Results of the Emergency Nutrition Assessment in 25 selected districts

Prevalence of Acute Malnutrition in children 6 – 59 months in 25 selected district in Zimbabwe, February 2017

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(Ministry of Health and Child Care - Zimbabwe)
National Nutrition Unit

Foreword

It is recognized that globally, approximately 45% of under-five death burden is due to all forms of undernutrition. It has also been documented that this increased risks of death and diseases are associated individually with wasting and stunting. Wasting and stunting are both associated with increased risk of mortality with even mild deficits being associated with higher risk of dying and increasing progressively with the degree of the deficit. This means that any child experiencing a degree of wasting or stunting in any context is at heightened risk of dying. Importantly, the child who is both stunted and wasted (even moderately) has the highest hazard of death, even higher than for severe wasting individually.

The causes of undernutrition are complex as nutritional status is dependent on a wide range of diverse and interconnected factors. Undernutrition results from two immediate determinants: poor dietary intake and repeated infectious diseases. The underlying determinants include food insecurity, inappropriate care practices, poor access to health care and an unhealthy environment, including inadequate access to water, sanitation and hygiene. All these factors result in the increased vulnerability to shocks and long-term stresses. In the past six months, Zimbabwe has experienced deterioration in both of these determinants.

Food and Nutrition Security (FNS) remain a major priority for national development. The volatile nature of FNS requires constant monitoring and evaluation according to season and place as different districts will be affected differently by the same hazard, shock or crisis. Nutrition crises may have a rapid or slow onset and as such need to be monitored regularly, particularly following any significant changes in the primary determinants of under nutrition, dietary intake and diseases occurrence.

In fulfilment of the Food and Nutrition Security Policy Commitment Six, which calls for the provision of timely food and nutrition security related information; the Ministry of Health and Child Care in collaboration its developmental partners embarked on Emergency Nutrition Assessment using the SMART methodology following the May 2016 ZIMVAC results that showed a high prevalence of Global Acute Malnutrition in 25 districts. The aim of the survey was to monito and seasonal targeted assistance which had been mounted by various partners in the 25 districts.

The results for the survey show lower prevalence rates of acute malnutrition compared to the ZIMVAC, which could be attributed to a robust food security response to the prevailing situation. Related to this, could be an increase in food security related coping strategies at household level; a situation that would require monitoring.

ACKNOWLEDGEMENT

The Ministry of Health and Child Care acknowledges the important contributions made by the Nutrition Emergency Working Group which worked tirelessly to make this survey possible. Members of the task force came from the Ministry of Health and Child Care, UNICEF, WHO, WFP, GOAL, PLAN, FEWSNET, MSF, World Vision and Save the Children

The work of all who monitored and supervised the field work at National and Provincial levels is greatly commended as they ensured that the whole activity was smoothly conducted from the logistics point of view right through to data analysis. Special mention also goes to all the health workers from the provinces who participated in data collection without whose services, this survey would not have been possible.

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List of Abbreviations

CSB	Corn Soya Blend
EA	Enumeration Area
ENA	Emergency Nutrition Assessment
GAM	Global Acute Malnutrition
HAZ	Height for Age Z-score
HH	Household
MAD	Minimum Acceptable Diet
MAM	Moderate Acute Malnutrition
MDD	Minimum Dietary Diversity
MMF	Minimum Meal Frequency
MUAC	Mid-Upper Arm Circumference
OR	Odds Ratio
RUSF	Ready to Use Supplementary Feed
RUTF	Ready to Use Therapeutic Feed
SAM	Severe Acute Malnutrition
SFP	Supplementary Feeding Programme
SMART	Standardised Monitoring
SPSS	Statistical Packages for Statistical Packages
TFP	Therapeutic Feeding Programme
UNICEF	United Nations Children's Fund
VAS	Vitamin A Supplementation
WASH	Water, Sanitation and Hygiene
WHO	World Health Organisation
WHZ	Weight for Height Z-score
ZDHS	Zimbabwe Demographic Health Survey
ZIMSTAT	Zimbabwe Statistical Agency
ZIMVAC	Zimbabwe Vulnerability Assessment Committee

EXCECUTIVE SUMMARY

Background/Context

Zimbabwe was negatively affected by two consecutive seasons of below normal rainfall, exacerbated by the El Nino phenomenon which was experienced in the 2015/16 season. The June 2016 Zimbabwe Vulnerability Assessment Committee (ZIMVAC) Rural Livelihoods Assessment indicated that 35 percent of the rural population was food insecure, with projections of an increase to 42% at the peak of the hunger season in January 2017. The ZIMVAC, June 2016, assessment also reported national Global Acute Malnutrition (GAM) and Severe Acute Malnutrition (SAM) prevalence of 4.4% and 1.8% respectively. A total of 25 districts had a GAM prevalence of 5% and above while 27 had a SAM prevalence of 2% and above. The Government of Zimbabwe with support from its partners has mobilised resources for a nutrition emergency response in the most vulnerable districts of the country. It is against this background that an emergency nutrition assessment was conducted in twenty-five rural districts of Zimbabwe, as a baseline at the inception of the emergency response activities.

Main Objectives

To determine and evaluate the current nutrition status of children aged 0 to 59 months in 25 districts selected for the nutrition emergency response.

Methodology

This assessment utilised the Standardised Monitoring and Assessment of Relief and Transitions (SMART) methodology in the planning and execution phases. The assessment employed a standard cluster survey design across the 25 emergency districts. A total of 30 Enumeration Areas (EAs) were randomly selected in each district and the sample size calculated using the ENA for SMART 2011 software. A Sample of 340 households, estimated to give 183 children under five was used across all districts.

The SMART Methodology training package was adapted and enumerators trained for 5 days. Electronic gadgets (tablets) were used for data collection. All the gadgets were connected to a central server where data was automatically uploaded on access to internet. Quality control measures employed include internal checks in the electronic questionnaire, support and supervision, continuous plausibility checks as data was uploaded into the server and feedback to enumeration teams.

Household level interviews were conducted with verbal consent, to collect information on anthropometry; infant feeding practices; mortality; Water, Sanitation and Hygiene (WASH); Child protection; childhood illnesses; access to growth monitoring services and access to nutritional treatment and feeding programmes. Each district had an enumeration team of 4 members who worked in pairs. The data collection exercise was conducted from 23 January to 3 February 2017. Data analysis was done using the ENA for SMART software for anthropometry and mortality while SPSS v.16 was used for other indicators.

Results

The study found GAM prevalence ranging from 0.4% to 5.8% in the 25 districts. Only 2 districts (Kariba 5.1% and Binga 5.8%) had GAM prevalence above 5%. Four districts (Umzingwane-2.2%, Kariba-2.5%, Gweru and Chegutu-2.6%) reported SAM prevalence above 2%. Stunting prevalence

ranged from 17.7% in Kariba to 31.6% in Bindura. Figure 1 below summarises the GAM, SAM and stunting levels in the 25 districts.

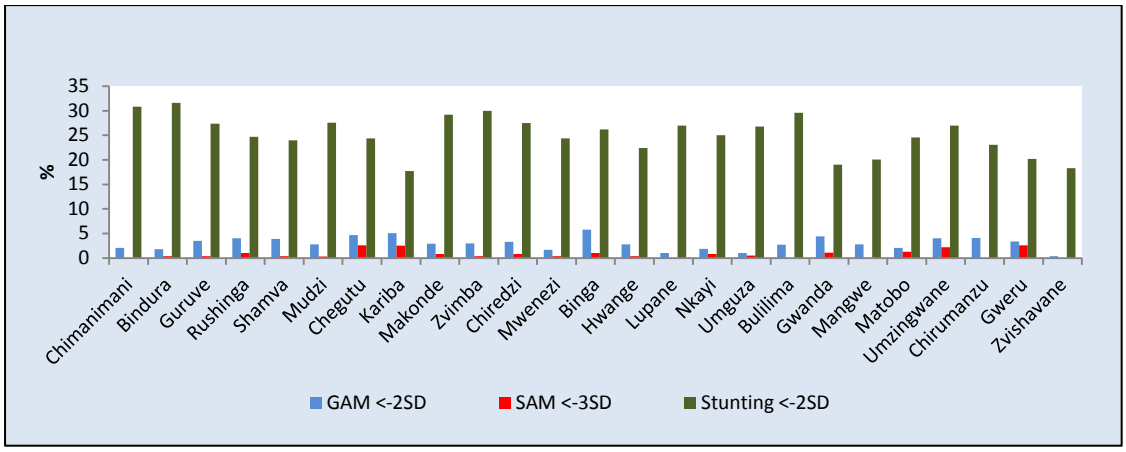

Figure 1: Prevalence of GAM SAM and Stunting for children aged 6-59m in the 25 surveyed districts

The nutrition survey assessed the level of access to growth monitoring, nutrition screening and Vitamin A supplementation (VAS) of under five children in surveyed households. All districts except Kariba (42%) reported VAS coverage above 50% for children aged 6-11 months. Less than three quarters (17/25) of the districts reported VAS coverage for children 12-59 months above 50%. Only 3 districts (Chimanimani- 80%, Binga- 92% and Mangwe- 94%) achieved the 80% national target for VAS.

Binga had the highest rates for growth monitoring (84%) and VAS coverage for children aged 6-11 months (82%), and it had the second highest (92%) VAS coverage for children aged 12-59 months. The neighbouring district, Lupane had the lowest rates for growth monitoring (18%) and VAS at 12-59 months (24%).

Most children were receiving below recommended complementary feeding for their age. Two indicators for food diversity (Minimum Dietary Diversity-MDD and 4 star diet) were used and the proportion of children receiving a MDD was almost double that which was reported using the 4-star indicator.

Conclusions and Recommendations

The prevalence of Global Acute Malnutrition was lower than the findings observed in the ZimVAC of May 2016. Chronic malnutrition rates from this survey are lower than rates from previous assessments such ZDHS 2015 and ZimVAC 2016, but are still of public health concern. A focused multi-sectoral approach will be needed to help reduce stunting. Coverage of Vitamin A supplementation for children falls far below the national target of 80%, for all districts except Binga. There is need for community level Vitamin A supplementation to improve the VAS coverage found to be very low in some of the 25 districts assessed in this study.

CHAPTER 1: BACKGROUND

The agriculture sector is the backbone of the Zimbabwean economy as well as livelihoods contributing between 10-15% of the Gross Domestic Product (GDP)[1]. The country's food security situation is vulnerable due to weather variabilities and resultant lower than average yields. Over the past decade there has been increased food and nutrition insecurity at the household and national levels, emanating from reduced production. Zimbabwe's 2014/15 agricultural season registered a 51 percent decline in maize production compared to the previous year (2013/14) due to drought which was particularly severe in the southern parts of the country[2]. In addition, in 2015/16, the country experienced a second consecutive year of poor harvests and domestic cereal supplies for the 2016/17 consumption year were only 28 percent of national requirements and 50% of five year average[3]. In accordance with Subsection (1) of Section 27 of the Civil Protection Act of 1989, the President of the Republic of Zimbabwe His Excellency Cde R.G. Mugabe, on 4 February 2016 declared a State of Drought Disaster following the impact of El Nino induced erratic rainfall.

Zimbabwe's economy went through a decade of weakening. Economic recovery was then experienced in 2009 with real GDP growth rate of 5.4% in 2009, there was continued growth until 2012 when it began to subside. Macroeconomic challenges continue to plague the country and affect overall livelihoods in rural and urban areas alike. In the 2016 Mid-Year Fiscal Policy Review Statement on September 8th, the Minister of Finance revised down the 2016 Gross Domestic Product (GDP) growth rate to 1.2 percent from the initial 2.7 percent. The economy continues in deflation, with year-on-year inflation averaging -1.8 percent between January and September 2016. Due to deflation, household incomes remain low and liquidity challenges affect the demand for goods and services, especially for poor households. Barter trade and in-kind labour payments are common transactions during lean periods especially for poor households; these are affected greatly when there are no carryover stocks.

The June 2016 ZIMVAC Rural Livelihoods Assessment indicated that 35 percent of the rural population (3.4 million people) will be food insecure during the months of October-December 2016. The prevalence was set to increase to 42 percent (4.1 million people) during the peak hunger season from between January and March 2017. This is the highest food insecurity prevalence since 2003 when it was 56%. The food insecurity prevalence has also surpassed five year averages by 75%. It is against this background that an emergency nutrition assessment was conducted in twenty-five rural districts of Zimbabwe identified as either food insecure or with high levels of malnutrition as reported in the 2016 rural livelihood assessment.

[1] www.zimstat.co.zw
[2] ZIMVAC 2016
[3] FEWSNET Outlook 2016

Introduction

Results of the May 2016 ZIMVAC rural livelihood assessment identified the district in which more than 5 percent of children had global acute malnutrition (GAM) and estimated that over 40 percent of the population would be food insecure between January and March 2017. Due to the widely varied livelihoods and the different climatic conditions present in high risk areas, populations across the country will likely have very different drought related experiences from the end of 2016 and beginning of 2017.

Nutrition emergencies are slow-onset events. Declining food security and health indicators are typically a good indication that rates of acute malnutrition will also rise over time. This year, Zimbabwe has experienced a concerning degradation in both determinants. As food insecurity and rates of diarrheal disease increase progressively, rates of malnutrition are likely to follow a similar trajectory.

Malnutrition is a condition that results from either poor dietary intake or underlying disease. Often the two occur simultaneously, a poorly nourished child is more susceptible to disease and an ill child is more prone to malnutrition. A child with moderate acute malnutrition (MAM) is twice as likely as their well-nourished counterpart to die, while a child with severe acute malnutrition (SAM) is 10 times as likely to die as a result of the undernourishment[4]. In Zimbabwe, the risk of acute malnutrition in children is increased during the lean months of September to March when household food insecurity is high. In 2016/17 consumption period, the risk of malnutrition during the lean season could be further exacerbated by severe Eli nino induced drought.

Food insecurity at the household level is one of the three main underlying causes of malnutrition. At the same time, nutrition security simultaneously requires food, good health and care especially for children. This underscores the fact that food security at household level is necessary but not sufficient to achieve nutrition security.

Objectives

Overall Objective

- To determine and evaluate the current nutrition status of children 0 to 59 months in 25 emergency districts

Specific Objectives

i. To estimate prevalence of global, moderate and severe acute malnutrition among children aged 6 to 59 months
ii. To estimate prevalence of chronic malnutrition among children aged 6 to 59 months
iii. To assess vitamin A supplementation coverage among children aged 6 to 59 months
iv. To determine core IYCF practices of children 0-23 months

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v. To assess the 2-weeks recall morbidity (diarrhoea, fever and cough) among children 0-59 months
vi. To assess the proportion of children residing in households with improved water sources and access to improved sanitation facilities
vii. To estimate crude and under five mortality rates.

CHAPTER 2: METHODOLOGY

1. Study design

The assessment was cross sectional and employed a standard cluster survey design across the 25 emergency districts. Zimbabwe Statistics Agency (ZIMSTAT) enumeration areas (EAs) were clusters. A total of 30 EAs were randomly selected in each district to allow for district level prevalence estimates of malnutrition. Villages were randomly selected from within the target EAs. Where EAs and villages were very big, they were segmented and segments randomly selected for data collection.

Study population

The survey was conducted among the rural population of the 25 emergency districts. All the households that resided in these districts had an equal chance of being selected into the survey.

Sample Size

The primary sampling unit for the survey were households. For assessment of nutritional status, all eligible children in the selected household aged children 6 – 59 months had their anthropometric measurements taken. Questions on feeding practices s were asked for all children below five years of age (0-59 months). Sample size was calculated using ENA for SMART software based on the parameters shown in Table 1. The prevalence of global acute malnutrition was estimated to range from 4.9 percent to 7.9 percent across the selected districts based on the 2016 ZIMVAC results. Three districts with unbelievable high GAM of above 7.9 percent (11% – 17.3%) were excluded from the sample size calculation. The highest sample size yielded was considered for all the districts.

Table 1: Parameters used in calculation of sample size

Parameters for Anthropometry	Value
Highest Estimated Prevalence of GAM (%)	7.9%
± Desired precision	5 %
Design Effect	1.5
Children to be included	183
Average HH Size	4.1
% Children under-5	15 %
% Non-response Households	3 %
Households to be included	340

Selection of Enumeration Areas and Households

A total of 30 enumeration areas (EAs) were randomly selected from each of the target districts. From each EA, one (1) was randomly selected and 12 households were enumerated to yield 360 households per district. Households were selected using either simple random sampling or systematic random sampling based on village master registers. As per protocol,

households were not replaced and therefore survey teams visited the household at least two times when an eligible child was not present during the first visit.

Data collection

Data collection followed the SMART survey procedures. Instead of paper based questionnaires, data collection teams entered data into hand-held electronic mobile devices that were linked to a central server. Data was automatically transferred to the central server whenever the device had connection to internet. Table 2 shows key variables that were collected.

Table 2: Key Variables collected during the Survey

Variable	Units
Sex	(f/m)
Birthday	(DD/MM/YYYY)
Age	(months)
Weight	(00.0kg)
Height	(000.0cm)
Oedema	Present/absent
Mid Upper Arm Circumference (MUAC)	(000mm)
Episodes of common childhood illnesses in past 2 weeks	Y/N
Access to Improved water sources for household use	
Hand washing facilities with soap/ash	Y/N
Household's use of sanitation facility	Y/N
Child access to malnutrition treatment programmes	Y/N
Child access to child supplementary feeding Programmes	Y/N
Infant and young child feeding practices	

Anthropometric measurements in Children 6-59 months

Children aged 6 – 59 months had their MUAC, heights and weights measured and oedema assessed in order to estimate the magnitude of both acute and chronic malnutrition in the population.

Weight and recumbent length were measured in children 6-23 months while weight and standing height in children 24-59 months from the sampled households. The weights were taken using SECA digital electronic scales while heights/lengths were measured using Shorr boards. Data on a child's age, weight, and/or height/length were combined to form indices, which are compared to WHO growth standards (WHO, 2006). The three indices formed were height-for-age, weight-for- height and weight-for-age. Each of the indices is expressed in terms of standard deviations from the median (Z-scores) of the WHO reference population and is described as below:

- Global Acute Malnutrition (GAM) is a measurement of nutritional status, defined as weight-for-height/length less than -2 z-score and/or oedema or a combination of MAM and SAM.

- Moderate Acute Malnutrition (MAM) is defined as weight-for-height/length between -2 and -3 Z-Score.

- Severe Acute Malnutrition (SAM) is defined as weight-for-height/length less than -3 z-score and/or oedema

Field work

Enumerator Recruitment and Training

To minimise errors that could arise from poor measurements and improper data collection, competent enumerators were recruited for the survey. Only enumerators fluent in English and local languages of the target area were considered for the survey. These were recruited from the target districts within the provinces. The recruited enumerators underwent a 5 days training that covered various aspects of conducting a standard nutrition survey based on generic SMART survey modules customised for Zimbabwe as necessary. Class demonstrations on how to take measurements for children, and measurement standardization process was done during training. The results for the standardization process were shared during a debrief session and feedback given as necessary. Moreover, a pilot was conducted in rural wards near Kadoma allowing anthropometrists to further enhance their measurement skills, in the process also field testing the data collection tools. After the pilot, a debrief session was held for the survey enumerators to share their experiences and necessary modifications were made.

Data collection teams

A total of 2 data collection teams per district were assembled. Two members constituted a team, a measurer and an assistant who also recorded the measurements on the hand-held electronic device. Data collection lasted for 12 days from January 23 through to February 3rd 2017. Two supervisors, a provincial nutritionist and one national supported and supervised the data collection teams.

Ethical issues

Verbal consent was obtained from all parents/guardians for children in the survey. The objective of the assessment was clearly explained to the caregivers to avoid suspicion and raising expectations. Participants were assured that all information they provided would be treated with strict confidentiality and that no raw data would be accessible to any person who is not part of the research team. Children who showed signs or symptoms and illness (e.g. those with severe acute malnutrition) that require immediate medical attention were referred to the nearest health facility.

