Secondary +	1.1	4803	1.3	8.9	3488	7.7	1315	9.3	2016
Adult education/Khalwa/ Sunday eductation	14.0	739	14.2	51.3	618	37.4	120	25.9	550
Wealth index quintiles									
Poorest	13.7	3013	14.7	53.8	2455	31.9	558	31.0	2252
Second	13.8	3176	14.9	47.7	2515	34.8	661	26.1	2296
Middle	10.8	3375	12.4	43.9	2635	30.9	739	18.6	2269
Fourth	7.1	3604	8.4	31.6	2827	16.9	778	13.3	2114
Richest	4.0	4006	5.0	17.3	3184	8.4	822	9.7	2075
SUDAN (TOTAL)	**9.5**	**17174**	**10.7**	**37.6**	**13615**	**23.5**	**3559**	**20.0**	**11006**

[1] SHHS indicator 7.2; [2] SHHS indicator 7.3; [3] SHHS indicator 7.4; [4] SHHS indicator 7.5

The percentage of women married before age 15 ranged from 5.2 in Northern State to 19.1 in Blue Nile State.

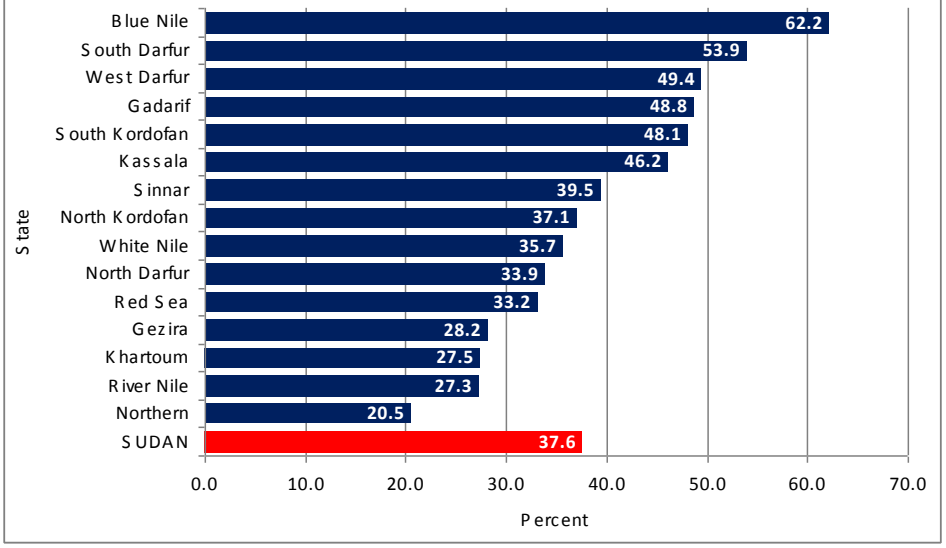
Figure 10.2: Early marriage
Percentage of women age 15-49 years who first married before their 15th birthday, Sudan, 2010



Women married before 18 years of age

Another SHHS2 indicators relating to early marriage relate to the percentage of women age 20-49 years married before 18 years of age. The SHHS2 data indicated that over one-third (37.6 per cent) of young women were married before age 18 (Table 10.2). The percentage of women married before age 18 ranged from 20.5 in Northern State to 62.2 in Blue Nile State.

Figure 10.3: Early marriage
Percentage of women age 20-49 years who first married before their 18th birthday, Sudan, 2010



The proportion of women age 20-49 years married before the age of 18 years varied substantially between those in urban areas (29.1 per cent) and those in rural area (42.0 per cent). The educational status of the woman appears to have an influence on the incidence of early marriage. The percentage of women married before 18 years of age declined steadily from 53.8 per cent among women with no formal education to 39.0 per cent among women with primary education and to 8.9 per cent among women who had secondary or higher level of education. The household wealth also appears to have an influence on the incidence of early marriage. The percentage of women married before 18 years of age was 17.3 per cent among women from households in the richest quintile compared to 53.8 per cent among women belonging to households in the poorest quintile.

Women age 15-19 years currently married

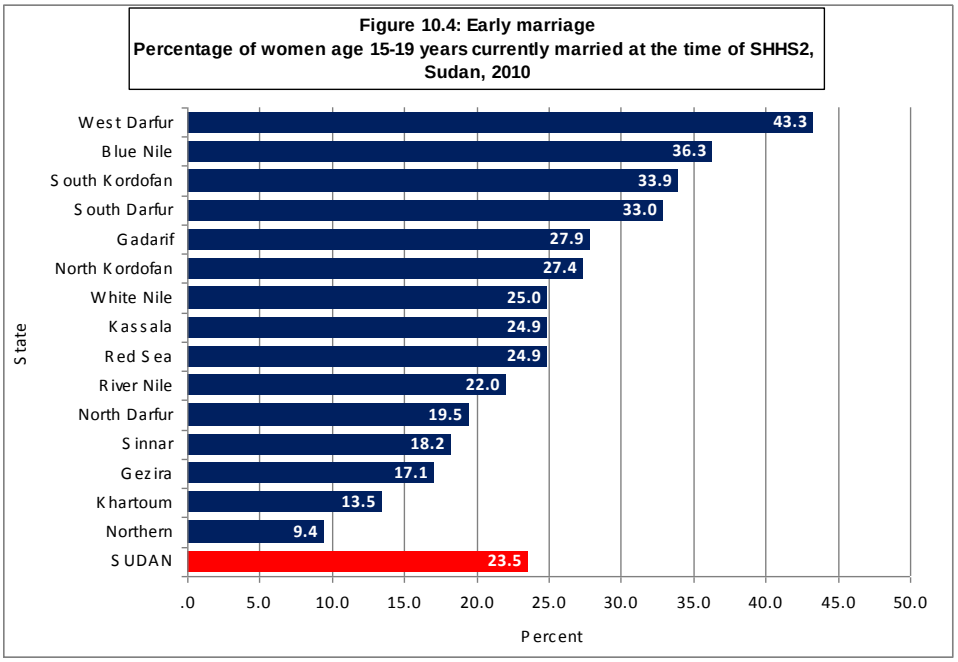
Another SHHS2 indicators relating to early marriage relate to the percentage of women age 15-19 years currently married, i.e. at the times of SHHS2. The SHHS2 data indicated that approximately one-fourth (23.5 per cent) of young women age 15-19 years were currently married at the time of the SHHS2.

The proportion of young women age 15-19 years currently married varied between urban and rural areas. The young women aged 15-19 years currently married varied between 14.6 per cent in urban areas and 28.3 per cent in rural areas.

The mother's educational status of the woman appears to have an influence on the incidence of early marriage. The percentage of women aged 15-19 years currently married showed a declining trend from 47.4 per cent among women with no formal education to 25.1 per cent among women with primary education and to 7.7 per cent among women who had secondary or higher level of education.

The household wealth also appears to have an influence on the incidence of early marriage. The percentage of women aged 15-19 years currently married was only 8.4 per cent among women from households in the richest quintile compared to 31.9 per cent among women belonging to households in the poorest quintile. The percentage of young women aged 15-19 years currently married ranged from 9.4 in Northern State to 43.3 in West Darfur State.

Figure 10.4: Early marriage
Percentage of women age 15-19 years currently married at the time of SHHS2, Sudan, 2010



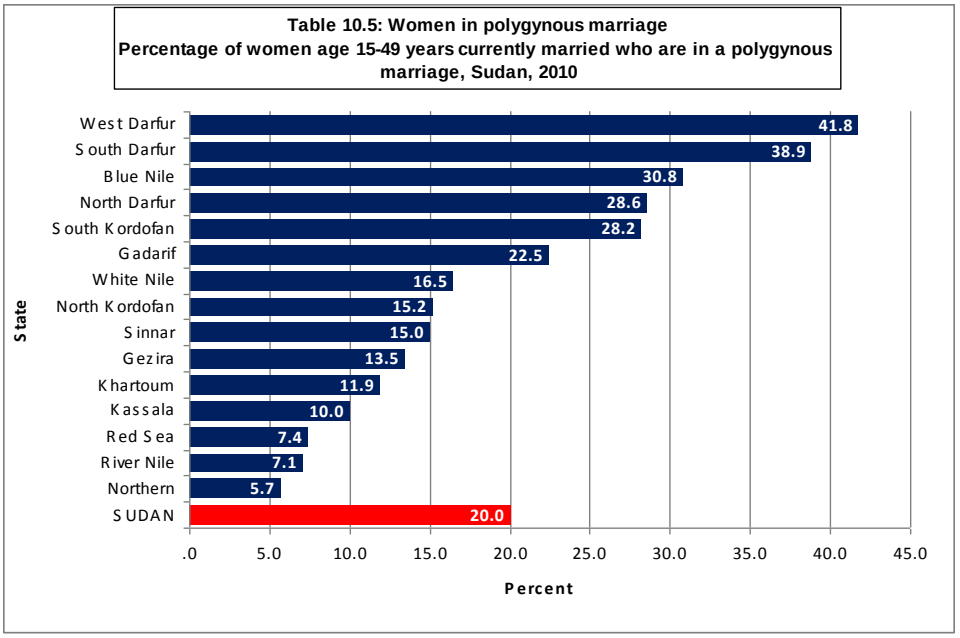
Women in Polygamous marriage

The information relating to the percentage of women in a Polygamous marriage is provided in Table 10.2. Nationwide, about 20.0 per cent of women age15-49 years were in Polygamous marriage. This percentage was lower among women in urban areas (15.3 per cent) than that among women in rural areas (22.1 per cent).

The incidence of polygamy appears to be linked to women's education level and the household wealth. While the percentage of women age 15-19 years in Polygamous marriage was 27.5 in the case of women with no formal education, it was only 14.9 among women with primary education and 9.3 among women with secondary or higher level of education. The percentage of women age 15-49 years in Polygamous marriage was only 9.7 in the case of women belonging to households in the richest quintile compared to 31.0 among women belonging to households in the poorest quintile. The age of the woman also appears to be a factor: the percentage of women in Polygamous marriage was lowest (10.8) among women in the age 15-19 years compared to 26.1 among women aged 35-39 years, 26.0 among women aged 40-44 years and 25.7 among women aged 45-49 years.

The percentage of women age 15-49 years in Polygamous marriage ranged from 5.7 per cent in Northern State to 41.8 per cent in West Darfur State.

Table 10.5: Women in polygynous marriage
Percentage of women age 15-49 years currently married who are in a polygynous marriage, Sudan, 2010



Trends in early marriage

Table 10.3 presents the proportion of women who were first married before age 15 and 18 years by residence and age groups. Examining the percentages of women married before age 15 and 18 years by different age groups allow us to see the trends in early marriage over time. There seems to be a positive trend in terms of reduction in the percentage of women married before age 15 over time.

Overall, the percentage of women married before age 15 was only 4.9 per cent among women in the age group 15-19 years compared to 7.2 per cent among women in the age group 20-24 years, 10.3 per cent among women in the age group 25-29 years, 10.6 per cent among women in the age group 30-34 years, 12.6 per cent among women in the age group 35-39 years, 13.2 per cent among women in the age group 40-44 years and 15.5 per cent among women in the age group 45-49 years. The percentage of women married before age 18 was 32.9 per cent among women in the age group 20-24 years compared to 36.3 per cent among women age 25-29 years, 37.0 per cent among women age 30-34 years, 40.6 per cent among women age 35-39 years, 43.1 per cent among women age 40-44 years and 43.2 per cent among women age 45-49 years.

A similar trend was observed in the case of women in urban areas who were married before age 15. The percentage of women in urban areas who were married before age 15 was only 1.9 per cent among women in the age group 15-19 years compared to 4.7 per cent among women in the age group 20-24 years, 6.1 per cent among women in the age group 25-29 years, 8.9 per cent among women in the age group 30-34 years, 11.3 per cent among women in the age group 35-39 years, 10.4 per cent among women in the age group 40-44 years and 14.7 per cent among women in the age group 45-49 years. The percentage of women in urban areas who were married before age 18 was 21.6 per cent among women in the age group 20-24 years compared to 26.5 per cent among women age 25-29 years, 30.3 per cent among women age 30-34 years, 32.4 per cent among women age 35-39 years, 34.3 per cent among women age 40-44 years and 41.9 per cent among women age 45-49 years.

Table 10.3: Trends in early marriage
Percentage of women who were first married or entered into a marital union before age 15 and 18, by residence and age groups, Sudan, 2010

Area of residence	Age	Percentage of women married before age 15	Number of women	Percentage of women married before age 18	Number of women
URBAN	15-19	1.9	1240	.	0
	20-24	4.7	1153	21.6	1153
	25-29	6.1	991	26.5	991
	30-34	8.9	748	30.3	748
	35-39	11.3	811	32.4	811
	40-44	10.4	526	34.3	526
	45-49	14.7	373	41.9	373
	Total (Urban)	**7.0**	**5842**	**29.1**	**4602**
RURAL	15-19	6.5	2319	.	0
	20-24	8.6	2169	39.0	2169
	25-29	12.1	2185	40.7	2185
	30-34	11.5	1391	40.6	1391
	35-39	13.2	1635	44.7	1635
	40-44	14.7	940	48.1	940
	45-49	16.0	693	43.8	693
	Total (Rural)	**10.8**	**11332**	**42.0**	**9013**
Total	15-19	4.9	3559	.	0
	20-24	7.2	3321	32.9	3321
	25-29	10.3	3176	36.3	3176
	30-34	10.6	2139	37.0	2139
	35-39	12.6	2446	40.6	2446
	40-44	13.2	1466	43.1	1466
	45-49	15.5	1067	43.2	1067
	Total	**9.5**	**17174**	**37.6**	**13615**

The percentage of women in rural areas who were married before age 15 was only 6.5 per cent among women in the age group 15-19 years compared to 8.6 per cent among women in the age group 20-24 years, 12.1 per cent among women in the age group 25-29 years, 11.5 per cent among women in the age group 30-34 years, 13.2 per cent among women in the age group 35-39 years, 14.7 per cent among women in the age group 40-44 years and 16.0 per cent among women in the age group 45-49 years. The percentage of women in rural areas who were married before age 18 was 39.0 per cent among women in the age group 20-24 years compared to 40.7 per cent among women aged 25-29 years, 40.6 per cent among women age 30-34 years, 44.7 per cent among women age 35-39 years, 48.1 per cent among women age 40-44 years and 43.8 per cent among women age 45-49 years.

Female Genital Mutilation/Cutting (FGM/C)

Female genital mutilation/cutting (FGM/C) is the partial or total removal of the female external genitalia or other injury to the female genital organs. FGM/C is always traumatic with immediate complications including excruciating pain, shock, urine retention, ulceration of the genitals and injury to adjacent tissue. Other complications include septicaemia, infertility, obstructed labour, and even death. The procedure is generally carried out on girls between the ages of five and 15 years. It is often performed by traditional practitioners, including midwives. It is generally performed by traditional midwives, nurses, midwives and doctors.

FGM/C is a fundamental violation of human rights. In the absence of any perceived medical necessity, it subjects girls and women to health risks and has life-threatening consequences. Among those rights violated are the rights to the highest attainable standard of health and to bodily integrity. Furthermore, it could be argued that girls (under 18) cannot be said to give informed consent to such a potentially damaging practice as FGM/C.

Prevalence of female genital mutilation/cutting (FGM/C)

Table 10.4 presents the prevalence of FGM/C among girls and women. The SHHS2 data shows that 87.6 per cent of women aged 15-49 and 65.5 per cent of ever women aged 0-50+ had some form of genital mutilation/cutting. The percentage of women who had been subjected to FGM/C was highest (89.8) among women in the age group 40-44 years and lowest (9.2) among girls in the age group 0-4 years. In addition to the age group 40-44 years, the FGM/C prevalence was over 80 per cent among the age groups 15-19 years (83.7 per cent), 20-24 years (86.8 per cent), 25-29 years (89.5 per cent), 30-34 years (88.3 per cent), 35-39 years (89.7 per cent), 45-49 years (89.1 per cent) and 50+ years (89.6 per cent). Younger women are less likely to have undergone any form of FGM/C than women in the older age groups, and fewer girls are perform cutting gentile due to age, however the gap between the girls and women due age has to be taken with caution.

Regards the FGM/C prevalence among the essential age groups, the proportion of girls/women who had been subjected to FGM/C was lowest at 37.0 per cent among those in the age group 0-14 years compared to 83.1 per cent among those in the age group 15-17 years and 88.2 per cent among those in the age group 18-49 years.

As regards the FGM/C prevalence among under-five children, the percentage of girls who had any form of female genital mutilation/cutting was lowest (3.9 per cent) among girls under one year of age and highest at 14.7 per cent among girls age 4 years. The prevalence rate was 7.6 per cent among girls age one year, 9.5 per cent among girls age two years, and 11.4 per cent among those age three years.

Table 10.4: Female genital mutilation/cutting prevalence (FGM/C)
Percentage of girls and women who have had undergone any form of FGM/C, Sudan, 2010

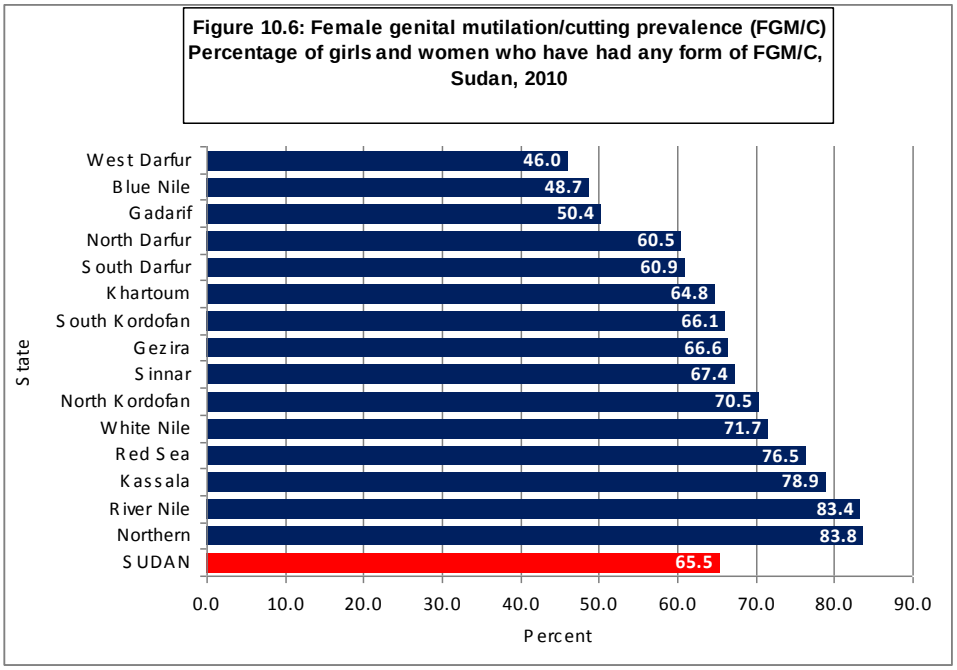
	Number of women	has (name) been perform cutting gentile /cut				
		Yes [1]	No	DK	Missing	Total
State of residence						
Northern	807	83.8	16.1	.0	.1	100.0
River Nile	1495	83.4	16.5	.1	.0	100.0
Red Sea	1098	76.5	22.9	.2	.3	100.0
Kassala	2475	78.9	20.9	.0	.3	100.0
Gadarif	2024	50.4	49.5	.0	.1	100.0
Khartoum	6544	64.8	34.7	.3	.2	100.0
Gezira	6716	66.6	33.3	.0	.0	100.0
White Nile	2248	71.7	28.2	.0	.1	100.0
Sinnar	1780	67.4	32.6	.0	.0	100.0
Blue Nile	1541	48.7	51.2	.0	.1	100.0
North Kordofan	4621	70.5	29.4	.0	.0	100.0
South Kordofan	1987	66.1	32.7	1.0	.3	100.0
North Darfur	2747	60.5	39.3	.1	.2	100.0
West Darfur	1850	46.0	52.9	.4	.7	100.0
South Darfur	5285	60.9	38.9	.1	.1	100.0
Age in years						
0-4	6802	9.2	90.3	.1	.5	100.0
5-9	6457	34.6	65.1	.1	.2	100.0
10-14	5825	72.2	27.4	.2	.2	100.0
15-19	4035	83.7	16.2	.0	.0	100.0
20-24	3700	86.8	12.9	.2	.2	100.0
25-29	3471	89.5	10.2	.2	.0	100.0
30-34	2314	88.3	11.7	.0	.0	100.0
35-39	2626	89.7	10.1	.1	.1	100.0
40-44	1610	89.8	10.1	.1	.0	100.0
45-49	1192	89.1	10.6	.3	.0	100.0
50+	5162	89.6	10.2	.1	.0	100.0
Children under 5 years of age						
0	1518	3.9	95.6	.0	.4	100.0
1	1300	7.6	91.7	.1	.6	100.0

2	1386	9.5	89.9	.0	.6	100.0
3	1414	11.4	88.3	.2	.2	100.0
4	1185	14.7	84.8	.2	.4	100.0
Essential age groups						
0-14 years	19084	37.0	62.6	.1	.3	100.0
15-17 years	2231	83.1	16.9	.1	.0	100.0
18-49 years	16716	88.2	11.6	.1	.1	100.0
Education level						
None	25591	55.5	44.1	.1	.2	100.0
Primary	13140	76.1	23.7	.1	.1	100.0
Secondary +	4291	91.5	8.3	.1	.0	100.0
Missing/DK	195	90.9	9.1	.1	.0	100.0
Wealth index quintiles						
Poorest	8837	63.0	36.7	.1	.2	100.0
Second	8632	63.6	36.2	.2	.1	100.0
Middle	8673	61.8	38.1	.1	.1	100.0
Fourth	8547	66.8	32.8	.2	.2	100.0
Richest	8527	72.6	27.1	.2	.1	100.0
SUDAN (TOTAL)	**43217**	**65.5**	**34.2**	**.1**	**.1**	**100.0**
[1] SHHS indicator 7.6						

FGM/C prevalence appears to be linked to both the education level of the women and the economic level of the household. While the percentage of women aged 15-49 years who had any form of FGM/C was 55.5 per cent among women with no formal education, it was 76.1 per cent for women with primary education and 91.5 per cent for women with secondary or higher level of education. The percentage of women age 15-49 years who had some form of female genital mutilation was 72.6 per cent for women from households in the richest quintile compared to 63.0 per cent for women from households in the poorest quintile.

The proportion of women age 15-49 years reported to have undergone any form of female genital mutilation/cutting varied by State, ranging from 46.0 per cent in West Darfur State to 83.8 per cent in Northern State.

Figure 10.6: Female genital mutilation/cutting prevalence (FGM/C)
Percentage of girls and women who have had any form of FGM/C, Sudan, 2010



Persons performing FGM/C

Table 10.5 shows information relating to the persons performing FGM/C. Female circumcision is performed mainly by the traditional midwives and qualified nurses/midwives. The SHHS2 results indicate that out of the perform FGM/C females, 58.5 per cent of them perform FGM/cutting by a traditional perform cutting gentiler while 38.9 per cent of them were perform cutting by a qualified nurse/midwife. Only a negligible percentage of other health professionals (including doctors) performed FGM/C, the highest being 1.2 per cent in Khartoum.

The percentage of women who had been subjected to FGM/C by traditional midwives was highest (87.3 per cent) among women in the age group 50+ years and lowest (40.7 per cent) among girls in the age group 10-14 years. In addition to the age group 50+ years, the FGM/C performed by traditional midwives was over the national average of 58.5 per cent among women in the age groups 30-34 years (60.2 per cent), 35-39 years (67.0 per cent), 40-44 years (74.0 per cent), and 45-49 years (76.4 per cent).

The percentage of women who had been subjected to FGM/C by a qualified nurse or midwife was highest (57.7 per cent) among girls in the age group 10-14 years and lowest (8.0 per cent) among women in the age group 50+ years. In addition to the age group 10-14 years, the FGM/C performed by a qualified nurse or midwife was over the national average of 38.9 per cent among girls/women in the age group 0-4 years (40.8 per cent), 5-9 years (52.3 per cent), 15-19 years (54.8 per cent), 20-24 years (49.9 per cent), and 25-29 years (42.8 per cent).

As regards the FGM/C performed by traditional midwives for under-five children, the proportion of girls who had been subjected to FGM/C by traditional midwives was highest (69.2 per cent) among those aged 1 year compared to 58.9 per cent among girls age below 1 year, 55.0 per cent among girls age 2 years, 56.2 per cent among those age 3 years and 56.5 per cent among girls age 4 years. The proportion of under-five girls who had been subjected to FGM/C by a qualified nurse or midwife was highest (43.5 per cent) among those aged 4 years compared to 38.7 per cent among girls age below 1 year, 30.8 per cent among girls age 2 years, 43.1 per cent among those age 3 years and 42.9 per cent among girls age 3 years.

Table 10.5: Persons performing FGM/C
Percentage of mutilated/cut girls and women by person who performed the FGM/C, Sudan, 2010

	Number of women	Who has done the cutting for (name)							
		Traditional midwives	Others	Doctor	Nurse or midwife	Other health professional	DK	Missing	Total
State of residence									
Northern	807	36.4	.0	.0	62.8	.0	.8	.0	100.0
River Nile	1495	51.4	2.0	.1	44.9	.0	1.5	.0	100.0
Red Sea	1098	79.3	.1	.2	17.6	.0	2.4	.4	100.0
Kassala	2475	76.0	.0	.0	22.9	.0	1.0	.0	100.0
Gadarif	2024	67.0	.6	.0	27.5	.1	4.6	.4	100.0
Khartoum	6544	42.3	.1	1.2	55.9	.2	.3	.0	100.0
Gezira	6716	66.1	.0	.2	31.7	.0	2.0	.0	100.0
White Nile	2248	36.5	.0	.2	62.3	.0	1.0	.0	100.0
Sinnar	1780	67.3	.0	.0	32.3	.0	.4	.0	100.0
Blue Nile	1541	70.9	.0	.0	28.7	.1	.3	.0	100.0
N. Kordofan	4621	59.1	.2	.3	35.8	.2	4.3	.1	100.0
S.Kordofan	1987	67.5	.3	.0	30.6	.0	1.4	.1	100.0
North Darfur	2747	52.4	.9	.4	41.6	.9	3.9	.0	100.0
West Darfur	1850	62.4	.1	.0	34.9	1.9	.5	.2	100.0
South Darfur	5285	60.5	1.2	.0	37.6	.0	.3	.5	100.0
Age group in years									
0-4	6802	58.3	.4	.3	40.8	.1	.0	.2	100.0
5-9	6457	46.2	.2	.3	52.3	.1	.6	.4	100.0
10-14	5825	40.7	.1	.6	57.7	.1	.6	.2	100.0
15-19	4035	43.2	.3	.5	54.8	.1	.9	.2	100.0
20-24	3700	47.7	.1	.6	49.9	.1	1.7	.0	100.0

25-29	3471	55.4	.3	.2	42.8	.1	1.2	.1	100.0
30-34	2314	60.2	.3	.0	37.1	.1	2.2	.0	100.0
35-39	2626	67.0	.3	.2	30.2	.1	2.0	.2	100.0
40-44	1610	74.0	.6	.1	22.7	.4	2.1	.1	100.0
45-49	1192	76.4	.3	.3	20.2	.2	2.6	.0	100.0
50+	5162	87.3	1.0	.0	8.0	.3	3.5	.0	100.0
Number of Children under five									
0	1518	58.9	1.1	1.2	38.7	.0	.0	.0	100.0
1	1300	69.2	.0	.0	30.8	.0	.0	.0	100.0
2	1386	55.0	.5	.6	43.1	.0	.0	.7	100.0
3	1414	56.2	.7	.0	42.9	.2	.0	.0	100.0
4	1185	56.5	.0	.0	43.5	.0	.0	.0	100.0
Education level									
None	25591	72.2	.6	.2	24.6	.2	2.0	.1	100.0
Primary	13140	45.3	.1	.3	52.8	.1	1.3	.2	100.0
Secondary +	4291	41.6	.0	.5	56.2	.2	1.4	.0	100.0
Missing/DK	195	78.9	.9	.0	18.7	.0	1.5	.0	100.0
Wealth index quintiles									
Poorest	8837	70.9	1.1	.1	25.8	.2	1.6	.4	100.0
Second	8632	70.9	.5	.1	26.3	.1	2.0	.1	100.0
Middle	8673	58.7	.1	.1	38.8	.1	2.1	.0	100.0
Fourth	8547	48.7	.1	.2	48.9	.2	1.7	.1	100.0
Richest	8527	45.1	.0	1.0	52.7	.1	1.1	.0	100.0
SUDAN	**43217**	**58.5**	**.4**	**.3**	**38.9**	**.2**	**1.7**	**.1**	**100.0**

The percentage of girls and women subjected to FGM/C by person who performed the FGM/C appears to be linked to the education level of the women. The proportion of girls who had been subjected to FGM/C by traditional midwives was 41.6 per cent among women who had no formal education compared to 45.3 per cent for women with primary education and 41.6 per cent for women with secondary and higher level of education. The proportion of girls/women who had been subjected to FGM/C by a qualified nurse or midwife was 24.6 per cent among women who had no formal education compared to 52.8 per cent for women with primary education and 56.2 per cent for women with secondary and higher level of education.

The percentage of girls and women subjected to FGM/C by person who performed the FGM/C appears also to be linked to household wealth. The proportion of girls who had been subjected to FGM/C by traditional midwives was 70.9 per cent among women from households in the poorest quintile compared to 41.6 per cent among women from households in the richest quintile. The proportion of girls who had been subjected to FGM/C by a qualified nurse or midwife was 25.8 per cent among women from households in the poorest quintile compared to 52.7 per cent among women households in the richest quintile.

The proportion of girls who had been subjected to FGM/C by a traditional midwife or by a qualified nurse/midwife varies by State. The proportion of girls who had been subjected to FGM/C by traditional midwives ranged from 36.4 per cent in Northern State to 79.3 per cent in Red Sea State. The proportion of girls who had been subjected to FGM/C by a qualified nurse or midwife ranged from 17.6 per cent in Red Sea State to 62.8 per cent in Northern State.

Women intending to perform FGM/C their daughters

Table 10.6 presents information relating to the proportion of ever-married women age 15-49 intending or not intending to perform cutting gentile (FGM/C) their daughters.

The SHHS2 findings indicated that about 48.0 per cent of ever married women age 15-49 years intended to perform cutting gentile their daughters while 33.6 per cent indicated that they did not intend to perform cutting gentile their daughters. This percentage was highest (55.9 per cent) among women in the age group 35-39 years and the lowest (30.5 per cent) among young girls/women in the age group 15-19 years. The proportion of women who indicated they did not intend to perform cutting gentile their daughters was highest (39.2 per cent) among women in the age group 40-44 years and the lowest (20.8 per cent) among women in the age group 15-19 years.

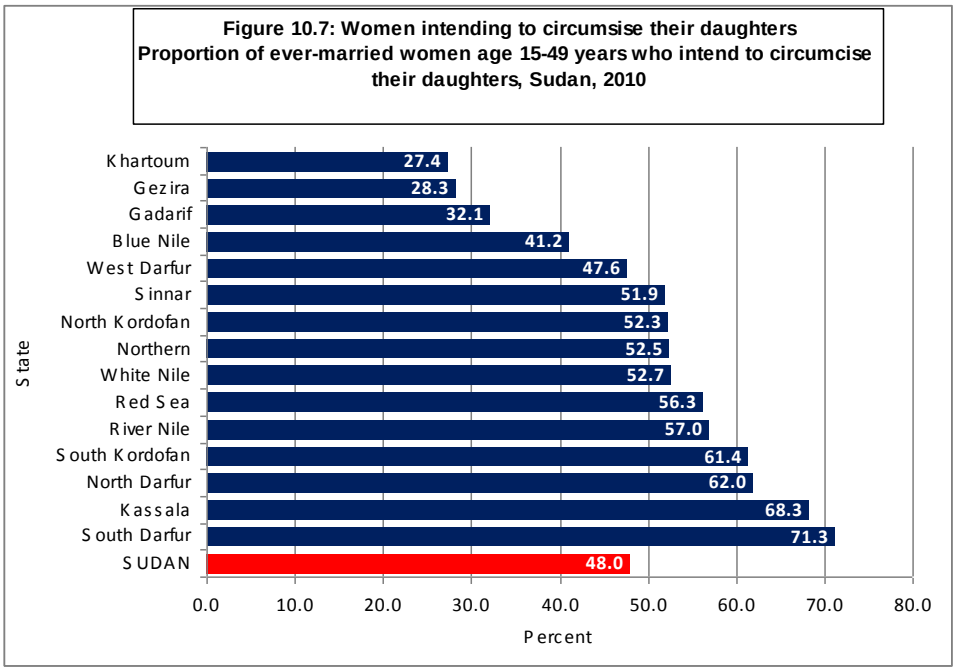
The intention of ever-married women age 15-49 years to perform cutting gentile their daughters appears to have a linkage with the woman's education level and the household wealth. The proportion of ever married women age 15-49 years intended to perform cutting gentile their daughters was 59.1 per cent among women who had no formal education compared to 47.2 per cent for women with primary education and 22.3 per cent for women with secondary and higher level of education. The proportion of women who did not intend to perform cutting gentile their daughters was 25.9 per cent among women who had no formal education compared to 33.5 per cent for women with primary education and 51.9 per cent for women with secondary or higher level of education. The percentage of ever married women age 15-49 years intended to perform cutting gentile their daughters was very high (70.0 per cent) among women from households in the poorest quintile compared to 27.9 per cent among women from households in the richest quintile. The percentage of women who did not intend to perform FGM/C on their daughters was 16.0 per cent among women from households in the poorest quintile compared to 52.1 per cent among women from households in the richest quintile.

Table 10.6: Women intending to FGM/C their daughters
Percentage of ever married women aged 15-49 years who intend or not intended to FGM/C their daughters, Sudan, 2010

	Number of women aged 15-49 years	Do you Intend to Perform cutting gentile your Daughter				
		Yes [1]	No	DK	Missing	Total
State of residence						
Northern	208	52.5	34.7	7.4	5.5	100.0
River Nile	386	57.0	28.7	4.3	10.0	100.0
Red Sea	331	56.3	19.0	6.9	17.9	100.0
Kassala	684	68.3	14.9	3.6	13.1	100.0
Gadarif	530	32.1	49.0	2.2	16.8	100.0
Khartoum	1718	27.4	50.5	2.8	19.3	100.0
Gezira	1574	28.3	48.8	2.1	20.8	100.0
Wite Nile	569	52.7	31.5	2.8	13.1	100.0
Sinnar	418	51.9	32.0	2.3	13.8	100.0
Blue Nile	425	41.2	48.5	2.6	7.7	100.0
North Kordofan	1106	52.3	28.7	4.8	14.2	100.0
South Kordofan	511	61.4	28.5	3.6	6.5	100.0
North Darfur	669	62.0	21.2	3.3	13.4	100.0
West Darfur	513	47.6	30.1	2.9	19.4	100.0
South Darfur	1364	71.3	12.7	2.2	13.8	100.0
Age						
15-19	838	30.5	20.8	4.2	44.5	100.0
20-24	1844	41.5	29.0	4.2	25.3	100.0
25-29	2414	47.5	33.7	4.2	14.6	100.0
30-34	1739	48.9	37.8	3.0	10.4	100.0
35-39	2054	55.9	34.7	2.1	7.3	100.0
40-44	1240	51.6	39.2	1.9	7.4	100.0
45-49	878	54.6	36.2	1.8	7.4	100.0
Education level						
None	4870	59.1	25.9	2.9	12.1	100.0
Primary	3569	47.2	33.5	3.1	16.2	100.0
Secondary +	2016	22.3	51.9	3.9	21.9	100.0
Adult education/ Khalwa/Sunday eductation	550	50.3	34.7	2.8	12.2	100.0
Wealth index quintiles						
Poorest	2252	70.0	16.0	2.4	11.5	100.0
Second	2296	57.1	24.9	3.1	14.8	100.0
Middle	2269	45.2	35.1	3.6	16.1	100.0
Fourth	2114	37.5	41.8	3.6	17.1	100.0
Richest	2075	27.9	52.1	3.0	17.0	100.0
SUDAN (TOTAL)	11006	48.0	33.6	3.2	15.3	100.0
[1] SHHS indicator 7.7						

The proportion of ever-married women age 15-49 years intending to perform cutting gentile their daughters ranged from 27.4 per cent in Khartoum State to 71.3 per cent in South Darfur State while the proportion of women not intending to perform cutting gentile their daughters was lowest at 12.7 per cent in West Darfur State and highest at 50.0 per cent in Khartoum State.

Figure 10.7: Women intending to circumsise their daughters
Proportion of ever-married women age 15-49 years who intend to circumcise their daughters, Sudan, 2010



Attitude of women age 15-49 years towards FGM/C

Table 10.7 presents the attitudes of women age 15-49 years towards whether the practice of FGM/C should be continued or discontinued.

Regarding opinion as to whether the practice should be continued or discontinued, 42.3 per cent of women thought it should be continued while 53.0 percent believed it should be discontinued. The attitude of women towards whether the practice of FGM/C should be continued or discontinued appears to be linked to the woman's education level and the household wealth. Approval of the continuation of the practice was highest among women with no formal education (59.7 per cent) than those with primary education (44.0 per cent) and those with secondary or higher level of education (17.3 per cent). Disapproval of the continuation of the practice was higher among women with secondary and higher level of education (79.8 per cent) than those with primary education (51.2 per cent) and those with no formal education (34.3 per cent). Women from households in the richest quintile are less likely to approve of the continuation of the practice than women from households in the poorest quintile. Approval of the continuation of the practice was higher among women from households in the poorest quintile (68.6 per cent) than those from households in the richest quintile (20.7 per cent). Disapproval of the continuation of the practice was highest among women from households in the richest quintile (75.9 per cent) than those from households in the poorest quintile (26.1 per cent).

The percentage of women who believed that the practice of FGM/C should be continued was lowest among women in the age group 15-19 years (37.3 per cent) and highest among women in the age group 35-39 years (46.6 per cent). The percentage of women who believed that the practice of FGM/C should be discontinued was highest among women in the age group 15-19 years (58.7 per cent) and lowest among women in the age group 35-39 years (48.2 per cent).

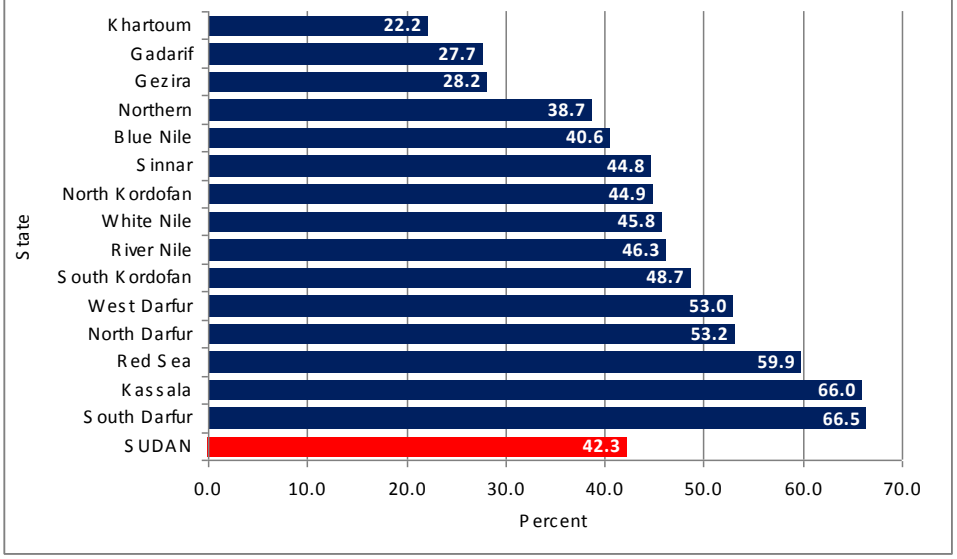
Table 10.7: Attitude towards FGM/C
Attitude of women aged 15-49 years towards whether the practice of FGM/C should be continued or discontinued, Sudan, 2010

	Number of men aged 15-49 years	Should practice be continued or discontinued					
		Continued [1]	Discontinue	Depends	DK	Missing	Total
State of residence							
Northern	403	38.7	56.7	1.2	3.1	.2	100.0
River Nile	706	46.3	48.8	.5	4.2	.2	100.0
Red Sea	512	59.9	36.9	.0	2.8	.3	100.0
Kassala	1071	66.0	29.0	1.6	3.3	.1	100.0
Gadarif	827	27.7	65.6	5.4	1.1	.1	100.0
Khartoum	3347	22.2	74.0	1.3	2.2	.3	100.0
Gezira	2853	28.2	69.1	.6	1.9	.2	100.0
Wite Nile	1014	45.8	49.8	1.3	1.5	1.7	100.0
Sinnar	719	44.8	49.7	3.7	1.6	.3	100.0
Blue Nile	607	40.6	53.0	5.0	1.1	.3	100.0
North Kordofan	1852	44.9	49.2	2.5	3.3	.1	100.0
South Kordofan	743	48.7	40.7	7.9	2.6	.1	100.0
North Darfur	1020	53.2	40.8	2.8	3.1	.1	100.0
West Darfur	700	53.0	41.1	.8	4.9	.1	100.0
South Darfur	2164	66.5	30.1	1.7	1.3	.4	100.0
Age group in years							
15-19	3559	37.3	58.7	.6	3.0	.4	100.0
20-24	3321	39.9	56.2	1.4	2.2	.3	100.0
25-29	3176	45.0	50.1	2.3	2.3	.3	100.0
30-34	2139	43.2	51.3	3.4	1.9	.3	100.0
35-39	2446	46.6	48.2	2.8	2.3	.1	100.0
40-44	1466	42.6	52.7	2.5	2.2	.1	100.0
45-49	1067	45.9	48.3	2.7	2.7	.4	100.0
Education level							
None	6062	59.7	34.3	2.4	3.4	.2	100.0
Primary	5570	44.0	51.2	2.2	2.4	.2	100.0
Secondary +	4803	17.3	79.8	1.4	.9	.6	100.0
Adult education/ Khalwa	739	48.1	46.1	2.4	3.4	.1	100.0
Wealth index quintiles							
Poorest	3013	68.6	26.1	2.4	2.9	.1	100.0
Second	3176	58.1	36.6	2.3	3.0	.1	100.0
Middle	3375	42.7	52.3	2.3	2.6	.2	100.0
Fourth	3604	29.9	65.4	1.9	2.3	.5	100.0
Richest	4006	20.7	75.9	1.5	1.4	.4	100.0
SUDAN (TOTAL)	**18539**	**42.3**	**53.0**	**2.0**	**2.4**	**.3**	**100.0**

[1] SHHS indicator 7.8

The percentage of women who believed that the practice of FGM/C should be continued was lowest in Khartoum State (22.2 per cent) and highest in South Darfur State (66.5 per cent). The percentage of women who believed that the practice of FGM/C should be discontinued was highest in Khartoum State (74.0 per cent) and lowest in Kassala State (29.0 per cent).

Figure 10.8: Attitude towards FGM/C
Attitude of women aged 15-49 years towards whether the practice of FGM/C should be continued or discontinued, Sudan, 2010



Attitude of ever married women age 15-49 years towards FGM/C

Table 10.8 presents the attitudes of ever married women age 15-49 years towards whether the practice of FGM/C should be continued or discontinued. Regarding opinion as to whether the practice should be continued or discontinued, 48.1 per cent of ever married women age 15-49 years thought it should be continued while 47.0 per cent believed it should be discontinued.

The percentage of ever married women who believed that the practice of FGM/C should be continued was highest among those in the age group 15-19 years (51.1 per cent) and lowest among those in the age group 40-44 years (43.4 per cent). The percentage of ever married women who believed that the practice of FGM/C should be discontinued was highest among those in the age group 40-44 years (52.6 per cent) and lowest among those in the age group 20-24 years (45.0 per cent).

The attitude of ever married women towards whether the practice of FGM/C should be continued or discontinued appears to be linked to the woman's education level and the household wealth. Approval of the continuation of the practice was higher among ever married women with no formal education (61.3 per cent) than amomg those with primary education (46.3 per cent) and those with secondary or higher level of education (19.0 per cent). Disapproval of the continuation of the practice was higher among ever married women with secondary and higher level of education (77.6 per cent) than among those with primary education (48.9 per cent) and those with no formal education (33.2 per cent). Ever married women from households in the richest quintile are less likely to approve of the continuation of the practice of female circumcision than women from households in the poorest quintile. Approval of the continuation of the practice was higher among ever married women from households in the poorest quintile (72.8 per cent) than among those from households in the richest quintile (24.9 per

cent). Disapproval of the continuation of the practice was higher among ever married women from households in the richest quintile (71.6 per cent) than those from households in the poorest quintile (22.1 per cent).

Table 10.8: Attitude towards FGM/C
Attitude of ever married women aged 15-49 years towards whether the practice of FGM/C should be continued or discontinued, Sudan, 2010

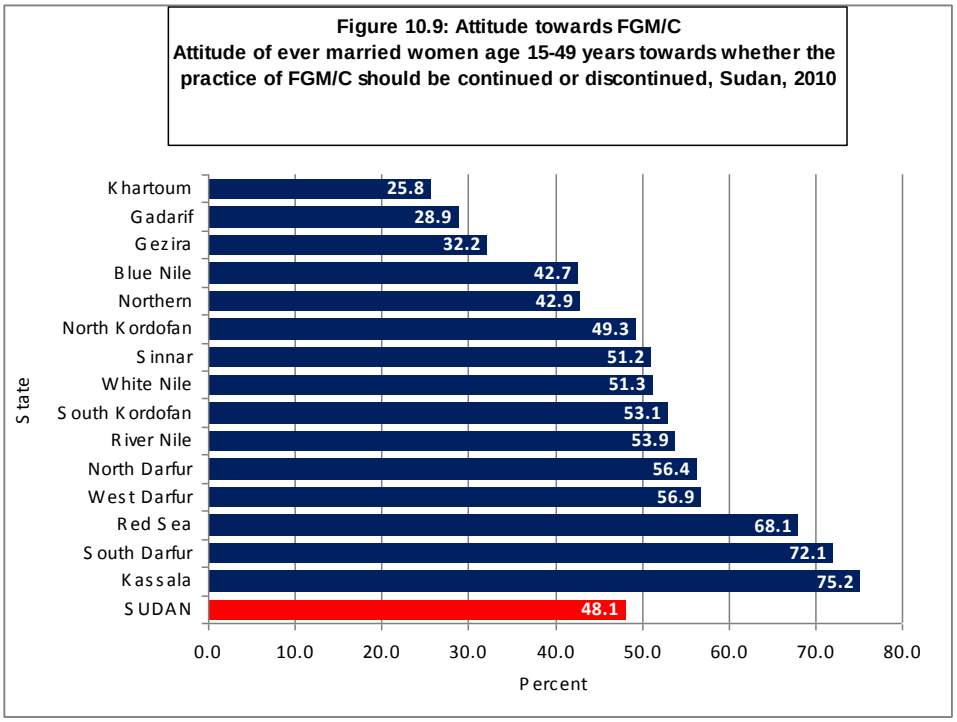
	Number of men aged 15-49 years	Should practice be continued or discontinued					
		Continued [1]	Discontinue	Depends	DK	Missing	Total
State of residence							
Northern	208	42.9	52.1	2.0	2.8	.2	100.0
River Nile	386	53.9	42.2	.5	3.2	.2	100.0
Red Sea	331	68.1	29.7	.0	2.2	.0	100.0
Kassala	684	75.2	21.7	1.3	1.8	.0	100.0
Gadarif	530	28.9	63.3	6.8	1.0	.0	100.0
Khartoum	1718	25.8	69.3	2.0	2.6	.3	100.0
Gezira	1574	32.2	66.1	.8	.8	.2	100.0
Wite Nile	569	51.3	43.6	2.0	2.0	1.1	100.0
Sinnar	418	51.2	42.8	4.8	1.0	.2	100.0
Blue Nile	425	42.7	50.5	5.9	.8	.1	100.0
North Kordofan	1106	49.3	45.5	2.6	2.6	.0	100.0
South Kordofan	511	53.1	35.1	9.2	2.6	.0	100.0
North Darfur	669	56.4	36.7	3.2	3.6	.2	100.0
West Darfur	513	56.9	37.9	.7	4.4	.1	100.0
South Darfur	1364	72.1	23.8	2.1	1.8	.3	100.0
Age group							
15-19	838	51.1	45.5	.9	2.2	.3	100.0
20-24	1844	50.6	45.0	1.6	2.4	.3	100.0
25-29	2414	49.2	45.7	2.7	2.3	.2	100.0
30-34	1739	46.3	48.1	3.7	1.7	.2	100.0
35-39	2054	48.2	46.8	2.7	2.2	.1	100.0
40-44	1240	43.4	52.6	2.6	1.2	.1	100.0
45-49	878	47.0	46.8	3.2	2.6	.4	100.0
Education level							
None	4870	61.3	33.2	2.5	2.8	.2	100.0
Primary	3569	46.3	48.9	2.6	1.9	.2	100.0
Secondary +	2016	19.0	77.6	2.6	.6	.3	100.0
Adult education/ Khalwa	550	49.6	44.7	2.8	2.9	.0	100.0
has (name) been perform cutting gentile							
Yes	9665	53.0	42.3	2.6	1.8	.2	100.0
No	1325	12.7	81.4	2.1	3.8	.0	100.0
DK	11	23.5	33.1	16.0	27.4	.0	100.0
Missing	5	61.0	30.7	8.2	.0	.0	100.0
Wealth index quintile							
Poorest	2252	72.8	22.1	2.5	2.4	.1	100.0
Second	2296	60.6	34.4	2.5	2.5	.1	100.0
Middle	2269	44.2	50.2	3.0	2.3	.2	100.0
Fourth	2114	35.1	59.7	2.5	2.4	.3	100.0
Richest	2075	24.9	71.6	2.3	.8	.4	100.0
SUDAN (TOTAL)	**11006**	**48.1**	**47.0**	**2.6**	**2.1**	**.2**	**100.0**

[1] SHHS indicator 7.9

The percentage of ever married women who believed that the practice of FGM/C should be continued was lowest in Khartoum State (25.8 per cent) and highest in South Darfur State (72.1 per cent). The percentage of ever married women who believed that the practice of FGM/C should be discontinued was highest in Khartoum State (69.3 per cent) and lowest in Kassala State (21.7 per

cent).

Figure 10.9: Attitude towards FGM/C
Attitude of ever married women age 15-49 years towards whether the practice of FGM/C should be continued or discontinued, Sudan, 2010



Attitudes Toward Domestic Violence

A number of questions were asked of women age 15-49 years to assess their attitudes toward whether husbands are justified to hit or beat their wives/partners in certain circumstances. These questions were asked to have an indication of the cultural beliefs that tend to be associated with the prevalence of violence against women by their husbands/partners. The main assumption here is that women that agree with the statements indicating that husbands/partners are justified to beat their wives/partners under the situations described in reality tend to be abused by their own husbands/partners.

The main SHHS2 indicator used to assess women's attitude towards domestic violence is as follows:

- *Attitude towards domestic violence:* Proportion of women age 15-49 years who state that a husband/partner is justified in hitting or beating his wife in at least one of the following circumstances: (i) she goes out without telling him, (ii) she neglects the children, (iii) she argues with him, (iv) she refuses sex with him, and (v) she burns the food.

The responses to SHHS2 questions are indicated in Table 10.10. Overall, 47.0 per cent of women in Sudan feel that their husband/partner has a right to hit or beat them for at least one of a variety of reasons. Women who approve their partner's violence, in most cases, agree and justify violence in instances when they neglect their children (35.2 per cent), or if they demonstrate their autonomy, for e.g. go out without telling their husbands or argue with them (31.5 per cent) or argue with the husband (30.1 per cent). Over one-fourth (27.7 per cent) of women believe that their partner has a right to hit or beat them if they refuse to have sex with him, while around one-fourth (26.7 per cent) of women believe that their partner has a right to hit or beat them or if they burn the food. Acceptance is more

present among those living in households on the poorest quintile, less educated, and also currently married women.

Table 10.10: Attitudes toward domestic violence
Percentage of women age 15-49 years who believe a husband is justified in beating his wife/partner in various circumstances, Sudan, 2010

	Percentage of women age 15-49 years who believe that a husband is justified in beating his wife/partner:						Number of women age 15-49 years
	If goes out without telling him	If she neglects the children	If she argues with him	If she refuses sex with him	If she burns the food	For any of these reasons [1]	
State of residence							
Northern	23.7	32.4	20.0	19.5	15.0	49.7	351
River Nile	19.5	19.8	15.6	15.0	15.0	28.4	637
Red Sea	13.3	14.8	11.0	9.5	8.6	19.2	477
Kassala	25.1	24.8	22.0	19.2	14.7	32.3	1004
Gadarif	24.7	32.0	26.6	21.1	22.4	43.4	773
Khartoum	17.0	20.1	16.9	12.3	13.1	30.8	3005
Gezira	16.3	19.8	16.1	17.3	12.6	29.6	2791
Wite Nile	33.3	38.7	31.8	33.1	30.3	52.0	906
Sinnar	33.7	33.7	28.7	29.2	31.6	49.7	675
Blue Nile	31.3	30.9	29.4	23.7	24.6	47.4	566
North Kordofan	48.3	53.8	40.4	36.1	37.5	67.8	1765
South Kordofan	49.4	58.0	49.6	39.7	41.4	73.1	700
North Darfur	26.5	29.5	25.1	26.0	22.6	46.2	930
West Darfur	72.1	74.8	70.5	63.2	66.6	83.6	672
South Darfur	57.1	62.5	60.0	59.0	56.6	74.6	1923
Area of residence							
Urban	21.0	25.4	21.4	17.1	16.7	38.2	5842
Rural	37.0	40.3	34.6	33.2	31.8	51.5	11332
Age group							
15-19	34.4	39.1	33.3	27.9	29.2	51.9	3559
20-24	30.0	33.0	28.4	26.6	24.8	46.3	3321
25-29	30.1	34.5	28.5	26.7	25.9	44.7	3176
30-34	30.7	33.6	28.0	27.3	26.3	44.9	2139
35-39	32.4	36.5	31.8	29.7	27.9	47.6	2446
40-44	30.8	34.4	30.0	29.1	26.7	45.7	1466
45-49	31.6	32.8	30.4	28.3	24.5	44.0	1067
Marital status							
Currently married	33.2	36.8	31.6	29.9	27.9	48.3	11006
Formerly married	36.0	40.3	35.6	33.4	32.1	51.0	972
Never married/in union	27.2	30.9	26.0	22.1	23.1	43.5	5197
Education level							
None	45.2	48.4	43.7	40.5	39.6	59.8	6062
Primary	30.7	34.8	28.7	25.8	26.0	47.0	5570
Secondary +	15.5	20.1	15.4	14.4	12.2	31.7	4803
Adult education/ Khalwa/Sunday eductation	29.6	29.3	24.5	24.5	19.9	40.4	739
Wealth index quintile							
Poorest	52.7	56.6	52.5	51.6	49.1	68.8	3013
Second	44.9	47.6	41.4	38.2	38.0	59.5	3176
Middle	32.5	36.1	30.7	26.7	25.9	48.6	3375
Fourth	20.6	24.8	18.7	17.0	16.8	36.2	3604
Richest	14.0	18.0	14.1	12.0	10.4	28.9	4006
SUDAN (TOTAL)	**31.5**	**35.2**	**30.1**	**27.7**	**26.7**	**47.0**	**17174**

[1] SHHS indicator 7.11

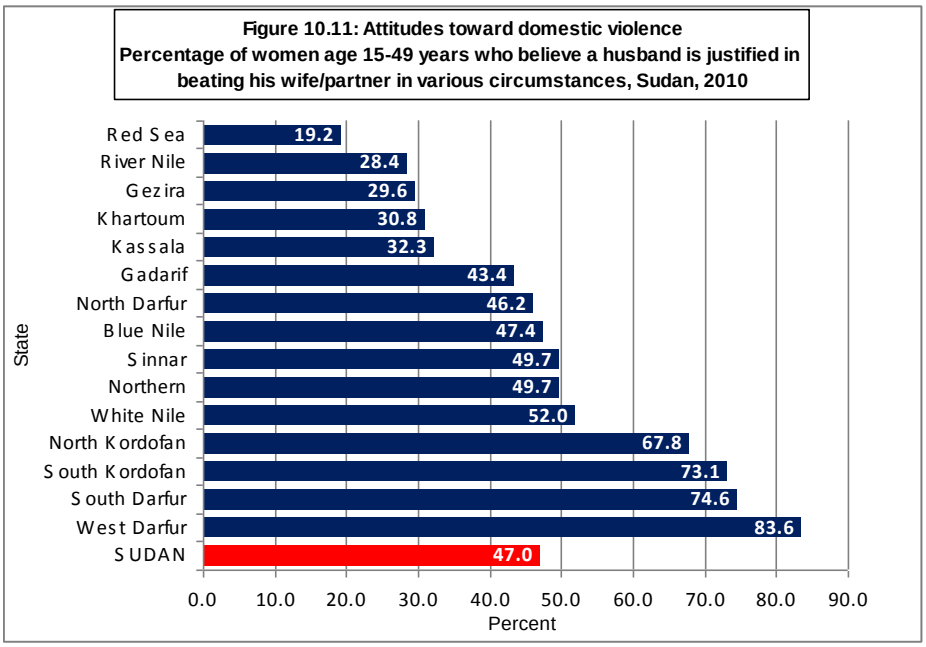
The attitude toward domestic violence appears to be linked to the women's education level and the household wealth. The percentage of women age 15-49 years who believe a husband is justified in beating his wife/partner in various circumstances was higher among women with no formal education

(59.8 per cent) than among those with primary education (47.0 per cent) and those with secondary or higher level of education (31.7 per cent). Women from households in the richest quintile are less likely to approve of the practice of beating wife/partner in various circumstances than women from households in the poorest quintile. Approval of the practice was highest among women from households in the poorest quintile (68.8 per cent) than those from households in the richest quintile (28.9 per cent).

The percentage of women age 15-49 years who believe that a husband is justified in beating his wife/partner in various circumstances was lowest among women in the age group 45-49 years (44.0 per cent) and highest among women in the age group 15-19 years (51.9 per cent). The percentage of women age 15-49 years who believe that a husband is justified in beating his wife/partner in various circumstances was higher among women in rural areas (51.5 per cent) than that among women in urban areas (38.2 per cent). The percentage of women age 15-49 years who believed that a husband was justified in beating his wife/partner in various circumstances was higher among formerly married women (51.0 per cent) than that among women currently married (48.3 per cent) and that among women never married (43.5 per cent).