Data management

Data were collected using android powered hand-held electronic devices (smart phones and tablets). Data were auto transferred into a central server where it could be export to ENA and SPSS for cleaning and analysis. As part quality control, the quality of data were checked as it filtered through to the server. Plausibility checks for anthropometry data were done using the ENA software as it filtered into the server and feedback provided to respective

teams where issues with data quality were identified. Data also underwent rigorous plausibility checks before analysis. The pooled scores for all the 25 districts retained an average score of 5% (excellent). At district level, the quality of data was mostly excellent with a few districts retaining an overall score of good. Only one district had an overall score of 12% (acceptable). Cleaned data was exported to ENA for SMART for calculation of prevalence of malnutrition based on WHO growth standards and SPSS for all other indicators and cross tabulations.

CHAPTER 3: RESULTS

Household Demographics

The survey collected data on household demographics and mortality across all the 25 emergency districts. Table 3 shows the distribution of the SMART Survey household population by sex and residence. Overall, across the 25 districts, a total of 46,239 individuals resided in the 8,913 households that were successfully interviewed of which 23,987 were female (52 %), and 22,252 (48%) were male.

Table 3: Population distribution by district and sex

District	Percentage of individuals		Number of individuals
	Male	Female	
Bindura	48.7	51.3	1861
Binga	47.7	52.3	1677
Bulilima	48.3	51.7	1872
Chegutu	49.3	50.7	1801
Chimanimani	46.8	53.2	1695
Chiredzi	48.7	51.3	1738
Chirumhanzu	48.1	51.9	1756
Guruve	50.2	49.8	1560
Gwanda	48.0	52.0	1731
Gweru	47.1	52.9	2204
Hwange	46.8	53.2	1946
Kariba	47.1	52.9	1767
Lupane	48.3	51.7	2237
Makonde	48.2	51.8	1972
Mangwe	47.5	52.5	1767
Matobo	46.9	53.1	1623
Mudzi	47.7	52.3	1844
Mwenezi	45.2	54.8	1784
Nkayi	49.0	51.0	2304
Rushinga	48.9	51.1	1746
Shamva	47.8	52.2	1765
Umguza	50.0	50.0	1798
Umzingwane	49.8	50.2	1920
Zvimba	49.7	50.3	1797
Zvishavane	47.3	52.7	2074
Total	48.1	51.9	46239

The age-sex structure of the sampled population is shown in the population pyramid in Figure 1. The broad base of the pyramid indicates a higher proportion of the young individuals compared to the older generation which is consistent with the population census results. The proportion of children under age 5 years was around 15 percent while the proportion of individuals age 70 years and older was about 4 percent. The age group with highest population proportion was the 10 -17 years. The proportion of female was lower

compared to males in the age groups younger than 18 years. The female proportion was higher from the age of 18 years on ward.

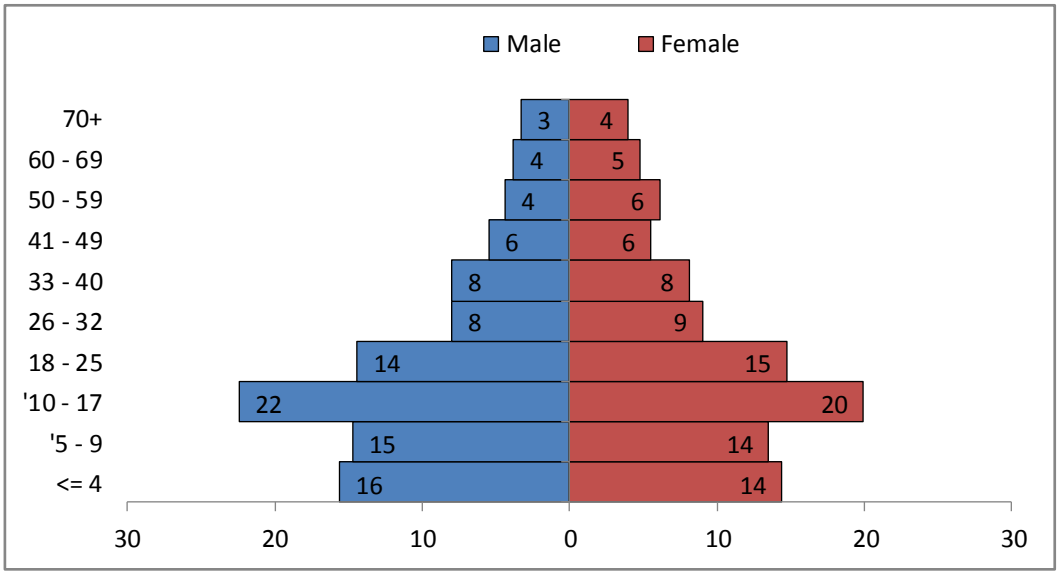

Figure 1: Age -Sex Population pyramid for the sampled districts

Figure 2 shows the distribution of the sampled under 5 population by district. Overall, the proportion of under 5 children sampled in the 25 districts was 15 % of the total population. The proportion of the under 5 children in relation to the total population varied across the 25 districts with 6 districts namely Binga, Gwanda, Lupane, Mangwe, Umguza and Umzingwane having the proportion of 13 percent which is below the average 15 percent. The highest proportion of the under 5s in relation to the total population was 18 percent in Bindura and Mudzi.

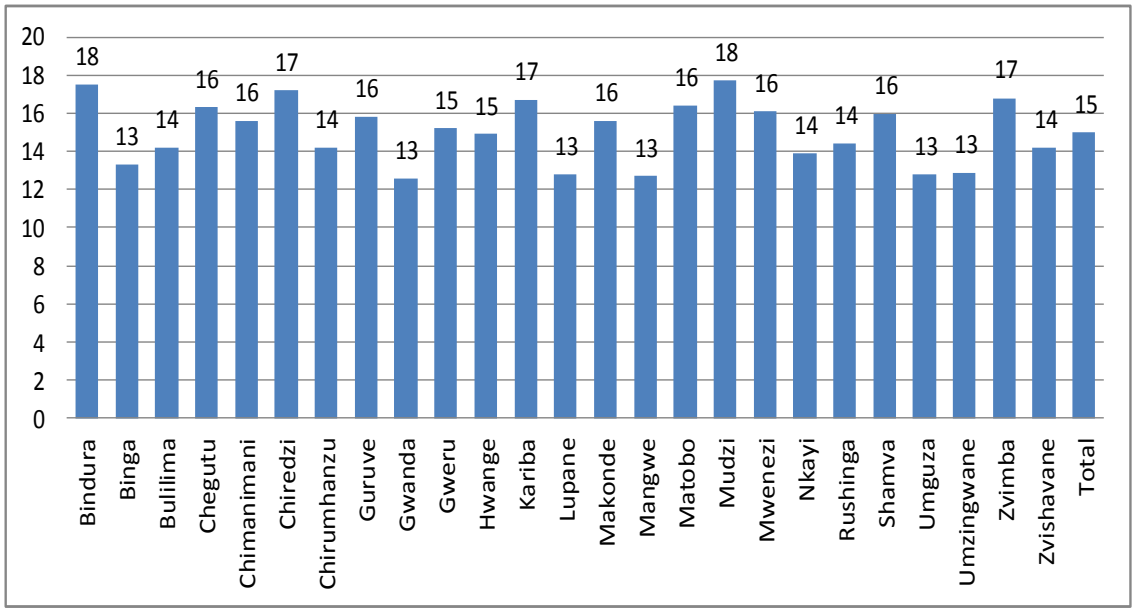

Figure 2: Proportion of under 5 children living in the sampled households by district

Table 4 shows the distribution of children by sex who had anthropometric measurements done. Out of 25 sampled districts, 24 had a fairly balanced representation of boys to girls ranging from 0.8 to 1.2 which is acceptable according to SMART Plausibility check, except Umzingwane that had 1.3. All the 25 sampled districts surpassed the minimum acceptable sample size of 180 children per district for the anthropometric measurements. Mudzi district had the highest number of children assessed (288) for anthropometry whilst Gwanda had the least number (181).

Table 4: Distribution of children for anthropometric assessment by sex by district

	Percentage of children		Total	Ratio
District	Male	Female	Sample	Boy: Girl
Chimanimani	45.8	54.2	236	0.8
Bindura	48.4	51.6	281	0.9
Guruve	55.3	44.7	226	1.2
Rushinga	48.4	51.6	223	0.9
Shamva	48.1	51.9	233	0.9
Mudzi	49.3	50.7	288	1.0
Chegutu	52.2	49.8	239	1.0
Kariba	47.7	52.3	237	0.9
Makonde	47.7	52.1	240	0.9
Zvimba	51.7	48.3	263	1.1
Chiredzi	52.9	47.1	240	1.1
Mwenezi	43.8	56.2	242	0.8
Binga	47.9	52.1	192	0.9
Hwange	54.3	45.7	256	1.2
Lupane	52.9	47.1	204	1.1
Nkayi	53.0	47.0	264	1.1
Umguza	45.2	54.8	199	0.8
Bulilima	53.8	46.2	225	1.2
Gwanda	49.2	50.8	181	1.0
Mangwe	54.4	45.6	180	1.2
Matobo	46.8	53.2	233	0.9
Umzingwane	57.4	42.6	223	1.3
Chirumanzu	52.3	47.7	195	1.1
Gweru	51.5	48.5	233	1.1
Zvishavane	50.6	49.4	235	1.0

Table 5 below shows the number of under 5 children who had their weight, height and MUAC measured. The number of children was distributed almost equal across all the age groups across all the districts. However, the 54 -59 months age group had the lowest number of children included in the survey across all the districts. Four districts namely Zvishavane, Binga, Mwenezi and Bulilima had an age distribution which was significantly different (p-value<0.05) to what is expected in standard population

Table 5: Distribution of children 6-59 months of age

	Proportion of children by age group (in Months)						p-value
District	6-17	18 -29	30 - 41	42 - 53	54 - 59	Total	
Chimanimani	58	51	67	43	17	236	0.069
Bindura	56	73	54	65	33	281	0.373
Guruve	47	64	54	45	16	226	0.124
Rushinga	46	52	58	47	20	223	0.556
Shamva	47	51	53	58	24	233	0.687
Mudzi	78	68	66	49	27	288	0.252
Chegutu	55	49	59	59	17	239	0.266
Kariba	61	57	54	43	22	237	0.614
Makonde	46	65	56	51	22	240	0.056
Zvimba	47	72	59	63	22	263	0.096
Chiredzi	51	63	55	58	13	240	0.065
Mwenezi	54	61	63	54	10	242	0.014
Binga	49	57	29	34	23	192	0.034
Hwange	54	59	67	55	21	256	0.395
Lupane	38	52	52	44	18	204	0.352
Nkayi	55	58	68	51	32	264	0.463
Umguza	46	43	38	58	14	199	0.073
Bulilima	55	49	45	64	12	225	0.021
Gwanda	46	45	31	42	17	181	0.527
Mangwe	34	40	47	43	16	180	0.423
Matobo	63	43	60	50	17	233	0.12
Umzingwane	45	51	56	46	25	223	0.723
Chirumanzu	31	51	42	45	26	195	0.132
Gweru	51	55	55	54	18	233	0.601
Zvishavane	39	68	57	51	20	235	0.038

Characteristics of parents and caregivers of the children below 5 years of age

The survey collected data on the mother's marital status, parental survival status, age of the parents and care givers and the living arrangements of the child's parents. These are essential since they have an influence on the care practices of the child. Figure 3 shows the proportion of mothers of under five children by their marital status. Across the districts, most mothers were married and living together with their male counterparts except for Mangwe, Bulilima and Matobo. In Bulilima (47 %) and Mangwe (54 %), most of the mothers had never married and are described as single mothers. Zvimba has the highest proportion of divorced mothers (20 %) while Mangwe had the lowest at 2.4%. Mudzi had the highest proportion of widowed at 3.8% mothers whilst Nkayi and Bulilima had the lowest (0%).

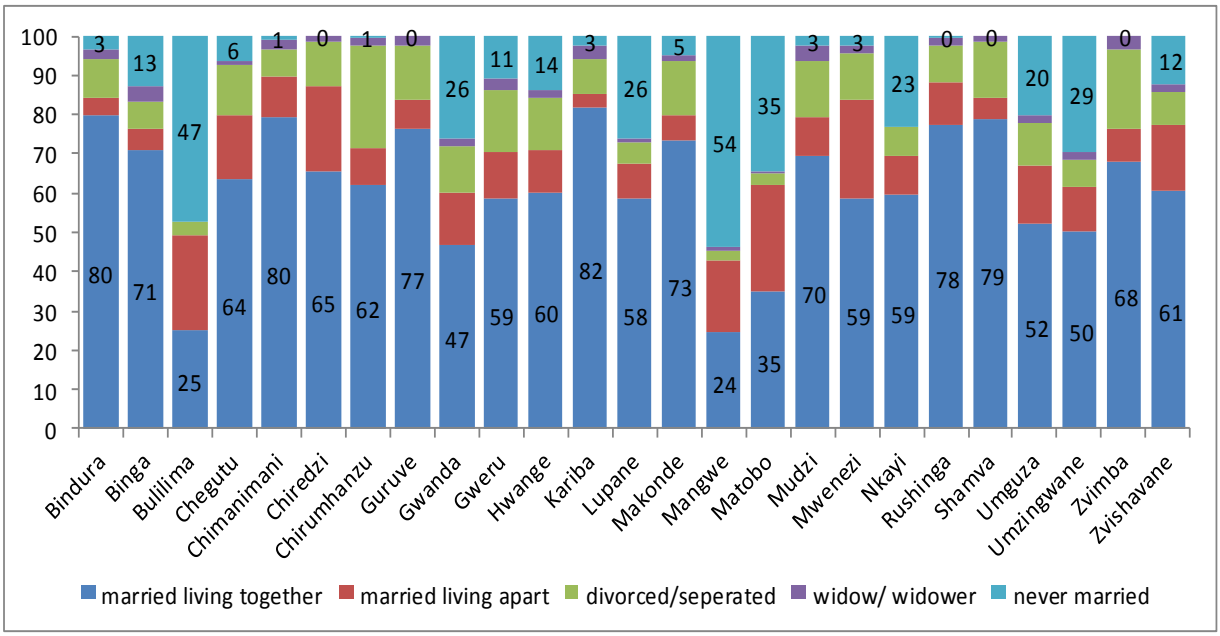

Figure 3: Proportion of mothers of under 5 children in the sampled households by their marital status

Figure 4 below shows that across all the districts majority of the mothers of under 5 children were aged between 20 and 24 years.

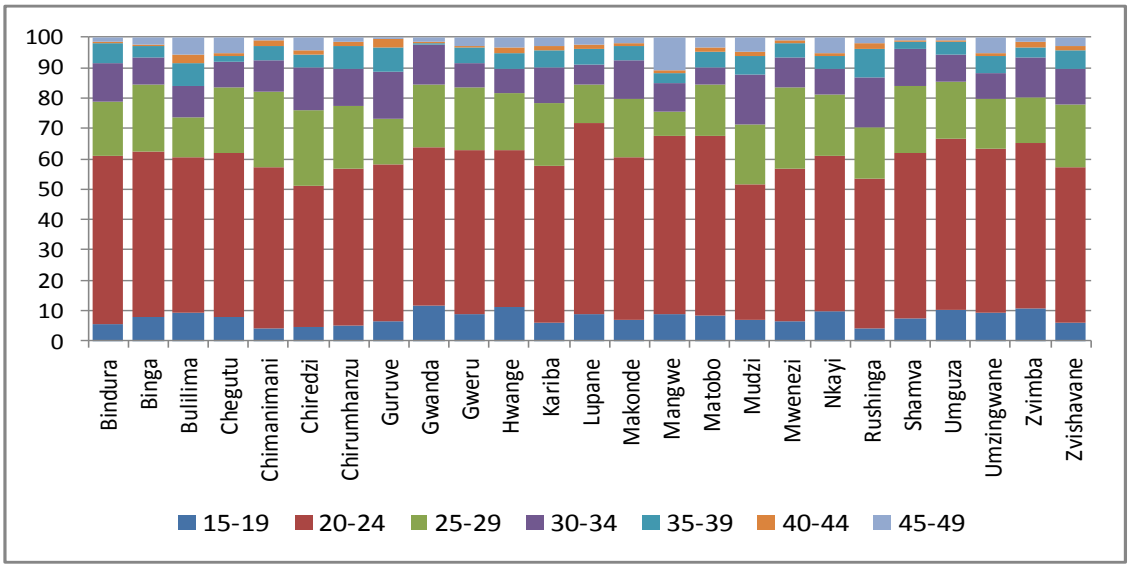

Figure 4: Percentage of mothers of under 5 children by age group by district

This survey also sought the relationship of caregiver to the child. The relationship were classified into four groups; mother, father, maid and other relatives. Figure 5 shows the proportion of children by relationship to caregiver by district. Across the 25 districts, majority of the caregivers of the under 5 children were the biological mothers. However about a third of children in 6 districts, most of them in Matebeleland South namely Bulilima, Gwanda, Mangwe, Matobo, Umzingwane and Zvishavane were being cared for by their

grandmothers. Surprisingly, more than a third (37 %) of under 5s in Guruve were being cared for by their fathers. This is despite that the mothers of the children were alive and staying in the household.

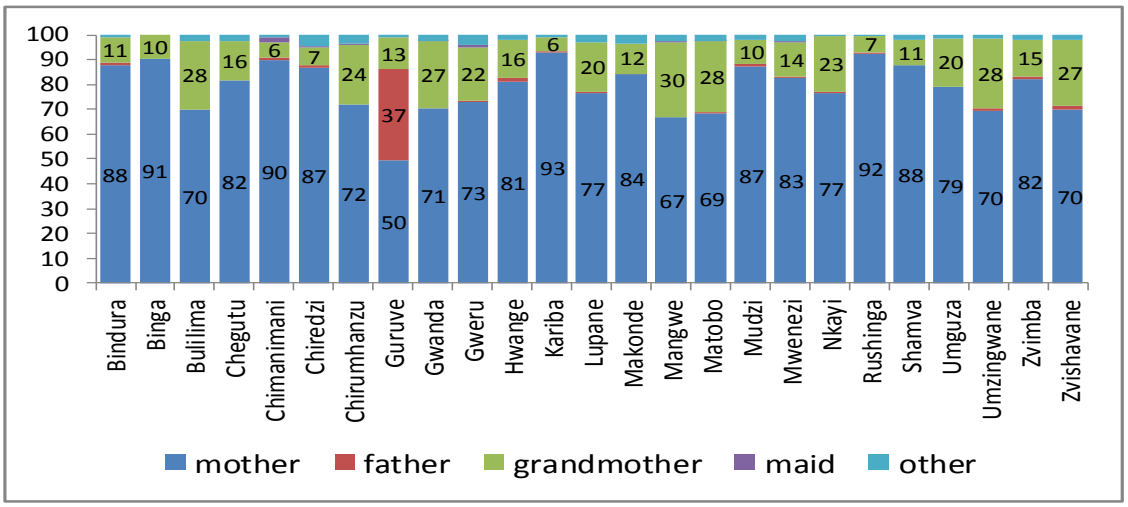

Figure 5: Percentage of caregivers of under 5 children by relationship to the child

The survey also investigated the ages of the primary care givers who were not the child's mother and revealed that the majority of caregivers of the children were between the ages of 45 -49 years of age. The distribution of the ages of primary caregivers other than the mother is given in figure 6 below.