The percentage of women age 15-49 years who believed that a husband was justified in beating his wife in various circumstances was lowest in Red Sea State (19.2 per cent) and highest in West Darfur State (83.6 per cent).

Figure 10.11: Attitudes toward domestic violence
Percentage of women age 15-49 years who believe a husband is justified in beating his wife/partner in various circumstances, Sudan, 2010



Children's Living Arrangements and Orphanhood

Children who are orphaned or in vulnerable households may be at increased risk of neglect or exploitation if the parents are not available to assist them. Children are considered as orphaned if they have one or both of their parents dead. Monitoring the variations in different outcomes for orphans and vulnerable children and comparing them to their peers gives us a measure of how well communities and governments are responding to their needs.

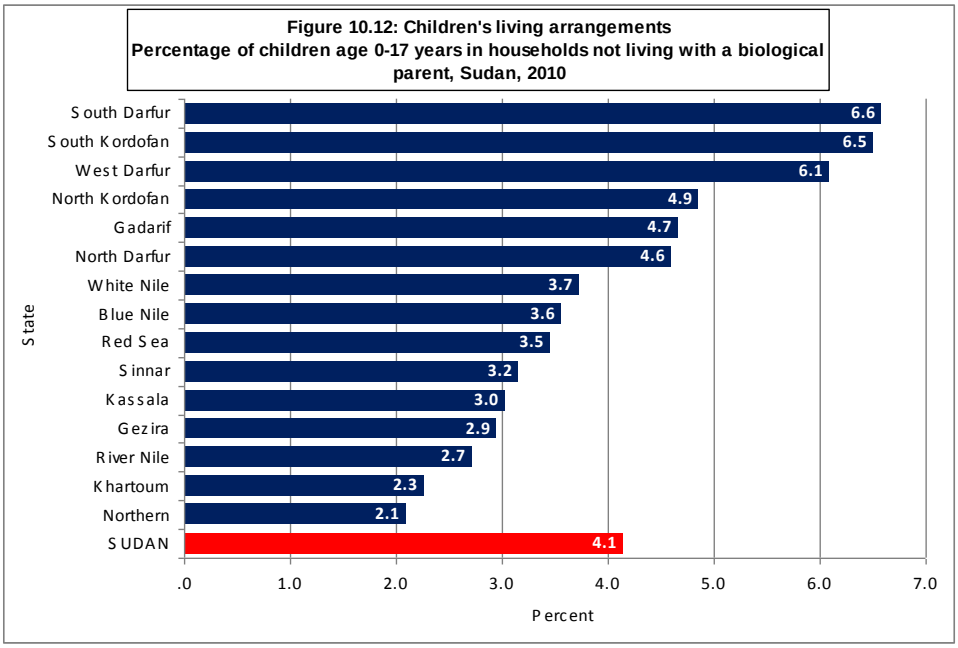
Children's living arrangements

Table 10.11 provides information relating to children's living arrangements and orphan hood. It indicates the percentage of children aged 0-17 years according to living arrangements, percentage of children age 0-17 years in households not living with a biological parent and percentage of children who have one or both biological parents dead. It also shows percentage of children living with neither parent, mother only, and father only.

The SHHS2 findings indicate that 76.2 per cent of children aged 0-17 years in Sudan live with both parents. About 4.1 per cent of children were not living with a biological parent. About 17.8 per cent of live with only their mother while about 1.9 per cent live with only their father. The proportion of children who did not live with a biological parent was slightly higher in the case of female children (5.0 per cent) than that in the case of male children (3.3 per cent). The proportion of children who did not live with a biological parent was slightly higher in rural areas (4.3 per cent) than that in urban areas (3.7 per cent). The proportion of children who did not live with a biological parent was highest (10.8 per cent) among those in the age group 15-17 years and lowest (1.2 per cent) among those in the age group 0-4 years.

The percentage of children who did not live with a biological parent ranged from 2.3 per cent in Khartoum State to 6.6 per cent in South Darfur State.

Figure 10.12: Children's living arrangements
Percentage of children age 0-17 years in households not living with a biological parent, Sudan, 2010



Prevalence of orphans

Nationwide, the prevalence of orphans (percentage of children under age 18 who have one or both of their parents dead) was 5.7 per cent. There was only a marginal difference in the percentage of children who had one or both of their parents dead between female children (5.7 per cent) and male children (5.6 per cent). The proportion of children who had one or both of their parents dead was marginally higher in urban areas (6.5 per cent) than that in rural areas (5.3 per cent). The proportion of children who did not live with a biological parent was highest among those aged 15-17 years (12.2 per cent) and lowest among those aged 0-4 years (1.8 per cent). The prevalence of orphans ranged from 3.2 per cent in River Nile State to 7.4 per cent in South Darfur State.

Figure 10.13: Prevalence of orphans
Percentage of children age 0-17 years who have one or both parents dead, Sudan, 2010

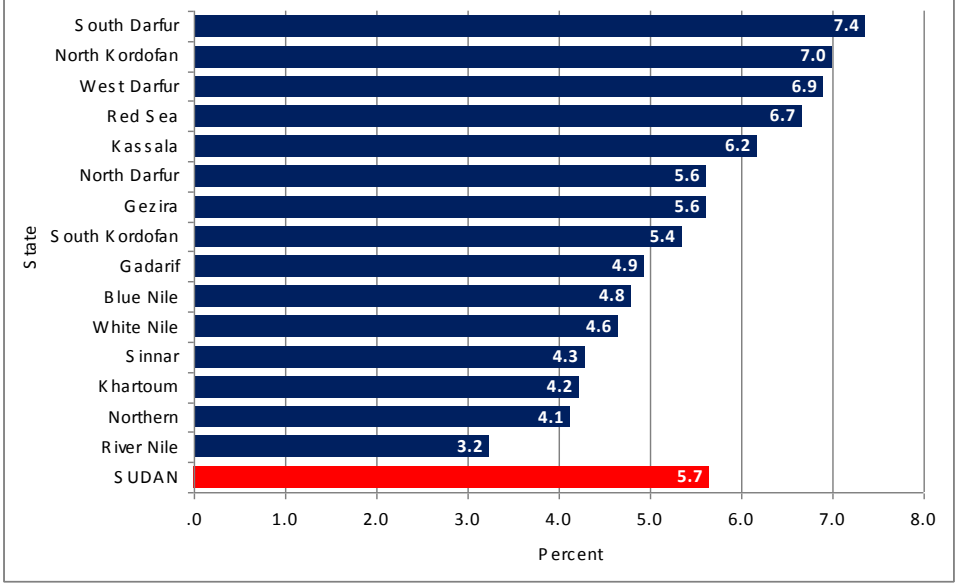


Table 10.11: Children's living arrangements and orphanhood
Percent distribution of children age 0-17 years according to living arrangements, percentage of children age 0-17 years in households not living with a biological parent and percentage of children who have one or both parents dead, Sudan, 2010

	Living with both parents	Living with neither parent				Living with mother only		Living with father only		Impossible to determine	Total	Not living with a biological parent [1]	One or both parents dead [2]	Number of children age 0-17 years
		Only father alive	Only mother alive	Both are alive	Both are dead	Father alive	Father dead	Mother alive	Mother dead					
Sex														
Male	77.1	.6	.4	2.1	.2	13.9	3.6	1.2	.8	.1	100.0	3.3	5.6	21663
Female	75.3	.7	.4	3.7	.1	14.4	3.6	.9	.8	.0	100.0	5.0	5.7	21315
State of residence														
Northern	81.5	.3	.3	1.4	.1	12.3	2.8	.6	.6	.1	100.0	2.1	4.1	624
River Nile	86.7	.3	.1	2.1	.1	7.8	2.3	.2	.3	.0	100.0	2.7	3.2	1290
Red Sea	82.4	1.4	.1	1.8	.1	8.0	3.9	1.0	1.1	.1	100.0	3.5	6.7	1008
Kassala	84.6	.6	.3	1.9	.4	6.5	3.6	.8	1.4	.0	100.0	3.0	6.2	2636
Gadarif	74.6	.7	.5	3.3	.2	16.3	3.1	.8	.4	.1	100.0	4.7	4.9	2128
Khartoum	83.7	.1	.3	1.6	.3	9.6	3.2	.7	.4	.1	100.0	2.3	4.2	6045
Gezira	69.9	.6	.2	1.9	.2	21.4	3.8	1.1	.8	.0	100.0	2.9	5.6	5964
White Nile	76.1	.4	.3	3.0	.1	15.5	2.8	.7	1.1	.0	100.0	3.7	4.6	2148
Sinnar	85.6	.7	.3	2.2	.0	7.2	2.7	.8	.6	.0	100.0	3.2	4.3	1763
Blue Nile	86.7	.6	.5	2.3	.2	5.0	2.7	1.1	.9	.0	100.0	3.6	4.8	1689
North Kordofan	67.0	.9	.4	3.5	.2	21.4	4.7	1.1	.9	.1	100.0	4.9	7.0	4633
South Kordofan	68.2	.5	1.1	4.6	.2	19.3	2.8	2.4	.7	.1	100.0	6.5	5.4	2148
North Darfur	77.4	.5	.3	3.8	.1	12.2	3.7	.8	1.1	.2	100.0	4.6	5.6	3078
West Darfur	71.1	.8	.7	4.4	.2	16.2	4.8	1.4	.4	.1	100.0	6.1	6.9	2089
South Darfur	73.4	1.3	.9	4.2	.2	13.7	4.1	1.2	.9	.0	100.0	6.6	7.4	5735
Area of residence														
Urban	78.8	.5	.5	2.4	.3	11.2	4.4	1.0	.8	.1	100.0	3.7	6.5	12305
Rural	75.2	.7	.4	3.1	.2	15.3	3.3	1.1	.8	.0	100.0	4.3	5.3	30673
Age group														
0-4 years	81.1	.2	.0	.9	.0	15.9	1.2	.2	.3	.1	100.0	1.2	1.8	13823
5-9 years	77.4	.6	.3	2.8	.1	13.8	3.0	1.2	.8	.1	100.0	3.8	4.8	13091
10-14 years	73.0	.9	.6	3.7	.3	13.0	5.7	1.5	1.2	.1	100.0	5.5	8.7	11611
15-17 years	66.1	1.4	1.6	7.1	.6	12.7	7.3	1.9	1.2	.0	100.0	10.8	12.2	4453
Wealth index quintile														
Poorest	72.9	.9	.6	3.8	.1	15.3	4.4	1.1	.8	.0	100.0	5.5	6.8	9853
Second	73.4	.5	.3	3.3	.2	16.4	3.7	1.1	1.0	.1	100.0	4.3	5.6	9281
Middle	76.5	.7	.4	2.9	.2	14.4	3.2	1.0	.7	.0	100.0	4.1	5.1	8822
Fourth	79.4	.6	.5	2.3	.2	11.7	3.9	.8	.6	.1	100.0	3.5	5.8	8129
Richest	80.6	.4	.4	1.7	.3	12.0	2.6	1.1	.9	.1	100.0	2.8	4.5	6893
SUDAN (TOTAL)	**76.2**	**.6**	**.4**	**2.9**	**.2**	**14.2**	**3.6**	**1.0**	**.8**	**.1**	**100.0**	**4.1**	**5.7**	**42978**

[1] SHHS indicator 7.12; [2] SHHS indicator 7.13

School attendance of orphans and non-orphans

One of the measures developed for the assessment of the status of orphaned children relative to their peers looks at the school attendance of children age 10-14 years who have lost both parents (double orphans) versus children whose parents are alive (and who live with at least one of these parents). If children whose parents have died do not have the same access to school as their peers, then families and schools are not ensuring that these children's rights are being met.

Table 10.12 provides information relating to school attendance of orphans and non-orphans. It indicates school attendance of children age 10-14 years by orphanhood. In Sudan, the percentage of children aged 10-14 years whose mother and father have died (double orphans) was 0.3 per cent while the percentage of children of whom both parents were alive and the child was living with at least one parent (non-orphans) at the time of SHHS2 was 87.5 per cent. Among the double orphans, only 78.8 per cent were attending school compared to 81.8 per cent among children aged 10-14 years who have not lost a parent and who live with at least one parent (non-orphans). This would suggest that double orphans are disadvantaged compared to the non-orphaned children in terms of school attendance. The orphans to non-orphans school attendance ratio was 0.96.

Table 10.12: School attendance of orphans and non-orphans
School attendance of children age 10-14 years by orphanhood, Sudan, 2010

	Percentage of children whose mother and father have died	Percentage of children of whom both parents are alive and child is living with at least one parent (non-orphans)	Number of children age 10-14 years	Percentage of children who are orphans and are attending	Total number of orphan children age 10-14 years	Percentage of children who are non-orphans and are attending	Total number of non-orphan children age 10-14 years	Orphans to non-orphans school attendance ratio
Sex								
Male	.4	87.4	5786	85.0	22	85.0	5056	1.00
Female	.2	87.7	5825	69.3	14	78.5	5106	.88
Area of residence								
Urban	.5	86.5	3372	94.8	17	92.0	2916	1.03
Rural	.2	87.9	8239	65.4	20	77.6	7246	.84
SUDAN	**.3**	**87.5**	**11611**	**78.8**	**37**	**81.8**	**10162**	**.96**

[1] SHHS indicator 7.14; MDG indicator 7.15

The proportion of children age 10-14 years whose mother and father have died (double orphans) was slightly higher for male children (0.4 per cent) than that for female children (0.2 per cent). The proportion of children age 10-14 years who were orphans and were attending school was higher among male children (85.0 per cent) than that among female children (69.3 per cent). The proportion of male children age 10-14 years who were non-orphans and were attending school was also higher (85.0 per cent) than that for female children (78.5 per cent). The orphan to non-orphan school attendance rate was also higher (1.0) for male children than that for female children (0.88).

There was only a marginal difference in the proportion of children age 10-14 years whose mother and father have died (double orphans) between children in urban areas (0.5 per cent) and children in rural areas (0.2 children). The proportion of children in rural areas age 10-14 years who were orphans and were attending school was higher among children in urban areas (94.8 per cent) than that among children in rural areas (65.4 per cent). The proportion of children age 10-14 years who were non-orphans and were attending school was also higher among children in urban areas (92.0 per cent) than that among children in rural areas (77.6 per cent). The orphan to non-orphan school attendance rate was also higher (1.03) for children in urban areas than that for children in rural areas (0.96).

XI. HIV/AIDS, Knowledge and Attitude

The strong linkage between spread of HIV/AIDS and behavioural patterns of people make it essential, for the purpose of halting and reversing the incidence of HIV, to have strong emphasis on behavioural change. Appropriate knowledge about the disease is seen as an indispensable starting point for changing behaviours. In order to avoid risky behaviours, people need to know about routes of HIV transmission and consequently the methods of prevention. They also need to be able to reject the common misconceptions about the illness. Misconceptions about HIV are common and can confuse young people and hinder prevention efforts.

One of the most important prerequisites for reducing the rate of HIV infection, therefore, is accurate knowledge of how HIV is transmitted and strategies for preventing transmission. Correct information is the first step toward raising awareness and giving young people the tools to protect oneself from HIV infection. The UN General Assembly Special Session on HIV/AIDS (UNGASS) called on governments to undertake measures to improve the knowledge and skills of young people to protect themselves from HIV. The indicators to measure this goal as well as the MDG of reducing HIV infections by half include improving the level of knowledge of HIV and its prevention, and changing behaviours to prevent further spread of the disease. Under the SHHS2, the HIV module was administered to women and men age 15-49 years.

Knowledge about HIV Transmission and Misconception about HIV/AIDS

One indicator which is both an MDG and UNGASS indicator is the percentage of young women who have comprehensive and correct knowledge of HIV prevention and transmission. In SHHS all women and men who have heard of AIDS were asked whether they knew of the two main ways of HIV transmission, i.e. having only one faithful uninfected partner and using a condom every time. Table 11.1 provides information relating to the percentage of women age 15-49 years who have heard of AIDS, percentage of women who have knowledge about HIV transmission, percentage of women age 15-49 years who know the main ways of preventing HIV transmission, percentage of women who know that a healthy looking person can have the AIDS virus, percentage of women who reject common misconceptions, and percentage of women who have comprehensive knowledge about HIV transmission.

Women age 15-49 years who have heard about AIDS: The SHHS2 data indicated that overall, more than three-fourths (76.4 per cent) of women age 15-49 years have heard of AIDS. The percentage of women who have heard of AIDS was highest among women in the age group 25-29 years (78.1 per cent) and lowest among women in the age group 40-49 years (75.6 per cent). The percentage of women who have heard of AIDS was higher among women in urban areas (90.8 per cent) than among women in rural areas (69.2 per cent). The percentage of women who have heard of AIDS was higher among women who were never married (82.1 per cent) than that among women who were ever married (74.1 per cent). The percentage of women who have heard of AIDS was relatively lower among women age 15-49 years with no formal education (55.6 per cent) than that among women with primary education (83.9 per cent) and among women with secondary or higher level of education (97.8 per cent). The percentage of women who have heard of AIDS was only 56.0 among women from households in the poorest quintile compared to 96.0 for

Table 11.1: Knowledge about HIV transmission, misconceptions about HIV/AIDS, and comprehensive knowledge about HIV transmission

Percentage of women age 15-49 years who know the main ways of preventing HIV transmission, percentage who know that a healthy looking person can have the AIDS virus, percentage who reject common misconceptions, and percentage who have comprehensive knowledge about HIV transmission Sudan, 2010

	Percentage who have heard of AIDS	Percentage who know transmission can be prevented by:		Percentage of women who know both ways	Percentage who know that a healthy looking person can have the AIDS virus	Percentage who know that HIV cannot be transmitted by:			Percentage who reject the two most common misconceptions and know that a healthy looking person can have the AIDS virus	Percentage with comprehensive knowledge [1]	Number of women
		Having only one faithful uninfected sex partner	Using a condom every time			Mosquito bites	Supernatural means	Sharing food with someone with AIDS			
Northern	88.0	73.1	21.9	20.0	36.0	65.1	71.9	66.4	21.4	6.7	351
River Nile	79.2	65.9	16.3	15.1	40.0	49.7	63.4	52.9	22.0	4.6	637
Red Sea	52.6	42.6	13.6	12.9	20.6	33.2	38.7	35.6	11.2	4.6	477
Kassala	63.4	39.7	10.8	9.5	22.7	34.6	42.3	39.6	14.5	4.0	1004
Gadarif	74.2	62.8	20.5	19.7	36.5	45.7	57.8	51.2	20.7	8.8	773
Khartoum	91.8	79.3	21.3	19.6	59.8	66.6	77.3	69.6	38.2	10.8	3005
Gezira	83.6	68.0	20.2	19.0	42.6	49.9	65.6	54.4	22.6	6.7	2791
Wite Nile	90.9	72.7	18.0	16.5	51.4	47.8	66.1	64.7	25.4	6.6	906
Sinnar	68.4	49.3	15.7	13.4	25.2	34.0	50.1	39.3	8.8	3.1	675
Blue Nile	52.9	43.5	12.5	12.0	20.1	25.0	38.6	34.6	9.8	3.8	566
North Kordofan	72.4	58.0	18.8	16.5	22.2	34.1	55.4	49.6	9.0	2.9	1765
South Kordofan	74.5	62.0	19.4	18.3	29.7	32.9	53.2	50.6	12.0	5.1	700
North Darfur	59.7	47.0	11.6	10.0	19.6	31.5	43.6	37.1	10.3	2.9	930
West Darfur	54.3	36.5	4.6	3.6	13.8	16.0	29.5	25.6	4.1	1.0	672
South Darfur	76.8	63.4	14.8	14.3	32.0	32.5	58.2	46.5	13.2	4.5	1923
Area of residence											
Urban	90.8	78.1	25.3	23.6	54.9	60.6	76.1	69.4	33.1	11.4	5842
Rural	69.2	53.7	13.0	11.8	26.5	34.6	49.8	42.1	12.2	3.0	11332
Age group											
15-24	76.4	61.8	16.8	15.4	36.2	46.2	60.5	53.1	19.9	5.3	6881
25-29	78.1	63.6	18.4	17.3	35.8	41.9	58.3	50.8	18.8	6.1	3176
30-39	76.2	62.1	17.6	16.1	36.5	42.1	58.3	51.4	19.5	7.2	4585
40-49	75.6	60.2	15.8	14.5	36.0	40.1	55.7	47.9	18.0	4.4	2533
Marital status											
Ever married	74.1	59.8	16.1	15.0	32.3	37.8	54.8	47.7	15.7	5.2	11977
Never married	82.1	66.8	19.5	17.7	45.1	56.3	68.1	60.1	27.6	7.4	5197
Education level											
None	55.6	39.1	7.6	6.6	16.6	18.7	31.7	26.3	4.3	.9	6062
Primary	83.9	69.2	16.7	15.7	35.7	45.4	65.3	57.2	16.4	4.2	5570
Secondary +	97.8	85.7	31.3	28.9	64.1	75.6	88.3	79.5	43.5	14.7	4803
Adult education/Khalwaductation	54.6	40.5	7.1	7.1	18.6	22.8	39.8	31.7	7.7	1.2	739
Wealth index quintileS											
Poorest	56.0	40.7	7.3	6.5	16.3	19.4	36.0	26.6	4.8	.8	3013
Second	58.6	42.3	9.5	8.5	16.1	22.4	37.4	32.7	5.4	1.5	3176
Middle	74.5	59.9	14.6	13.4	29.8	35.9	53.5	47.1	11.1	3.0	3375
Fourth	89.9	75.1	20.6	19.1	47.0	55.8	73.4	66.0	26.7	8.1	3604
Richest	96.0	83.4	29.7	27.7	62.6	73.4	84.1	75.6	41.5	13.5	4006
SUDAN (TOTAL)	**76.6**	**62.0**	**17.2**	**15.8**	**36.2**	**43.4**	**58.8**	**51.4**	**19.3**	**5.8**	**17174**

[1] SHHS indicator 8.1

women belonging to households in the richest quintile. The proportion of women age 15-49 years who have heard of AIDS ranged from 52.6 per cent in Red Sea State to 91.8 per cent in Khartoum State.

Knowledge of the ways of preventing HIV transmission (women age 15-49 years)

The SHHS2 findings indicated that 62.0 per cent of women age 15-49 years knew of having one faithful uninfected sex partner and 17.2 per cent of them knew of using a condom every time during sexual intercourse as main ways of preventing HIV transmission. However, the proportion of women who knew of both the main ways of preventing HIV transmission was only 15.8 per cent. The percentage of women who knew that one could prevent HIV transmission by having one faithful uninfected sex partner was highest among women in the age group 25-29 years (63.6 per cent) and lowest among women in the age group 40-49 years (60.2 per cent). The proportion of women who knew that one could prevent HIV transmission by using a condom every time was highest among women in the age group 25-29 years (18.4 per cent) and lowest among women in the age group 40-49 years (15.8 per cent), while the proportion of women who knew both the ways of preventing HIV transmission was also highest among women in the age group 25-29 years (17.3 per cent) and lowest among women in the age group 40-49 years (14.5 per cent).

The proportion of women age 15-49 years who knew the main ways of preventing HIV transmission was higher among women in urban areas than among women in rural areas. The proportion of women aged 15-49 years who knew that one could prevent HIV transmission by having one faithful uninfected sex partner was 78.1 per cent among women in urban areas compared to 53.7 per cent among women in rural areas. The proportion of women aged 15-49 years who knew that one could prevent HIV transmission by using a condom every time during sexual intercourse was 25.3 per cent among women in urban areas compared to 13.0 per cent among women in rural areas while the proportion of women aged 15-49 years who knew both the ways of preventing HIV transmission was 23.6 per cent among women in urban areas compared to 11.8 per cent among women in rural areas.

The proportion of women age 15-49 years who knew the main ways of preventing HIV transmission was higher among women who were never married than among women ever married. The proportion of women who knew that one could prevent HIV transmission by having one faithful uninfected sex partner was 66.8 per cent among women who were never married compared to 59.8 per cent among women ever married. The proportion of women age 15-49 years who knew that one could prevent HIV transmission by using a condom every time was 19.5 per cent among women who were never married compared to 16.1 per cent among women ever married while the proportion of women aged 15-49 years who knew both the ways of preventing HIV transmission was 17.7 per cent among women who were never married compared to 15.0 per cent among women ever married.

The proportion of women who knew the main ways of preventing HIV transmission varied with women's educational level and household wealth. For instance, only 39.1per cent of women with no formal education knew that one could prevent HIV transmission by having one faithful uninfected sex partner compared to 69.2 per cent among women with primary education and 85.7 per cent among those with secondary or higher level of education. Only 7.6 per cent of women with no formal education knew that one could prevent HIV transmission by using a condom every time compared to 16.7 per cent among women with primary education and 31.3 per cent among those with secondary or higher level of education. Only 6.6 per cent of women with no formal education knew both the ways of preventing HIV transmission compared to 15.7 per cent among women with primary education and 28.9 per cent among those with secondary or higher level of education.

The proportion of women age 15-49 years who knew that one could prevent HIV transmission by having one faithful uninfected sex partner was only 40.7 among women from households in the poorest quintile compared to 83.4 among women from households in the richest quintile. Similarly, the proportion of women who knew that one could prevent HIV transmission by using a condom every time was only 7.3 per cent among women from households in the poorest quintile compared to 29.7 per cent among women from households in the richest quintile. The proportion of women who knew both ways of preventing HIV transmission was only 6.5 per cent among women from households in the poorest quintile compared to 27.7 per cent among women from households in the richest quintile.

The proportion of women aged 15-49 years who knew the main ways of preventing HIV transmission varies substantially by State of residence. The proportion of women who knew both ways of preventing HIV transmission ranged from 20.0 per cent in Northern State to 3.6 per cent in West Darfur State.

Knowledge of the fact that a healthy looking person can have the AIDS virus (women aged 15-49 years)

Overall, 36.2 per cent of women age 15-49 years knew that a healthy looking person could have the AIDS virus. The proportion of women who knew that a healthy looking person could have the AIDS virus was higher among women in urban areas (54.9 per cent) than among women in rural areas (26.5 per cent). The proportion of women who knew that a healthy looking person could have the AIDS virus was higher among women who were never married (45.1 per cent) than among women ever married (32.3 per cent). The percentage of women who knew that a healthy looking person could have the AIDS virus varied with women's educational level and level of household wealth. For instance, only 16.6 per cent of women who had no formal education knew that a healthy looking person could have the AIDS virus compared to 35.7 per cent among women with primary education and 64.1 per cent among those with secondary or higher level of education. The proportion of women who knew that a healthy looking person could have the AIDS virus was only 16.3 per cent among women from households in the poorest quintile compared to 62.6 per cent among women from households in the richest quintile. The percentage of women age 15-49 years who knew that a healthy looking person could have AIDS virus ranged from 13.8 per cent in West Darfur State to 59.8 per cent in Khartoum State.

Knowledge of common misconceptions concerning HIV transmission (women aged 15-49 years)

Table 11.1 also presents information regarding the proportion of women aged 15-49 years who reject common misconceptions concerning HIV. The indicator is based on the three most common and relevant misconceptions that HIV can be transmitted by mosquito bites, by supernatural means and by sharing food with someone with AIDS. The table provides information regarding the percentage of women who know that HIV cannot be transmitted by mosquito bites, by supernatural means and by sharing food with someone with AIDS. It also provides information relating to the percentage of women age 15-49 years who reject the two most common misconceptions and know that a healthy looking person can have the AIDS virus.

The SHHS2 data indicated that overall, 43.4 per cent of women age 15-49 years knew that HIV could not be transmitted by mosquito bite while 58.8 per cent of them knew that HIV could not be transmitted by supernatural means. About 51.4 per cent of them knew that HIV could not be transmitted by sharing food with someone with AIDS. The proportion of women age 15-49 years who rejected the two most common misconceptions and knew that a healthy looking person could have the AIDS virus was 19.3 per cent.

The proportion of women age 15-49 years who knew that HIV could not be transmitted by mosquito bites or supernatural means or by sharing food with someone with AIDS varied among women from rural and urban areas. For instance, while the proportion of women who believed that HIV could not be transmitted by mosquito bite was only 34.6 per cent among women in rural areas, it was 60.6 per cent among women from urban areas. The proportion of women who knew that HIV could not be transmitted through supernatural means was 49.8 per cent among women in rural areas compared to 76.1 per cent among women from urban areas. The proportion of women who knew that HIV could not be transmitted by sharing food with someone with AIDS was 42.1 per cent among women in rural areas compared to 69.4 per cent among women from urban areas. The proportion of women age 15-49 years who rejected the two most common misconceptions and knew that a healthy looking person could have the AIDS virus was only 12.2 per cent among women in rural areas compared to 33.1 per cent among women from urban areas.

The proportion of women age 15-49 years who know that HIV could not be transmitted by mosquito bite or by supernatural means or by sharing food with someone with AIDS also varied with the marital status of the woman. For instance, the proportion of women who believed that HIV could not be transmitted by mosquito bite was only 37.8 per cent among women ever married compared to 56.3 per cent among women who were never married. The proportion of women who knew that HIV could not be transmitted through supernatural means was 54.8 per cent among women ever married compared to 68.1 per cent among women who were never married. The proportion of women who knew that HIV could not be transmitted by sharing food with someone with AIDS was only 47.7 per cent among women ever married compared to 60.1 per cent among women who were never married. The proportion of women aged 15-49 years who rejected the two most common misconceptions and knew that a healthy looking person could have the AIDS virus was only 15.7 per cent among women ever married compared to 27.6 per cent among women who were never married.