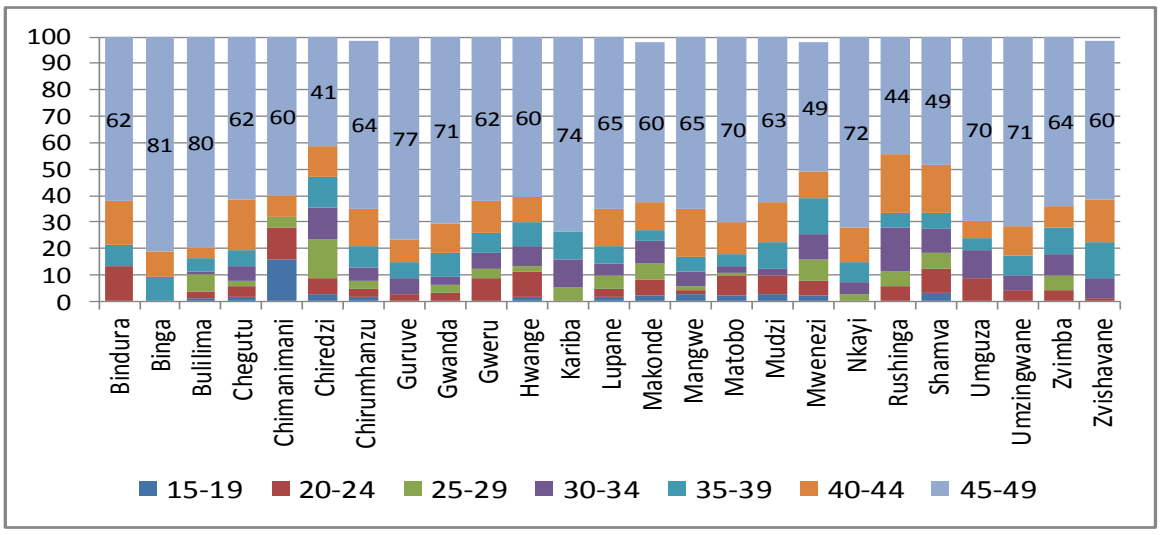

Figure 6: Proportion of under 5 caregivers by age group by district

The survey also investigated the country of residence of mothers of under 5s who were alive and not staying with their children. The results in figure 7 showed that the majority of mothers were residing within Zimbabwe with Rushinga and Kariba districts having the highest proportion of 100 percenteach. However the survey showed that 4 districts in Matebeleland South namely Bulilima, Gwanda, Mangwe and Matobo had majority of the absent mothers staying outside Zimbabwe.

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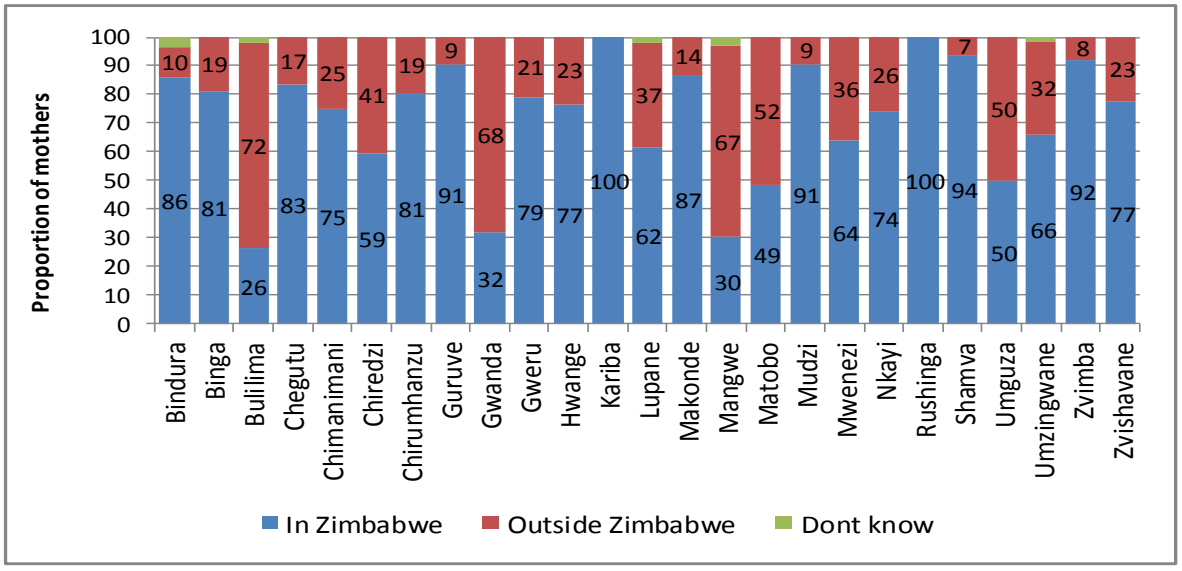


Figure 7: Proportion of mothers of under 5 children by where they reside

Orphan hood in children 6 – 59 months of age

Orphans included children whose mother or father has died (single orphans) as well as children who have lost both parents (double orphans). The foster children are those with both parents alive but are living in a household where neither their biological mother nor biological father resides. Table 6 below shows the proportion of orphaned and fostered children 6 to 59 months by district.

Table 6: Proportion of fostered and orphaned under 5 children by district

District	Mother dead	Father dead	Both Parents dead	Either parent dead	Fostered
Bindura	2.0	4.9	0.3	6.6	8.4
Binga	0.9	5.0	0.9	5.3	4.3
Bulilima	2.0	2.0	0.0	4.6	15.1
Chegutu	0.0	3.5	0.0	3.6	13.1
Chimanimani	2.7	2.7	0.4	5.1	3.6
Chiredzi	0.4	2.5	0.0	3.0	8.6
Chirumhanzu	0.5	3.6	0.0	4.1	22.1
Guruve	0.0	3.3	0.0	3.3	10.4
Gwanda	0.5	3.2	0.5	3.5	20.8
Gweru	0.7	4.6	0.3	5.2	19.0
Hwange	1.1	2.1	0.0	3.2	11.0
Kariba	0.4	5.4	0.0	5.9	3.7
Lupane	1.9	2.3	0.0	4.6	14.2
Makonde	1.4	4.1	1.0	4.4	11.0
Mangwe	2.8	4.7	0.0	7.9	26.5
Matobo	1.6	3.5	0.4	5.5	16.9
Mudzi	1.6	4.1	0.0	5.8	7.5
Mwenezi	2.6	5.5	1.5	6.6	10.4
Nkayi	1.0	4.7	0.0	6.1	14.9
Rushinga	0.4	2.4	0.0	2.9	5.0
Shamva	0.4	3.1	0.4	3.1	9.8
Umguza	1.4	6.8	1.4	7.3	13.2
Umzingwane	3.0	6.4	0.9	8.9	19.0
Zvimba	1.4	3.1	0.0	4.5	10.1
Zvishavane	1.4	3.2	0.4	4.5	13.4

Generally the proportion of children 6 – 59 months old whose mother died ranged from 0 percent to 3 percent across all the districts. Umzingwane has the highest proportion of children with their mothers dead (3 %) while Guruve has 0 percent which is the lowest. The other districts of concern in terms of the magnitude of the children with their mothers dead are Mangwe (2.8 %), Chimanimani (2.7 %), Mwenezi (2.6 %), Bindura (2 %), Bulilima (2 %) and Lupane (1,9 %). The proportion of under 5 children with their fathers dead ranged from 2 percent to 6 .8 percent with Umguza being the highest and Bulilima being the lowest. Umzingwane (8.9 %) had the highest proportion of households with single orphans whilst

Rushinga (2.9 %) had the least. The district with the highest proportion of under 5 children with both parents dead was Mwenezi (1.5%) followed by Umguza (1.4%). However, majority of the selected districts- 13 out of the 25- did not have any double orphan reported. The proportion of children under fosters care ranged from 3.6 percent to 26.5 percent with Chimanimani being the least and Mangwe being the highest.

INFANT AND YOUNG CHILD FEEDING PRACTICES

The survey assessed the infant and young child feeding practices. Figure 8 shows that across all the 25 districts, more than 75 percent of the children 0-23 months of age have ever been breast fed at some point in life. The proportion of the children ever breastfed ranged from 77 percent to 100 percent. Rushinga had the highest proportion of children ever breastfed at 100 percent while Nkayi (77%) had the least proportion.

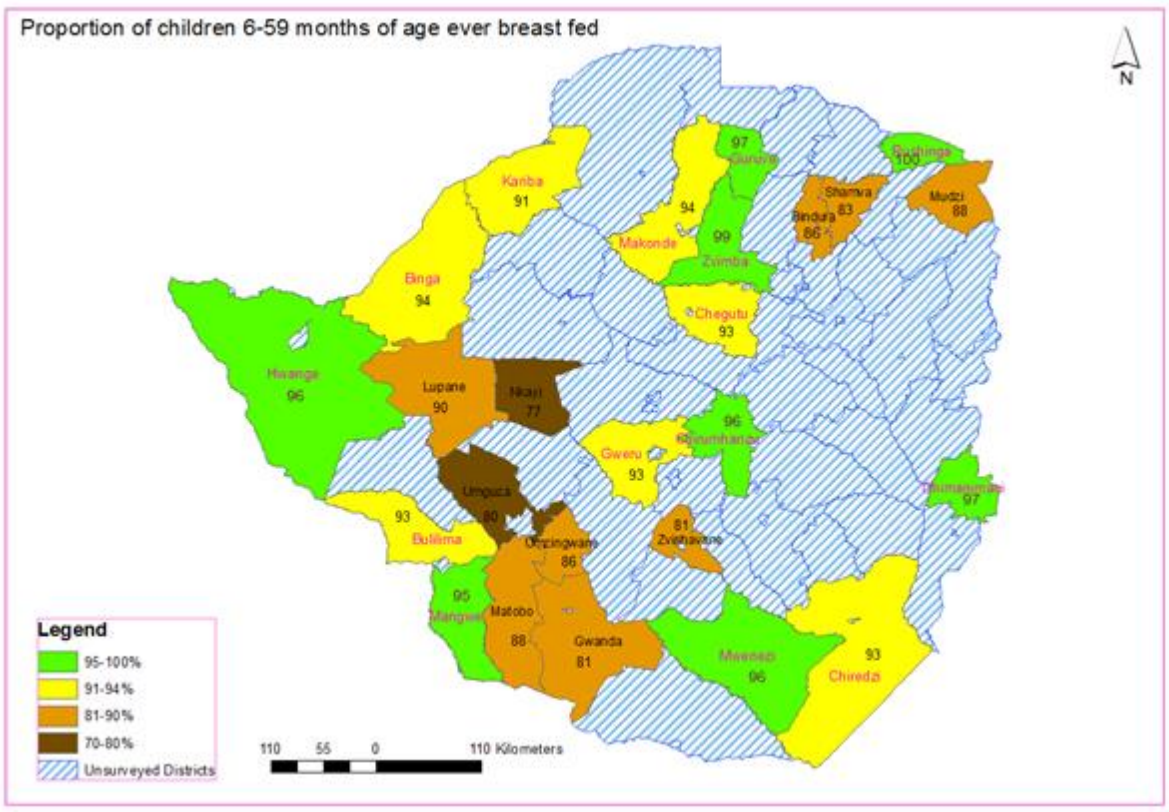


Figure 8: Proportion of children 6-59 months of age ever breast fed

The proportion of children fed from a bottle with an artificial teat was assessed. The proportion of children fed from a bottle with a teat varied from 0 percent to 19 percent across the 25 districts. Gweru district had the highest proportion of children 0-23 months at 18.8 percent fed from a bottle with a teat followed by Bindura (16.9 %) while 3 districts namely Guruve, Mudzi and Kariba did not have any child 0-23 months fed from a bottle with a teat. Figure 9 below shows the proportion on children 0-23 months who are bottle fed by district.

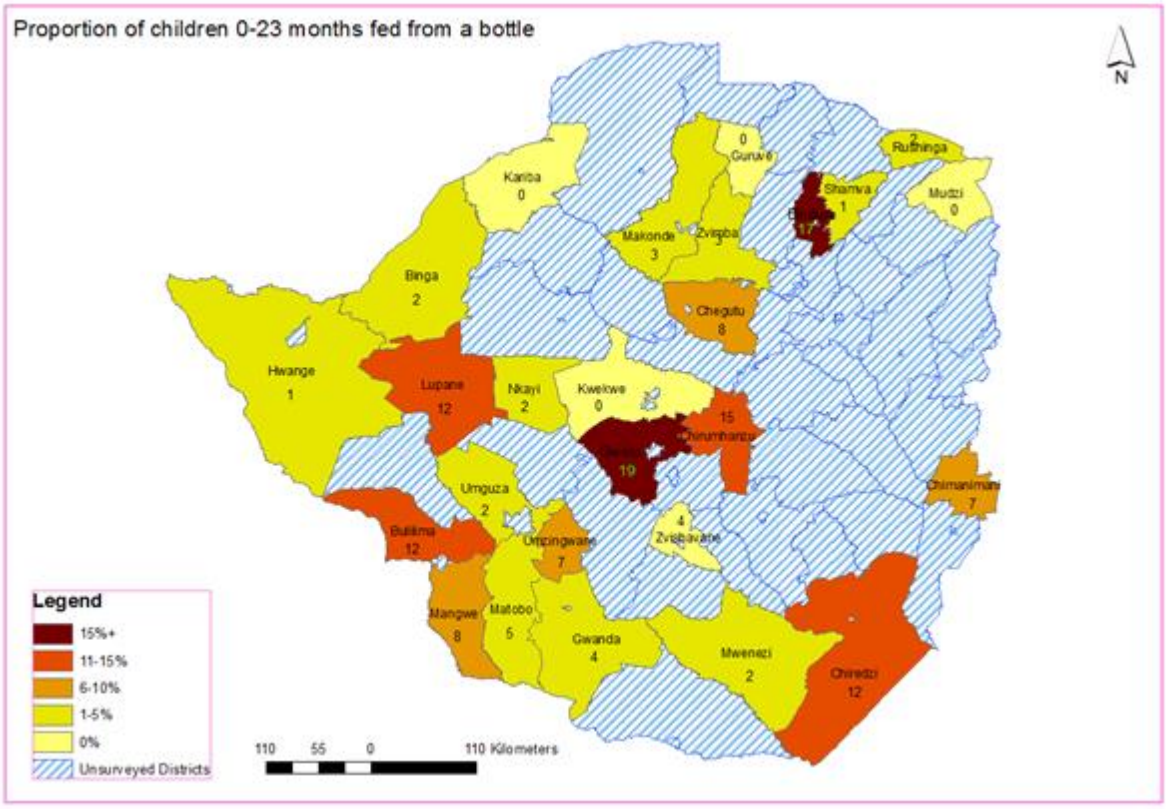


Figure 9: proportion of children 0-23 months fed from a bottle

Minimum meal frequency (MMF), minimum dietary diversity (MDD) and minimum adequate diet (MAD)

The number of food groups consumed is a proxy for the quality of children's diets, the more diverse the better. Umzingwane had the highest proportion of children between 6-23 months of age who received the minimum number of meals recommended for their age (77 %). Mwenezi, Shamva and Chegutu recorded the least percentage (0%) of children between 6-23 months of age who received the minimum number of meals. Chirumhanzu (39 %) had the highest proportion of children between 6-23 months who received the minimum number of food groups recommended for their age. Nkayi and Binga (1 %) had the lowest proportion of children receiving minimum number of food groups recommended for their age. Table 7 below presents MMF, MDD and MAD by district.

Table 7: Proportion of children receiving minimum meal frequency, minimum dietary diversity and minimum adequate diet.

	Proportion of children 6-23 months of age receiving			
District	Minimum meal frequency	Minimum Dietary Diversity	Minimum Acceptable Diet	Total sample 0-23 months
Bindura	18.2	21.2	2.0	99
Binga	42.1	1.3	0.0	76
Bulilima	64.2	2.5	6.2	81
Chegutu	0.0	19.6	0.0	92
Chimanimani	36.7	31.1	12.2	90
Chiredzi	51.0	25.5	12.2	98
Chirumhanzu	35.7	39.3	10.7	56
Guruve	29.4	19.1	4.4	68
Gwanda	75.3	5.5	8.2	73
Gweru	16.7	20.0	3.3	90
Hwange	19.8	9.3	1.2	86
Kariba	16.9	6.7	0.0	89
Lupane	57.3	5.3	5.3	75
Makonde	37.0	10.9	3.3	92
Mangwe	53.3	10.0	5.0	60
Matobo	17.6	11.8	4.4	68
Mudzi	7.8	5.8	0.0	103
Mwenezi	0.0	10.1	0.0	99
Nkayi	31.7	1.2	0.0	82
Rushinga	26.0	20.5	6.8	73
Shamva	0.0	13.7	0.0	73
Umguza	4.3	4.3	0.0	69
Umzingwane	76.8	30.4	10.1	69
Zvimba	27.2	11.1	3.7	81
Zvishavane	33.8	9.1	2.6	77

Generally the proportion of children 6-23 months of age receiving a minimum acceptable diet is very low across the districts ranging from 0 percent to 12 percent. Chimanimani and Chiredzi had the highest proportion (12 %) of children between 6-23 months of age who received a minimum acceptable diet while Shamva, Mudzi, Chegutu, Kariba, Nkayi, Umguza and Mwenezi were the lowest at 0 percent.

Consumption of a four star diet among children 6-23 months of age

There are four food groups which may be added in a different order to create a 4 star diet for children 6-23 months. These comprise:

- Animal-source foods (meat, chicken, fish, liver), and eggs, milk and milk products
- Staples (maize, wheat, rice, millet and sorghum); roots and tubers (cassava, potatoes)
- Legumes (beans, lentils, peas, groundnuts) and seeds (sesame)
- Vitamin A-rich fruits and vegetables (mango, papaya, passion fruit, oranges, dark-green leaves, carrots, yellow sweet potato and pumpkin), and other fruit and vegetables (banana, pineapple, watermelon, tomatoes, avocado, eggplant and cabbage)

A four star diet ensures that a child gets nutrients from the four main groups enriching complementary feeding. Figure 10 shows that Chimanimani had the highest proportion (22 %) of children 6-23 months of age receiving a four star diet while Nkayi, Binga, Matopo and Umguza had the lowest proportion at 0 percent.

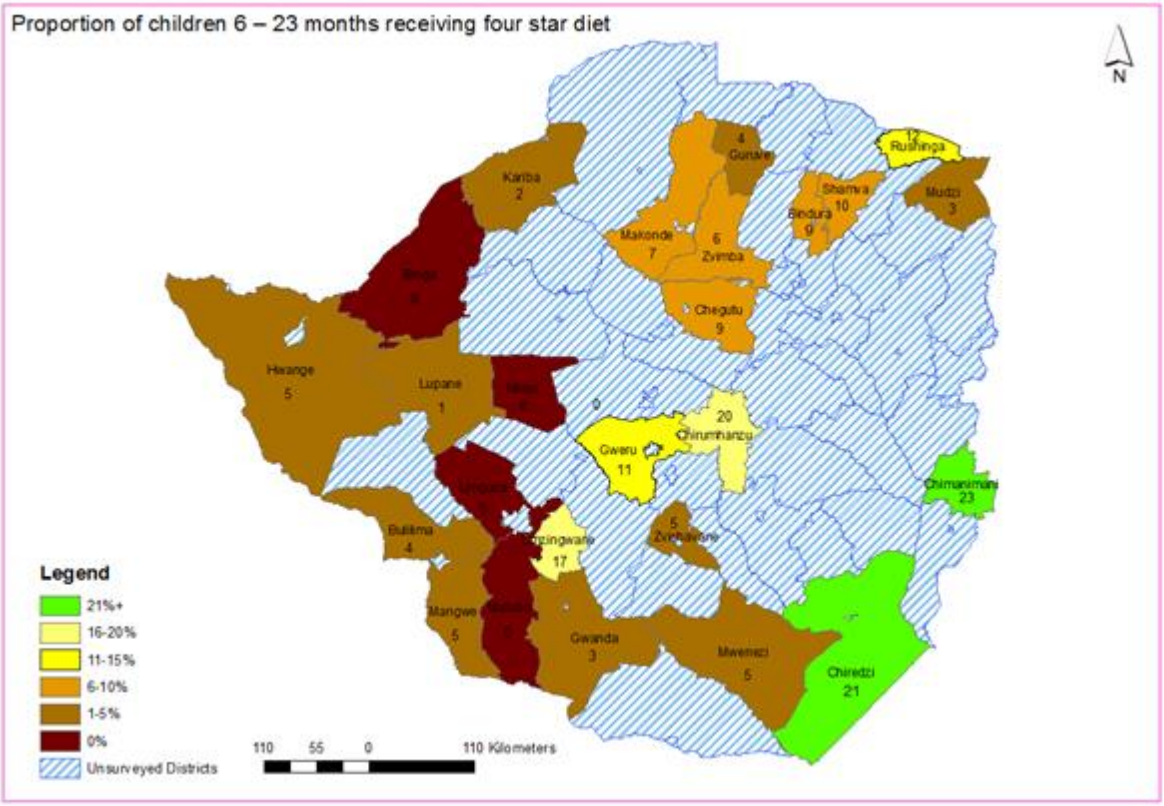


Figure 10: Proportion of children 6 – 23 months receiving four star diet

Food groups consumed by children 6-59 months of age

Diets for children 6-59 months of age were evaluated to determine the number of food groups they consumed in last 24 hours preceding the survey. The seven food groups used included grains, roots and tubers, legumes and nuts, dairy products (milk, yoghurt, cheese), meat and fish group (meat, fish, poultry and liver/organ meats, edible insects such as ***amacimbi and ishwa***), eggs, vitamin-A rich fruits and vegetables (dark green coloured vegetables such as kale, orange and yellow coloured vegetables such as carrots and pumpkins), other fruits and vegetables. Table 8 below shows the proportion of children receiving each of the food groups by district.