The proportion of women age 15-49 years who know that HIV could not be transmitted by mosquito bite or by supernatural means or by sharing food with someone with AIDS varied with educational level of the women. For instance, while the proportion of women who believed that HIV could not be transmitted by mosquito bite was only 18.7 per cent among those with no formal education, it was 45.4 per cent among

women with primary education and 75.6 per cent among those with secondary or higher level of education. The proportion of women who knew that HIV could not be transmitted through supernatural means was only 31.7 per cent among those with no formal education compared to 65.3 per cent among women with primary education and 88.3 per cent among those with secondary or higher level of education. The proportion of women who knew that HIV could not be transmitted by sharing food with someone with AIDS was only 26.3 per cent among those with no formal education compared to 57.2 among women with primary education and 79.5 per cent among those with secondary or higher level of education. The proportion of women age 15-49 years who rejected the two most common misconceptions and knew that a healthy looking person could have the AIDS virus was only 4.3 per cent among those with no formal education compared to 16.4 per cent among women with primary education and 43.5 per cent among those with secondary or higher level of education.

The proportion of women age 15-49 years who knew that HIV could not be transmitted by mosquito bites or supernatural means or by sharing food with someone with AIDS also varied with household wealth. For instance, while the proportion of women who believed that HIV could not be transmitted by mosquito bite was only 19.4 per cent among women from households in the poorest quintile, it was 73.4 per cent among women from households in the richest quintile. The percentage of women who knew that HIV could not be transmitted through supernatural means was only 36.0 per cent among those from households in the poorest quintile compared to 84.1 among women from households in the richest quintile. The proportion of women who knew that HIV could not be transmitted by sharing food with someone with AIDS was only 26.6 per cent among those from households in the poorest quintile compared to 75.6 per cent among women from households in the richest quintile. The proportion of women who rejected the two most common misconceptions and knew that a healthy looking person could have the AIDS virus was only 4.8 per cent among those from households in the poorest quintile compared to 41.5 per cent among women from households in the richest quintile.

The proportion of women aged 15-49 years who believed that HIV could not be transmitted by mosquito bites ranged from 16.0 per cent in West Darfur State to 66.6 per cent in Khartoum State.

The proportion of women aged 15-49 years who believed that HIV could not be transmitted through supernatural means ranged from 29.5 in West Darfur State to 77.3 in Khartoum State.

The proportion of women aged 15-49 years who believed that HIV could not be transmitted by sharing food with someone with AIDS ranged from 25.6 in West Darfur State to 69.6 in Khartoum State.

The proportion of women aged 15-49 years who rejected the two most common misconceptions and knew that a healthy looking person could have the AIDS virus ranged from 4.1 per cent in West Darfur State to 38.2 per cent in Khartoum State.

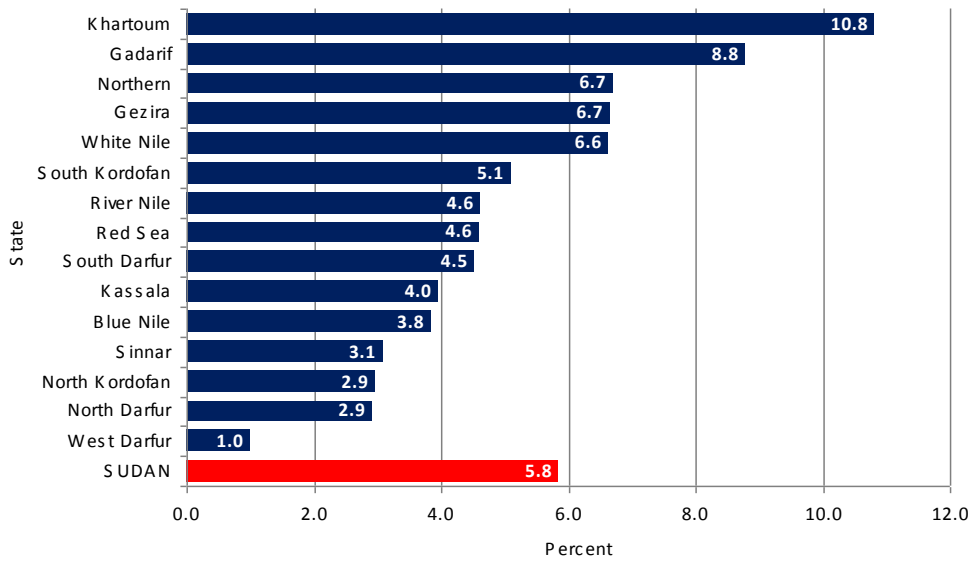
Comprehensive knowledge (among women age 15-49 years) about HIV prevention and transmission

Table 11.1 also presents the proportion of women age 15-49 years with comprehensive knowledge about HIV prevention and transmission. Women who have comprehensive knowledge about HIV prevention and transmission include those who know of the two ways of HIV prevention (having only one faithful uninfected partner and using a condom every time), who know that a healthy looking person can have the AIDS virus, and who reject the two most common misconceptions. Comprehensive knowledge of HIV prevention is still very low. Overall, only 5.8 per cent of women were found to have comprehensive knowledge of HIV prevention, which was higher among women in urban areas (11.4 per cent) than among women in rural areas (3.0 per cent. The proportion of women who had comprehensive knowledge about HIV prevention was highest among women in the age group 30-39 years (7.2 per cent) and lowest among women in the age group 40-49 years (4.4 per cent).

The proportion of women age 15-49 years who had comprehensive knowledge about HIV prevention was higher among women who were never married (7.4 per cent) than that among women ever married (5.2 per cent). The proportion of women who had comprehensive knowledge about HIV prevention varied with woman's educational level and household wealth. For instance, only 0.9 per cent of women who had no formal education had comprehensive knowledge about HIV prevention compared to 4.2 per cent among women with primary education and 14.7 per cent among those with secondary or higher level of education. The proportion of women who had comprehensive knowledge about HIV prevention and transmission was only 0.8 per cent among women from households in the poorest quintile compared to 13.5 per cent among women from households in the richest quintile. The proportion of women age 15-49 years who had

comprehensive knowledge about HIV prevention ranged from 1.0 per cent in West Darfur State to 10.8 per cent in Khartoum State.

Figure 11.1: Comprehensive knowledge about HIV prevention among women age 15-49 yeras
Percentage of women age 15-49 years with comprehensive knowledge about HIV prevention, Sudan, 2010



Knowledge about HIV prevention among women age 15-24 years

Young women age 15-24 years who have heard of AIDS: Table 11.2 presents information relating to the awareness of AIDS among young women age 15-24 years (i.e. proportion of women age 15-24 years who have heard of AIDS). Overall, more than three-fourths (76.4 per cent) of women aged 15-24 years have heard of AIDS. The percentage of young women who have heard of AIDS was higher among women in the age group 20-24 years (78.5 per cent) than that among women in the age group 15-19 years (74.5 per cent). The percentage of young women who have heard of AIDS was higher among women in urban areas (90.7 per cent) than that among women in rural areas (68.8 per cent). The percentage of young women who have heard of AIDS was higher among women who were never married (80.9 per cent) than that among women who were ever married (70.0 per cent). The percentage of young women who have heard of AIDS was found to be low among women with no formal education. Only 46.2 per cent of those with no formal education have heard of AIDS compared to 78.5 per cent among women with primary education and 97.1 per cent among women with secondary or higher level of education. The awareness of AIDS was also particularly low among women from households in the poorest quintile. The proportion of women who have heard of AIDS was only 53.2 per cent among women from households in the poorest quintile compared to 95.4 per cent among women belonging to households in the richest quintile. The awareness of AIDS among women age 15-49 years also varies substantially by State of residence. The proportion of women age 15-49 years who have heard of AIDS ranged from 48.4 per cent in West Darfur State to 91.4 per cent in White Nile State.

Knowledge (among women aged 15-24 years) of the main ways of preventing HIV transmission

The SHHS2 findings indicated that 61.8 per cent of women age 15-24 years knew of having one faithful uninfected sex partner and 16.8 per cent knew of using a condom every time as main ways of preventing HIV transmission. However, the proportion of women who knew of both the main ways of preventing HIV transmission was only 15.4 per cent

Table 11.2: Knowledge about HIV transmission, misconceptions about HIV/AIDS, and comprehensive knowledge about HIV transmission among young people

Percentage of young women age 15-24 years who know the main ways of preventing HIV transmission, percentage who know that a healthy looking person can have the AIDS virus, percentage who reject common misconceptions, and percentage who have comprehensive knowledge about HIV transmission, Sudan, 2010

	Percentage who have heard of AIDS	Percentage who know transmission can be prevented by:		Percentage of women who know both ways	Percentage who know that a healthy looking person can have the AIDS virus	Percentage who know that HIV cannot be transmitted by:			Percentage who reject the two most common misconceptions and know that a healthy looking person can have the AIDS virus	Percentage with comprehensive knowledge [1]	Number of women
		Having only one faithful uninfected sex partner	Using a condom every time			Mosquito bites	Supernatural means	Sharing food with someone with AIDS			
State of residence											
Northern	86.9	70.3	14.8	13.8	35.0	64.3	72.2	65.7	20.8	4.3	117
River Nile	76.4	65.0	13.7	13.5	39.9	49.7	64.8	53.7	21.6	4.0	240
Red Sea	56.6	46.2	13.5	12.8	18.7	38.1	42.8	40.9	11.4	3.9	163
Kassala	65.1	40.2	12.9	10.7	25.3	39.9	46.7	44.8	18.5	4.6	367
Gadarif	72.7	62.3	20.9	20.6	34.2	47.3	59.8	51.9	19.6	9.1	332
Khartoum	91.2	76.8	16.9	15.5	56.8	70.8	78.8	68.2	38.2	8.3	1209
Gezira	83.8	68.8	20.2	18.8	41.9	52.4	67.5	54.8	22.2	5.4	1186
Wite Nile	91.4	71.5	18.8	16.8	51.6	50.7	68.1	69.4	29.1	7.9	365
Sinnar	69.6	50.3	13.9	12.5	26.8	37.3	52.1	42.5	8.7	1.8	293
Blue Nile	57.5	47.6	14.6	13.7	23.3	30.9	42.9	40.2	12.5	5.2	228
North Kordofan	71.3	58.2	19.6	17.2	24.0	37.6	56.5	52.7	11.0	3.6	725
South Kordofan	72.7	61.6	19.5	18.3	27.5	35.5	53.8	51.8	12.6	4.9	288
North Darfur	59.7	48.1	12.5	10.3	19.5	35.3	44.9	39.6	10.9	3.4	346
West Darfur	48.4	32.4	4.4	3.7	11.3	13.6	26.7	25.0	4.1	1.0	263
South Darfur	75.9	61.9	16.6	16.1	34.2	32.3	58.2	48.4	12.4	4.5	757
Urban	90.7	76.4	23.2	21.4	54.8	63.0	77.6	70.1	33.9	9.9	2393
Rural	68.8	54.0	13.4	12.2	26.2	37.3	51.4	44.1	12.5	2.9	4488
Age group											
15-19	74.5	58.8	14.3	13.2	34.3	47.1	59.4	51.4	19.5	4.3	3559
20-24	78.5	64.9	19.4	17.8	38.1	45.3	61.7	55.0	20.4	6.5	3321
Marital status											
Ever married/in union	70.0	56.1	14.9	14.0	26.8	33.5	51.4	44.0	10.9	3.8	2844
Never married/in union	80.9	65.7	18.1	16.4	42.8	55.2	67.0	59.6	26.3	6.4	4037
Education level											
None	46.2	31.5	6.6	5.8	12.8	15.6	24.8	22.0	2.6	.5	1616
Primary	78.5	62.8	14.1	13.2	30.7	40.7	59.1	50.4	12.5	2.8	2502
Secondary +	97.1	83.5	27.0	24.8	58.9	74.0	87.8	78.7	40.0	11.5	2507
Adult education/Khalwaduct ation	44.2	30.0	6.5	6.3	13.4	20.9	32.9	25.7	5.6	.7	255
Wealth index quintileS											
Poorest	53.2	39.4	8.3	7.1	17.7	21.4	35.7	29.1	5.8	.8	1047
Second	57.7	42.4	10.8	10.1	15.5	24.2	38.3	35.8	5.5	2.0	1288
Middle	75.2	60.6	14.7	13.5	29.9	40.1	56.5	49.6	12.3	3.1	1450
Fourth	89.9	74.2	20.9	19.0	47.8	58.1	75.1	66.2	27.1	7.6	1545
Richest	95.4	81.7	25.3	23.7	60.1	75.2	84.9	74.0	41.4	10.9	1551
SUDAN (TOTAL)	**76.4**	**61.8**	**16.8**	**15.4**	**36.2**	**46.2**	**60.5**	**53.1**	**19.9**	**5.3**	**6881**

[1] SHHS indicator 8.2

The proportion of women who knew that one could prevent HIV transmission by having one faithful uninfected sex partner was higher among women in the age group 20-24 years (64.9 per cent) than that among women in the age group 15-19 years (58.8 per cent). The proportion of women who knew that one could prevent HIV transmission by using a condom every time was higher among women in the age group 20-24 years (19.4 per cent) than that among women in the age group 15-19 years (14.3 per cent). The proportion of women who knew both the ways of preventing HIV transmission was also higher among women in the age group 20-24 years (17.8 per cent) than that among women in the age group 15-19 years (13.2 per cent).

The proportion of women age 15-24 years who knew the main ways of preventing HIV transmission was higher among women in urban areas than among women in rural areas. The proportion of women who knew that one could prevent HIV transmission by having one faithful uninfected sex partner was 76.4 per cent

among women in urban areas compared to 54.0 per cent among women in rural areas. The proportion of women who knew that one could prevent HIV transmission by using a condom every time was 23.2 per cent among women in urban areas compared to 13.4 per cent among women in rural areas. The proportion of women who knew both the ways of preventing HIV transmission was 21.4 per cent among women in urban areas compared to 12.2 per cent among women in rural areas.

The proportion of women aged 15-24 years who knew the main ways of preventing HIV transmission was higher among women who were never married than among women ever married. The proportion of women who knew that one could prevent HIV transmission by having one faithful uninfected sex partner was 65.7 per cent among women who were never married compared to 56.1 per cent among women ever married. The proportion of women who knew that one could prevent HIV transmission by using a condom every time was 18.1 per cent among women who were never married compared to 14.9 per cent among women ever married. The proportion of women who knew both the ways of preventing HIV transmission was 16.4 per cent among women who were never married compared to 14.0 per cent among women ever married.

The proportion of women age 15-24 years who knew the main ways of preventing HIV transmission varied with women's level of education and household wealth. For instance, only 31.5 per cent of women with no formal education knew that one could prevent HIV transmission by having one faithful uninfected sex partner compared to 62.8 per cent among women with primary education and 83.5 per cent among those with secondary or higher level of education. Only 6.6 per cent of women with no formal education knew that one could prevent HIV transmission by using a condom every time compared to 14.1 per cent among women with primary education and 27.0 per cent among those with secondary or higher level of education while only 5.8 per cent of women with no formal education knew both the ways of preventing HIV transmission compared to 13.2 per cent among women with primary education and 24.8 per cent among those with secondary or higher level of education.

The proportion of women age 15-24 years who knew that one could prevent HIV transmission by having one faithful uninfected sex partner was only 39.4 among women from households in the poorest quintile compared to 81.7 among women from households in the richest quintile. Similarly, the proportion of women who knew that one could prevent HIV transmission by using a condom every time was only 8.3 among women from households in the poorest quintile compared to 25.3 among women from households in the richest quintile. The proportion of women who knew both ways of preventing HIV transmission was only 7.1 among households in the poorest quintile compared to 23.7 among women from households in the richest quintile.

The proportion of women age 15-24 years who knew the main ways of preventing HIV transmission varies substantially by State of residence. The percentages of women who knew both ways of preventing HIV transmission ranged from 3.7 in West Darfur State to 20.6 in Khartoum State.

Knowledge (among women aged 15-24 years) of the fact that a healthy looking person can have the AIDS virus

Table 11.2 also presents information regarding the proportion of women age 15-24 years who know that a healthy looking person can have the AIDS virus. Overall, 36.2 per cent of women age 15-24 years knew that a healthy looking person can have the AIDS virus. The proportion of women who knew that a healthy looking person could have the AIDS virus was higher among women in urban areas (54.8 per cent) than that among women in rural areas (26.2 per cent).

The proportion of women age 15-24 years who knew that a healthy looking person could have the AIDS virus was higher among women who were never married (42.8 per cent) than among women ever married (26.8 per cent). The proportion of women who knew that a healthy looking person could have the AIDS virus varied with women's level of education and household wealth. For instance, only 12.8 per cent of women who had no formal education knew that a healthy looking person could have the AIDS virus compared to 30.7 per cent among women with primary education and 58.9 per cent among those with secondary or higher level of education. The proportion of women who knew that a healthy looking person could have the AIDS virus was only 17.7 among women from households in the poorest quintile compared to 60.1 among women from households in the richest quintile.

The proportion of women age 15-24 years who knew that a healthy looking person could have AIDS virus ranged from 11.3 per cent in West Darfur State to 56.8 per cent in Khartoum State.

Knowledge (among women aged 15-24 years) of common misconceptions concerning HIV transmission

Table 11.2 also presents information regarding the proportion of women aged 15-24 years who reject common misconceptions concerning HIV. It also provides information relating to the percentage of women aged 15-24 years who reject the two most common misconceptions and know that a healthy looking person can have the AIDS virus.

Overall, 46.2 per cent of women age 15-24 years knew that HIV could not be transmitted by mosquito bites while 60.5 per cent of them knew that HIV could not be transmitted through supernatural means. About 53.1 per cent of them knew that HIV could not be transmitted by sharing food with someone with AIDS. The proportion of women aged 15-24 years who rejected the two most common misconceptions and knew that a healthy looking person could have the AIDS virus was 19.9 per cent.

The proportion of women age 15-24 years who know that HIV could not be transmitted by mosquito bite or by supernatural means or by sharing food with someone with AIDS varied among women from rural and urban areas. For instance, while the proportion of women who believed that HIV could not be transmitted by mosquito bite was only 37.3 per cent among women in rural areas, it was 63.0 per cent among women from urban areas. The proportion of women who knew that HIV could not be transmitted through supernatural means was 51.4 per cent among those in rural areas compared to 77.6 per cent among women from urban areas. The proportion of women who knew that HIV could not be transmitted by sharing food with someone with AIDS was 44.1 per cent among women in rural areas compared to 70.1 per cent among women from urban areas. The proportion of women who rejected the two most common misconceptions and knew that a healthy looking person could have the AIDS virus was only 12.5 per cent among women in rural areas compared to 33.9 per cent among women from urban areas.

The proportion of women age 15-24 years who knew that HIV could not be transmitted by mosquito bite or by supernatural means or by sharing food with someone with AIDS also varied with the marital status of the woman. For instance, the proportion of women who believed that HIV could not be transmitted by mosquito bite was only 33.5 per cent among women ever married compared to 55.2 per cent among women who were never married. The proportion of women who knew that HIV could not be transmitted through supernatural means was 51.4 per cent among women ever married compared to 67.0 per cent among women who were never married/in union. The proportion of women who knew that HIV could not be transmitted by sharing food with someone with AIDS was only 44.0 per cent among women ever married compared to 59.6 per cent among women who were never married. The proportion of women who rejected the two most common misconceptions and knew that a healthy looking person could have the AIDS virus was only 10.9 per cent among women ever married compared to 26.3 per cent among women who were never married.

The proportion of women age 15-24 years who know that HIV could not be transmitted by mosquito bite or by supernatural means or by sharing food with someone with AIDS also varied with the level of education of the woman. For instance, while the proportion of women who believed that HIV could not be transmitted by mosquito bite was only 15.6 per cent among those with no formal education, it was 40.7 per cent among women with primary education and 74.0 per cent among those with secondary or higher level of education. The proportion of women who knew that HIV could not be transmitted through supernatural means was only 24.8 per cent among those with no formal education compared to 59.1 per cent among women with primary education and 87.8 per cent among those with secondary or higher level of education. The proportion of women who knew that HIV could not be transmitted by sharing food with someone with AIDS was only 22.0 per cent among women with no formal education compared to 50.4 among women with primary education and 78.7 per cent among women with secondary or higher level of education. The proportion of women who rejected the two most common misconceptions and knew that a healthy looking person could have the AIDS virus was only 2.6 per cent among those with no formal education compared to 12.5 per cent among women with primary education and 40.0 per cent among women with secondary or higher level of education.

The proportion of women aged 20-24 years who knew that HIV could not be transmitted by mosquito bite or by supernatural means or by sharing food with someone with AIDS also varied with the household wealth. For instance, while the proportion of women who believed that HIV could not be transmitted by mosquito bites was only 21.4 per cent among women from households in the poorest quintile, it was 75.2 per cent among women from households in the richest quintile. The proportion of women who knew that HIV could not be transmitted through supernatural means was only 35.7 per cent among women from households in the poorest quintile compared to 84.9 among women from households in the richest quintile. The proportion of women who knew that HIV could not be transmitted by sharing food with someone with AIDS was only

29.1 per cent among those from households in the poorest quintile compared to 74.0 per cent among women from households in the richest quintile. The proportion of women who rejected the two most common misconceptions and knew that a healthy looking person could have the AIDS virus was only 5.8 per cent among women from households in the poorest quintile compared to 41.4 among women from households in the richest quintile.

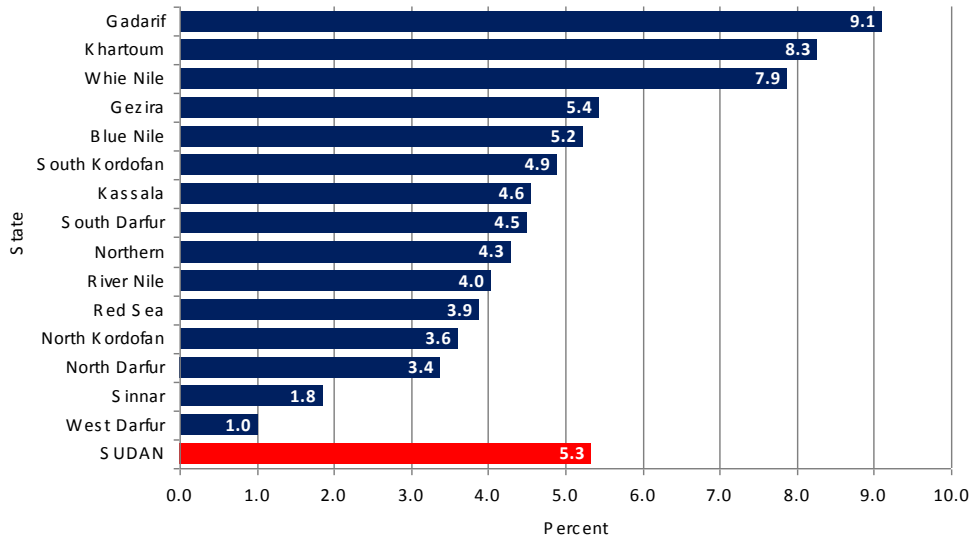
The knowledge (among women age 15-24 years) about HIV transmission and misconceptions about HIV/AIDS varies substantially by State of residence. The proportion of women who believed that HIV could not be transmitted by mosquito bites ranged from 13.6 per cent in West Darfur State to 70.8 per cent in Khartoum State. The proportion of women who believed that HIV could not be transmitted through supernatural means ranged from 26.7 in West Darfur State to 78.8 in Khartoum State. The proportion of women who believed that HIV could not be transmitted by sharing food with someone with AIDS ranged from 25.0 in West Darfur State to 68.2 in Khartoum State. The proportion of women who rejected the two most common misconceptions and knew that a healthy looking person could have AIDS virus ranged from 4.1 per cent in West Darfur State to 38.2 per cent in Khartoum State.

Comprehensive knowledge about HIV prevention among women aged 15-24 years

Table 11.2 also presents information relating to the proportion of women age 15-24 years with comprehensive knowledge about HIV prevention and transmission. Overall, only 5.3 per cent of women age 15-24 years had comprehensive knowledge about HIV prevention, which was higher among women in urban areas (9.9 per cent) than among women in rural areas (2.9 per cent. The proportion of women who had comprehensive knowledge about HIV prevention and transmission was higher among women in the age group 20-24 years (6.5 per cent) than that among women in the age group 15-19 years (4.3 per cent).

The proportion of women age 15-24 years who had comprehensive knowledge about HIV prevention and transmission was higher among women who were never married (6.4 per cent) than among women ever married (3.8 per cent). The proportion of women who had comprehensive knowledge about HIV prevention and transmission varied with woman's level of education and household wealth. For instance, only 0.5 per cent of women who had no formal education had comprehensive knowledge about HIV prevention and transmission compared to 2.8 per cent among women with primary education and 11.5 per cent among those with secondary or higher level of education. The proportion of women who had comprehensive knowledge about HIV prevention and transmission was only 0.8 per cent among women from households in the poorest quintile compared to 10.9 per cent among women from households in the richest quintile. The proportion of women age 15-24 years with comprehensive knowledge about HIV transmission and prevention ranged between 1.0 per cent in West Darfur State and 9.1 in Gadarif State.

Figure 11.2: Comprehensive knowledge about HIV prevention
Percentage of women age 15-24 years with comprehensive knowledge about HIV prevention, Sudan, 2010



Knowledge of mother-to-child transmission of HIV

Knowledge of mother-to-child transmission of HIV is also an important first step for women to seek HIV testing when they are pregnant to avoid infection in the baby. Women should know that HIV can be transmitted during pregnancy, delivery, and through breastfeeding. The level of knowledge among women age 15-49 years concerning mother-to-child transmission is presented in Table 11.5.

Table 11.5: Knowledge of mother-to-child HIV transmission
Percentage of women age 15-49 years who correctly identify means of HIV transmission from mother to child, Sudan, 2010

	Percentage who know HIV can be transmitted from mother to	Percent who know HIV can be transmitted:				Does not know any of the specific means	Number of women
		During pregnancy	During delivery	By breastfeedin	All three means [1]		
State of residence							
Northern	72.8	64.3	49.3	55.1	37.2	15.2	351
River Nile	61.3	54.8	49.4	38.9	31.4	17.9	637
Red Sea	40.4	33.8	28.3	23.1	15.7	12.2	477
Kassala	44.3	39.7	36.4	34.1	27.0	19.0	1004
Gadarif	58.1	50.1	46.9	38.5	29.7	16.1	773
Khartoum	76.7	70.5	62.1	50.6	42.6	15.1	3005
Gezira	67.6	52.6	50.6	43.8	30.5	16.0	2791
Wite Nile	76.2	64.5	56.4	54.6	38.6	14.7	906
Sinnar	53.9	45.7	40.1	41.5	30.1	14.5	675
Blue Nile	40.1	33.1	32.4	31.0	22.9	12.8	566
North Kordofan	57.4	51.1	45.7	47.8	37.8	15.0	1765
South Kordofan	52.4	43.9	40.7	40.4	29.4	22.1	700

North Darfur	39.5	31.9	28.6	28.3	20.0	20.2	930
West Darfur	39.1	33.3	32.6	30.2	24.0	15.2	672
South Darfur	59.4	50.2	46.0	48.0	34.9	17.4	1923
Area of residence							
Urban	77.0	69.0	61.4	51.5	41.4	13.8	5842
Rural	51.7	42.8	39.5	38.7	28.1	17.5	11332
Age group							
15-24	61.6	52.6	47.1	45.3	33.7	14.8	6881
25+	59.4	51.1	46.8	41.6	32.0	17.2	10293
15-19	59.8	50.6	45.9	45.2	33.2	14.6	3559
20-24	63.5	54.8	48.4	45.3	34.1	15.0	3321
25-29	60.5	51.5	47.4	43.1	32.6	17.6	3176
30-39	59.4	50.8	46.2	41.6	31.5	16.8	4585
40-49	58.2	51.1	47.3	39.8	32.1	17.4	2533
Marital status							
Ever married	56.6	48.5	44.1	40.8	31.0	17.5	11977
Never married	68.8	59.0	53.4	48.3	36.5	13.3	5197
Education level							
None	36.4	31.0	28.0	29.5	22.1	19.2	6062
Primary	66.5	56.0	51.4	48.6	36.4	17.4	5570
Secondary +	86.6	75.8	68.5	55.7	43.4	11.3	4803
Adult education/ Khalwa/Sunday eductation	38.8	32.2	28.4	30.7	21.7	15.8	739
Wealth index quintiles							
Poorest	37.5	31.5	28.0	30.9	22.0	18.5	3013
Second	40.5	33.1	30.8	33.1	24.1	18.1	3176
Middle	58.3	49.2	46.3	44.1	33.8	16.1	3375
Fourth	72.5	61.7	56.6	50.3	38.4	17.4	3604
Richest	83.9	74.8	65.7	52.8	41.3	12.1	4006
SUDAN (TOTAL)	**60.3**	**51.7**	**46.9**	**43.1**	**32.7**	**16.2**	**17174**
[1] SHHS indicator 8.5							

Knowledge of mother-to-child transmission of HIV (women age 15-49 years)

Overall, 60.3 per cent of women age 15-49 years knew that HIV could be transmitted from mother to child. About 51.7 per cent of women knew that HIV could be transmitted from mother to child during pregnancy; 46.9 per cent of women knew that HIV could be transmitted from mother to child during delivery; and 43.1 per cent of women knew that HIV could be transmitted from mother to child by breastfeeding. The percentage of women who knew all three ways of mother-to-child transmission (i.e. HIV can be transmitted during pregnancy, during delivery, and by breastfeeding) was 32.7 per cent, while 16.2 per cent of women did not know of any of the specific means.

The proportion of women who know that AIDS can be transmitted from mother to child was higher among those in the age group 15-24 years (61.6 per cent) than that among those aged 25 years and above (59.4 per cent). The proportion of women who knew that HIV could be transmitted from mother to child during pregnancy was 52.6 per cent among women in the age group 15-24 years compared to 51.1 per cent among those aged 25 years and above; the proportion of women who knew that HIV could be transmitted from mother to child during delivery was 47.1 per cent among women in the age group 15-24 years compared to 46.8 per cent among those aged 25 years and above; the proportion of women who knew that HIV could be transmitted from mother to child by breast feeding was 45.3 per cent among women in the age group 15-24 years compared to 41.6 per cent among those aged 25 years and above. Similarly, the proportion of women who knew all three ways of HIV transmission from mother to child also was higher among those in the age group 15-24 years (33.7 per cent) and lower among those aged 25 years and above (32.0 per cent). The proportion of women who did not know any specific way to prevent HIV transmission from mother-to-child was lower among those in the age group 15-24 years (14.8 per cent) and higher among those aged 25 years and above (17.2 per cent).

The proportion of women who knew that AIDS could be transmitted from mother to child varied between women belonging to different age groups. The proportion of women who knew that AIDS could be transmitted from mother to child was highest among women in the age group 20-24 years (63.5 per cent) and lowest among women in the age group 40-49 years (58.2 per cent). The proportion of women who knew that HIV could be transmitted from mother to child during pregnancy was highest among women in the age

group 20-24 years (54.8 per cent) and lowest among women in the age group 15-19 years (50.6 per cent). The proportion of women who knew that HIV could be transmitted from mother to child during delivery was highest among women in the age group 20-24 years (48.4 per cent) and lowest among women in the age group 15-19 years (45.9 per cent). The proportion of women who knew that HIV could be transmitted from mother to child by breast feeding was highest among women in the age group 20-24 years (45.3 per cent) and lowest among women in the age group 40-49 years (39.8 per cent). The proportion of women who knew all three ways of HIV transmission from mother to child was highest among women in the age group 20-24 years (34.1 per cent) and lowest among women in the age group 30-39 years (31.5 per cent). The proportion of women who did not know any of the specific means to prevent HIV transmission from mother-to-child was highest among women in the age group 25-29 years (17.6 per cent) and lowest among women in the age group 15-19 years (14.6 per cent).

The proportion of women aged 15-49 years who know that AIDS can be transmitted from mother to child seems to vary between women in rural and urban areas, being 51.7 per cent among women in rural areas and 77.0 per cent among those from urban areas. The proportion of women who knew that HIV could be transmitted from mother to child during pregnancy was only 42.8 per cent among women from rural areas compared to 69.0 per cent among those from urban areas; the proportion of women who knew that HIV could be transmitted from mother to child during delivery was only 39.5 per cent among women from rural areas compared to 61.4 among those from urban areas; the proportion of women who knew that HIV could be transmitted from mother to child by breast feeding was only 38.7 per cent among women from the from rural areas compared to 51.5 per cent among those from urban areas.

Similarly, the proportion of women who knew all three ways of HIV transmission from mother to child also varied between women in rural and urban areas, the proportion being 28.1 per cent among women from rural areas and 41.4 per cent among those from urban areas. The proportion of women who did not know any specific way to prevent HIV transmission from mother-to-child was 17.5 per cent among women from rural areas compared to 13.8 per cent among those from urban areas.

The proportion of women aged 15-49 years who know that AIDS can be transmitted from mother to child seems to vary among women ever married and women never married, the proportion being 56.6 per cent among women ever married and 68.8 per cent among women never married. The proportion of women who knew that HIV could be transmitted from mother to child during pregnancy was only 48.5 per cent among women ever married compared to 59.0 per cent among those women never married; the proportion of women who knew that HIV could be transmitted from mother to child during delivery was only 44.1 per cent among women ever married compared to 53.4 per cent among those women never married; the proportion of women who knew that HIV could be transmitted from mother to child by breast feeding was only 40.8 among women ever married compared to 48.3 per cent among those women never married. Similarly, the proportion of women who knew all three ways of HIV transmission from mother to child also varied between women ever married and women never married, the percentages being 31.0 per cent among women ever married and 36.5 per cent among those never married. The percentage of women who did not know any specific way to prevent HIV transmission from mother-to-child was 17.5 per cent among women ever married compared to 13.3 per cent among those women never married.

The proportion of women aged 15-49 years who knew that HIV can be transmitted from mother to child appears to increase with the woman's education level, the proportion being 36.4 per cent among women with no formal education compared to 66.5 per cent among those with primary education and 86.6 per cent among women with secondary or higher level of education. The proportion of women who knew that HIV could be transmitted from mother to child during pregnancy was only 31.0 per cent among women with no formal education compared to 56.0 per cent among women with primary education and 75.8 per cent among women with secondary or higher level of education. The proportion of women who knew that HIV could be transmitted from mother to child during delivery was only 28.0 per cent among women with no formal education compared to 51.4 per cent among those with primary education and 68.5 per cent among women with secondary or higher level of education. Similarly, the proportion of women who knew all three ways of HIV transmission from mother to child was only 22.1 per cent among women with no formal education compared to 36.4 per cent among women with primary education and 43.4 per cent among women with secondary or higher level of education. The proportion of women who did not know any specific way to prevent HIV transmission from mother-to-child appears to decrease with higher level of education among women, the proportion being 19.2 per cent among women with no formal education compared to 17.4 per cent among with primary education and 11.3 per cent among women with secondary or higher level of education.

The proportion of women aged 15-49 years who know that AIDS can be transmitted from mother to child also seems to increase with household wealth, the proportion being 37.5 per cent among women from households in the poorest quintile and 83.9 per cent among those from households in the richest quintile. The proportion of women who knew that HIV could be transmitted from mother to child during pregnancy was only 31.5 per cent among women from households in the poorest quintile compared to 74.8 per cent among those from households in the richest quintile; the proportion of women who knew that HIV could be transmitted from mother to child during delivery was only 28.0 among women from households in the poorest quintile compared to 65.7 per cent among those from households in the richest quintile; the proportion of women who knew that HIV could be transmitted from mother to child by breast feeding was only 30.9 per cent among women from households in the poorest quintile compared to 52.8 per cent among those from households in the richest quintile. Similarly, the proportion of women who knew all three ways of HIV transmission from mother to child also increases with the increasing level of household wealth, the proportion being 22.0 per cent among women from households in the poorest quintile to 41.3 per cent among those from households in the richest quintile. The proportion of women who did not know any specific way to prevent HIV transmission from mother-to-child appears to decrease with higher level of household wealth, the percentage being 18.5 per cent among women from households in the poorest quintile to 12.1 per cent among those from households in the richest quintile.

The proportion of women age 15-49 years who know that AIDS could be transmitted from mother to child varies substantially by State of residence, ranging from 39.1 per cent in West Darfur to 76.7 per cent in Khartoum State. The proportion of women who knew all three ways of HIV transmission from mother-to-child ranged from 15.7 per cent in Red Sea State to 42.6 per cent in Khartoum State. The proportion of women who did not know any of the specific means to prevent HIV transmission from mother-to-child ranged from 12.2 per cent in Red Sea State to 22.1 per cent in South Kordofan State.

Figure 11.5: Knowledge of mother-to-child transmission of HIV
Percentage of women age 15-49 years who correctly identify all three means of mother-to-child transmission of HIV, Sudan, 2010

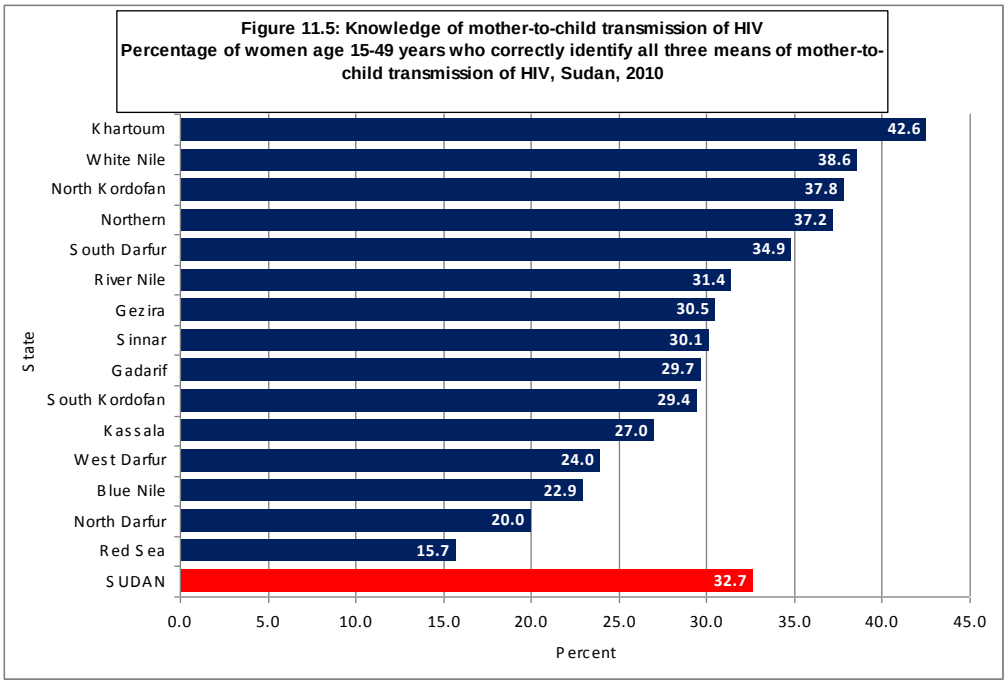


Table 11.7: Accepting attitudes toward people living with HIV/AIDS
Percentage of women age 15-49 years who have heard of AIDS who express an accepting attitude towards people living with HIV/AIDS, Sudan , 2010

	Percent of women who:						Number of women who have herd of AIDS
	Are willing to care for a family member with the AIDS virus in own home	Would buy fresh vegetables from a shopkeeper or vendor who has the AIDS virus	Believe that a female teacher with the AIDS virus and is not sick should be allowed to continue teaching	Would not want to keep secret that a family member got infected with the AIDS virus	Agree with at least one accepting attitude	Express accepting attitudes on all four indicators [1]	
State of residence							
Northern	55.8	29.7	47.0	65.8	94.8	9.2	309
River Nile	77.2	33.4	44.8	41.5	90.5	10.0	504
Red Sea	57.4	41.8	48.7	48.0	85.9	12.8	251
Kassala	53.7	30.2	45.3	35.5	79.9	6.5	636
Gadarif	74.5	31.2	51.7	44.7	92.0	11.0	573
Khartoum	64.5	38.0	56.6	36.9	92.0	7.7	2759
Gezira	75.7	30.3	52.3	36.9	89.1	11.5	2334
Wite Nile	73.6	30.8	45.3	45.4	91.4	11.4	824
Sinnar	53.2	27.0	38.3	48.7	87.0	6.7	462
Blue Nile	53.0	27.3	41.9	51.8	86.4	6.5	300
North Kordofan	64.5	23.5	36.0	49.3	89.8	4.3	1277
South Kordofan	64.2	26.3	35.5	60.2	92.7	7.7	522
North Darfur	65.1	17.8	25.7	42.6	84.1	4.2	555
West Darfur	62.2	20.7	26.7	38.8	82.3	3.7	365
South Darfur	63.7	22.7	38.4	55.7	92.2	7.9	1477
Area of residence							
Urban	66.6	37.3	55.7	42.6	92.2	9.4	5308
Rural	66.1	24.5	38.6	45.1	88.0	7.5	7839
Age group							
15-24	67.0	31.8	49.1	44.0	90.9	8.7	5259
25+	65.9	28.2	43.2	44.1	88.9	8.0	7888
15-19	65.8	30.2	48.0	44.9	91.3	8.2	2650
20-24	68.2	33.5	50.1	43.0	90.6	9.2	2609
25-29	65.9	28.8	44.3	43.8	88.8	8.3	2481
30-39	64.9	28.8	43.8	44.3	88.8	7.7	3491
40-49	67.6	26.4	40.5	44.3	89.1	8.0	1916
Marital status							
Ever married	64.7	26.1	40.8	44.1	88.0	6.6	8880
Never married	69.8	37.2	55.4	44.0	93.2	11.7	4267
Education level							
None	57.8	13.9	23.6	46.2	82.9	2.4	3370
Primary	65.7	26.9	43.4	44.4	89.7	7.2	4674
Secondary +	73.9	44.5	64.5	42.3	95.0	13.8	4700
Adult education/Khalwa/Sunday eductation	56.3	20.2	32.7	43.8	84.1	5.4	403
Wealth index quintiles							
Poorest	61.4	14.4	26.0	46.5	85.1	2.6	1687
Second	55.8	16.5	27.2	49.5	84.8	2.9	1862
Middle	66.4	25.1	38.9	47.5	89.0	8.2	2512
Fourth	68.3	34.4	53.2	42.6	90.1	11.3	3239
Richest	71.9	41.7	60.9	39.3	94.1	10.8	3846
SUDAN (TOTAL)	**66.3**	**29.7**	**45.5**	**44.1**	**89.7**	**8.3**	**13147**

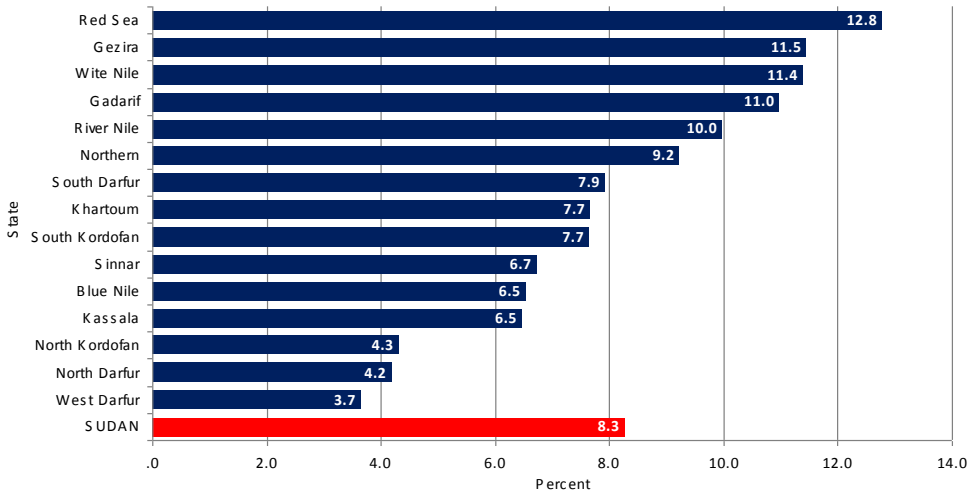
[1] SHHS indicator 8.7

The proportion of women age 15-49 years who expressed accepting attitudes on all four indicators appears to increase with the increasing educational level of the women and the household wealth. The proportion of

women who expressed accepting attitudes on all four indicators was only 2.4 per cent among women with no formal education compared to 7.2 per cent among those with primary education and 13.8 per cent among women with secondary or higher level of education. The proportion of women who expressed accepting attitudes on all four indicators was 2.6 per cent among women from households in the poorest quintile compared to 10.8 among those from households in the richest quintile.

The proportion of women age 15-49 years who expressed accepting attitudes on all four indicators ranged from 3.7 per cent in West Darfur to 12.8 per cent in Red Sea State.

Figure 11.7: Accepting attitudes toward people living with HIV/AIDS
Percentage of women age 15-49 years who have heard of AIDS and who express accepting attitudes towards people living with HIV/AIDS (accepting attitudes on four indicators), Sudan, 2010



Knowledge of a Place for HIV Testing

Another important indicator is the knowledge of where to be tested for HIV and use of such services. In order to protect themselves and to prevent infecting others, it is important for individuals to know their HIV status. Knowledge of one's status is also a critical factor in the decision to seek treatment. Questions related to knowledge among women of a facility for HIV testing and whether they have ever been tested is presented in Table 11.9.

Overall, 14.4 per cent of women age 15-49 years knew of a place for HIV testing though only 2.5 per cent have actually been tested, 0.9 per cent have been tested in the last 12 months preceding SHHS2 and 0.5 per cent has been tested and have been told the result.

The percentage of women age 15-49 years who knew a place to get tested for HIV was higher among women in urban areas (26.1 per cent) than among those in rural areas (8.4 per cent). The percentage of women age 15-49 years who knew a place to get tested for HIV was highest among women in the age group 30-34 years (17.4 per cent) and lowest among women in the age group 15-19 years (11.1 per cent). The percentage of women who knew a place for HIV testing was slightly higher among never married women (15.1 per cent) than among ever married women (14.1 per cent).

The proportion of women age 15-49 years who knew a place for HIV testing appears to increase with the increasing level of household wealth. The proportion of women who knew a place to get tested was only 3.9 per cent among women from households in the poorest quintile compared to 29.1 per cent among those from the households in the richest quintile.

Table 11.9: Knowledge of a place for HIV testing
Percentage of women age 15-49 years who know where to get an HIV test, percentage of women who have ever been tested, percentage of women who have been tested in the last 12 months, and percentage of women who have been tested and have been told the result, Sudan, 2010

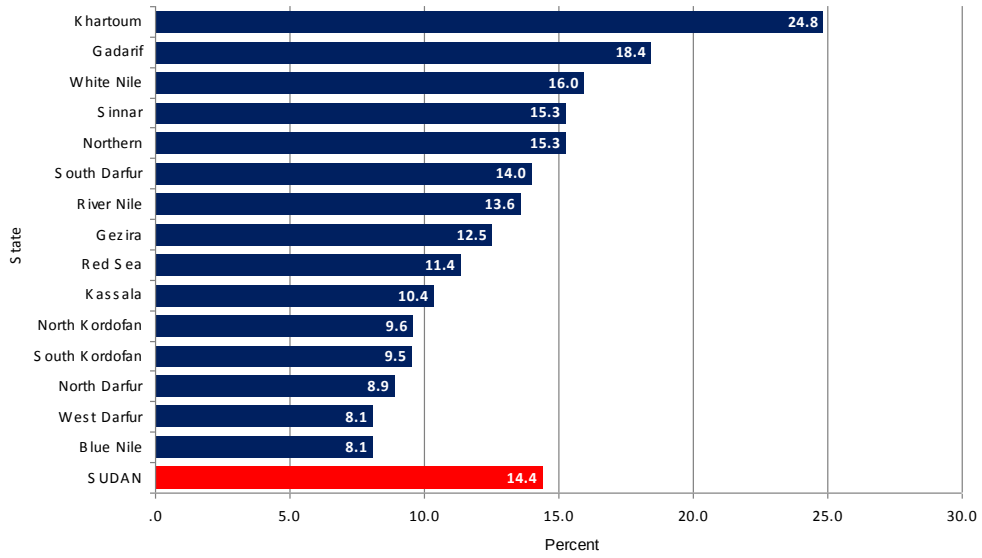
	Percentage of women who:				Number of men
	Know a place to get tested [1]	Have ever been tested	Have been tested in the last 12 months	Have been tested and have been told result [2]	
State of residence					
Northern	15.3	1.0	.2	.2	351
River Nile	13.6	1.8	.5	.4	637
Red Sea	11.4	1.9	.5	.1	477
Kassala	10.4	2.0	.8	.6	1004
Gadarif	18.4	2.7	.7	.4	773
Khartoum	24.8	6.9	2.1	1.4	3005
Gezira	12.5	.6	.2	.1	2791
Wite Nile	16.0	1.6	.4	.3	906
Sinnar	15.3	.8	.2	.1	675
Blue Nile	8.1	.9	.5	.1	566
North Kordofan	9.6	1.9	1.1	.5	1765
South Kordofan	9.5	1.4	.9	.5	700
North Darfur	8.9	2.1	1.1	.7	930
West Darfur	8.1	3.0	1.4	.6	672
South Darfur	14.0	1.6	.6	.5	1923
Area of residence					
Urban	26.1	5.3	1.7	1.0	5842
Rural	8.4	1.0	.5	.3	11332
Age group					
15-19	11.1	1.4	.5	.4	3559
20-24	14.4	2.0	.6	.3	3321
25-29	14.4	2.9	1.2	.5	3176
30-34	17.4	3.0	1.2	.7	2139
35-39	15.9	3.0	1.3	.9	2446
40-44	16.1	3.3	.6	.5	1466
45-49	13.7	3.1	1.2	1.1	1067
Marital status					
Ever married/in union	14.1	3.1	1.1	.7	11977
Never married/in union	15.1	1.0	.3	.3	5197
Wealth index quintile					
Poorest	3.9	.5	.2	.1	3013
Second	5.0	1.0	.6	.4	3176
Middle	10.7	1.6	.8	.5	3375
Fourth	18.6	3.5	1.7	1.0	3604
Richest	29.1	5.0	1.0	.6	4006
SUDAN (TOTAL)	**14.4**	**2.5**	**.9**	**.5**	**17174**

[1] SHHS indicator 8.9
[2] SHHS indicator 8.10

The percentage of women age 15-49 years who knew a place to get tested ranged between 8.1 in Blue Nile and West Darfur States and 24.8 in Khartoum State.

The percentage of women aged 15-49 years who have been tested for HIV and have been told result ranged between 0.1 in Red Sea, Gezira, Sinnar and Blue Nile States and 1.4 in Khartoum State.

Figure 11.9: Knowledge of a place for HIV testing
Percentage of women age 15-49 years who state that they know a place to be tested for HIV, Sudan, 2010



XII. Injury and Chronic Diseases

The SHHS2 included some key indicators required to assess the situation in regard to injury suffered by children and adults over the 12 months preceding the SHHS2. The key topics covered by the SHHS2 included the proportion of children and adults who had suffered an injury over the 12 months preceding the SHHS2, causes of most recent injury, type of health care received in the first week and resulting disability. The SHHS2 also included some key indicators required to assess the proportion of children and adults affected by chronic diseases over the 12 months preceding the SHHS2. The key topics covered by the SHHS2 included the prevalence of chronic diseases, and major chronic diseases among people. The key SHHS2 indicators include the following: The key SHHS2 indicators relating to injury and chronic diseases include the following:

- *Injury suffered over the past 12 months:* The percentage of respondents who had an injury over the 12 months preceding the SHHS2.
- *Diability due to injury*: The percentage of those who got injured during the past 12 months and suffered disability as a result of the injury.
- *Prevalence of chronic diseases:* Proportion of respondents age 10 to 65+ with chronic diseases

Injury suffered over the past 12 months

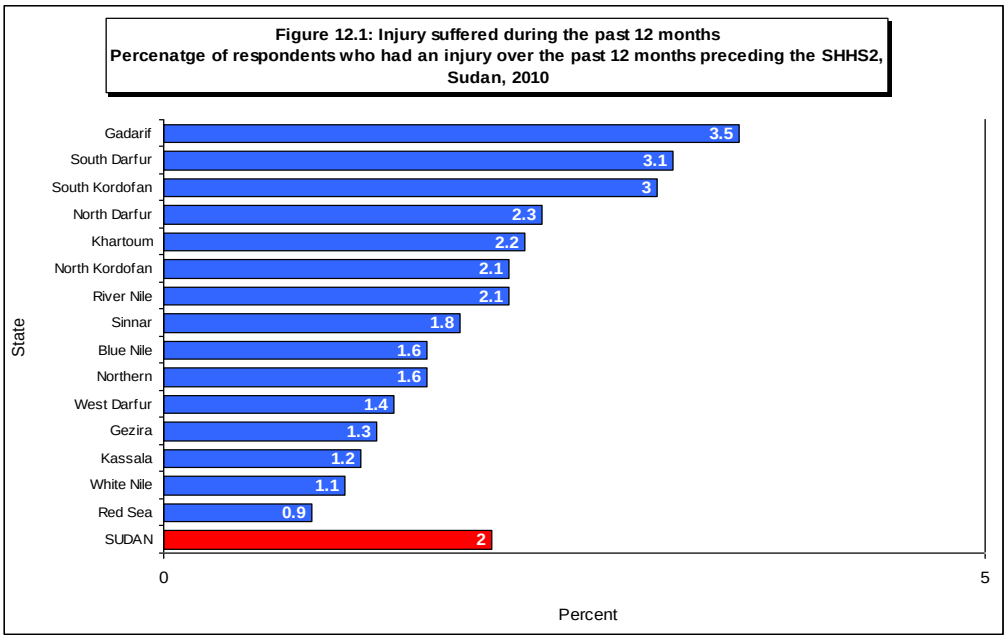
Table 12.1 indicates the percentage of respondents who had an injury over the 12 months preceding the SHHS2. The SHHS2 data indicated that overall 2.0 per cent of the respondents had suffered an injury over the 12 months preceding the SHHS2.

Table 12.1: Injury suffered over the 12 months preceding SHHS2, Sudan, 2010

Background characteristics	Percentage of respondents who had an injury over the past 12 months [1]	Number of respondents
Sex		
Male	2.6	41300
Female	1.5	43212
Age group		
0-14 years	1.4	38516
15-44 years	2.2	32839
45-64 years	3.4	9844
65+ years	3.9	3267
State of residence		
Northern	1.6	1538
River Nile	2.1	3005
Red Sea	0.9	2247
Kassala	1.2	5133
Gadarif	3.5	3977
Khartoum	2.2	13474
Gezira	1.3	12614
White Nile	1.1	4363
Sinnar	1.8	3487
Blue Nile	1.6	3025
North Kordofan	2.1	8660
South Kordofan	3.0	3800
North Darfur	2.3	5348
West Darfur	1.4	3616
South Darfur	3.1	10227
SUDAN (TOTAL)	**2.0**	**84514**
Area of residence		
Urban	2.1	26662
Rural	2.0	57850
Education level		
None	1.9	47709
Primary	2.1	21471
Secondary +	2.3	14744
Wealth index quintiles		
Poorest	2.5	16899
Second	2.1	16906
Middle	1.9	16907
Fourth	1.7	16896
Richest	2.0	16905
[1] SHHS indicator 9.1		

The percentage of respondents who had an injury over the past 12 months preceding the SHHS2 was slightly higher among those over age 65 years (3.9 per cent) than that among those in the age group 45-64 years (3.4 per cent), 15-44 years (2.2 per cent) and those in the age group 0-14 years (1.4 per cent). The percentage of respondents who had an injury during the past 12 months was slightly higher among males (2.6per cent) than among females (1.5 per cent). There was little difference in the percentage of respondents who had an injury during the past 12 months between those from urban areas (2.1 per cent) and those from rural areas (2.0 per cent). There was very little difference in the percentage of respondents who had an injury over the past 12 months between those who had no formal education (1.9 per cent), those who had primary education (2.1 per cent) and those who had secondary or higher level of education (2.3 per cent). The percentage of respondents who had an injury over the past 12 months varied marginally with increasing level of household wealth, the percentage being 2.5 per cent among those from households in the poorest quintile, 2.1 per cent among those from households in the second wealth index quintile, 1.9 per cent among those from households in the middle wealth index quintile, 1.7 per cent among those from households in the fourth wealth index quintile and 2.0 per cent among those from households in the richest quintile. The percentage of respondents who had an injury over the past 12 months varied between 0.9 per cent in Red Sea State and 3.5 per cent in Gadarif State.

Figure 12.1: Injury suffered during the past 12 months
Percenatge of respondents who had an injury over the past 12 months preceding the SHHS2, Sudan, 2010



Causes of most recent injury

Table 12.2 indicates the main cause of most recent injury, type of health care sought and resulting disability. The SHHS2 data indicated that of the respondents who suffered injury during the 12 months preceding the SHHS2, injury in 33.3 per cent of them was caused by fall, while injury in 18.2 per cent of them was caused by animal bite/venom, and injury in 16.1 per cent of them was caused by road traffic accident. Assault caused injury in 7.0 per cent of the respondents, mechanical (non-transport) problems caused injury in 5.8 per cent of the respondents while fire/hot substance caused injury in 4.9 per cent of the respondents and poisoning caused injury in 4.3 per cent of the respondents.

The SHHS2 data also indicated that of those who had suffered injury during the past 12 months, 14.9 per cent of them received no medical care, while 15.7 of them received medical care inpatients in a hospital, 37.4 per cent of them received medical care in outpatient department in a hospital or other health facility, and 32.0 per cent of them were treated by traditional healers.