Table 8: Proportion of children 6-59 months of age by food group consumed

District	Proportion of children 6 – 59 months of age consuming							Total number of 6-23
	Starch	Legumes	Milk	Meat	Eggs	VA rich plants	Other plants	
Bindura	96.8	20.6	5.0	31.2	4.6	80.9	23.0	282
Binga	97.9	12.4	2.6	9.8	1.0	49.5	25.8	194
Bulilima	98.3	35.9	9.4	17.5	2.6	74.8	4.7	234
Chegutu	98.0	16.8	19.9	43.0	7.0	80.1	24.2	256
Chimanimani	98.7	23.2	5.5	47.7	10.1	89.9	35.4	237
Chiredzi	97.7	48.8	26.2	48.5	8.1	71.2	28.8	260
Chirumhanzu	98.0	44.4	7.3	55.6	17.1	88.3	16.1	205
Guruve	99.6	31.4	4.0	42.2	6.7	73.5	48.0	223
Gwanda	99.0	26.4	35.2	20.7	1.6	44.0	25.4	193
Gweru	98.6	22.6	30.1	43.7	9.7	79.6	24.7	279
Hwange	98.4	24.9	19.5	22.2	1.6	66.9	15.6	257
Kariba	98.0	25.5	4.4	34.3	4.0	57.4	7.6	251
Lupane	98.2	14.9	20.6	22.8	3.9	47.8	38.2	228
Makonde	96.2	17.4	15.5	34.5	3.4	70.5	17.8	264
Mangwe	97.9	19.6	19.6	14.4	1.0	55.2	11.3	194
Matobo	90.0	11.0	12.8	18.7	5.5	81.3	46.1	219
Mudzi	97.9	16.3	2.8	18.7	2.4	69.9	9.7	289
Mwenezi	95.6	22.6	5.6	38.3	6.9	74.6	9.3	248
Nkayi	98.1	13.6	33.6	19.2	3.8	56.2	30.6	265
Rushinga	98.7	51.1	4.0	22.4	6.7	72.6	17.5	223
Shamva	98.3	29.2	4.7	41.5	8.5	85.6	4.2	236
Umguza	98.0	13.7	9.8	33.3	5.4	77.0	9.3	204
Umzingwane	97.8	27.2	16.2	46.5	11.4	78.9	14.5	228
Zvimba	98.9	17.9	4.5	57.8	5.6	73.9	12.7	268
Zvishavane	96.4	16.2	6.3	32.0	4.3	73.5	18.6	253

Table 8 above shows that generally there is high consumption of starchy foods in all the 25 selected districts. Guruve had the highest proportion (99.6 percent) of under 5s consuming starchy foods followed by Gwanda. Most districts were under 50 percent in terms of legumes consumption amongst children 6 to 59 months with the highest Rushinga (51 %) and Matobo being the lowest at 11 percent. Across all the districts, the proportion of

children consuming the meat group is low. The proportion of children consuming foods from the meat group ranged from 10 percent in Binga to 58 percent in Zvimba. The proportion of children consuming the foods from the milk group ranged from 3 percent to 36 percent across the districts. Binga and Mudzi (3 percent apiece) had the lowest proportion of children 6 – 59 months of age who consumed food from the milk group in the past 24 hours preceding the survey while Gwanda had the highest (35 percent) followed by Nkayi (34 percent) and Gweru (30 percent).

The proportion of under 5 children consuming eggs across all the districts was less than 20 percent which is very low given the nutritive value of the eggs in children. The highest proportion of children consuming eggs was in Chirumanzu (17 %) followed by Umzingwane with (11.4 %) while Binga and Mangwe (1 %) had the least.

The proportion of children who consumed vitamin A rich fruits and vegetables was generally high in almost all the districts ranging from 44 percent to 90 percent. The highest proportion of children consuming vitamin A rich fruits and vegetables was in Chimanimani (90 percent) followed by Chirumanzu (88 %) and Gwanda being the least with 44 percent. Guruve had the highest percentage (48 %) of children consuming other fruits and vegetables followed by Matobo (46 %). The districts with least proportion of children consuming other fruits and vegetables were Shamva (4.2 %) and Bulilima (4.7 %).

NUTRITIONAL STATUS OF CHILDREN

Prevalence of Global Acute malnutrition (Weight for Height WHO standard)

Global Acute Malnutrition (GAM) across the surveyed 25 districts ranged from 0.4 percent to 5.8 percent as shown in figure 11. Majority of the districts had a prevalence of Global Acute Malnutrition of less than 5 percent which is within an acceptable range according to WHO emergency thresholds. A total of nine districts had malnutrition ranging from 3percent to less than 5 percent, while 12 districts had GAM of 1 percent to 2.9 percent with Zvishavane reporting the lowest prevalence. Two districts, Binga (5.8 %) and Kariba (5.1 %) had a prevalence of GAM which is medium according to WHO emergency thresholds. The medium range according to WHO is between 5 – 9 percent of Global Acute Malnutrition which is recommended for targeted supplementary feeding.

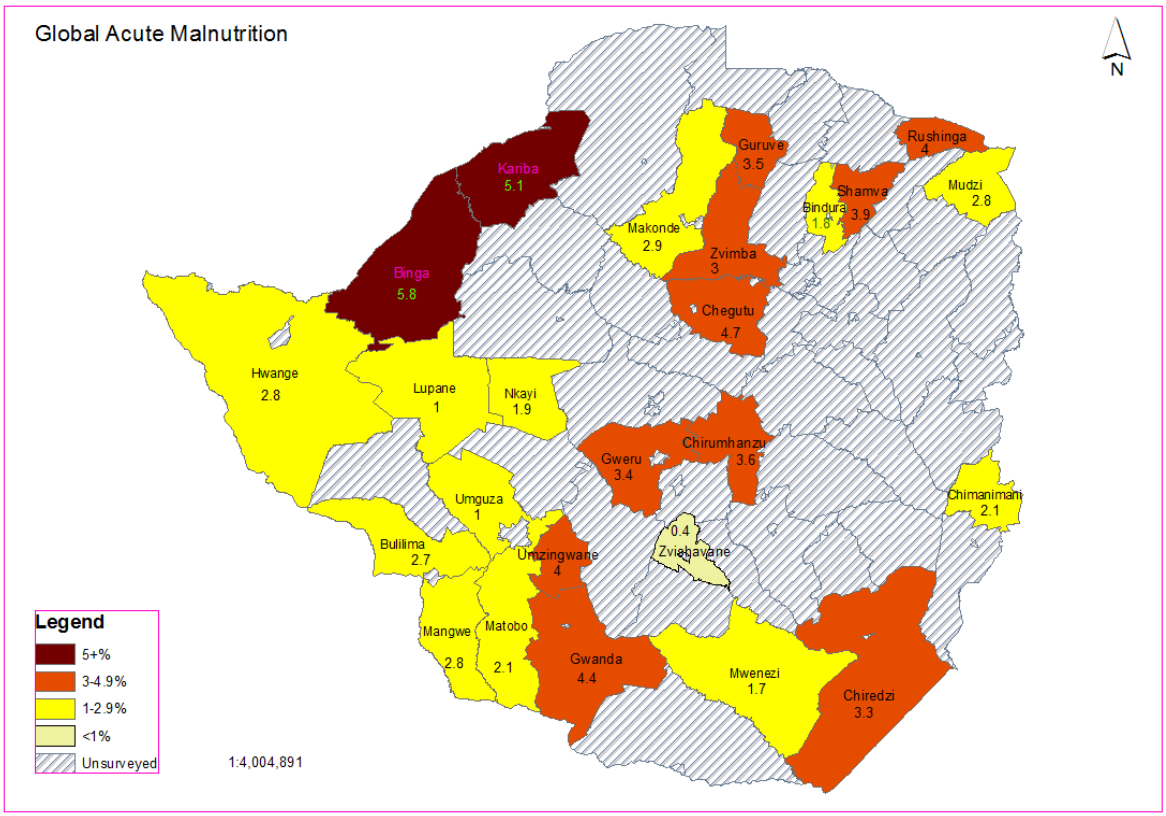


Figure 11: Prevalence of Global Acute Malnutrition

Prevalence of Moderate Acute Malnutrition

The prevalence of Moderate Acute Malnutrition (MAM) was highest in Binga (4.7 %) followed by Chirumhanzu (3.6 %) and the least prevalence was in Zvishavane (0.4 %). Figure 12 below shows prevalence of MAM by district.

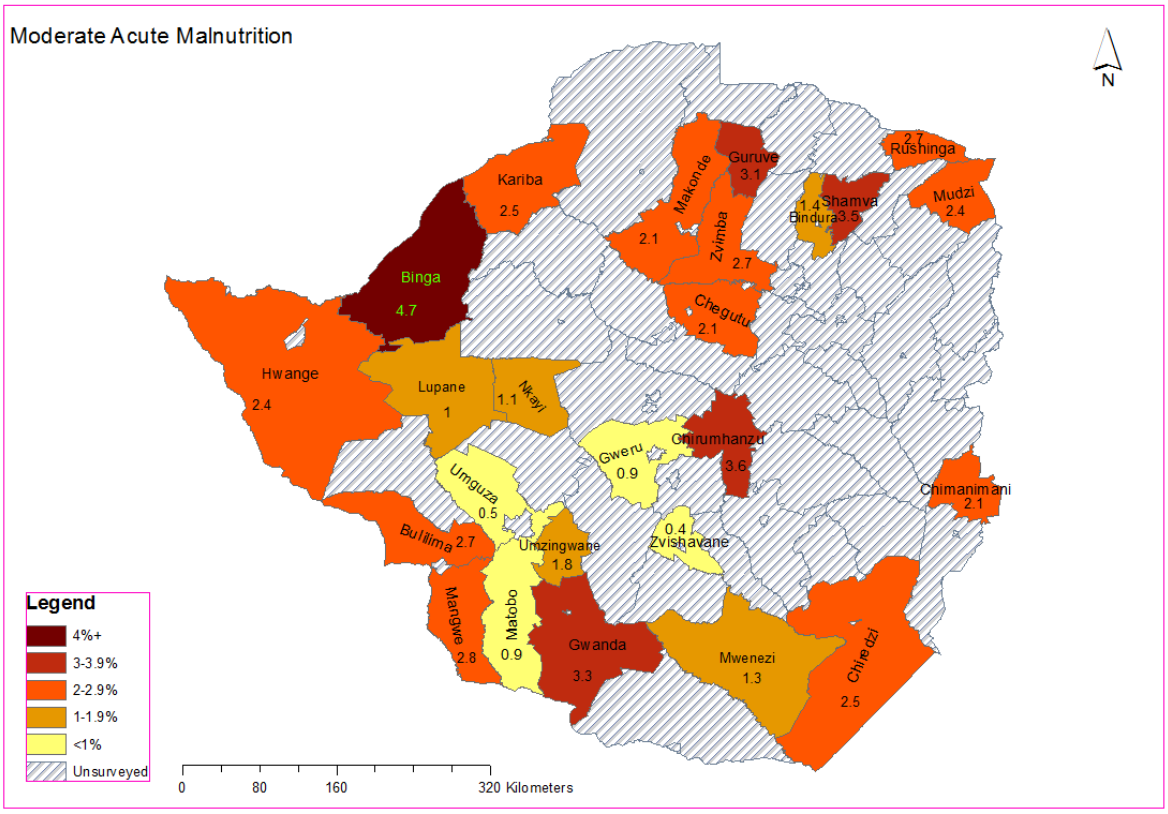


Figure 12: Prevalence of Moderate Acute Malnutrition

Prevalence Severe Acute malnutrition

Generally the majority of surveyed districts had a low prevalence of Severe Acute Malnutrition (SAM) with eighteen (18) out of the twenty five (25) districts recording prevalence of lower than 1 percent. A total of four districts recorded SAM of above 2 percent namely Chegutu (2.6 %); Gweru (2.6 %); Kariba (2.5 %) and Umzingwane (2.3 %). Figure 13 presents prevalence of SAM by district.

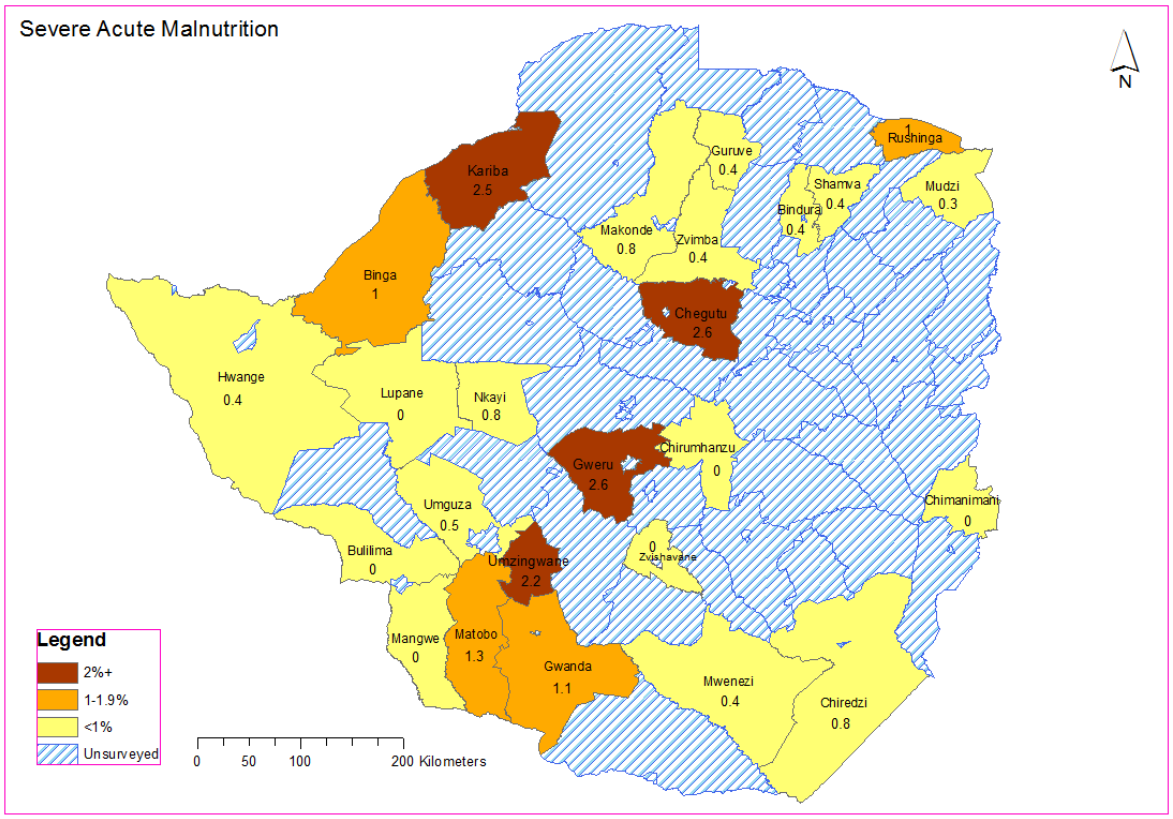


Figure 13: Prevalence of SAM by district

Prevalence of Acute Malnutrition by sex

Figure 14 below show the prevalence of acute malnutrition in boys and girls by type in the total sample of the 25 districts surveyed. Generally the prevalence of acute malnutrition was higher amongst boys than girls. The difference of GAM and MAM across sex was statistically significant (p-values 0.006 and 0.026 respectively). Whereas the difference in SAM between boys and girls was statistically insignificant (p-value 0.114).

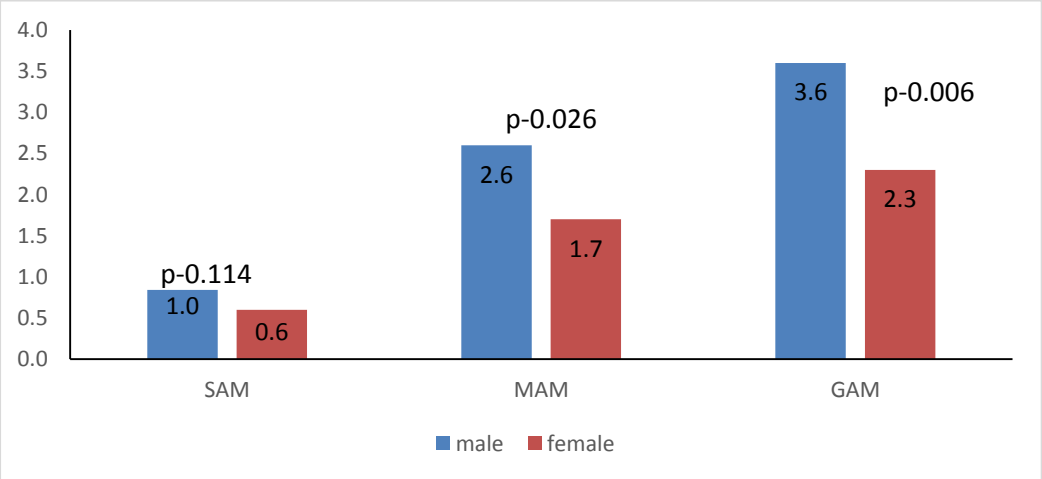


Figure 14: Prevalence of Acute Malnutrition by sex

Prevalence of Acute malnutrition by age group

Figure 15 below presents prevalence of acute malnutrition by type and by age group. Prevalence of acute malnutrition increased steeply between 6-11 months and 12- 23 months age group. This is the age group for complementary feeding hence there could be some relationship with the feeding practices. The prevalence peaks at 12- 23 months age group before a gradual decrease, lowest among the 48- 59 months age group.

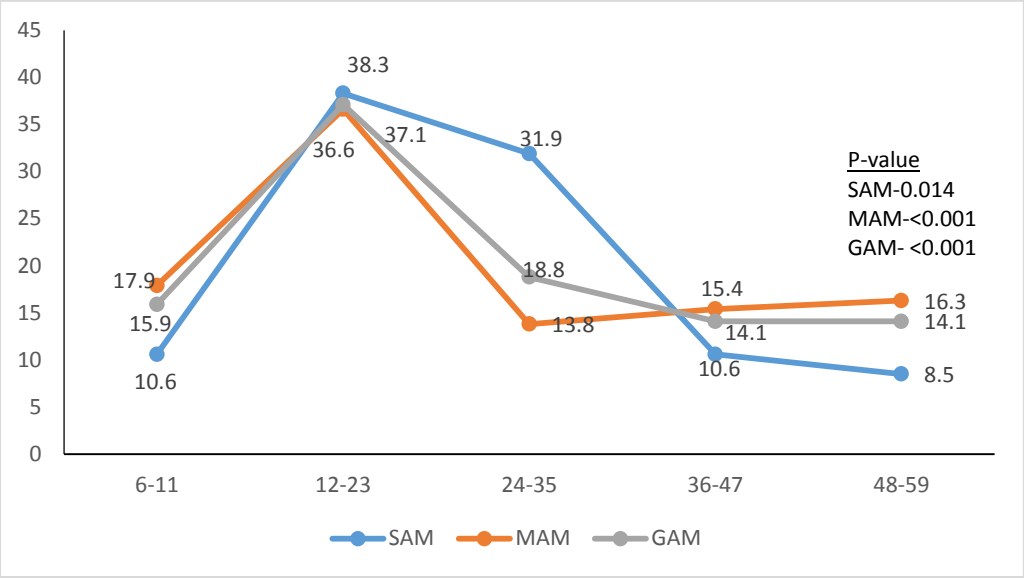


Figure 15: Prevalence of Acute Malnutrition by type and by age group

Prevalence of Acute Malnutrition using MUAC

Generally malnutrition was low in all the 25 surveyed districts that were screened using MUAC. Table 9 presents prevalence of Acute Malnutrition using MUAC. Based on MUAC and /or oedema , Umguza and Bindura district had the highest prevalence of acute malnutrition of 4.5 percent and 4.3 percent respectively. Chegutu had the highest prevalence of severe acute malnutrition of 2.9 percent followed by Gweru with 1.3 percent Bulilima, Mwenezi and Zvishavane districts recorded zero percent prevalence of global acute malnutrition. Oedema cases were recorded in Chegutu (6 cases) and Gweru (3 cases). The rest of the distrcts did not record any oedema cases.

Table 9: Prevalence of Acute Malnutrition byMUAC

District	Severe (MUAC) <115mm)	Moderate (MUAC) 115-124mm)	GAM (MUAC >125mm)	Oedema
Bindura	0.4	3.9	4.3	0
Binga	0.0	2.6	2.6	0
Bulilima	0.0	0.0	0.0	0
Chegutu	0.4	1.7	2.1	6
Chimanimani	0.0	1.7	1.7	0
Chiredzi	0.4	1.2	1.7	0
Chirumhanzu	0.0	2.6	2.6	0
Guruve	0.0	0.9	0.9	0
Gwanda	0.0	0.6	0.6	0
Gweru	0.0	1.7	1.7	3
Hwange	0.0	1.2	1.2	0
Kariba	0.0	2.1	2.1	0
Lupane	0.5	1.5	2.0	0
Makonde	0.0	0.8	0.8	0
Mangwe	0.0	2.8	2.8	0
Matobo	0.9	2.6	3.4	0
Mudzi	0.7	2.1	2.8	0
Mwenezi	0.0	0.0	0.0	0
Nkayi	0.0	1.1	1.1	0
Rushinga	0.0	0.9	0.9	0
Shamva	0.0	0.9	0.9	0
Umguza	0.5	4.0	4.5	0
Umzingwane	0.0	0.4	0.4	0
Zvimba	0.0	0.8	0.8	0
Zvishavane	0.0	0.0	0.0	0
All districts	0.2	1.5	1.7	9

Percentage of children with acute malnutrition by MUAC and WHZ

Table 10 below shows the percentages of children with acute malnutrition as measured by MUAC and WHZ. The results show that there was a high percentage of children who were classified as wasted, moderately wasted and severely wasted using WHZ compared to those identified by MUAC. There were 58 percent children classified as wasted by WHZ as opposed to 28 percent classified by MUAC. Similarly the WHZ identified 55 percent of children as moderately acute malnourished compared to 37 percent classified using MUAC. WHZ also classified 80 percent as severely malnourished compared to 15 percent classified using MUAC. Only 15 percent, 9 percent and 4 percent were classified as wasted, moderately wasted and severely wasted respectively by both WHZ and MUAC. These results show that MUAC missed at least 55 percent of children with acute malnutrition. The differences in the proportion of children identified by either WHZ and or MUAC were statistically significant (p- <0.001).

Table 10: Percentage of children 6-59 months) with acute malnutrition by MUAC and WHZ

	Wasting (WHZ<-2 or MUAC <125mm)	Moderate (WHZ ≥-3& WHZ <-2 or MUAC ≥ 115mm & MUAC<125mm)	Severe (WHZ<-3 or MUAC<115mm)
MUAC only	**27.8**	**35.6**	**15.2**
WHZ only	**57.7**	**55.2**	**80.4**
Both	**14.5**	**9.3**	**4.3**
p-vale	**<0.001**	**<0.001**	**<0.001**

Prevalence of underweight by district

Figure 16 below presents prevalence of underweight by district. Binga (15.6 %), Makonde (14.6 %), Mudzi (13.9 %) and Mangwe (13.9 %) had the highest prevalence of underweight. Of the 25 districts, 11 had a prevalence of underweight above the 10 percent threshold. On the contrary, Zvishavane district had the lowest prevalence of underweight of 6.4 percent.

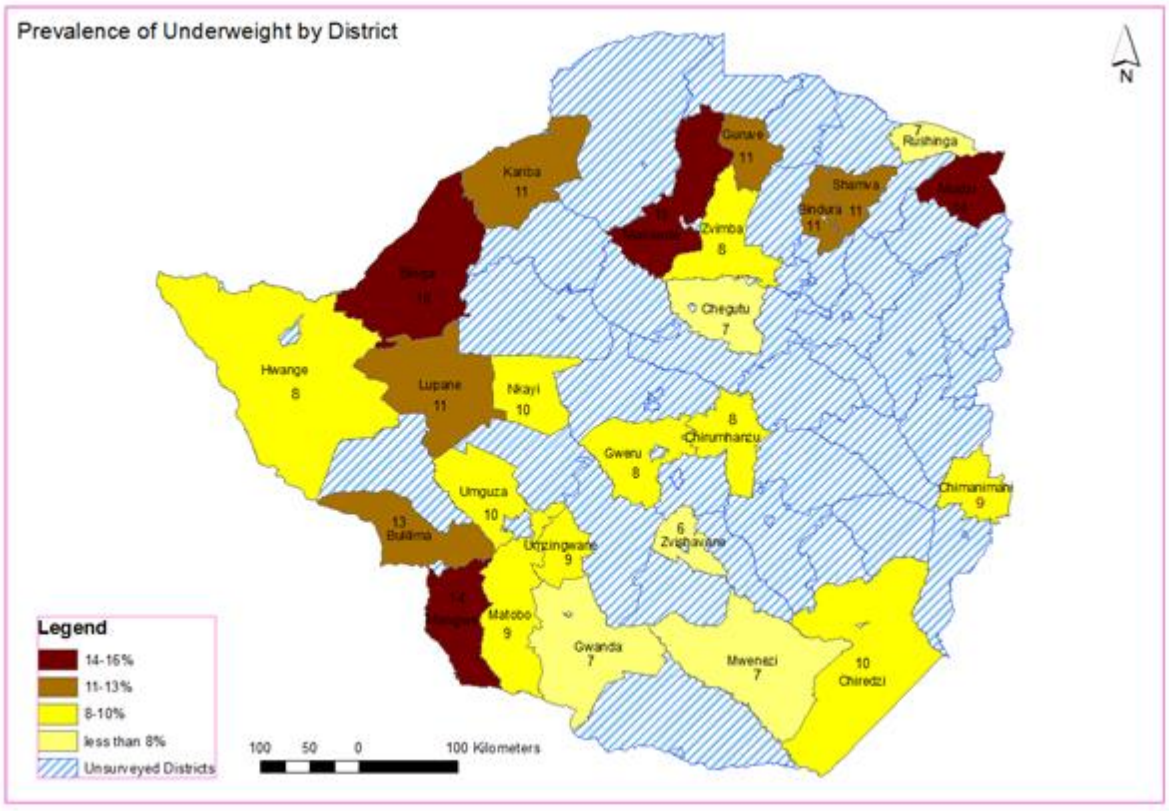


Figure 16: Prevalence of underweight by district

Prevalence of underweight by district by sex

Figure 17 below shows the prevalence of underweight by sex. Generally there is a higher prevalence of underweight in boys compared to girls in almost all the districts except for Chirumhanzu (9.7 %), Lupane (10.4 %) and Hwange (6.8 %) where underweight prevalence was higher in girls than in boys. The results of the survey show that boys in Binga (20.7 %), Mangwe (17.3 %) and Mudzi (16.2 %) were most affected by underweight thangirls who were 11 percent, 9.8 percent and 11, 6 percent respectively.

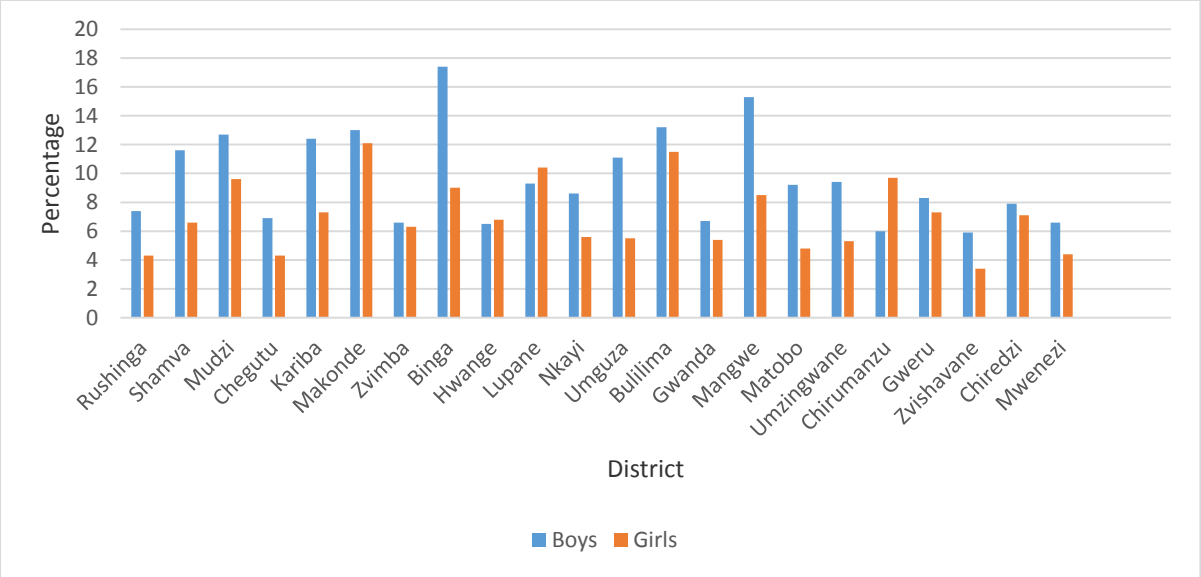


Figure 17: Prevalence of underweight by district by sex

Prevalence of Stunting

Figure 18 shows proportions of children 6-59 months of age below -2 SD Heights for Age z-score. There were three districts with stunting prevalence of 30 percent and above and these include Zvimba (30 %); Bindura (32 %) and Chimanimani (31 %). Overally Bindura district had the highest prevalence of 32 percent whilst Kariba and Zvishavane had the least prevalence of 18 percent each.

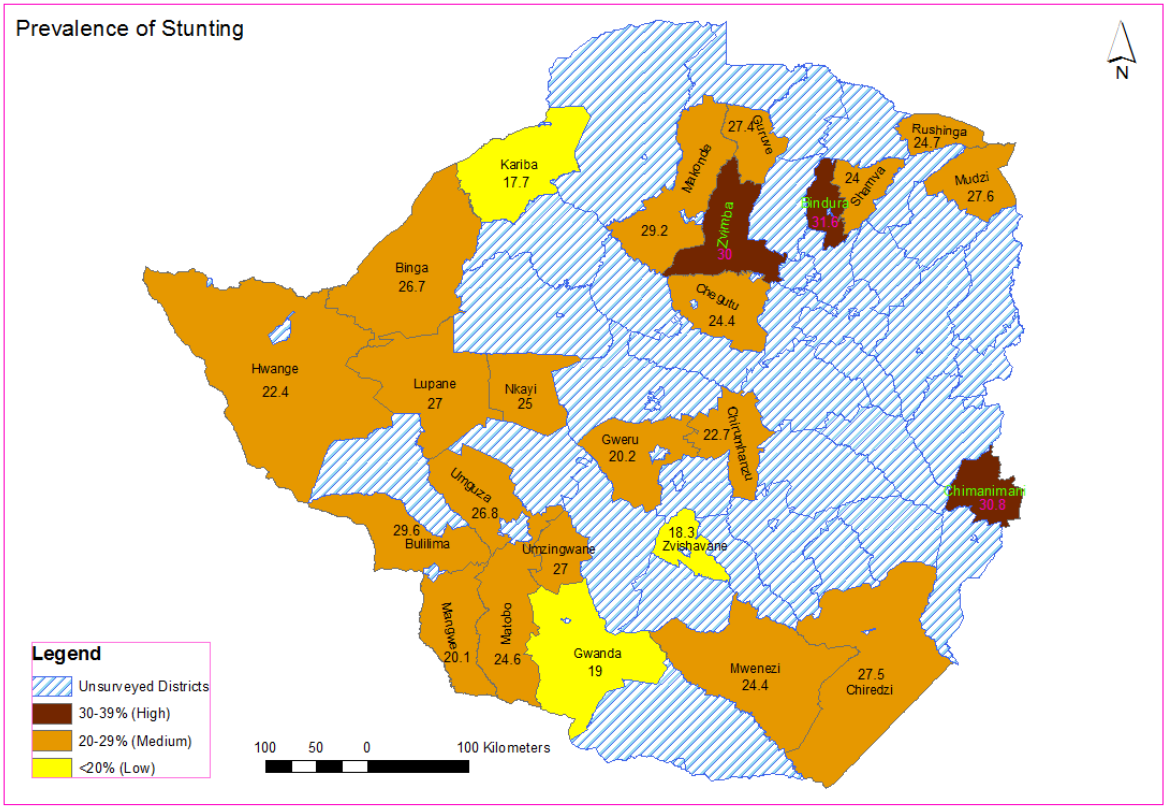


Figure 18: Prevalence of Stunting

Prevalence of stunting by sex in 25 emergency districts in Zimbabwe

The figure 20 below shows the prevalence of stunting by sex in 25 emergency districts. Prevalence of stunting was generally higher amongst boys than girls except for Zvimba (29.4 %), Chiredzi (26.8 %) and Bulilima (29.2 %). Overally, Chimanimani recorded the highest prevalence amongst boys (35.2 %), followed by Makonde and Binga with 34.8 percent and 33.7 percent respectively. For girls, highest prevalence was observed inBindura, Zvimba and Bulilima with 30.8 percent, 30.7 percent and 30.1 percent respectively.

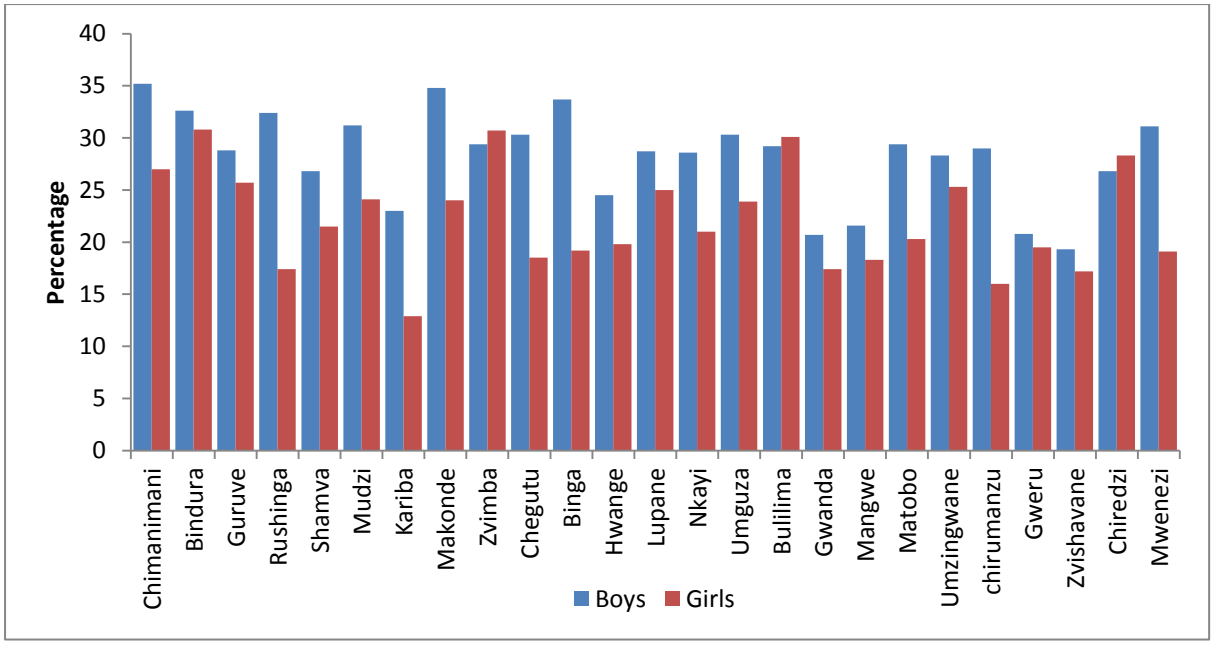


Figure 19: Prevalence of stunting by sex in 25 emergency districts

Prevalence of undernutrition by age group in 25 emergency districts among children 6-59months

The Figure 21 below presents prevalence of stunting, global acute malnutrition and underweight by age group in the 25 emergency districts. Stunting increases sharply from 6-17 months and peaks in the 18-29 months category. It then falls gradually from 30-59 months. On the other hand, Underweight is high from 18 – 40 months and drops from 41 months onwards. The trends also show that Global acute malnutrition generally decreases with age.