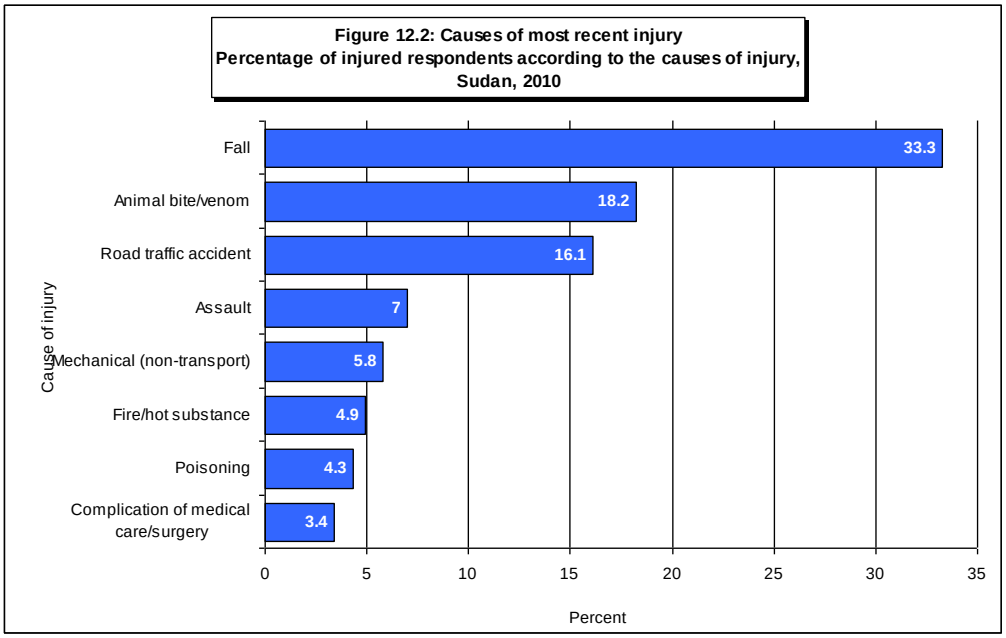
Table 12.2 Causes of most recent injury, type of health care sought and resulting disability, Sudan, 2010

Cause of most recent injury	Percentage of injured respondents in each category	Type of health care in the first week of most recent injury				Suffered disability as a result of recent Injury [1]
		None	Inpatient	Outpatient in hospital or other health facility	Traditional healer	
Road traffic accident	16.1	13.4	22.3	57.6	6.7	33.1
Poisoning	4.3	9.5	25.7	44.6	20.3	11.0
Fall	33.3	12.7	11.6	30.2	45.6	30.9
Mechanical (non-transport)	5.8	15.2	8.1	49.5	27.3	23.2
Near drowning [2]	0.2	25.0	25.0	50.0		25.0
Fire/Hot substance (non-transport)	4.9	19.5	15.9	51.2	13.4	17.1
Animal bite/venom	18.2	18.4	5.9	21.1	54.6	6.8
Electric shock [2]	0.8	42.9	-	21.4	35.7	35.7
Intentional self-harm	0.1	-	50.0	50.0	-	-
Assault	7.0	12.3	22.8	48.2	16.7	25.8
Complication of medical or surgical care	3.4	7.1	62.5	25.0	5.4	41.4
Others	5.9	23.2	18.2	40.4	18.2	40.6
SUDAN (TOTAL)	**100.0**	**14.9**	**15.7**	**37.4**	**32.0**	**25.4**

[1] SHHS indicator 9.2 [2] Less than five cases

The SHHS2 data also indicated that overall 25.4 per cent of those who got injured during the past 12 months suffered disability as a result of the injury. Of those who got injured in a road traffic accident, 33.1 per cent of them suffered disability as a result of the injury. Of those who got injured due to fall, 30.9 per cent of them suffered disability as a result of the injury while of those who got injured due to assault, 25.8 per cent of them suffered disability as a result of the injury.

Figure 12.2: Causes of most recent injury
Percentage of injured respondents according to the causes of injury, Sudan, 2010



Chronic diseases

Prevalence of Chronic Diseases

Table 12.3 indicates the percentage of children and adults with or without a chronic disease. The SHHS2 data indicates that overall 9.1 per cent of the respondents were affected by a chronic disease.

Table 12.3: Chronic diseases
Percentage of respondents with or without chronic diseases, Sudan, 2010

	Chronic diseases							
	Yes		No		DK		Missing	
	Number of respondent	Percentage of respondents with chronic	Number of respondent	Percentage of respondents without chronic disease	Number of respondent	DK (%)	Number of respondent	Missing (%)
State of residence								
Northern	134	11.2	1,057	88.7	0	0.0	0	0.0
River Nile	181	8.1	2,054	91.9	0	0.0	0	0.0
Red Sea	65	4.0	1,553	95.7	0	0.0	4	0.2
Kassala	184	5.2	3,331	94.7	0	0.0	2	0.1
Gadarif	181	6.9	2,421	92.9	2	0.1	3	0.1
Khartoum	1,146	11.7	8,644	88.3	0	0.0	2	0.0
Gezira	745	8.2	8,341	91.7	0	0.0	6	0.1
White Nile	280	9.3	2,740	90.5	5	0.2	3	0.1
Sinnar	143	5.9	2,260	94.0	0	0.0	2	0.1
Blue Nile	138	7.3	1,746	92.6	1	0.0	0	0.0
N. Kordofan	609	10.6	5,139	89.3	0	0.0	7	0.1
S.Kordofan	178	7.5	2,208	92.5	1	0.0	0	0.0
N. Darfur	227	6.7	3,139	92.9	4	0.1	9	0.3
West Darfur	162	7.2	2,087	92.7	1	0.0	1	0.1
S.Darfur	860	13.3	5,591	86.5	0	0.0	15	0.2
SUDAN (Total)	**5,235**	**9.1**	**52,313**	**90.8**	**13**	**0.0**	**55**	**0.1**
Area of residence								
Urban	2,078	10.8	17,188	89.2	2	0.0	10	0.1
Rural	3,157	8.2	35,125	91.6	11	0.0	44	0.1
Sex								
Male	2,260	8.2	25,364	91.7	8	0.0	26	0.1
Female	2,975	9.9	26,949	90.0	6	0.0	28	0.1
Age group								
10 - 14 yrs	248	2.1	11,337	97.6	1	0.0	24	0.2
15 – 34 yrs	1,018	4.1	23,656	95.8	5	0.0	15	0.1
35 – 64 yrs	2,871	16.0	15,107	83.9	6	0.0	12	0.1
65 + yrs	1,097	33.1	2,213	66.7	1	0.0	4	0.1
Wealth index quintiles								
Poorest	1,035	9.8	9,466	89.9	1	0.0	25	0.2
Second	852	7.2	10,901	92.7	4	0.0	7	0.1
Middle	826	6.9	11,039	92.9	6	0.0	16	0.1
Fourth	975	8.5	10,523	91.5	0	0.0	2	0.0
Richest	1,548	13.0	10,384	87.0	2	0.0	5	0.0

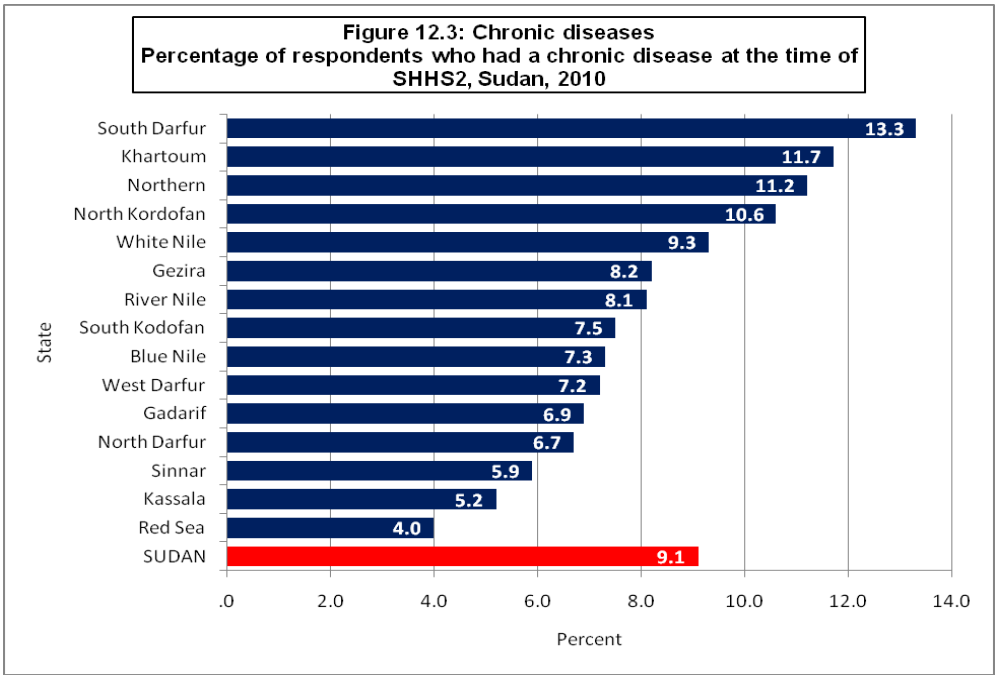
[1] SHHS Indicator 9.4

The percentage of respondents with a chronic disease was slightly higher among those living inmen in urban areas (10.8 per cent) than that among those living in rural areas (8.2 per cent). The percentage of respondents with a chronic disease was slightly higher among female respondents (9.9 per cent) than that among male respondents (8.2 per cent). The percentage of respondents with a chronic disease appears to increase with the age of the respondent. The percentage of respondents with a chronic disease was lowest at 2.1 per cent in the case of children in the age group 10-14 years compared to 4.1 per cent in the case of respondents in the age group 15-34 years, 16.0 per cent in the case of those in the age group 35-64 years and 33.1 per cent in the case of those in the age group 65+ yeras).

The percentage of respondents with a chronic disease was lowest at 6.9 per cent for those from households in the middle wealth index quintile compared to 7.2 per cent for those from households in the second wealth

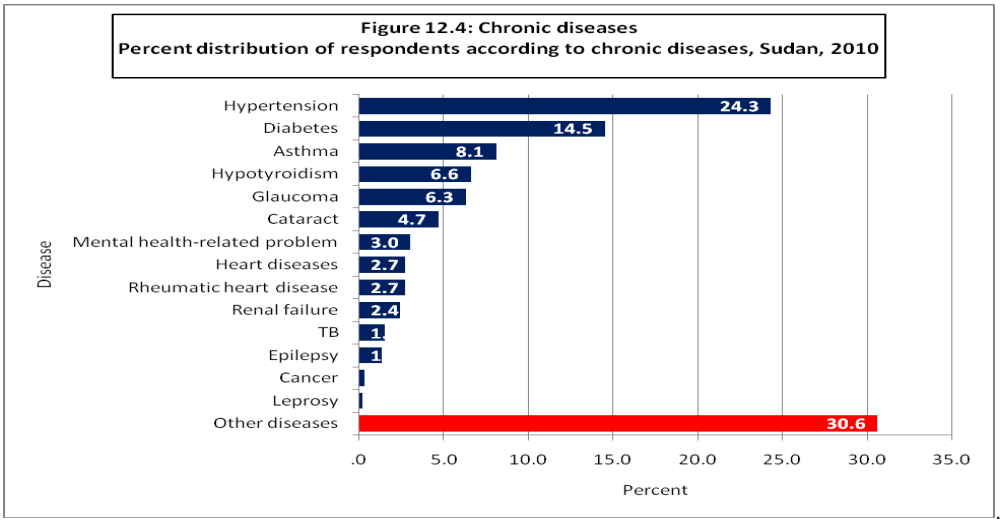
index quintile, 8.5 per cent for those from households in the fourth wealth index quintile, 9.8 per cent for those from households in the poorest quintile and 13.0 per cent for respondents from households in the richest quintile.

The percentage of respondents with a chronic disease ranged from 4.0 per cent in Red Sea State to 11.7 per cent in Khartoum State.



Major Chronic Diseases Among People

Tables 12.4a to Table 12.4d indicate the percentage of children and adults with specific chronic disease. Figure 12.4 indicates the percent distribution of respondents with chronic disease according to diseases. The SHHS2 data indicates that the major chronic diseases that are prevalent among people of Sudan and the percent distribution of respondents according to diseases are as follows: Hypertension (24.3 per cent), Diabetes (14.5 per cent), Asthma (8.1 per cent), Hypothyroidism (6.6 per cent), Glaucoma (6.3 per cent), Cataract (4.7 per cent), Mental health-related problems (3.0 per cent), Heart disease (2.7 per cent), Rhuematic heart disease (2.7 per cent), Renal failure (2.4 per cent), TB (1.5 per cent), Epilepsy (1.3 per cent), cancer (0.3 per cent), Leprosy (0.2 per cent) and other diseases (30.6 per cent).



People with hypertension: Table 12.4a indicates the percentage of children and adults affected by diseases such as hypertension, diabetes, heart disease and cancer. The SHHS2 data indicated that approximately one-fourth (24.3 per cent) of the respondents with chronic disease were affected by hypertension. The percentage with hypertension was higher among those living in urban areas (33.0 per cent) than that among those living in rural areas (18.6 per cent). The percentage with hypertension was slightly higher among female respondents (26.4 per cent) than that among male respondents (21.6 per cent). The percentage with hypertension appears to increase with the age of the respondent. The percentage with hypertension was lowest at 1.9 per cent in the case of children in the age group 10-14 years compared to 6.8 per cent in the case of respondents in the age group 15-34 years, 28.5 per cent in the case of those in the age group 35-64 years and 34.6 per cent in the case of those over age 65 years. The percentage with hypertension shows an increasing trend with increase in household wealth. The percentage with hypertension increased from 4.9 per cent in the case of those from households in the poorest quintile to 11.4 per cent for those from households in the second wealth index quintile, 25.1 per cent for those from households in the middle wealth index quintile, to 33.1 per cent for those from households in the fourth wealth index quintile and to 38.5 per cent for respondents from households in the richest quintile. The percentage with hypertension ranged from 3.3 per cent in West Darfur State to 43.5 per cent in Northern State.

Table 12.4a: Chronic diseases
Percent distribution of respondents with chronic disease by type of disease, Sudan, 2010

	Disease							
	Hypertension		Diabetes		Heart Disease		Cancer	
	Number of respondents	Percentage of respondents with disease (%)	Number of respondents	Percentage of respondents with disease (%)	Number of respondents	Percentage of respondents with disease (%)	Number of respondent	Percentage of respondents with disease (%)
State of residence								
Northern	58	43.5	42	31.5	3	2.5	0	0.3
River Nile	68	37.6	42	23.0	7	3.9	1	0.3
Red Sea	25	37.8	14	21.7	2	2.6	0	0.0
Kassala	37	19.8	40	21.9	5	2.7	0	0.0
Gadarif	49	27.2	28	15.2	5	2.7	0	0.0
Khartoum	416	36.3	290	25.3	45	3.9	4	0.4
Gezira	284	38.2	124	16.6	10	1.3	4	0.5
White Nile	69	24.4	49	17.4	3	0.9	1	0.5
Sinnar	53	36.7	20	14.1	3	2.3	0	0.0
Blue Nile	21	15.1	8	5.5	3	2.3	1	0.4
N.Kordofan	71	11.7	38	6.2	16	2.6	2	0.3
S.Kordofan	38	21.5	10	5.8	7	3.9	1	0.4
N.Darfur	32	14.0	16	7.0	0	0.0	0	0.0
W.Darfur	5	3.3	7	4.5	9	5.5	1	0.8
S.Darfur	48	5.5	29	3.4	23	2.6	0	0.0
SUDAN (TOTAL)	**1,273**	**24.3**	**757**	**14.5**	**140**	**2.7**	**14**	**0.3**

Area of residence								
Urban	685	33.0	463	22.3	74	3.6	6	0.3
Rural	588	18.6	293	9.3	66	2.1	8	0.3
Sex								
Male	489	21.6	398	17.6	69	3.0	3	0.1
Female	784	26.4	359	12.1	72	2.4	12	0.4
Age group								
10 - 14	5	1.9	5	2.0	10	3.9	0	0.0
15 - 34	70	6.8	52	5.1	28	2.7	1	0.1
35 - 64	819	28.5	544	19.0	74	2.6	10	0.4
65 +	380	34.6	155	14.1	29	2.6	3	0.3
Wealth index quintiles								
Poorest	51	4.9	26	2.5	25	2.4	1	0.1
Second	97	11.4	37	4.4	15	1.8	1	0.1
Middle	208	25.1	77	9.4	24	2.9	3	0.4
Fourth	322	33.1	167	17.2	31	3.2	2	0.2
Richest	596	38.5	449	29.0	46	2.9	7	0.5

People with diabetes: The SHHS2 data also indicated that approximately 14.5 per cent of the respondents with chronic disease were affected by diabetes. The percentage with diabetes was higher among those living in urban areas (22.3 per cent) than that among those living in rural areas (9.3 per cent). The percentage with diabetes was slightly higher among male respondents (17.6 per cent) than that among female respondents (12.1 per cent). The percentage with diabetes appears to increase with the age of the respondent. The percentage with diabetes was lowest at 2.0 per cent in the case of children in the age group 10-14 years compared to 5.1 per cent in the case of respondents in the age group 15-34 years, 19.0 per cent in the case of those in the age group 35-64 years and 14.1 per cent in the case of those over age 65 years. The percentage with diabetes shows an increasing trend with increase in household wealth. The percentage with diabetes increased from 2.5 per cent in the case of those from households in the poorest quintile to 4.4 per cent for those from households in the second wealth index quintile, 9.4 per cent for those from households in the middle wealth index quintile, to 17.2 per cent for those from households in the fourth wealth index quintile and to 29.0 per cent for respondents from households in the richest quintile. The percentage with diabetes ranged from 3.4 per cent in South Darfur State to 31.5 per cent in Northern State.

People with heart disease and cancer: The SHHS2 data also indicated that approximately 2.7 per cent of the respondents with chronic disease were affected by heart disease while 0.3 per cent of the respondents with chronic disease were affected by cancer. The percentage with heart disease was sightly higher among those living in urban areas (3.6 per cent) than that among those living in rural areas (2.1 per cent). The percentage with heart disease was marginally higher among male respondents (3.0 per cent) than that among female respondents (2.4 per cent). The percentage with heart disease ranged from zero per cent in North Darfur State to 5.5 per cent in West Darfur State.

Table 12.4b indicates the percentage of children and adults affected by diseases such as epilepsy, asthma, hypothyroidism and glaucoma.

Table 12.4b: Chronic diseases
Percent distribution of respondents with chronic disease by type of disease, Sudan, 2010

	Disease							
	Epilepsy		Asthma		Hypothyroidism		Glaucoma	
	Number of respondent	Percentage of respondents with disease (%)	Number of respondent	Percentage of respondents with disease (%)	Number of respondent	Percentage of respondents with disease (%)	Number of respondent	Percentage of respondents with disease (%)
State of residence								
Northern	1	0.8	10	7.7	7	5.3	4	2.8
River Nile	1	0.5	14	7.6	8	4.5	8	4.2
Red Sea	2	3.0	7	10.6	2	3.6	3	4.7
Kassala	3	1.6	16	8.6	9	5.1	18	9.7
Gadarif	4	2.1	19	10.3	20	10.9	17	9.5
Khartoum	6	0.5	79	6.9	89	7.8	45	3.9
Gezira	3	0.4	84	11.2	22	2.9	25	3.4
White Nile	1	0.4	19	6.8	33	11.9	17	6.2
Sinnar	1	0.7	17	11.7	4	2.9	11	7.8
Blue Nile	3	2.3	13	9.3	2	1.7	8	6.1
N.Kordofan	11	1.8	45	7.4	49	8.0	59	9.8
S.Kordofan	2	1.2	7	3.9	20	11.4	17	9.5
N.Darfur	8	3.6	18	8.0	10	4.3	23	10.3
W.Darfur	4	2.7	18	10.9	12	7.3	14	8.8

S.Darfur	19	2.2	59	6.9	56	6.5	57	6.7
SUDAN (TOTAL)	**70**	**1.3**	**424**	**8.1**	**344**	**6.6**	**327**	**6.3**
Area of residence								
Urban	20	1.0	165	8.0	165	7.9	61	2.9
Rural	50	1.6	258	8.2	179	5.7	267	8.4
Sex								
Male	30	1.3	232	10.2	35	1.5	155	6.9
Female	40	1.4	192	6.5	310	10.4	172	5.8
Age group								
10 - 14	15	5.8	44	17.6	10	4.0	33	13.4
15 - 34	32	3.1	124	12.2	141	13.9	41	4.0
35 - 64	20	0.7	201	7.0	180	6.3	118	4.1
65 +	4	0.4	56	5.1	13	1.2	135	12.3
Wealth index quintiles								
Poorest	29	2.8	63	6.1	59	5.7	110	10.6
Second	13	1.5	75	8.8	50	5.9	92	10.7
Middle	9	1.1	72	8.8	63	7.6	70	8.5
Fourth	11	1.1	76	7.8	75	7.7	29	2.9
Richest	8	0.5	137	8.9	97	6.3	27	1.8

People with epilepsy: The SHHS2 data indicated that approximately 1.3 per cent of the respondents with chronic disease were affected by epilepsy. The percentage with epilepsy was marginally higher among those living in rural areas (1.6 per cent) than that among those living in urban areas (1.0 per cent). There was no noticeable difference in the percentage with epilepsy between male respondents (1.3 per cent) and female respondents (1.4 per cent). The percentage with epilepsy appears to decrease with the age of the respondent. The percentage with epilepsy was highest at 5.8 per cent among children in the age group 10-14 years compared to 3.1 per cent among respondents in the age group 15-34 years, 0.7 per cent among those in the age group 35-64 years and 0.4 per cent among those over age 65 years. The percentage with epilepsy shows a declining trend with increase in household wealth.The percentage with epilepsy decreased from 2.8 per cent in the case of those from households in the poorest quintile to 1.5 per cent for those from households in the second wealth index quintile, to 1.1 per cent for those from households in the middle wealth index quintile, to 1.1 per cent for those from households in the fourth wealth index quintile and to 0.5 per cent for respondents from households in the richest quintile.The percentage with epilepsy ranged from 0.4 per cent in Gezira and White Nile States to 3.6 per cent in North Darfur State.

People with asthma: The SHHS2 data also indicated that approximately 8.1 per cent of the respondents with chronic disease were affected by asthma. There was no noticeable difference in the percentage with asthma among those living in urban areas (8.0 per cent) than that among those living in rural areas (8.2 per cent). The percentage of respondents with asthma was higher for male respondents (10.2 per cent) than that for female respondents (6.5 per cent). The percentage with asthma appears to decrease with the age of the respondent. The percentage of respondents with asthma was highest at 17.6 per cent among children in the age group 10-14 years compared to 12.2 per cent among respondents in the age group 15-34 years, 7.0 per cent among those in the age group 35-64 years and 5.1 per cent among those over age 65 years. The percentage with asthma was higher among those from households in the richest quintile (8.9 per cent) than that among those from households in the poorest quintile (6.1 per cent). The percentage with asthma ranged from 3.9 per cent in South Kordofan State to 11.7 per cent in Sinnar State.

People with hypothyroidism: The SHHS2 data also indicated that approximately 6.6 per cent of the respondents with chronic disease were affected by hypothyroidism. The percentage with hypothyroidism was slightly higher among those living in urban areas (7.9 per cent) than that among those living in rural areas (5.7 per cent). The percentage with hypothyroidism was higher for female respondents (10.4 per cent) than that for male respondents (1.5 per cent). The percentage with hypothyroidism was highest at 13.9 per cent among those in the age group 15-34 years and lowest among those over age 65 years, while the percentage was 4.0 for children in the age group 110-14 years, and 6.3 among those in the age group 35-64 years. The percentage with hypothyroidism was lowest among those from households in the poorest quintile (5.7 per cent) and highest among those from households in thefourth wealth index quintile (7.7 per cent). The percentage with hypothyroidism ranged from 1.7 per cent in Blue Nile State to 11.9 per cent in Whie Nile State.

People with glaucoma: The SHHS2 data indicated that approximately 6.3 per cent of the respondents with chronic disease were affected by glaucoma. The percentage with glaucoma was higher among those living in rural areas (8.4 per cent) than that among those living in urban areas (2.9 per cent). The percentage with glaucoma was slightly higher for male respondents (6.9 per cent) than that for female respondents (5.8 per cent). The percentage with glaucoma was higher among those in the age group 10-14 years (13.4 per cent) and among those over age 65 years (12.3 per cent) than that among those in the age group 15-35 years,

(4.0 per cent) and that among those in the age group 35-64 years (4.1 per cent). The percentage with glaucoma was higher among those from households in the second wealth index quintile (10.7 per cent) and among those in the poorest quintile (10.6 per cent) than those from households in the middle wealth index quintile (8.5 per cent) and among those in the fourth wealth index quintile (2.9 per cent while it was lowest among those from households in the richest quintile (1.8 per cent). The percentage with glaucoma ranged from 2.8 per cent in Northern State to 10.3 per cent in North Darfur State.

Table 12.4c indicates the percentage of children and adults affected by diseases such as cataract, mental heath, TB and rheumatic heart disease.

People with cataract: The SHHS2 data indicated that approximately 4.7 per cent of the respondents with chronic disease were affected by cataract. The percentage with cataract was higher among those living in rural areas (6.0 per cent) than that among those living in urban areas (2.6 per cent). There was only a marginal difference in the percentage with cataract between male respondents (5.2 per cent) and female respondents (4.3 per cent). The percentage with cataract was highest at 11.7 per cent among those over age 65 years and lowest among those in the age group 15-34 years. The percentage with cataract shows a declining trend with increase in household wealth. The percentage with cataract decreased from 6.2 per cent in the case of those from households in the poorest quintile to 6.1 per cent for those from households in the second wealth index quintile, to 5.9 per cent for those from households in the middle wealth index quintile, to 3.7 per cent for those from households in the fourth wealth index quintile and to 2.9 per cent for respondents from households in the richest quintile. The percentage with cataract ranged from 2.0 per cent in Khartoum to 7.1 per cent in Blue Nile State.

Table 12.4c: (continued): Chronic diseases
Percent distribution of respondents with chronic disease by type of disease, Sudan, 2010

	Disease							
	Cataract		Mental Health		TB		Rheumatic Heart Disease	
	Number of respondent	Percentage of respondents with disease (%)	Number of respondent	Percentage of respondents with disease (%)	Number of respondent	Percentage of respondents with disease (%)	Number of respondent	Percentage of respondents with disease (%)
State of residence								
Northern	5	4.0	6	4.3	1	0.4	3	2.4
River Nile	7	3.9	16	8.9	0	0.1	7	3.7
Red Sea	4	5.5	3	4.9	0	0.0	1	1.2
Kassala	11	6.2	8	4.6	19	10.5	2	1.0
Gadarif	8	4.3	4	2.0	3	1.8	2	0.9
Khartoum	23	2.0	12	1.1	20	1.8	60	5.3
Gezira	50	6.7	38	5.1	6	0.8	5	0.7
White Nile	15	5.4	5	2.0	2	0.7	10	3.4
Sinnar	9	6.2	5	3.7	1	0.4	0	0.3
Blue Nile	10	7.1	5	3.5	5	3.5	2	1.4
N.Kordofan	41	6.7	14	2.3	9	1.5	13	2.2
S.Kordofan	11	5.9	9	5.2	4	2.0	4	2.2
N.Darfur	9	3.9	5	2.0	0	0.0	8	3.6
W.Darfur	4	2.7	4	2.2	5	3.0	4	2.5
S.Darfur	38	4.4	21	2.5	5	0.6	19	2.2
SUDAN (Total)	**245**	**4.7**	**156**	**3.0**	**79**	**1.5**	**140**	**2.7**
Area of residence								
Urban	54	2.6	44	2.1	30	1.4	71	3.4
Rural	191	6.0	111	3.5	49	1.6	69	2.2
Sex								
Male	118	5.2	83	3.7	40	1.8	53	2.3
Female	127	4.3	73	2.4	39	1.3	87	2.9
Age group								
10 - 14	5	1.8	12	4.9	7	2.9	5	1.9
15 - 34	13	1.3	73	7.2	21	2.1	14	1.4
35 - 64	98	3.4	65	2.2	41	1.4	78	2.7
65 +	129	11.7	5	0.5	9	0.8	43	3.9
Wealth index quintile								
Poorest	64	6.2	29	2.8	25	2.4	27	2.6
Second	52	6.1	35	4.1	18	2.2	11	1.3
Middle	49	5.9	25	3.1	12	1.5	25	3.0
Fourth	36	3.7	31	3.2	19	1.9	31	3.2
Richest	45	2.9	35	2.3	4	0.3	45	2.9

People with mental health-related problem: The SHHS2 data also indicated that approximately 3.0 per cent of the respondents with chronic disease were affected by mental health-related problem. There percentage with mental health-related problem was slightly higher among those living in rural areas (3.5 per cent) than that among those living in urban areas (2.1 per cent). The percentage with mental health-related problem was higher for male respondents (3.7 per cent) than that for female respondents (2.4 per cent). The percentage with mental health problem was highest at 7.2 per cent among those in the age group 15-34 years compared to 4.9 per cent among children in the age group 10-14 years, 2.2 per cent among respondents in the age group 35-64 years, and 0.5 per cent among those over age 65 years. The percentage with mental health-related problem was highest among those from households in the second wealth index quintile (4.1 per cent) and lowest among those from the richest quintile (2.3 per cent). The percentage with mental health problem ranged from 1.1 per cent in South Khartoum State to 5.2 per cent in South Kordofan State.

People with TB: The SHHS2 data indicated that approximately 1.5 per cent of the respondents with chronic disease were affected by *TB*. There was no noticeable difference in percentage with TB among those living in urban areas (1.4 per cent) than that among those living in rural areas (1.6 per cent). The percentage with TB was slightly higher for male respondents (1.8 per cent) than that for female respondents (1.3 per cent). The percentage with TB was highest at 2.9 per cent among children in the age group 10-14 years and lowest among those over age 65 years (0.5 per cent), while the percentage was 2.1 for those in the age group 15-34 years, and 1.4 among those in the age group 35-64 years. The percentage with TB was lowest among those from households in the richest quintile (0.3 per cent) and highest among those from households in the poorest quintile (2.4 per cent). The percentage with TB ranged from zero per cent in North Darfur State to 10.5 per cent in Kassala State.