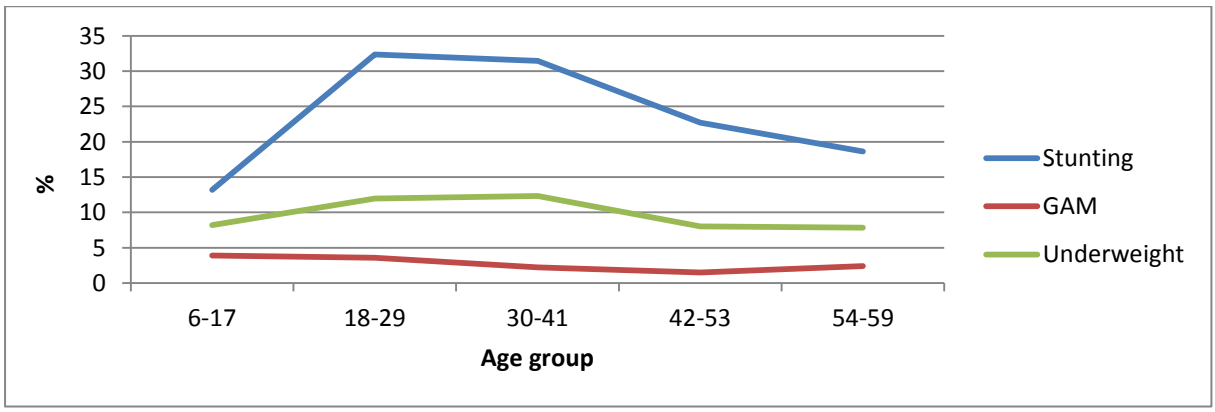


Figure 20: Undernutrition by age group

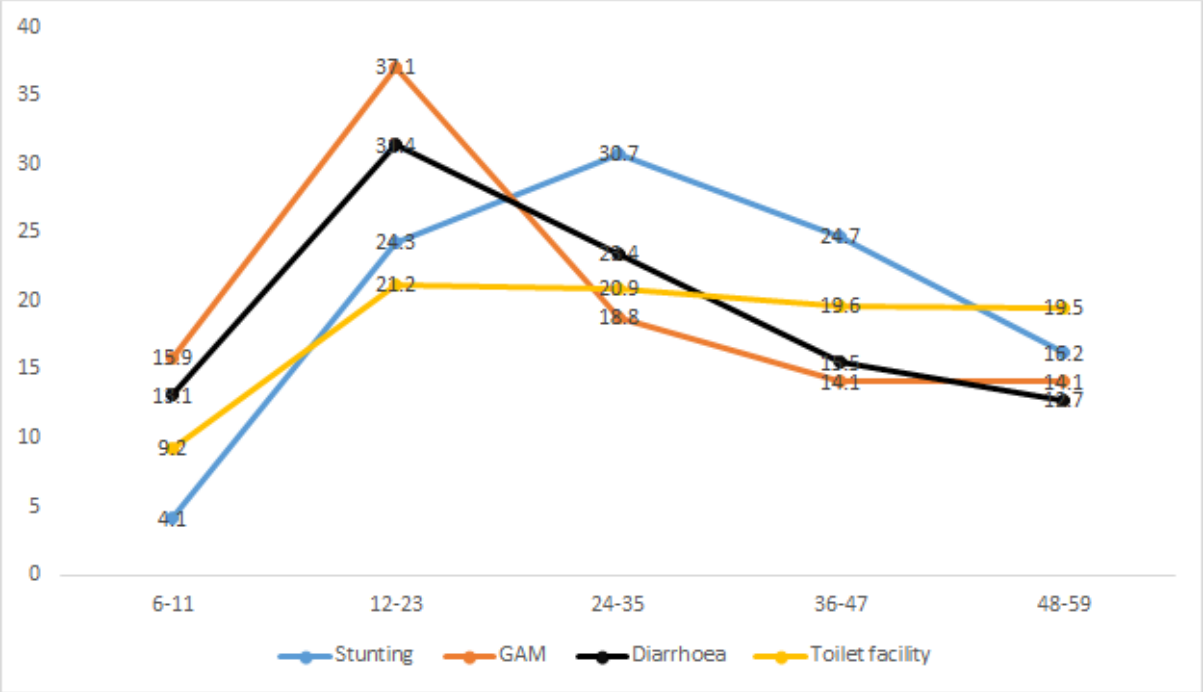
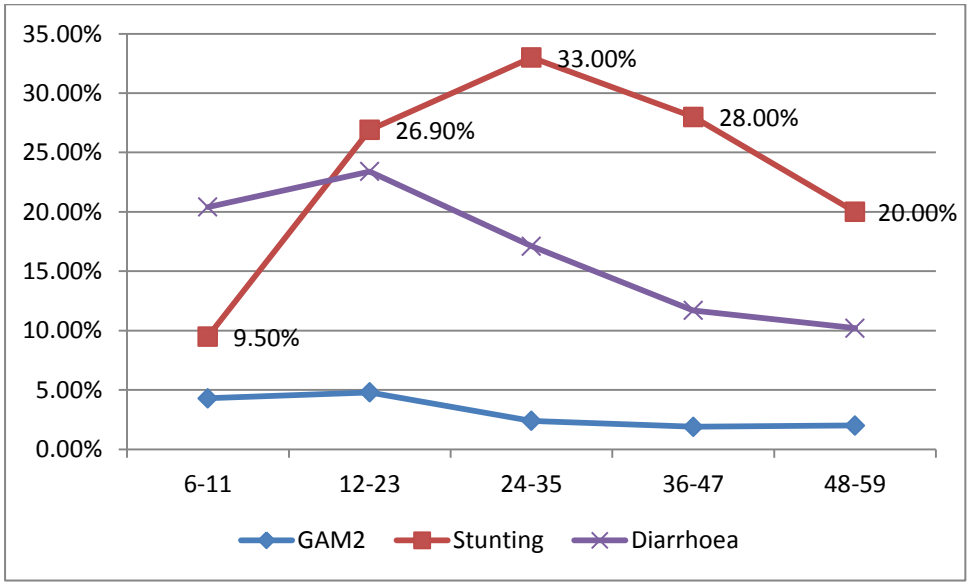


Figure 22 : Relationship of undernutrition to diarrhea and lack of toilet facility



There seems to be a relationship between malnutrition (stunting or GAM) and Diarrhoea as well as between malnutrition and having no toilet facility. The proportion of children with stunting and GAM tend to rise with age from 6 to 23 months and decrease gradually from 24 to 59 months. The pattern is similar to the proportion of children having diarrhea and living in household without a toilet facility. The proportion of children with diarrhoea and

those living in households without a toilet facility increases with age group from 6 to 23 months and gradually decrease from 24 to 59 months.

CHILD HEALTH

Children with weight, height and MUAC measured by health worker

Figure 22 below presents the proportion of children who had their weight, height or MUAC measured by a Health Worker within 30 days preceding the survey. Weight, heights and MUAC measurements are done at growth monitoring visits at health facilities or outreach points or during active malnutrition case finding by health workers. The results show that Binga (83.9 %) and Hwange (78.6 %) had the highest proportion of children who had either weight, height or MUAC measured by a health worker in the last 30 days prior to the survey. This could be attributed to active screening of malnutrition by community health workers. Though the same intervention is being implemented in districts such as Lupane, Zvishavane, Umzingwane and Gwanda, the coverage remained low. Lupane recorded the least proportion at 18.2 percent.

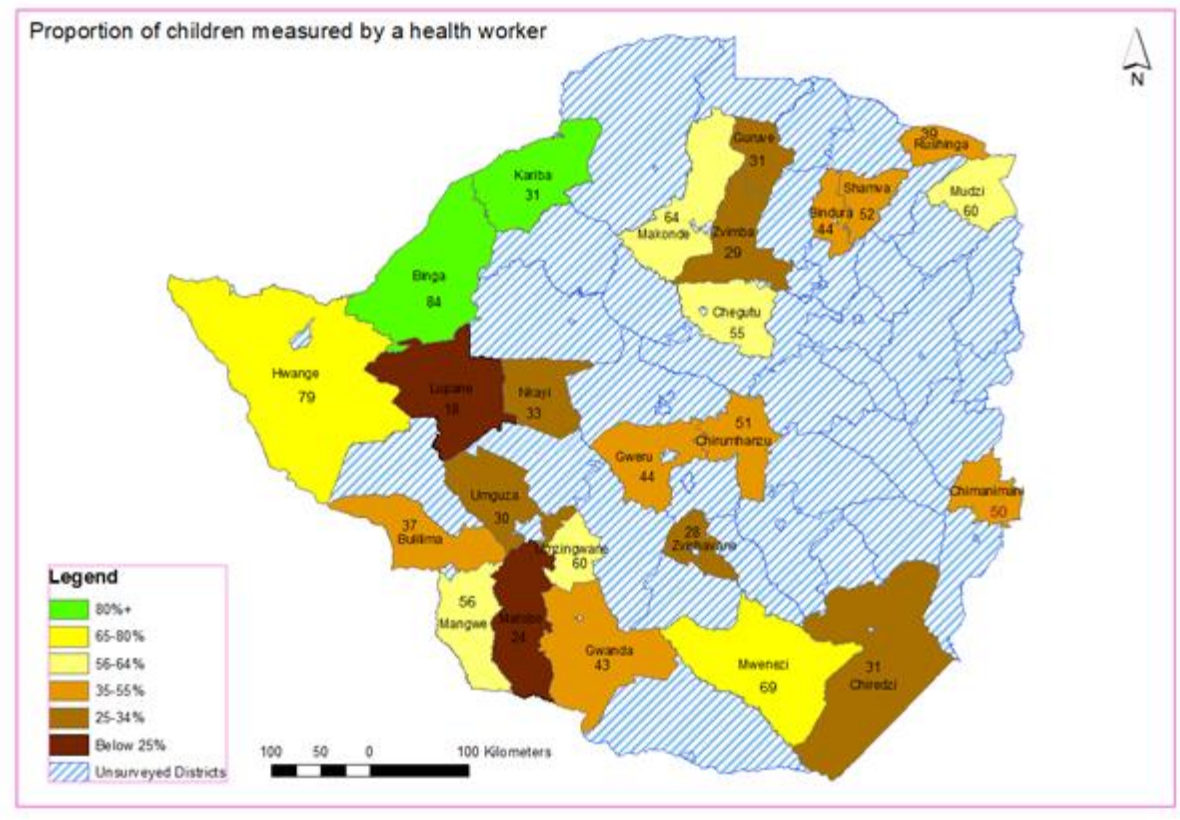


Figure 21: Children accessing growth monitoring by district

Vitamin A Supplementation Coverages 6-11 months

The survey collected data on vitamin A supplementation in the last 12 months among children 6-59 months. The information was verified using the child health card. Figure 23 below presents Vitamin A supplementation coverages by district in children 6-11 months. The data show that Binga (87 %), Hwange (85.7 %) and Bulilima (85.7 %) districts recorded highest Vitamin A Supplementation (VAS) coverages in the 6 – 11 months age group which are above the 85 percent national target. The lowest coverage of VAS amongst the 6 – 11 months age group was recorded in Chegutu at 53.1 percent and Kariba at 42.3 percent.

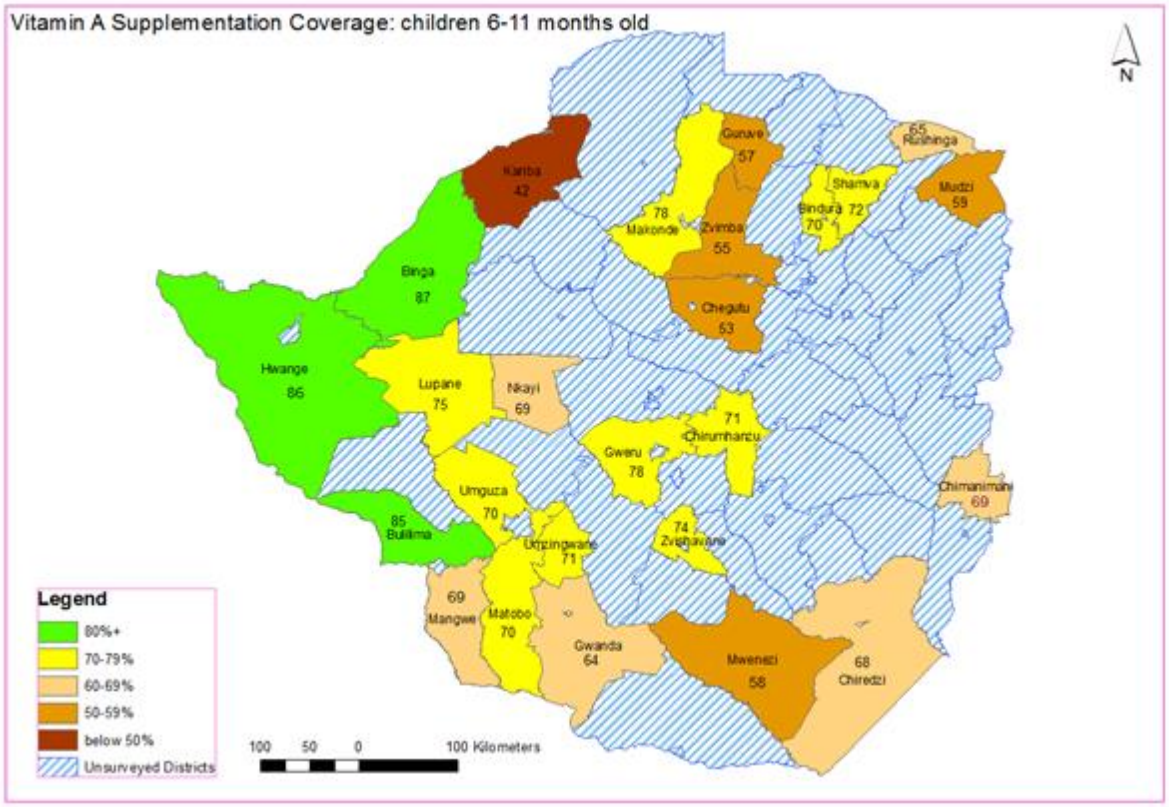


Figure 22: Vitamin A supplementation coverages 6- 11 months

Vitamin A supplementation coverages 12- 59 months

Figure 24 below illustrates Vitamin A supplementation coverages in 12-59 months. In the 12-59 age groups only two districts Binga (92 %) and Mangwe (93.9 %) had VAS coverages above 90 percent whilst the least coverages were recorded in Kariba (31.5 %) and Lupane (24.3 %). Lupane emerged as the lowest in proportion of children who were measured by a health worker as well as VAS.

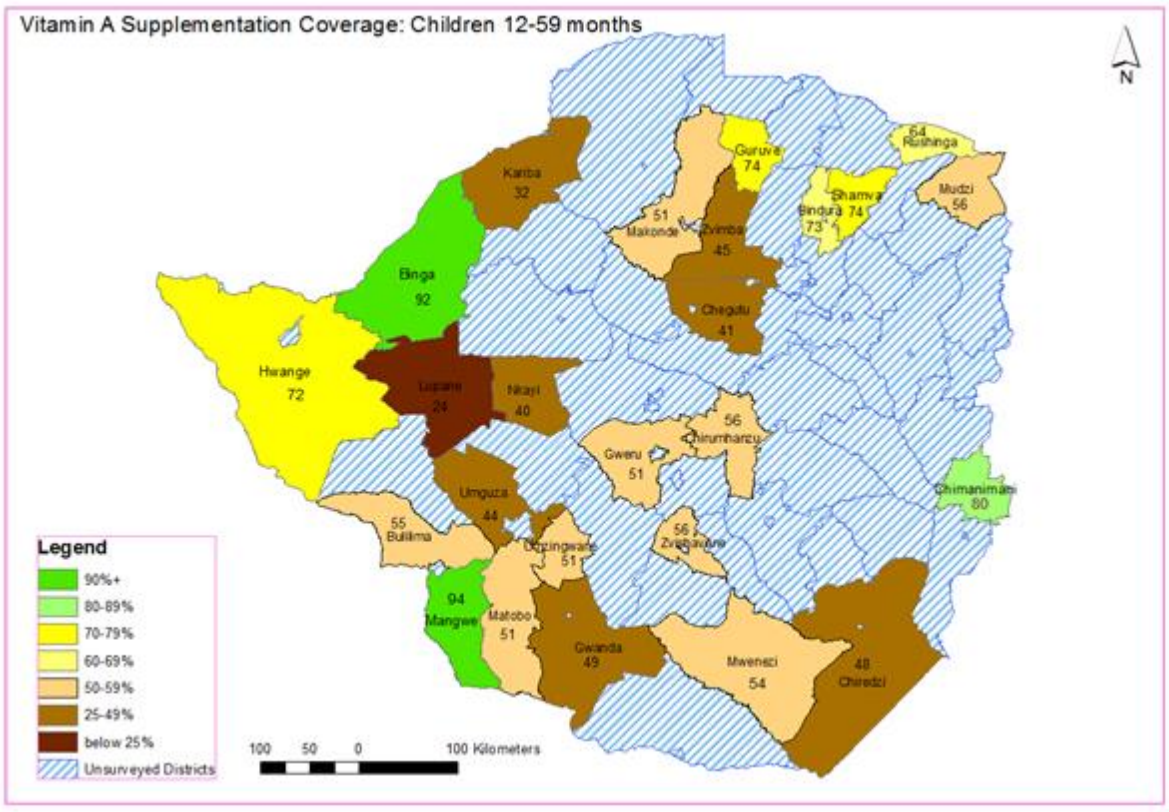


Figure 24: Vitamin A supplementation coverages 12-59 months

Reasons for receiving less than 2 doses of Vitamin A Capsules

Figure 25 below illustrates the reasons for children 6 – 59 months cited by caregivers for not receiving the recommended 2 doses of Vitamin A supplementation per year. Lack of information (51 %) was the major reason for children not receiving Vitamin A followed by distance to the health facility (27%). Other reasons were **client related** which included forgetting, lack of time or absence, fear of health worker and no child health card.

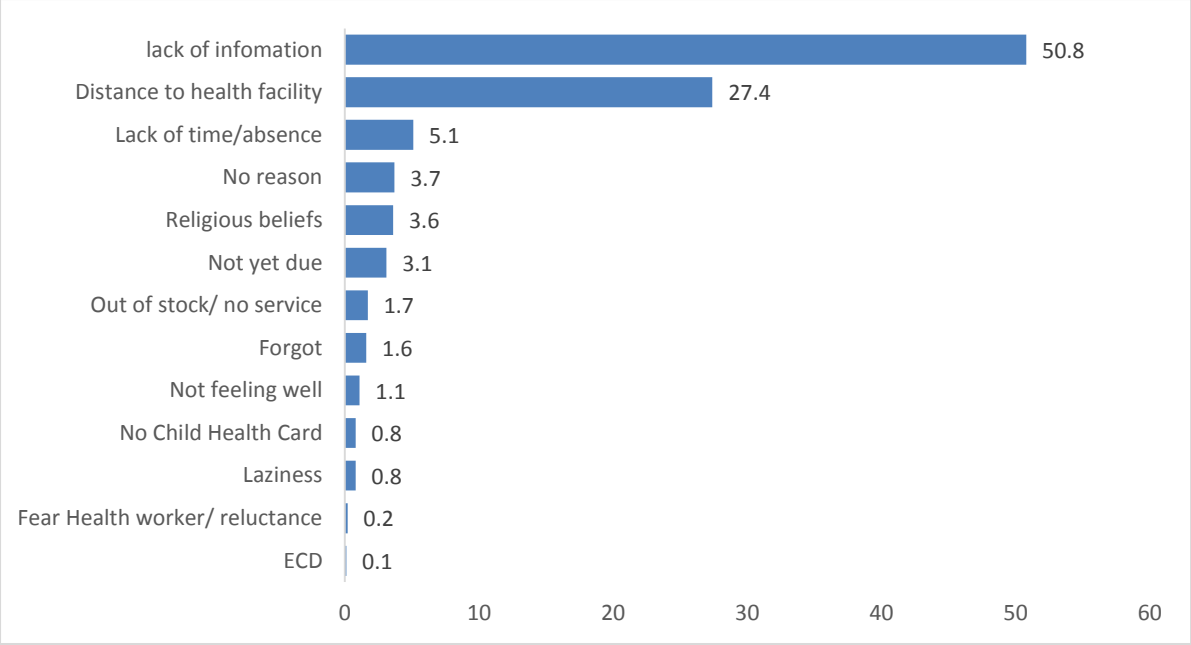


Figure 23: Reasons for receiving less than 2 doses by age

Children admitted supplementary and therapeutic feeding by districts

The survey also collected data on the proportion of children admitted in the selective feeding programmes. There are two forms of Selective Feeding Programmes:- (1) **Supplementary Feeding Programmes (SFP)** to rehabilitate moderately malnourished persons or to prevent a deterioration of nutritional status of those most at-risk by meeting their additional needs and (2) **Therapeutic Feeding Programmes (TFP)** to rehabilitate severely malnourished persons and thus reduce excess mortality. Table 11 below shows the proportion children 6-59 months of age admitted in supplementary feeding or therapeutic feeding programmes by districts. Bulilima had the highest percentage of children admitted to the supplementary feeding programme (27.3%) followed by Gwanda (22.3 %) and Mangwe (16.7 %). Gweru reported the highest coverage of super cereal plus at 44.7 percent, followed by Kariba at 38 percent and Binga at 37 percent.

Kariba (20.3 percent) had the highest coverage for Ready to Use Therapeutic Foods followed by Mwenezi (1.7 %) and Umguza (0.9 %) whilst the lowest was reported in 11 districts at 0 percent. For RUTF Umguza recorded the highest coverage rate at 2.0 percent, followed by Rushinga (1.8 %) and Mudzi (1.7 %). The lowest coverage was reported in 6 districts at 0 percent.