People with rheumatic heart disease: The SHHS2 data indicated that approximately 2.7 per cent of the respondents with chronic disease were affected by rheumatic heart disease. The percentage with rheumatic heart disease was higher among those living in urban areas (3.4 per cent) than that among those living in rural areas (2.2 per cent). The percentage with rheumatic heart disease was slightly higher for female respondents (2.9 per cent) than that for male respondents (2.3 per cent). The percentage with rheumatic heart disease was higher among those over age 65 years and lowest among those in the age group 15-34 years. The percentage with rheumatic heart disease was lowest among those from households in the second wealth index quintile (1.3 per cent) and highest among those from households in the fourth wealth index quintile (3.2 per cent). The percentage with rheumatic heart disease ranged from 0.3 per cent in Sinnar State to 5.3 per cent in North Khartoum State.

Table 12.4d indicates the percentage of children and adults affected by diseases such as renal failure, leprosy and other diseases.

Table 12.3d (continued): Chronic diseases
Percent distribution of respondents with chronic disease by type of disease, Sudan, 2010

	Disease							
	Renal Failure		Leprosy		Others		Any of the diseases	
	Number of respondent	Percentage of respondents with disease (%)	Number of respondent	Percentage of respondents with disease (%)	Number of respondent	Percentage of respondents with disease (%)	Total number of respondent	Percentage of respondents with chronic
State of residence								
Northern	1	0.7	0	0.1	10	7.4	134	11.2
River Nile	3	1.8	0	0.0	29	15.8	181	8.1
Red Sea	1	0.9	0	0.0	7	11.4	65	4.0
Kassala	1	0.6	0	0.0	37	20.2	184	5.2
Gadarif	4	1.9	0	0.0	34	18.7	181	6.9
Khartoum	29	2.6	0	0.0	194	16.9	1,146	11.7
Gezira	4	0.6	0	0.0	173	23.3	745	8.2
White Nile	15	5.4	0	0.0	64	22.7	280	9.3
Sinnar	2	1.3	0	0.0	31	21.7	143	5.9
Blue Nile	3	1.8	0	0.0	60	43.5	138	7.3
N.Kordofan	9	1.5	6	1.0	266	43.7	609	10.6
S.Kordofan	10	5.4	0	0.0	51	28.7	178	7.5
N.Darfur	4	1.7	1	0.3	99	43.6	227	6.7
W.Darfur	9	5.6	2	1.2	67	40.9	162	7.2
S.Darfur	30	3.5	0	0.0	479	55.6	860	13.3
SUDAN (Total)	**124**	**2.4**	**9**	**0.2**	**1,601**	**30.6**	**5,235**	**9.1**
Area of residence								

Urban	52	2.5	0	0.0	445	21.4	2,078	10.8
Rural	72	2.3	9	0.3	1,156	36.6	3,157	8.2
Sex								
Male	57	2.5	3	0.1	692	30.6	2,260	8.2
Female	67	2.2	6	0.2	908	30.5	2,975	9.9
Age group								
10 - 14 yrs	1	0.3	0	0.0	100	40.2	248	2.1
15 – 34 yrs	43	4.2	2	0.2	380	37.3	1,018	4.1
35 – 64 yrs	65	2.2	4	0.1	857	29.8	2,871	16.0
65 + yrs	16	1.5	2	0.2	264	24.1	1,097	33.1
Wealth index quintiles								
Poorest	37	3.5	4	0.4	521	50.4	1,035	9.8
Second	24	2.8	4	0.5	376	44.1	852	7.2
Middle	15	1.9	1	0.1	234	28.3	826	6.9
Fourth	29	2.9	0	0.0	221	22.7	975	8.5
Richest	20	1.3	0	0.0	248	16.0	1,548	13.0

People with renal failure and leprosy: The SHHS2 data indicated that approximately 2.4 per cent of the respondents were affected by renal failure. There was no noticeable difference in the percentage of those with renal failure between rural and urban residents and between male and female respondents. The percentage with renal failure was highest at 4.2 per cent among those in the age group 15-34 years and lowest among those over age 65 years. The percentage with percentage with renal failure was highest at 3.5 per cent among those from households in the poorest quintile and lowest at 1.3 per cent among those from households in the richest quintile.The percentage with renal failure ranged from 0.6 per cent in Kassala State to 5.6 per cent in West Darfur State. The SHHS2 data also indicated that approximately 0.2 per cent of the respondents with a chronic disease were affected by leprosy.

People with other diseases: The SHHS2 data also indicated that approximately 30.6 per cent of the respondents with chronic disease were affected by diseases other than those mentioned above. The percentage with diseases other than those mentioned above was higher among those living in rural areas (36.6 per cent) than that among those living in urban areas (21.4 per cent). There was no difference in the percentage with other diseases between male (30.6 per cent) and female respondents (30.5 per cent). The percentage with other diseases was highest at 40.2 per cent among children in the age group 40.2 per cent and lowest among those over age 65 years (24.1 per cent). The percentage with other diseases was highest among those from households in the poorest quintile (50.4 per cent) and lowest among those from households in the richest quintile (16.0 per cent). The percentage with other diseases ranges from 7.4 per cent in Northern State to 55.6 per cent in South Darfur State.

XIII. Food Security

The SHHS2 included some key indicators required to assess the situation in regard to food security of population in Sudan. The key topics covered by the SHHS2 included the food sources, dietary diversity, food consumption patterns, food security and food insecurity, and food insecurity by income sources. The key SHHS2 indicators relating to food security include the following:

- *Food consumption status:* The proportion of households with poor, borderline and acceptable/adequate food consumption score;
- *Food security status:* The proportion of food secure households;
- *Food insecurity status:* The proportion of moderately and severely food insecure househods;

Food sources

Table 13.1 indicates the food sources of people in Sudan. It indicates the proportion of households which rely on own production of food items such as Sorghum, Millet, Wheat/Bread, Eggs and Milk as well as the proportion of households that rely on the market as the main source for these food items. The SHHS2 data shows that the majority of the households in Sudan rely on the market as the main food source, though the propotion of households that rely on own production of food items and those who rely on the market vary among States. The proportion of households which rely on own production of Sorghum ranged between zero per cent in Red Sea State to 40 per cent in South Kordofan State while the proportion of households which relied on the market for Sorghum ranged between 57 per cent in North Darfur State to 99 per cent in Red Sea and Khartoum States.

Table 13.1: Food sources

	Sorghum		Millet		Wheat/Bread		Eggs		Milk	
	Own production	Market purchase	Own production	Market purchase	Own production	Market purchase	Own production	Market purchase	Own production	Market purchase
Northern	11	87	6	91	13	87	19	80	21	79
River Nile	6	92	0	100	2	97	12	87	46	52
Red Sea	0	99	1	99	1	99	5	95	20	79
Kassala	13	85	7	93	4	95	15	84	21	78
Gadarif	15	84	16	82	1	99	28	72	19	80
Khartoum	1	99	0	100	0	99	1	99	2	97
Gezira	21	73	5	95	1	98	15	85	20	79
White Nile	13	86	4	95	0	100	13	86	11	88
Sinnar	19	80	30	68	1	99	22	76	15	83
Blue Nile	34	65	41	57	1	98	35	63	35	64
N. Kordofan	10	88	15	84	1	99	31	67	46	53
S. Kordofan	40	59	34	65	2	98	45	55	38	61
North Darfur	22	57	29	69	0	98	36	62	32	67
West Darfur	12	67	27	70	1	93	11	85	24	73
South Darfur	20	79	32	68	1	99	35	65	36	64

The proportion of households which rely on own production of Millet ranged between zero per cent in River Nile State to 41 per cent in Blue Nile State while the proportion of households which relied on the market for Millet ranged between 57 per cent in Blue Nile State to 100 per cent in River Nile and Khartoum States.

The proportion of households which rely on own production of Wheat/Bread ranged between zero per cent in Khartoum, White Nile and North Darfur States to 13 per cent in Northern State while the proportion of households which relied on the market for procurement of Wheat/Bread ranged between 87 per cent in Northern State to 100 per cent in White Nile State.

The proportion of households which rely on own production of eggs ranged between 1 per cent in Khartoum State to 45 per cent in South Kordofan State while the proportion of households which relied on the market for eggs ranged between 63 per cent in Blue Nile State to 100 per cent in White Nile State.

The proportion of households which rely on own production of milk ranged between 2 per cent in Khartoum State to 46 per cent in River Nile and North Kordofan States while the proportion of households which relied on the market for milk ranged between 53 per cent in North Kordofan State to 97 per cent in Khartoum

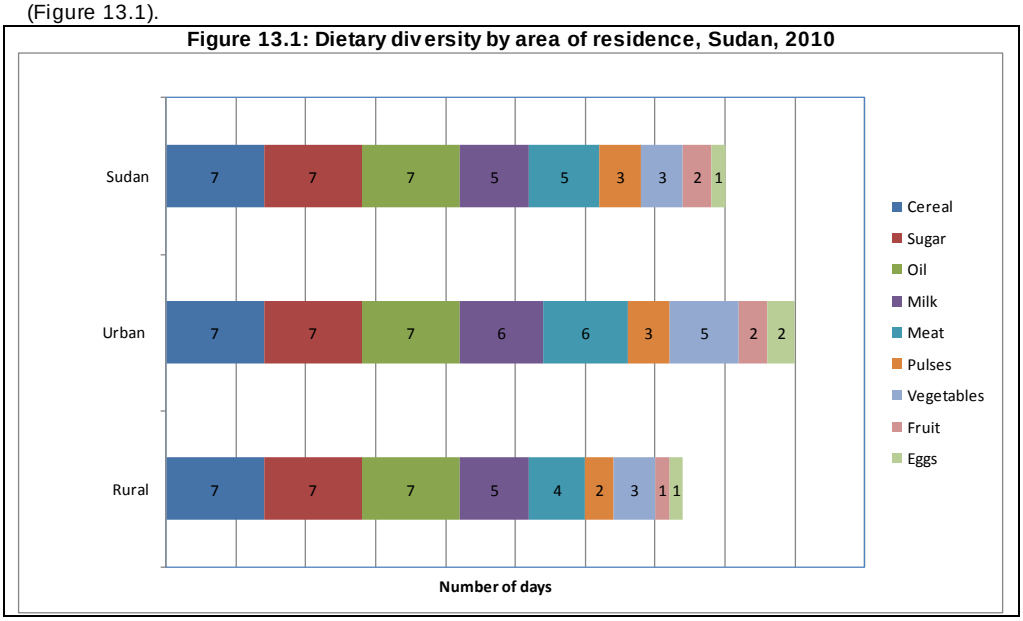
State.

Food consumption Patterns and Dietary Diversity

Diets in Sudan are diverse, linked in large part to its climatic conditions and resource base. The main dietary sources for people in Sudan includes cereal, sugar, oil, milk, meat, pulses, vegetables, fruits and eggs. Though the main staples of the Sudanese diet are sorghum and millet, in certain areas, especially in pastoral areas, there is a significant amount of meat and milk consumed as well.

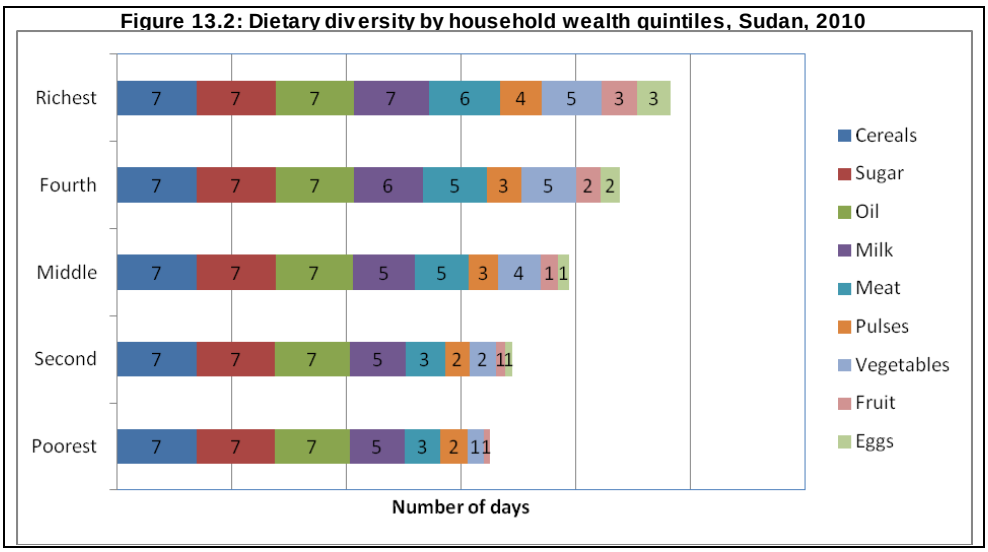
The SHHS2 data indicated that the urban households had a more diversified diet than rural households (Figure 13.1).

Figure 13.1: Dietary diversity by area of residence, Sudan, 2010



The SHHS2 data also indicated that the dietary diversity increases with increasing household wealth. The population living in households in the poorest quintile has a limited diet compared to households in the richest quintile (Figure 13.2).

Figure 13.2: Dietary diversity by household wealth quintiles, Sudan, 2010



Household food consumption score

Studies have shown that there is a significant correlation between diet diversity and nutrient adequacy, children's and women's anthropometry and socio-economic status (Ruel, 2003)[9]. The World Food Programme (WFP), building on this work, has created a custom dietary diversity tool intended to capture different consumption patterns, in terms of both the number and frequency of food groups consumed.

The "food consumption score" is calculated by examining the number of times certain foods (grouped into basic food groups) are eaten in the seven days preceding the survey and then weighting them by approximate nutrient density values. The food categories created and their corresponding weights are shown in Table 13.2.

Table 13.2: Nutrient density values by basic food groups/category, Sudan, 2010

Basic food group or food category	Weighting value
Cereals and tubers (sorghum, millet, maize, cassava, yams and sweet potato)	2
Pulses (beans, sesame, groundnuts)	3
Meats (beef, poultry, fish, eggs and wild game)	4
Milk/ milk products (ghii)	4
Fruits and vegetables (leaves, fruits and greens)	1
Oil and fat	0.5
Sugar	0.5

The food consumption (FC) score was calculated as follows:

FC score= (number of time cereal eaten*2) + (number of time pulses eaten*2) + (number of times meats eaten*4) + (number of time dairy eaten*4) + (number of times veggies eaten*1) + (number of times fruits eaten*1) + (number of times oil eaten*0.5) + (number of time sugar eaten*0.5)

It may be noted that the number of times any particular item was eaten was capped at 7 per week. This calculation provides each household a food consumption score, ranging up to 112. Households are then categorized into three food consumption groups according to their score: Poor food consumption, borderline food consumption, and acceptable food consumption. The thresholds are set at 21 and 35, where below 21 is considered to be poor, and more than 35 acceptable.

It may be noted that the above classification is a snapshot of the food consumption situation at the moment of the data collection and it cannot be considered representative of what households consume at other times of the year. Given livestock migration and agricultural patterns as well as the fluid security situation, the proportion of households in different food consumption groups in Sudan is likely to vary depending on both time of year and what is actually happening on the ground at the time of the survey.

Food consumption situation

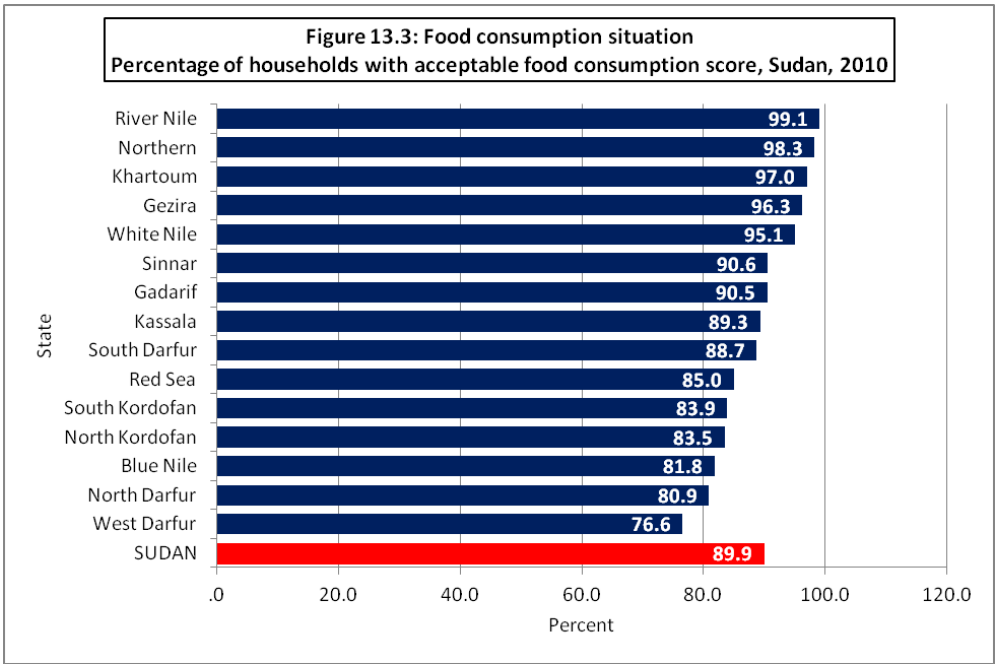
Table 13.4 indicates the food consumption situation in different States of Sudan. The overall food consumption situation in Sudan is good. About 9 out of ten (89.9 per cent) of the households in Sudan have acceptable food consumption score.

Table 13.4: Food consumption situation
Percent distribution of households according to food consumption score (poor, borderline and acceptable food consumption score), Sudan, 2010

[9] Ruel M., 2003. *Operationalizing dietary diversity: a review of measurement issues and research priorities*. Journal of Nutrition 133:3922S-3926S.

State	Food consumption score		
	Households with poor food consumption score (%)	Households with borderline food consumption score (%)	Households with acceptable food consumption score (%) [1]
Northern	0.7	1.0	98.3
River Nile	0.0	0.9	99.1
Red Sea	9.4	5.7	85.0
Kassala	6.7	4.0	89.3
Gadarif	2.4	7.1	90.5
Khartoum	0.7	2.3	97.0
Gezira	0.9	2.7	96.3
White Nile	0.9	4.0	95.1
Sinnar	2.2	7.1	90.6
Blue Nile	3.3	14.9	81.8
North Kordofan	5.9	10.5	83.5
South Kordofan	4.8	11.4	83.9
North Darfur	9.2	9.9	80.9
West Darfur	6.8	16.7	76.6
South Darfur	3.0	8.2	88.7
SUDAN (TOTAL)	**3.5**	**6.6**	**89.9**
SHHS indicator 10.1			

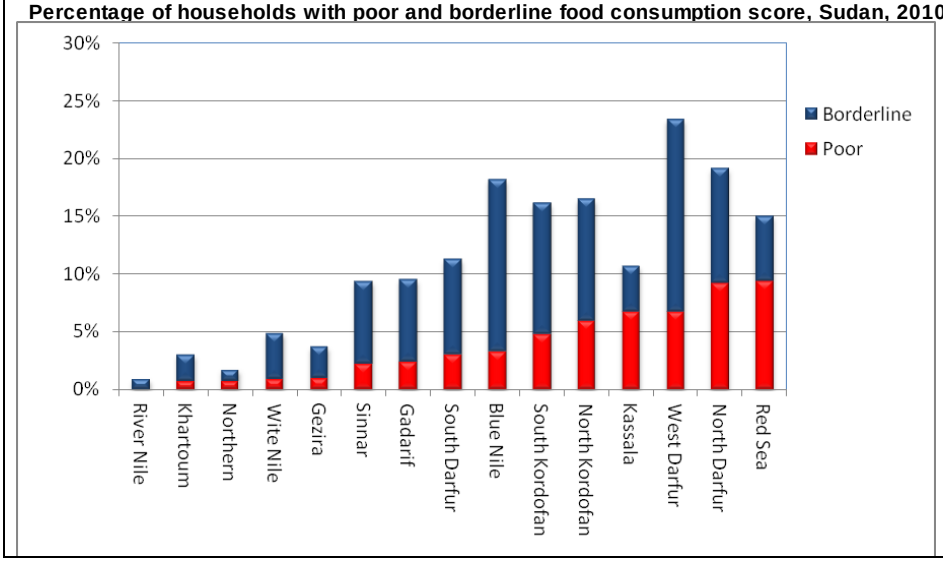
The proportion of households that had an acceptable food consumption score ranged between 76.6 per cent in West Darfur and 99.1 per cent in River Nile State. More than 95 percent of the households had an acceptable food consumption score in states such as River Nile (99.1 per cent), Northern (98.3 per cent), Khartoum (97.0 per cent), Gezira (96.3 per cent) and White Nile (95.1 per cent). The proportion of households with acceptable food consumption score was over 90 per cent in the States of Gadarif (90.5 per cent) and Sinnar (90.6 per cent). The percentage of households with acceptable food consumption score ranged between 85 and 90 in the States of Red Sea (85.0 per cent), South Darfur (88.7 per cent), and Kassala (89.3%) while it ranged between 80 and 85 per cent in the States of South Kordofan (83.9 per cent), North Kordofan (83.5 per cent), Blue Nile (81.8 per cent) and North Darfur (80.9 per cent). The percentage of households with acceptable food consumption score was below 80 in the State of West Darfur (76.6 per cent).



The SHHS2 data also indicated that the proportion of households that had a borderline food consumption score was 6.6 per cent. The percentage of households that had a borderline food consumption score ranged between 0.9 per cent in River Nile State and 16.7 per cent in West Darfur State. The States which had a relatively higher proportion of households with borderline consumption score included West Darfur State (16.7 per cent), Blue Nile (14.9 per cent), South Kordofan (11.4 per cent) and North Kordofan (10.5 per cent). The States which had a relatively lower proportion of households with borderline consumption score included River Nile (0.9 per cent), Northern (1.0 per cent), Khartoum (2.3 per cent) and White Nile (2.7 per cent).

The SHHS2 data indicated that the proportion of households that had a poor food consumption score was 3.5 per cent. The percentage of households that had a poor food consumption score ranged between zero per cent in River Nile State and 9.4 per cent in Red Sea State. The States which had a relatively higher proportion of households with poor consumption score included Red Sea State (9.4 per cent), North Darfur (9.2 per cent), West Darfur (6.8 per cent), Kassala (6.7 per cent) and North Kordofan (5.9 per cent). The States which had a relatively lower proportion of households with poor consumption score included River Nile (zero per cent), Northern (0.7 per cent), Khartoum (0.7 per cent), Gezira (0.9 per cent) and White Nile (0.9 per cent).

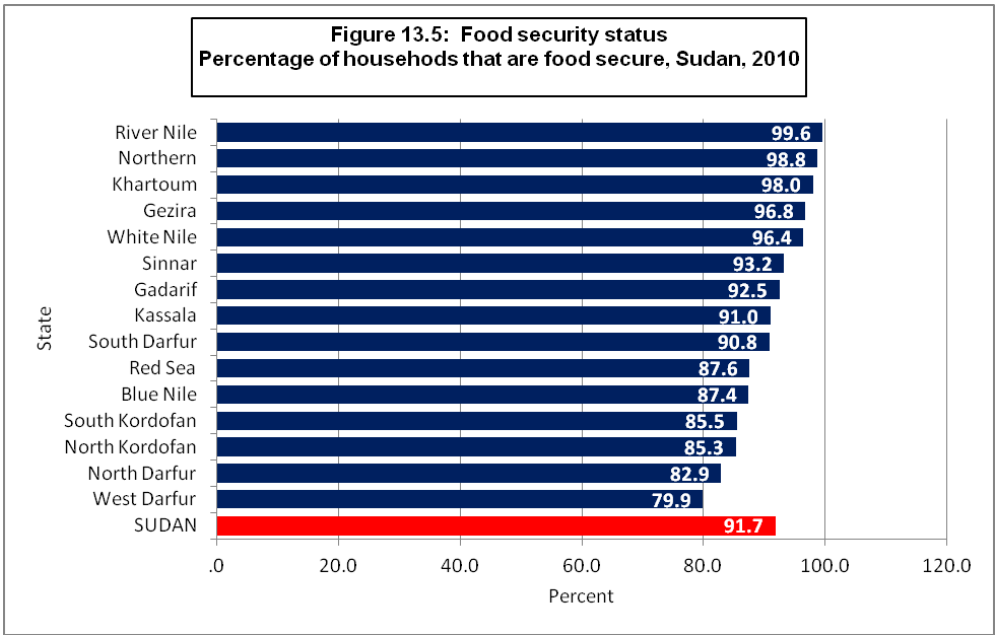
Figure 13.4: Food consumption pattern
Percentage of households with poor and borderline food consumption score, Sudan, 2010



Food security situation. In this assessment, food security is an indicator based on two variables: food consumption and relative expenditure on food. In the latter indicator, less than 65 percent of total monthly expenditure on food is regarded as good and over 65 percent is poor where any changes in food prices could have a detrimental outcome.

Table 13.5 indicates the food security status of households in different States of Sudan. It indicates the percentage of households that are food secure, moderately food insecure and severely food insecure in different states of Sudan.

Food secure households: The SHHS2 data indicates that overall, the food security situation in Sudan is good. About 91.7 per cent of the households are food secure while about 5.0 per cent of the households are moderately food insecure and 3.4 per cent of the households are severely food insecure. The percentage of food secure households ranged between 79.9 per cent in West Darfur State to 99.6 per cent in River Nile State.



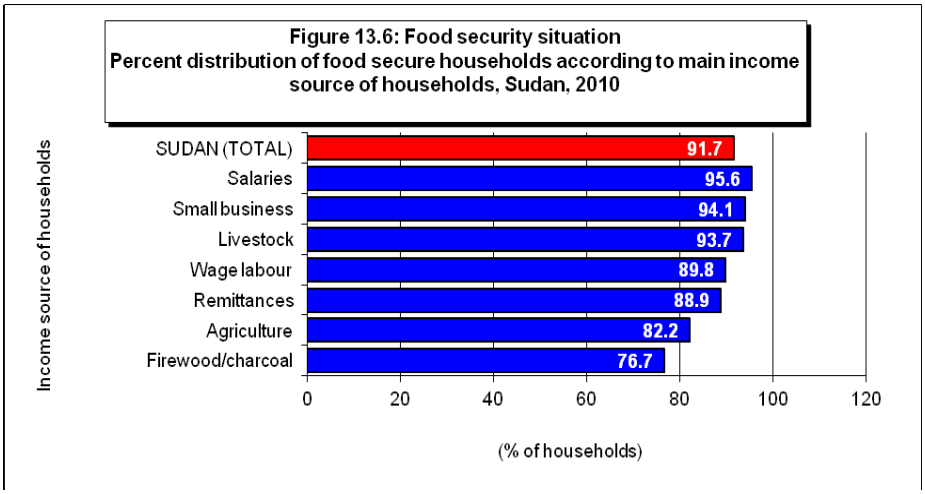
More than 95 percent of the households were food secure in States such as River Nile (99.6 per cent), Northern (98.8 per cent), Khartoum (98.0 per cent), Gezira (96.8 per cent) and White Nile (96.4 per cent). The proportion of food secure households was over 90 per cent in the States of Sinnar (93.2 per cent), Gadarif (92.5 per cent), Kassala (91.0 per cent) and South Darfur (90.8 per cent). The percentage of households that was food secure ranged between 85 and 90 in the States of Red Sea (87.6 per cent), Blue Nie (87.4 per cent), South Kordofan (85.5 per cent), and North Kodofan (85.3 per cent) while it ranged between 80 and 85 per cent in the State of North Darfur (82.9 per cent) and below 80 in the State of West Darfur (79.9 per cent).