Table 11: Children receiving supplementary and therapeutic foods by district

	CSB	Super cereal plus	RUTF	RUSF	micronutrient powders
Bindura	1.7	2.1	0.7	0.7	0.7
Binga	7.0	37.0	0.5	0.5	0.0
Bulilima	27.3	0.9	0.4	0.4	0.0
Chegutu	0.8	4.0	1.2	0.0	1.6
Chimanimani	11.9	0.4	0.8	0.0	0.4
Chiredzi	2.0	0.4	0.0	0.0	0.0
Chirumhanzu	0.0	2.5	0.0	0.0	1.5
Guruve	0.9	0.4	0.0	0.4	0.0
Gwanda	22.3	2.0	1.0	0.5	1.0
Gweru	2.6	44.7	0.8	0.4	1.1
Hwange	0.4	1.1	0.4	0.0	0.8
Kariba	10.1	38.0	1.2	20.2	2.0
Lupane	1.7	1.7	2.1	0.0	0.9
Makonde	0.8	5.7	0.0	0.8	0.0
Mangwe	16.7	0.0	0.0	0.0	0.5
Matobo	2.6	0.9	0.9	0.0	0.0
Mudzi	2.0	4.4	1.7	0.0	0.3
Mwenezi	1.7	6.6	0.4	1.7	0.0
Nkayi	0.8	0.0	0.0	0.0	0.0
Rushinga	4.0	0.9	1.8	0.4	1.8
Shamva	2.1	1.7	0.4	0.4	0.4
Umguza	1.0	3.0	2.0	1.0	2.5
Umzingwane	0.4	0.0	0.9	0.0	0.9
Zvimba	0.0	0.0	0.4	0.4	0.0
Zvishavane	9.1	4.3	0.4	0.8	0.4
Total	4.9	6.6	0.7	1.2	0.7

Children benefiting from feeding Programme

The Figure 26 below shows the proportion of households under feeding programs. The highest percentage of children admitted into a feeding programme was recorded in Gweru at (40.1 %), followed by Kariba at (35.8 %) and Binga at (33.6 %). The lowest coverage was recorded in Nkayi and Zvimba at (0.3 %).

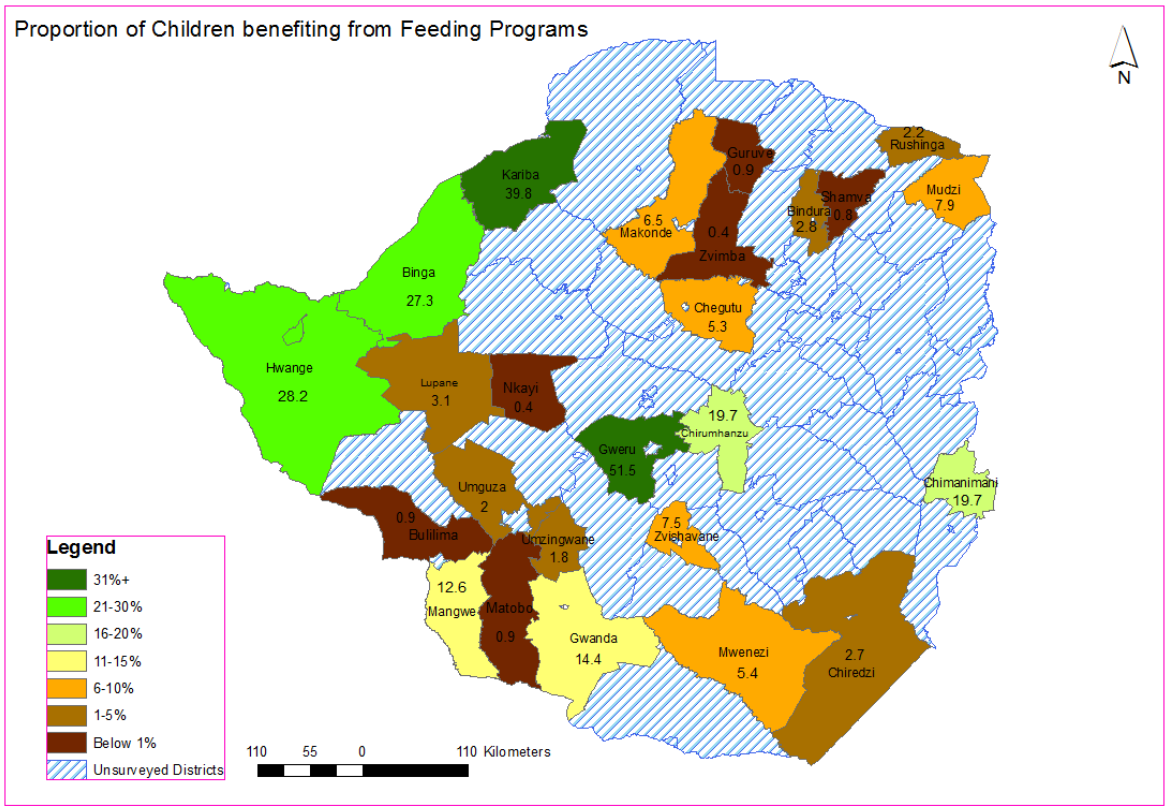


Figure 26: Proportion of children benefitting from feeding programmes

CHILD HOOD ILLNESSES

Prevalence of Childhood illnesses by district

Of all the children who were ill with the cough two weeks prior, Kariba recorded the highest at 49, 8 percent, followed by Lupane (45 %) and Gweru (40, 4 %). The lowest proportion of children suffering from cough two weeks prior to the survey was recorded in Binga with 9, 5 percent. Diarrhoea and fever was most prevalent in Kariba at 36, 6 percent and 43, 4 percent respectively and, both were lowest in Bulilima at 4 percent and 7.9 percent respectively.

Among the children 0-59 months old reported to have been ill two weeks prior the survey, the highest proportion had cough at 49, 8 percent, fever at 43, 4 percent and diarrhoea at 36, 5 percent. Rates of illness in children during the survey period were higher than previously reported – likely a result of the timing of the survey which was carried out during the rainy season.

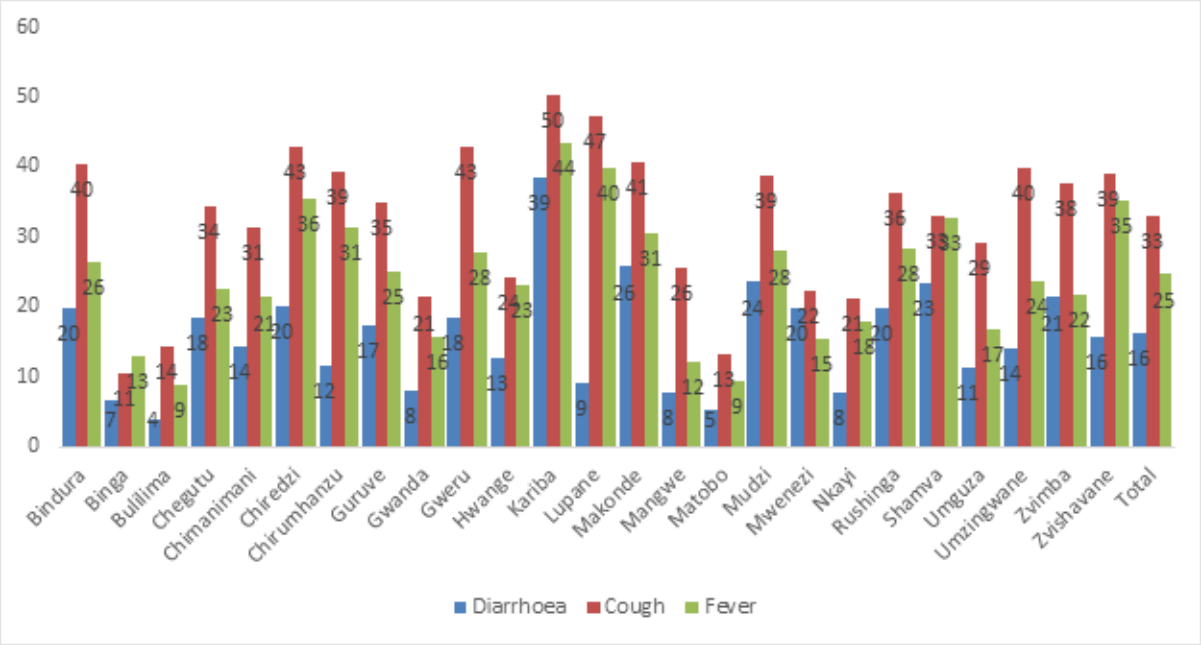


Figure 24: Prevalence of Childhood illnesses by district

WATER SANITATION AND HYGIENE

The three main underlying causes of undernutrition, namely unsuitable or insufficient food intake, poor care practices and disease, are directly or indirectly related to inadequate access to water, sanitation and hygiene. Poor WASH conditions facilitate ingestion of fecal pathogens which leads to diarrhea, intestinal worms and environmental enteric dysfunction. This directly relates to the body's ability to resist and respond to sickness by affecting the absorption of nutrients and decreasing body's immunity. Consumption of un safe water from unprotected sources has many indirect effects on nutrition. Umguza had the highest proportion of children living in households with improved water sources at 98, 6 percentwhile Binga (48, 9 %) had the least proportion

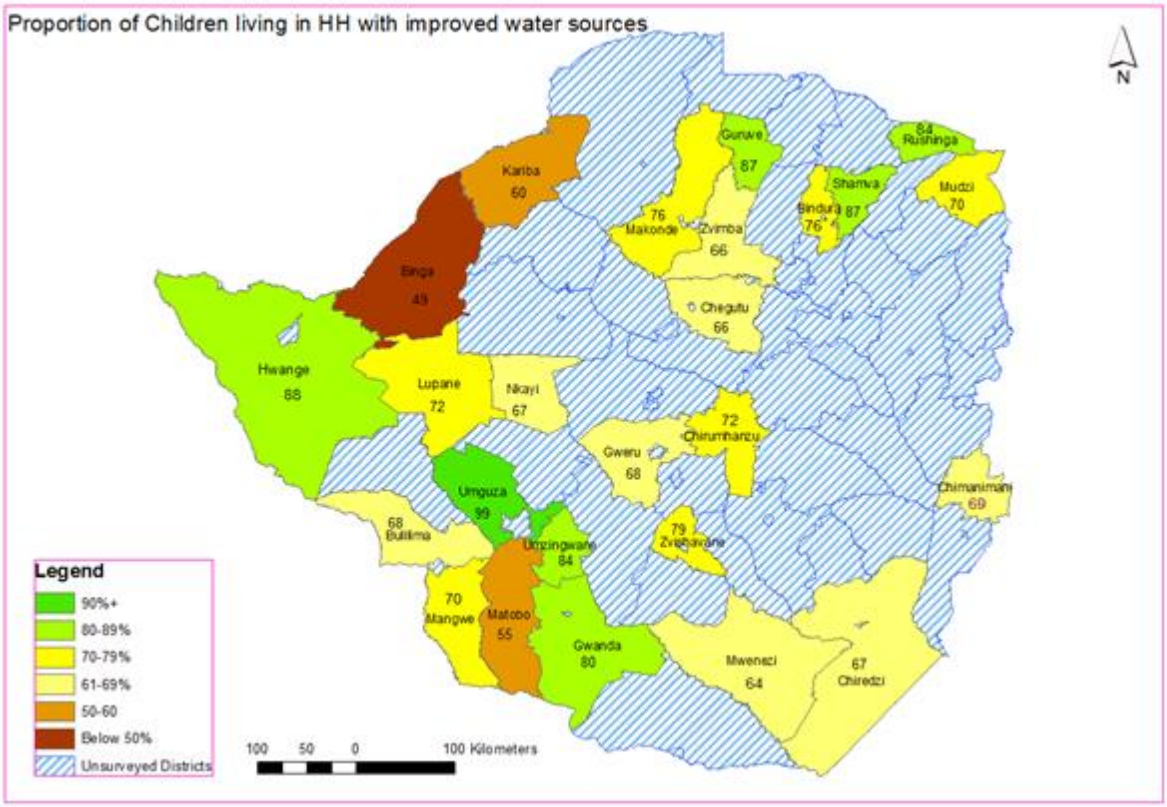


Figure 25: Proportion of children living in households with improved water sources

Proportion of children living in households with Improved/Unimproved toilet facility/ no facility

Figure 28 below presents proportion of children living in households with improved/ unimproved/ or no toilet facilities. Chimanimani district had the highest proportion of children living in households with access to improved toilet facilities, at 82.1 percent whilst Binga had the least at 25.8 percent. Binga had the highest proportion of children living in households that practice open defecation, at 73. 3 percent, followed by Lupane and Kariba, both at 66.4 percent. The least was Chimanimani with 3.5 percent. Bindura recorded the highest percentage of children living in households with access to unimproved sanitation facilities, at 36.6 percent. Umguza, Nkayi and Lupane were the least with all three recording 0 percent. For improved/ or unimproved toilet facilities table see Annex III.

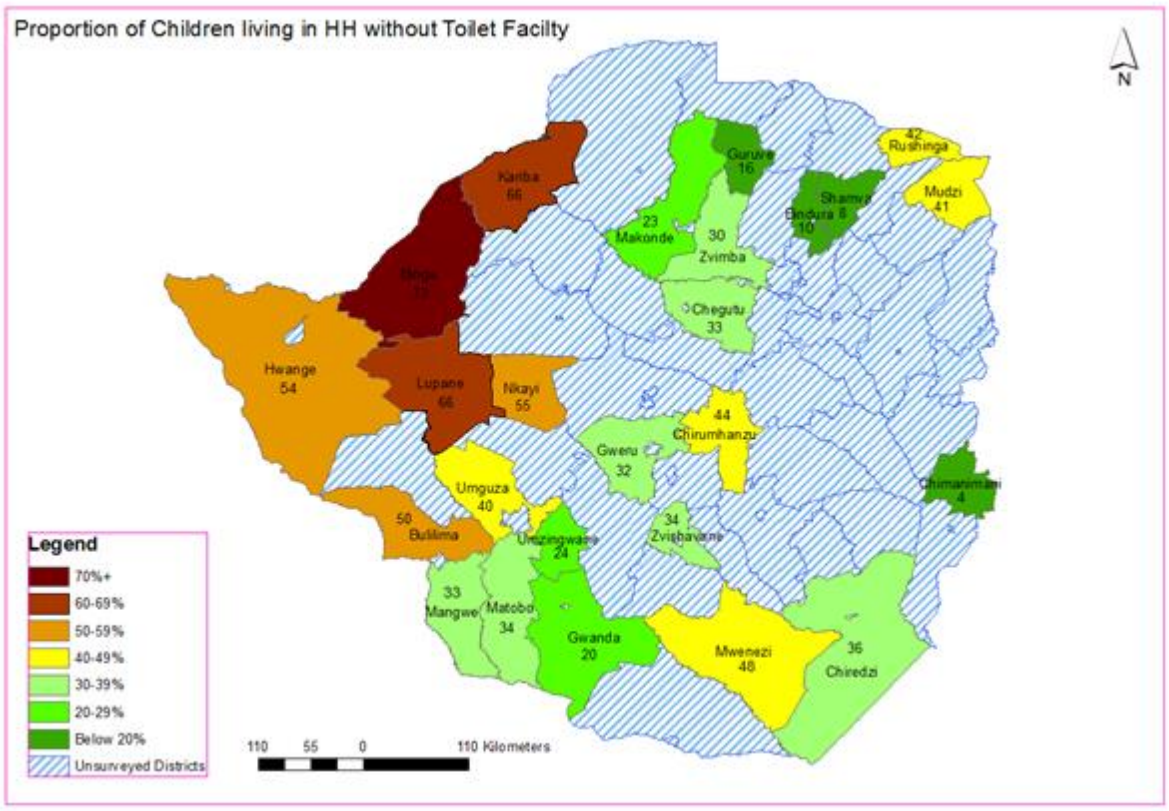


Figure 28: Proportion of children living in households practicing open defecation

Children living in households practicing hand washing

According to World Health Organization, **50 percent** of child undernutrition cases are due to repeated diarrhoea and intestinal infections caused by poor sanitation and hygiene conditions or by a lack of safe water. Hygiene plays an important part in preventing micronutrient deficiencies, stunting, wasting and nutrition-related deaths. Handwashing is critical in preventing childhood malnutrition. Figure 29 below shows the proportion of under 5 children living in households practicing hand washing by district. The proportion of children living in households practicing hand washing is lowest in Kariba district. However the rest of the districts have more than 50 percent of the children living in households practicing hand washing. Rushinga and Umguza both recorded highest proportion of children living in households practicing hand washing at 96 percent followed by Chirumhanzu at 95 percent.

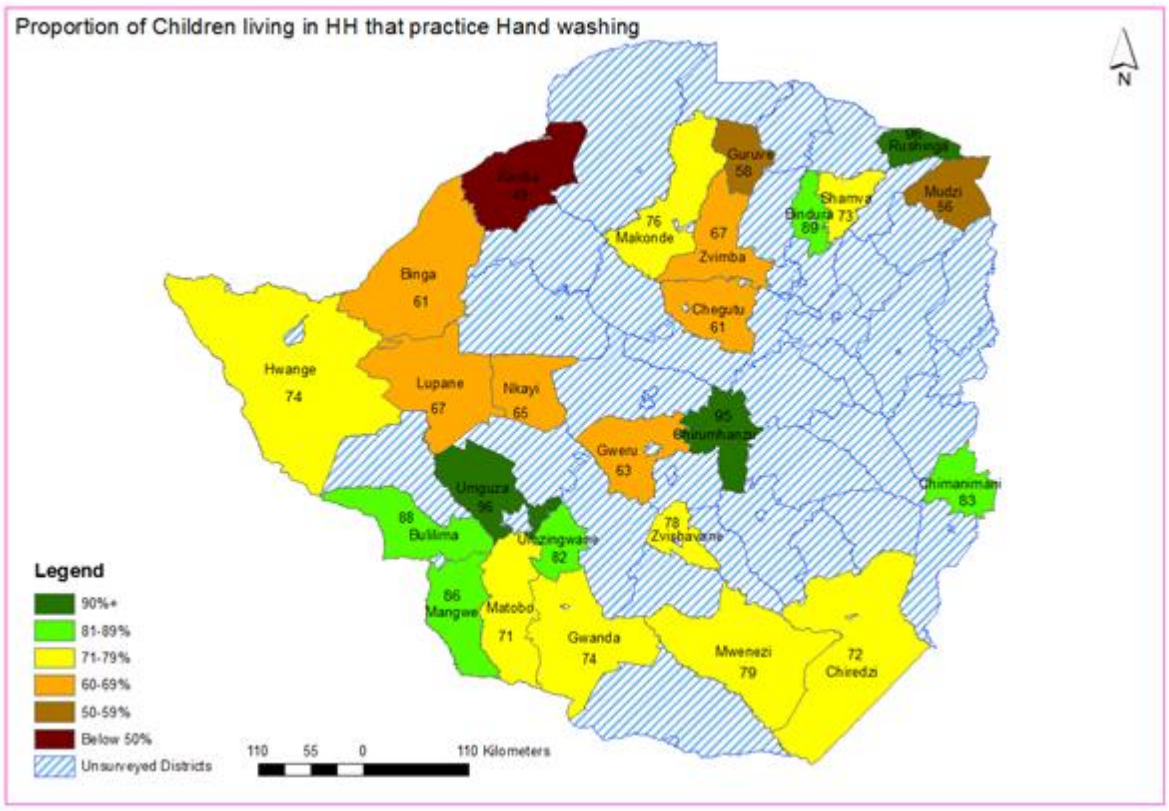


Figure 29: Proportion of children living in households practicing hand washing

MORTALITY

Crude Mortality Rate

Overall, all the 25 districts had crude mortality rates below the WHO cut-off point of 1 death per 10,000 population per day. Crude mortality rate was highest in Zvimba district at 0.82 deaths per 10,000 population per day followed by Bulilima at 0.62 deaths per 10,000 population per day. The rest of the 25 districts were below 0.25 deaths per 10,000 population per day.