Table 13.5: Food security status
Perecentage of households that are food secure, moderately food insecure and severely food insecure, Sudan, 2010

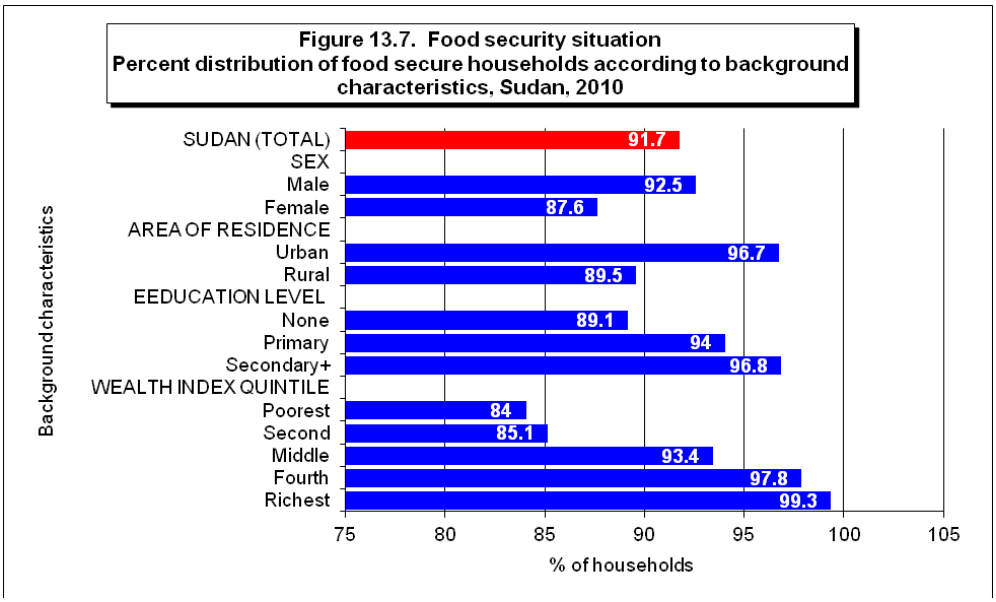
	Severely food insecure	Moderately food insecure	Food secure
State of residence			
Northern	0.4	0.8	98.8
River Nile	0.0	0.4	99.6
Red Sea	9.3	3.1	87.6
Kassala	6.8	2.2	91.0
Gadarif	2.4	5.1	92.5
Khartoum	0.5	1.6	98.0
Gezira	0.9	2.2	96.8
White Nile	0.8	2.8	96.4
Sinnar	1.8	5.0	93.2
Blue Nile	3.5	9.1	87.4
North Kordofan	5.8	8.9	85.3
South Kordofan	4.6	9.9	85.5
North Darfur	9.4	7.7	82.9
West Darfur	7.0	13.1	79.9
South Darfur	3.1	6.1	90.8
SUDAN (TOTAL)	**3.4**	**5.0**	**91.7**
Gender of household head			
Male	3.1	4.4	92.5
Female	5.0	7.4	87.6
Area of residence			

Urban	0.9	2.4	96.7
Rural	4.5	6.0	89.5
Main income source of household			
Agriculture	5.7	12.1	82.2
Livestock	2.4	3.9	93.7
Remittances	3.7	7.4	88.9
Wage Labour	4.1	6.1	89.8
Salaries	1.6	2.8	95.6
Small Business	1.9	4.0	94.1
Firewood/Charcoal	14.3	9.0	76.7
Other	3.6	3.1	93.3
Education level of household head			
None	4.6	6.2	89.1
Primary	2.2	3.8	94.0
Secondary +	1.0	2.2	96.8
Wealth index quintiles			
Poorest	7.3	8.6	84.0
Second	5.9	9.0	85.1
Middle	2.4	4.2	93.4
Fourth	0.6	1.6	97.8
Richest	0.1	0.6	99.3

The percentage of food secure households was higher among households whose main source of income was salaries (95.6 per cent), small business (94.1 per cent), livestock (93.7 per cent) than that for household whose main source of incme were wafe labour (89.8 per cent), remittances (88.9 per cent) and agriculture (82.2 per cent) and lowest among households whose main sources of income came firewood/charcoal selling.



The percentage of food secure households was higher among those in urban areas (96.7 per cent) than that in rural areas (89.5 per cent). The percentage of food secure households was higher for male-headed households (92.5 per cent) than that for female-headed households (87.6 per cent). The percentage of food secure households showed increasing trend with increasing level of education of the household head. The percentage of food secure households was lower among households which had household head with no formal education (89.1 per cent) compared to those households whose household head had primary education (94.0 per cent) and households whose household head had secondary or higher level of education (96.8 per cent).



The percentage of food secure households showed increasing trend with increasing level of household wealth. The percentage of food secure households increased from 84.0 per cent in the case of households in the poorest quintile to 85.1 per cent for households in the second wealth index quintile, 93.4 per cent for households in the middle wealth index quintile, 97.8 per cent for households in the fourth wealth index quintile and 99.3 per cent for households in the richest quintile.

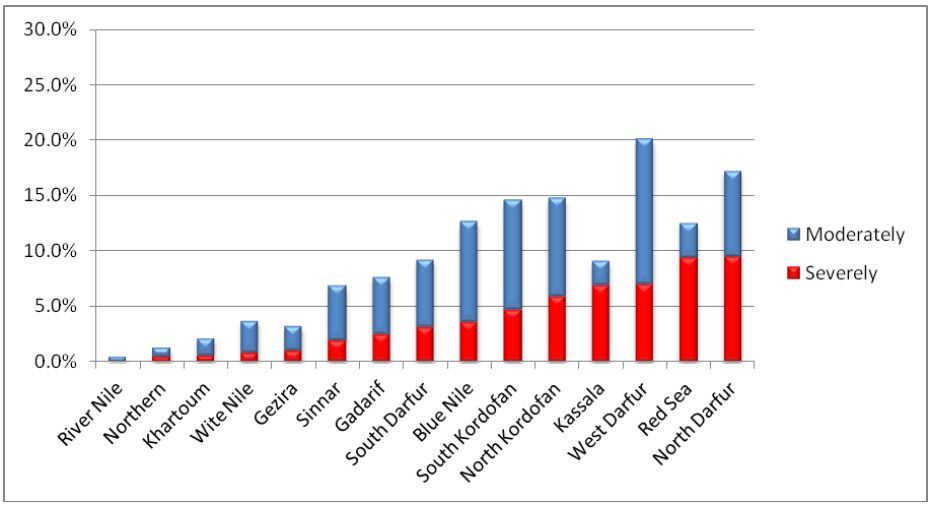
Moderately food insecure households

The SHHS2 data indicated that the proportion of moderately food insecure households was 5.0 per cent. The percentage of moderately food insecure households ranged between 0.4 per cent in River Nile State and 13.1 per cent in West Darfur State. The States which had a relatively higher proportion of proportion of moderately food insecure households included West Darfur (7.7 per cent), North Kordofan (8.9 per cent), Blue Nile (9.1 per cent), South Kordofan (9.9 per cent) and West Darfur (13.1 per cent). The States which had a relatively lower proportion of proportion of moderately food insecure households included River Nile (0.4 per cent), Northern (0.8 per cent), Khartoum (1.6 per cent), Kassala (2.2 per cent), Gezira (2.2 per cent) and White Nile (2.8 per cent).

The proportion of moderately food insecure households was lower among those in urban areas (2.4 per cent) than among those in rural areas (6.0 per cent). The proportion of moderately food insecure households was higher for female-headed households (7.4 per cent) than that for male-headed households (4.4 per cent). The proportion of moderately food insecure households showed a decreasing trend with increasing level of education of the household head. The the proportion of moderately food insecure households was higher among households which had household head with no formal education (6.2 per cent) compared to those households whose household head had primary education (3.8 per cent) and households whose household head had secondary or higher level of education (2.2 per cent). The proportion of moderately food insecure households also showed a decreasing trend with increasing level of household wealth. The proportion of moderately food insecure households decreased from 8.6 per cent in the case of households in the poorest quintile to 4.2 per cent for households in the middle wealth index quintile, 1.6 per cent for households in the fourth wealth index quintile and to 0.6 per cent for households in the richest quintile.

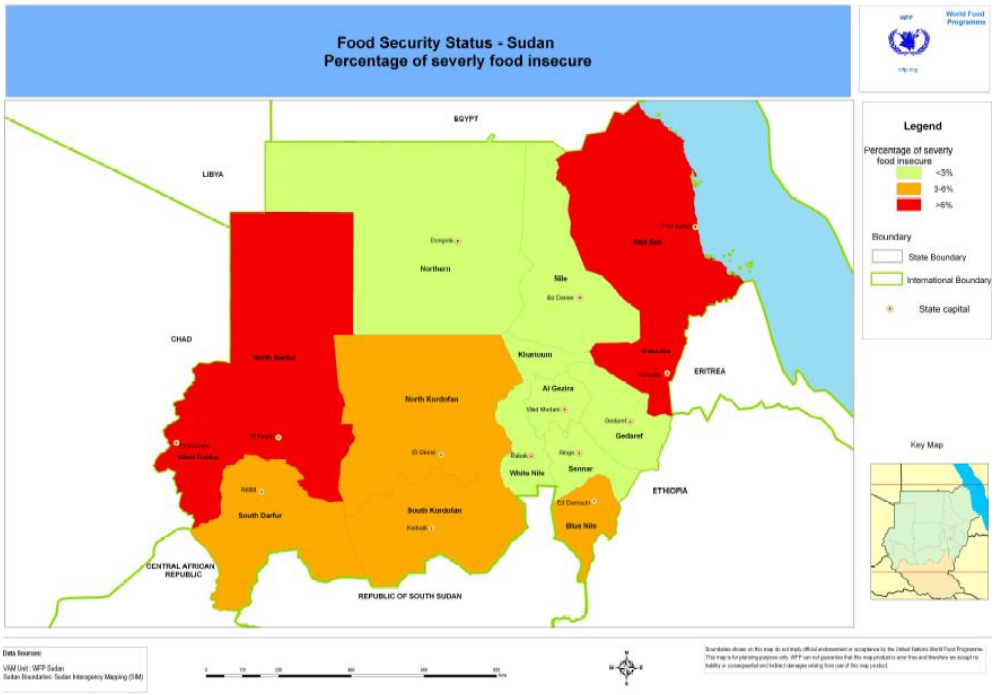
The proportion of moderately food insecure households was lower among households whose main source of income was salaries (2.8 per cent), livestock (3.9 per cent) and small business (4.0 per cent) than that for household whose main source of income is wage labour (6.1 per cent), remittances (7.4 per cent) and firewood/charcoal (9.0 per cent) and highest among households whose main sources of income came agriculture (12.1 per cent).

Figure 13.8: Moderately and severely food insecure households
Percentage of moderately and severely food insecure households, Sudan, 2010



Severely food insecure households

The SHHS2 data indicated that the proportion of severely food insecure households in Sudan was 3.4 per cent. The proportion of severely food insecure households ranged between zero per cent in River Nile State and 9.4 per cent in North Darfur State.



In addition to North Darfur State, the States which had a relatively higher proportion of severely food insecure households included North Kordofan (5.8 per cent), Kassala (6.8 per cent), West Darfur (7.0 per

cent), and Red Sea (9.3 per cent). In addition to River Nile State, the States which had a relatively lower proportion of severely food insecure households included, Northern (0.4 per cent), Khartoum (0.5 per cent), White Nile (0.8 per cent), Gezira (0.9 per cent, Sinnar (1.8 per cent) and Gadarif (2.4 per cent).

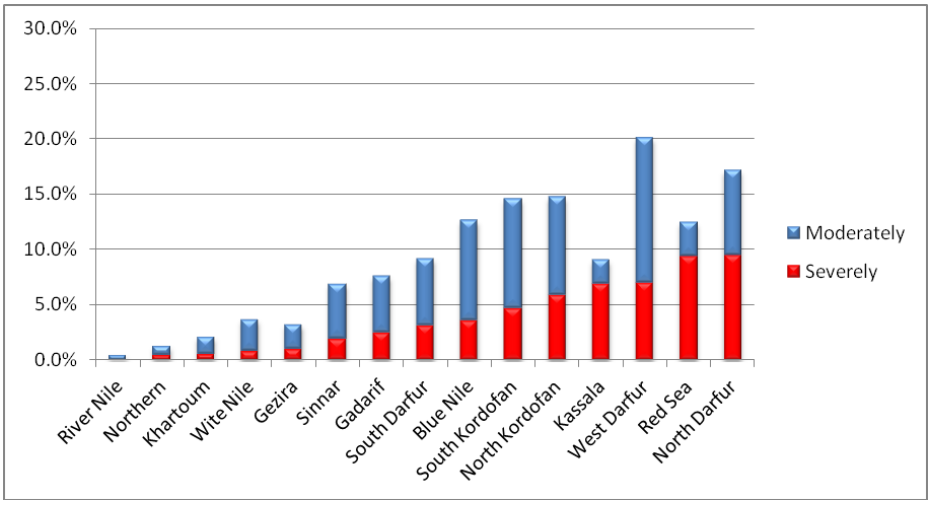
The proportion of severely food insecure households was lower among those in urban areas (0.9 per cent) than among those in rural areas (4.5 per cent). The proportion of severely food insecure households was higher for female-headed households (5.0 per cent) than that for male-headed households (3.1 per cent). The proportion of severely food insecure households showed a decreasing trend with increasing level of education of the household head. The proportion of severely food insecure households was higher among households which had household head with no formal education (4.6 per cent) compared to those households whose household head had primary education (2.2 per cent) and households whose household head had secondary or higher level of education (1.0 per cent). The proportion of severely food insecure households also showed a decreasing trend with increasing level of household wealth. The proportion of severely food insecure households decreased from 7.3 per cent in the case of households in the poorest quintile to 5.9 cent in the case of households in the second wealth quintile, to 2.4 per cent for households in the middle wealth index quintile, 0.6 per cent for households in the fourth wealth index quintile and to 0.1 per cent for households in the richest quintile.

The proportion of severely food insecure households was lower among households whose main source of income was salaries (1.6 per cent), small business (1.9 per cent), and livestock (2.4 per cent) than that for household whose main source of income was remittances (3.7 per cent), wage labour (4.1 per cent), agriculture (5.7 per cent) while the proportion was highest among households whose main source of income was firewood/charcoal (14.3 per cent).

Moderately or severely food insecure households

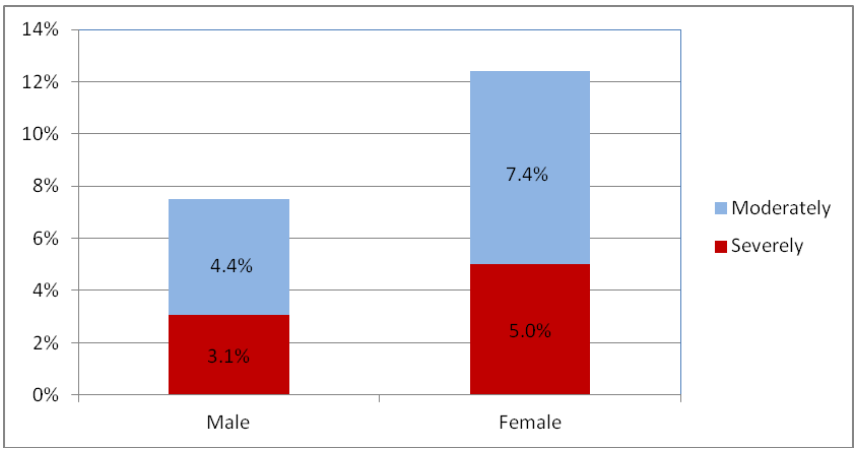
The proportion of households that are moderately or severely food insecure provides an indication of the proportion of population that is food insecure or vulnerable to food insecurity. The SHHS2 data indicated that a total of about 8.4 per cent of households were moderately or severely food insecure. The proportion of moderately and severely food insecure households ranged between 0.4 per cent in River Nile State and 20.1 per cent in West Darfur State.

Figure 13.8: Moderately and severely food insecure households
Percentage of moderately and severely food insecure households, Sudan, 2010



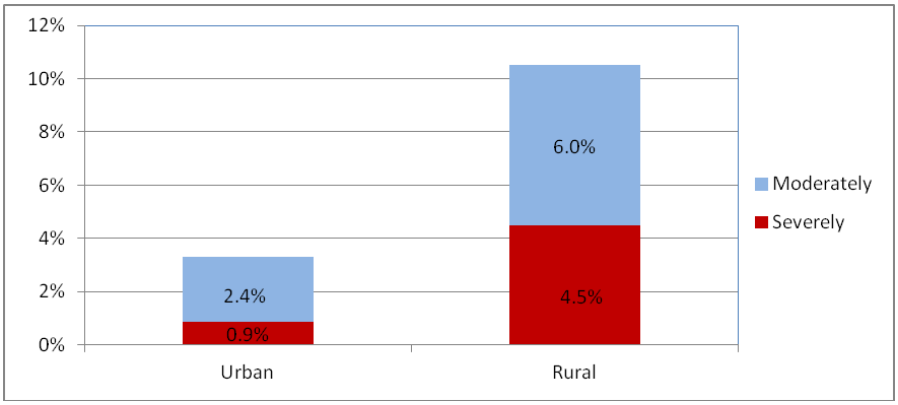
The SHHS2 data relating to the proportion of moderately and severely food insecure households indicate that female-headed households are more likely to be food insecure or vulnerable to food insecurity than male-headed households.

Figure 13.9: Food insecurity by gender of household head, Sudan, 2010



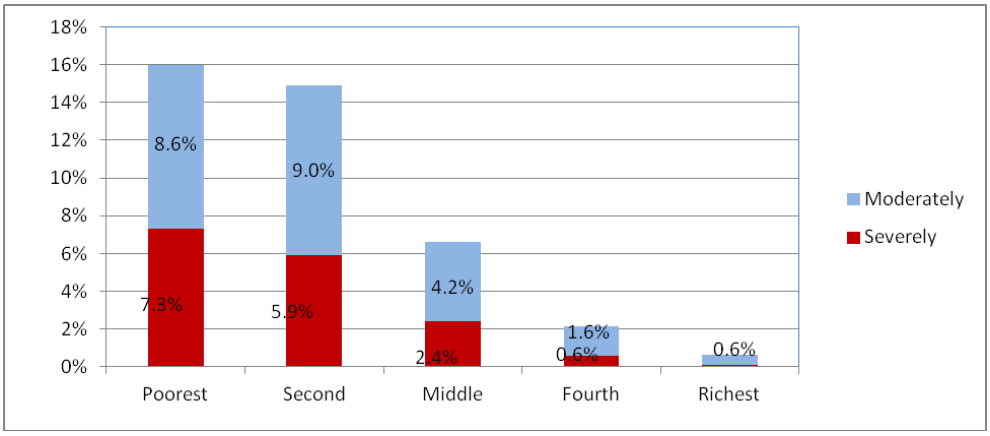
The SHHS2 data relating to the proportion of moderately and severely food insecure households also indicate that households in rural areas are more likely to be food insecure or vulnerable to food insecurity than households in urban areas.

Figure 13.10: Food insecurity by area of residence, Sudan, 2010



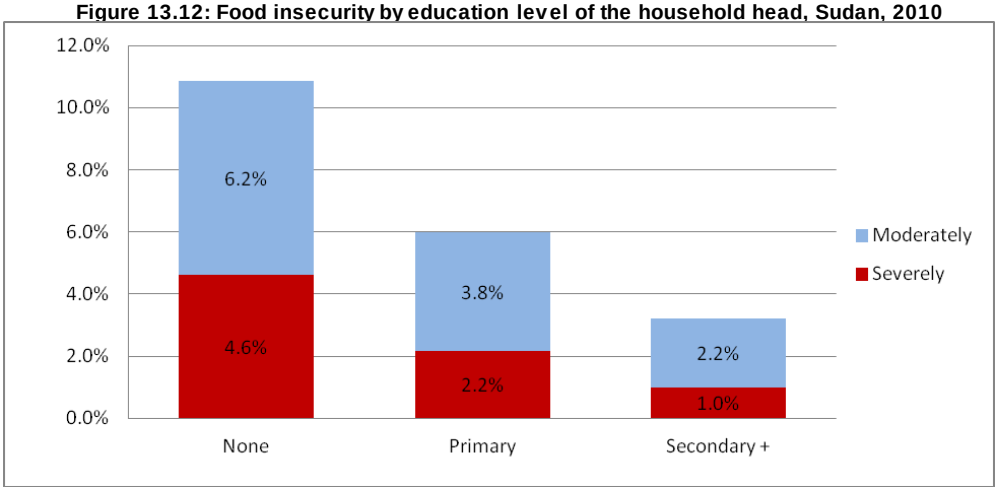
The SHHS2 data relating to the proportion of moderately and severely food insecure households also indicate that households in the poorest quintile are more likely to be food insecure or vulnerable than households in the richest quintiles.

Figure 13.11: Food insecurity by wealth index quintiles, Sudan, 2010



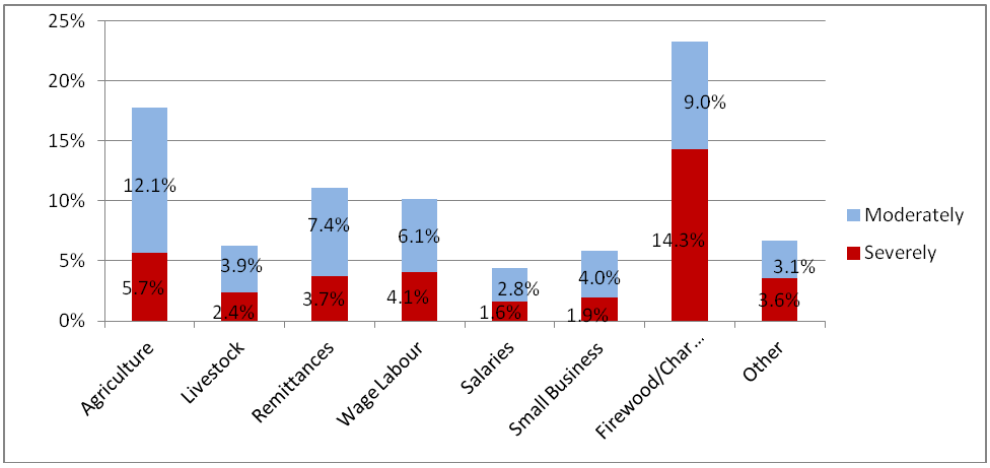
The SHHS2 data relating to the proportion of moderately and severely food insecure households also indicate that households which have household head with no formal education are more likely to be food insecure or vulnerable than households which have household head with primary or secondary or higher levels of education.

Figure 13.12: Food insecurity by education level of the household head, Sudan, 2010



The SHHS2 data relating to the proportion of moderately and severely food insecure households also indicate that households relying on household income sources such as salaried work, small business and sale of livestock are generally less food insecure or vulnerable to food insecurity than households who rely on household income sources such as sale of firewood and agriculture.

Figure 13.13: Food insecurity by main income source, Sudan, 2010


25%
20%
15%
10%
5%
0%
12.1%
5.7%
3.9%
2.4%
7.4%
3.7%
6.1%
4.1%
2.8%
1.6%
4.0%
1.9%
9.0%
14.3%
3.1%
3.6%
Agriculture
Livestock
Remittances
Wage Labour
Salaries
Small Business
Firewood/Char...
Other
Moderately
Severely

MATERNAL MORTALITY

Introduction

A Maternal Mortality survey was carried out alongside the SHHS2 data collection that provides the estimates of MMR by area of residence and by State. The National average of MMR was estimated at 215 per 100,000 live births. The MMR was higher in rural areas (225 per 100,000 live births) than in urban areas (194 per 100,000 live births). The MMR was lowest in Sinnar State (106 per 100,000 live births) followed by South Kordofan (112 per 100,000 live births) and the highest in South Darfur State (335 per 100,000 live births). Seven of the 15 States have MMR that is higher than the national average of 216 per 100,000 live births, a majority of them in the conflict-affected areas (Figure 10.8).

Sampling Design

The Maternal Mortality Rate was estimated using the direct method. The sample design of the MMR followed the same multi stage process with increase in the sample size that intended to extract a reliable estimate. For more information on sample design, The Government of Sudan has decided to consider the direct method for measuring Maternal Mortality Ratio, as an integral component of the SHHS. The idea of this method is to utilize the listing operation that will be undertaken to update the household list in the sample EA's as being the next to the Ultimate Sampling Unit (USU) , the Household, for the purpose of collecting information on maternal deaths and live births. Nonetheless, due to the Government desire to have MMR estimates at State level with a reasonable high precision, the Sample EA's for most states greatly exceeds the requirements of the Main SHHS. In the latter case a sub sample of 40 AE's will be selected from the MMR Sample with equal probability. Again a sample of 25 HH's will be selected systematically from each of the 40 EA's. see Annex B.

In Sudan due to lack of proper civil registration systems the maternal mortality is measured through household survey and the Census conducted every 10 years, the margin of the uncertainty is such that you cannot draw firm conclusion about the direction of trend.

Maternal death is a vital event which is characterized by an extremely low prevalence level compared to other vital events. For this reason, a larger sample size is required to estimate this phenomenon with higher precision level. Yet, the cost of the field work is minimal as only two or three questions are addressed to households. In addition, data entry at household level is not needed, only at EA level.

The Government of Sudan in coordination with PAPFAM Survey Project League of Arab States has decided to consider the direct method for measuring Maternal Mortality Ratio, as an integral component of the SHHS. The idea of this method was to utilize the listing operation that was undertaken to update the household list in the sample EA's as being the next to the Ultimate Sampling Unit (USU), the Household, for the purpose of collecting information on maternal deaths and live births. Nonetheless, due to the Government desire to have MMR estimates at State level with a reasonable high precision, the Sample EA's for most states greatly exceeds the requirements of the SHHS. In the latter case a sub sample of 40 AE's was to be selected from the MMR Sample with equal probability. Again a sample of 25 HH's was to be selected systematically from each of the 40 EA's.

The main advantages of the direct method are: 1- it can provide relatively recent estimates of MMR compared with the traditional sisterhood method, which usually has a reference period ranges from 5 -10 years preceding the survey date; 2- With a modest added cost, the direct method can be applied to produce reasonably precise estimates for larger number of analysis domains (15 states in the situation of Sudan), In fact this cannot be done with the sisterhood method as it requires extraordinary large sample for the main survey which is unjustifiable on the ground of cost-benefit considerations; 3- the direct survey method of estimating MMR is analogous to the direct estimation method depending on vital registration data, of course if complete and reliable, thus avoiding the known technical weaknesses and limitations of the indirect sisterhood method.

Findings of MMR

Table 10.15 The SHHS2 data provides the estimates of MMR by area of residence and by State. The National average of MMR was estimated at 215 per 100,000 live births. The MMR was higher in rural areas (225 per 100,000 live births) than in urban areas (194 per 100,000 live births). The MMR was lowest in Sinnar State (106 per 100,000 live births) followed by South Kordofan (112 per 100,000 live births) and the highest in South Darfur State (335 per 100,000 live births). Seven of the 15 States have MMR that is higher than the national average of 216 per 100,000 live births, a majority of them in the conflict-affected areas (Figure 10.8).

Table 1: MMR estimates in Sudan states by residence type (urban/rural), 2010

Residence Type	MMR (100000)	Standard error	95% confidence Interval		Coefficient of variation (%)
			Lower limit	Upper Limit	
Urban	194.4	15.3	164.3	224.4	4.1
Rural	225.4	9.3	207.2	243.6	7.9
Total Sudan	215.6	8.3	199.3	231.9	3.9

Table MMR 2: MMR estimates in Sudan by state, 2010

State	MMR (100000)	Standard error	95% confidence Interval		Coefficient of variation (%)
			Lower limit	Upper Limit	
Northern	127	26.0	76.0	178.2	20.5
River Nile	147	26.7	94.8	199.5	18.1
Red Sea	280	45.2	191.5	368.6	16.1
Kassala	245	32.9	180.4	309.3	13.4
Gedarif	267	39.2	190.2	344.0	14.7
Khartoum	175	28.5	119.6	231.2	16.2
Gazira	185	24.5	137.8	233.8	13.2
White Nile	169	21.8	125.6	211.3	13.0
Sinnar	106	19.6	67.2	144.1	18.5
Blue Nile	258	22.2	214.4	301.6	8.6
North Kordofan	208	22.6	163.7	252.2	10.8
South Kordofan	112	19.1	75.0	149.8	17.0
North Darfur	178	20.5	137.3	217.8	11.6
West Darfur	322	23.5	276.2	368.3	7.3
South Darfur	335	28.9	278.1	391.7	8.6
Sudan	215.6				

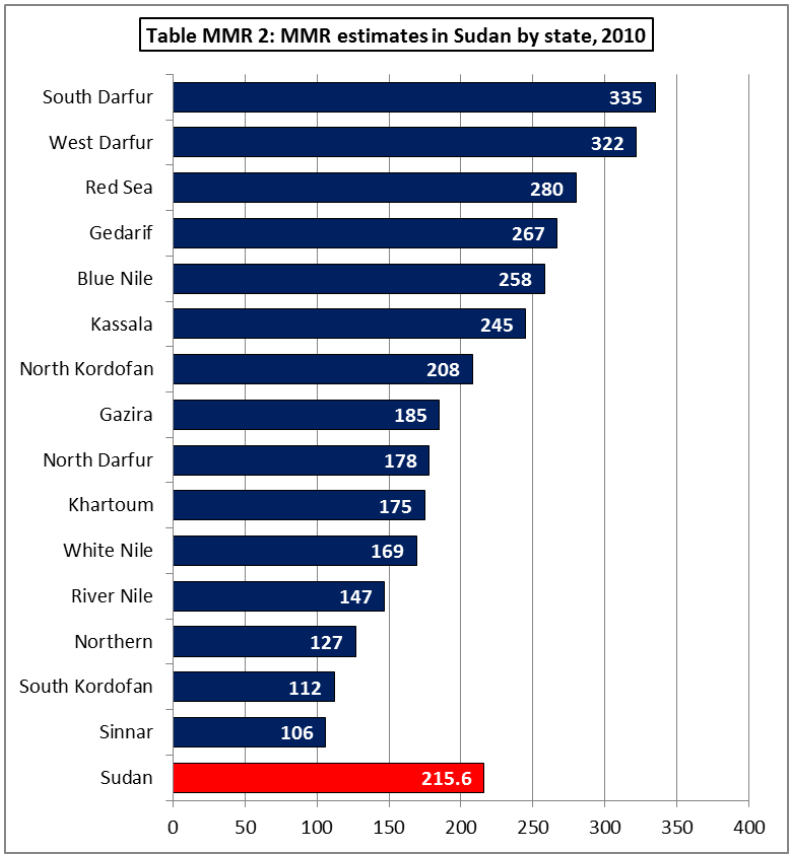


Figure 10. 8: Maternal mortality ratio