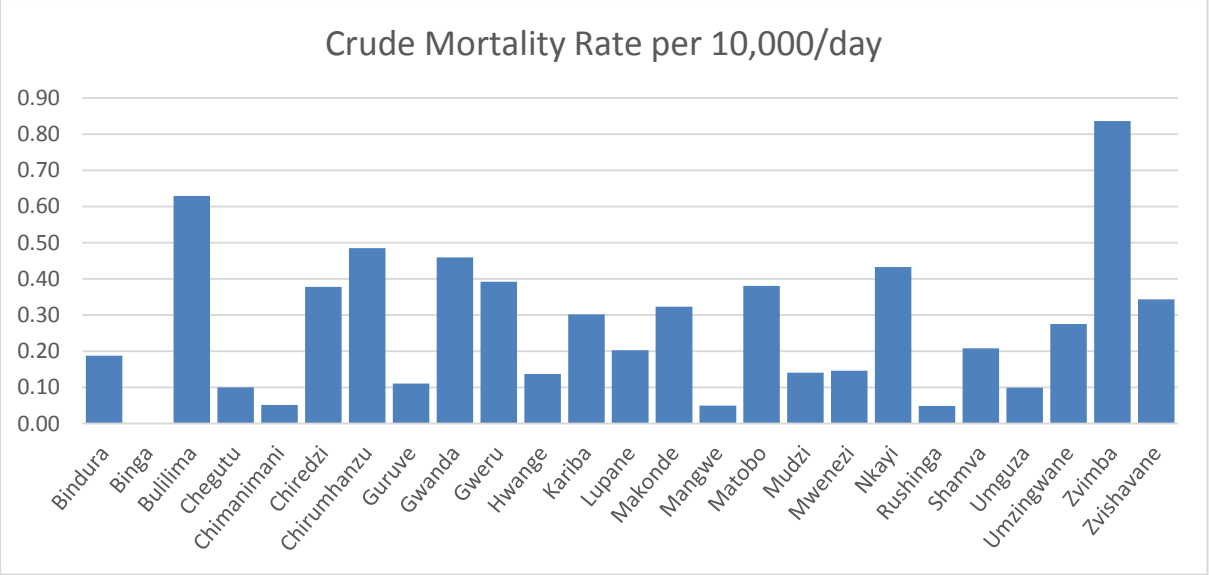


Figure 30: Crude Mortality Rate

Crude mortality rate by sex

Figure 31 shows crude mortality rate by sex. There were more female deaths than male deaths in Bulilima, Gwanda, Zvishavane, Umzingwane, Kariba, Bindura, Matobo, Hwange and Chimanimani districts.

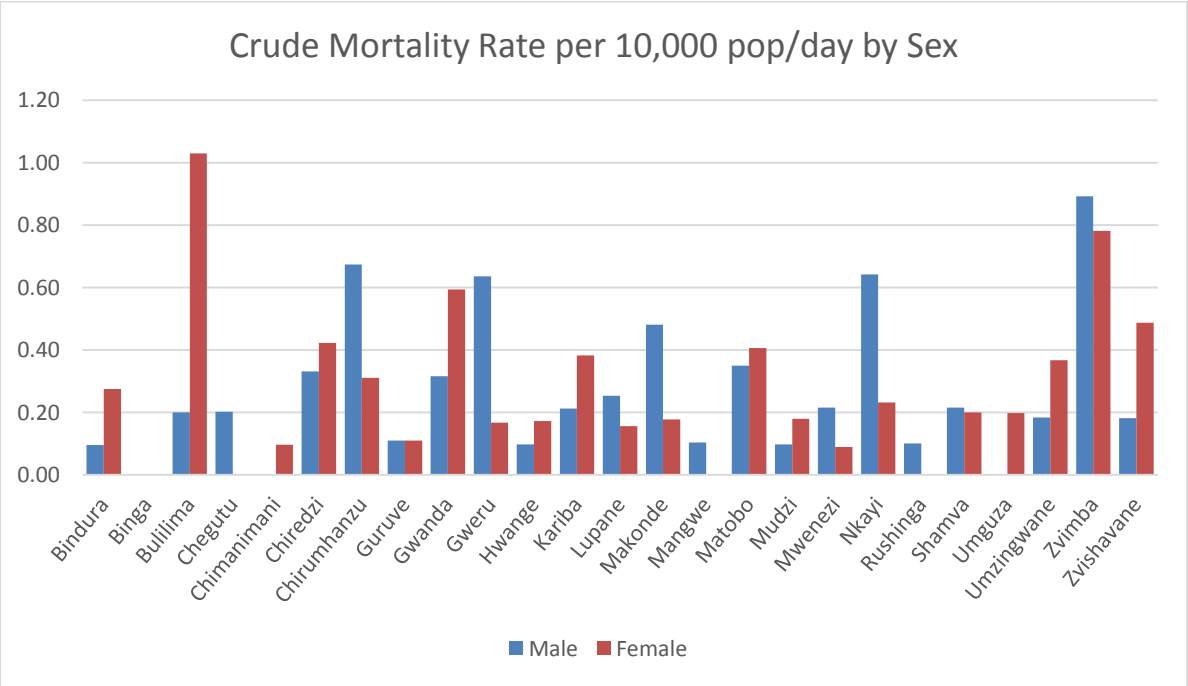


Figure 31: Crude mortality rate by sex

Under-five mortality per 10,000 children per day for the period Oct 16 - Jan17

Figure 32 shows under-five mortality. Overall the under- five mortality rate was below 2 deaths per 10,000 children per day for the period October 2016 to January 2017. Shamva had the highest mortality rate of 0.66 deaths per 10,000 children per day followed by Chiredzi at 0.63, Gweru at 0.58 and Zvimba at 0.59. The rest of the districts had mortality rates of less than 0.5 deaths per 10,000 children per day. More than half the districts (14 out of 25) recorded no deaths of children under the age of five years during the period October 2016 to January 2017.

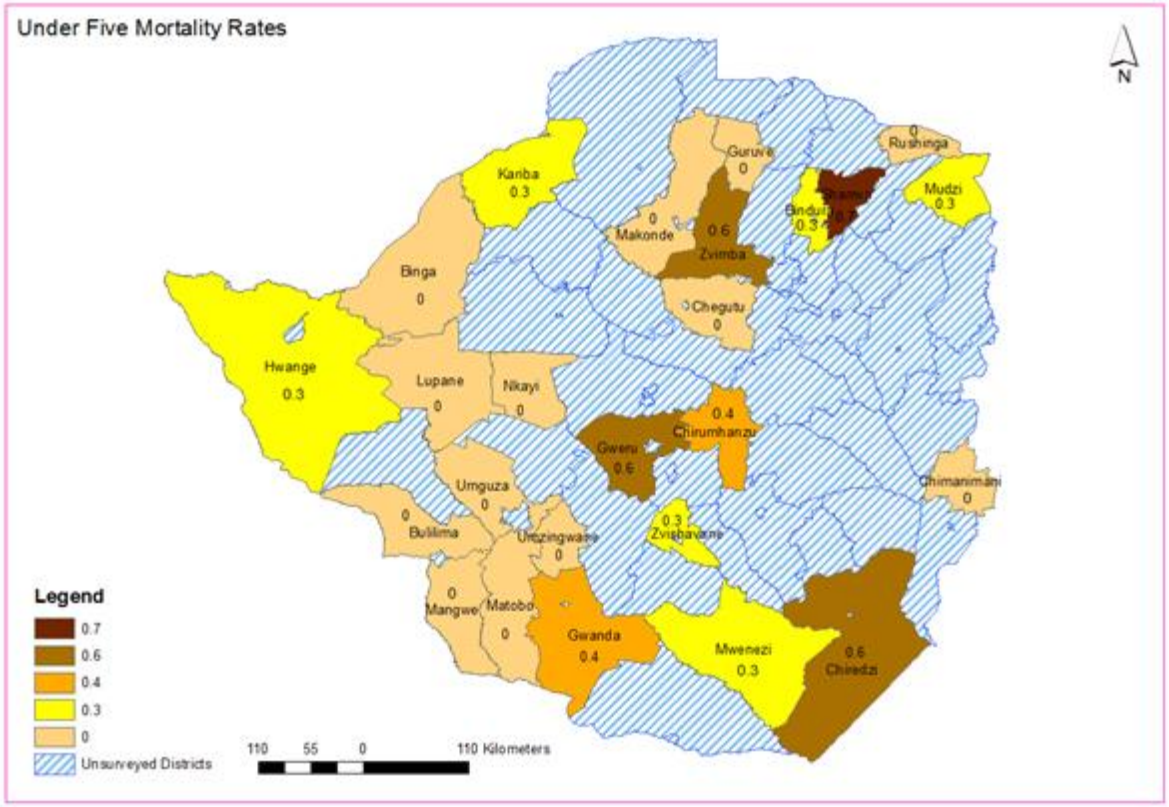


Figure 32: Under-five mortality per 10,000 children per day

Table 12: **Crude associations (unadjusted Odds Ratio (OR)) between Global Acute Malnutrition (WHZ <-2SD) and covariates**

Variable	Category	GAM		OR	95% CI	p-value
		No n (%)	Yes n (%)			
HH water source	Improved	4054 (97.0)	127 (3.0)	1		
	Unimproved	1540 (97.3))	43 (2.7)	1.1	0.8 - 1.6	0.52
Toilet facility	Improved	3147 (97.6)	79 (2.4)	0.2	0.1 – 1.0	0.04*
	Unimproved	447 (97)	14 (3.0)	0.3	0.1 - 1.5	0.15
	No facility	1988 (96.4)	75 (3.6)	1		
Wash hands	No	1440 (96.1)	59 (3.9)	1.5	1.1 - 2.1	
	Yes	4160 (97.4)	111 (2.6)	1		0.01*
Orphan	no	5093 (97.1)	150 (2.9)	1		
	yes	284 (95.3)	14 (4.7)	1.7	0.9 – 3.0	0.07
Mother Alive	no	71 (92.2)	6 (7.8)	1		
	yes	5526 (97.1)	164 (2.9)	2.9	1.0 - 6.6	0.01*
MAD	no	1108 (95.4)	54 (4.6)	1.2	0 .4 - 3.9	0.78
	yes	73 (96.1)	3 (3.9)	1		
Admitted in any feeding programme	no	5067 (97.4)	137 (2.6)	1		
	yes	523 (94.1)	33 (5.9)	2.3	1.5 - 3.5	<0.001 *
Diarrhoea	no	4692 (97.3)	129 (2.7)	1		
	yes	904 (95.8)	40 (4.2)	1.6	1.1 - 2.3	0.009*
Cough	no	3748 (96.8)	124 (3.2)	1		
	yes	1848 (97.6)	46 (2.4)	1.3	0.9 - 1.9	0.10
Fever	no	4227 (97.3)	118 (2.7)	1		
	yes	1365 (96.3)	52 (3.7)	0.7	0.5 - 1.0	0.07

**represents significant associations p-<0.05, 1 represents control group.*

From table 12 shows that children 6 to 59 months old whose mothers are dead are 2.9 times likely to have GAM compared to children of the same age who have their mothers still alive. The association is not statistically significant at 95% confidence level. Children 6 to 59 months old who had diarrhoea in the last two weeks were 1.6 times likely to have GAM compared to children of the same age group who did not have diarrhoea in the same time period. The association between diarrhoea and GAM was statically significant at 95% confidence level.

Table 13: **Crude (unadjusted Odds Ratio (OR)) associations between stunting (HAZ <-2SD) with covariates**

		Stunting				
Variable	**Category**	**No n (%)**	**Yes n (%)**	**OR**	**95% CI**	**p-value**
HH water source	Improved	3120 (74.9)	1046 (25.1)			
	Unimproved	1170 (74.3)	404 (25.7)	0.9	0.9 – 1.1	0.664
Toilet facility	Improved	2445 (76.1)	768 (23.9)	1.0		
	Unimproved	329 (72.1)	127 (27.9)	1.2	1.0 – 1.5	0.08
	No facility	1502 (73)	555 (27)	1.2	1.0 – 1.3	0.011*
Wash hands	No	1110 (74.3)	384 (25.7)	1.0		
	Yes	3185 (74.9)	1067 (25.1)	1.0	0.9 – 1.2	0.641
Orphan	No	3938 (75.4)	1284 (24.6)			
	Yes	195 (65.9)	101 (34.1)	1.6	1.2 – 2.0	0.001*
Mother Alive	No	48 (62.3)	29 (37.7)			
	Yes	4245 (74.9)	1421 (25.1)	1.8	1.1 – 3.0	0.039*
Mother Lives in household	No	729 (73.1)	268 (26.9)			
	Yes	3518 (75.3)	1154 (24.7)	1.2	1.01 – 1.4	0.149
MAD	No	953 (77.9)	271 (22.1)			
	Yes	63 (81.8)	14 (18.2)	1.5	0.84 – 3.0	0.415
Admitted in any feeding programme	No	3872 (74.7)	1311 (25.3)			
	Yes	416 (75.2)	137 (24.8)	1.0	0.79 – 1.2	0.789
Diarrhoea	No	3614 (75.3)	1187 (24.7)			
	Yes	677 (72)	263 (28)	1.2	1.01 – 1.4	0.036*
Cough	No	2851 (74)	1004 (26)			
	Yes	1440 (76.3)	447 (23.7)	0.9	0.78 – 1.0	0.054
Fever	No	3222 (74.5)	1105 (25.5)			
	Yes	1065 (75.5)	346 (24.5)	1.0	0 .82 – 1.1	0.446

** represents a significant association, 1 represents the control group.*

Table 13 above presents the associations between stunting (HAZ <-2 SD) and many covariates before adjustment. Children 6 to 59 months old who were orphans (lost either parents or one parent) were 1.6 times likely to be stunted compared to children of the same age group who were not orphans. The association between stunting and orphan hood was

statistically significant at 95% confidence level. Children 6 to 59 months who did not have a minimum acceptable diet were 1.5 timely to be stunted compared to children of the same age group who had a minimum acceptable diet. The association between stunting and MAD was statistically insignificant at 95% confidence level.

Table 14: Adjusted associations (Odds Ratio) between Stunting (HAZ<-2SD) and covariates

Stunting	Category	Odds Ratio	p-value	[95% Conf. Interval]
Orphan	Yes	1.6	<0.001*	1.2 - 2.0
	No	1		
Diarrhoea	Yes	1.2	0.016*	1.0 - 1.4
	No			
Toilet facility	improved	1		
	no facility	1.2	0.016*	1.0 - 1.3
	unimproved	1.2	0.075	1.0 - 1.5
Cough	Yes	0.7	0.028*	0.8 - 1.0
	No	1		
Constant		0.3	<0.001*	0.3 - 0.3

*represents a significant association, 1 represents the control group

Table 14 above represents the associations between a covariate and stunting (HAZ <-2SD) controlling for the presents of other covariates. Children 6 to 59 months old who were orphans (either parents or one parent dead) at the time of assessment were 1.6 times likely to be stunted compared to children of the same age group who were not orphans after adjusting or controlling for Diarrhoea, toilet facility and coughing. The association was statistically significant at 95% confidence level.

Table 15: **Adjusted associations (Odds Ratio) between Global Acute Malnutrition (WHZ <-2SD) and covariates**

GAM	Category	Odds Ratio	p-value	95% CI
Diarrhoea	Yes	1.5	0.044	1.0 - 2.2
	No	1		
Hand washing	Yes	0.7	0.017	0.5 - 0.9
	No	1		
Orphan	Yes	1.7	0.073	1.0 - 2.9
	No	1		
Fever	Yes	1.3	0.215	0.9 - 1.7
	No	1		
Constant		0.1	<0.001	0.1 - 0.0

**represents a significant association, 1 represents the control group*

Table 15 above presents the adjusted (controlled) associations between GAM and covariates. Children 6 to 59 months old who had diarrhoea in the past two weeks prior to the assessment were 1.5 times likely to have GAM compared to children who did not have diarrhoea of the same age group adjusting for hand washing, being an Orphan and having Fever. The adjusted association between GAM and diarrhoea was statistically significant at 95% confidence level.

CHAPTER 4: DISCUSSION

The prevalence of Global Acute Malnutrition was lower than the findings observed in the ZimVAC 2016, with Binga and Kariba recording the highest prevalence of GAM among the 25 emergency districts. Generally, boys more affected by malnutrition than girls. That boys are more affected by malnutrition especially stunting is not peculiar to this study alone but a phenomenon observed in other studies in Zimbabwe (ZimVAC 2016, FNC, 2010) and across many countries (Wamani, *et al*., 2007; FSNAU, 2011; FSNAU 2012; Black *et al*., 2013). However, while consistent with other findings mentioned above, this is different from the ZDHS 2015 finding where boys and girls were equally affected by acute malnutrition (ZDHS, 2016). The reason for is however not well understood. Most districts in particular Binga, Guruve, Shamva, Gwanda and Chirumanzu have relatively high caseloads of children with MAM that without interventions and good coverage, these children may slip into SAM, increasing their odds for death if not given treatment and/or nutritional rehabilitation.

Districts that include Gweru, Umzingwane, Kariba and Chegutu have SAM rates above the NCHS cut off threshold of 2% and this is a course for concern especially with 10 cases of oedema reported in this survey. This may suggest that a gap still exist in some districts with regard to active case finding and referral. As such Active case finding should be intensified where it is being undertaken and initiated where it is not yet taking place so as to identify and refer children early enough for treatment to prevent child deaths. Chronic malnutrition rates from this survey are lower than rates from previous assessments such ZDHS 2015 and ZimVAC 2016, however it remains a public health challenge which require focused interventions during the 'window of opportunity' using a multi-sectoral approach.

Child feeding practices remain sub-optimal across all the 25 districts that were assessed in this survey. Optimal infant and young child feeding (IYCF) during the first two years of life lowers morbidity and mortality and reduces the risk of chronic disease. The recommended practices that promote optimal nutrition include early initiation of breastfeeding within 1 hour of birth, exclusive breastfeeding for the first 6 months of life and introduction of nutritionally-adequate and safe complementary (solid) foods at 6 months together with continued breastfeeding up to 2 years of age or beyond. Breastfeeding reduces the risk of many perinatal infections, acute lower respiratory infections and diarrhoea in infants below 23 months. Suboptimal breastfeeding is responsible for 45 percent of neonatal infectious deaths, 30 percent of diarrhoeal deaths and 18 percent of acute respiratory deaths in children under 5 years (Reference???).

Undiversified diets and inadequate meal frequency exposes children who have reached 6 months of age to risk of both acute and chronic malnutrition. Children need to be fed frequently and with solid and semi-solid foods appropriate for their age once they have attained 6 months of age. Children 6 – 23 months of age should be fed a minimum acceptable diet (MAD) to ensure appropriate growth and development. Minimum adequate diet is achieved by meeting both the minimum meal frequency and minimum dietary diversity. To satisfy the minimum meal frequency, breastfed children should consume solids, semisolids and soft foods at least 2 times if they are 6–8 months old and 3 times if they are

9–23 months old. Non breastfed children aged 6-23 months old should consume solids, semi-solid, soft foods at least 4 times per day and milk or milk products at least 2 times a day to meet the minimum meal frequency.

Breastfed children 6-23 months of age are regarded as meeting a minimum dietary diversity if they are consuming at least 4 out of the 7 food groups. The seven food groups include grains, roots and tubers, legumes and nuts, dairy products, meat and fish, eggs, vitamin-A rich fruits and vegetables, other fruits and vegetables. Non breast fed children 6-23 months of age should consume four or more food groups out of six food groups to meet minimum dietary diversity. The six food items are similar to the above but exclude the dairy products.

Bottle feeding an infant with poorly prepared infant formula in unhygienic conditions puts the infant at a great risk of illness, resulting in increased risk of mortality. Feeding an infant from a bottle with an artificial teat may also make it more difficult for the baby to learn to attach well at the breast and has been associated with earlier cessation of breastfeeding (WHO). According to WHO, if an infant cannot feed directly from the breast, then the safest alternative is to feed expressed breast milk from a cup. Whereas 3 districts namely Guruve, Mudzi and Kariba did not have any child 0-23 months fed from a bottle with a teat, Gweru and Bindura reported an increase in the proportion of children 0-23 fed from a bottle with nipple the previous day when compared with the 2010 national nutrition survey findings (FNC, 2010), an undesirable situation.

Save for Binga, coverage of Vitamin A supplementation for children falls far below the acceptable range of 85% This calls for utilisation of innovative strategies such as the use of Village health workers in administration vitamin A at community level and integration with other interventions that target the under-fives.

Binga, Kariba and Gwanda had the highest prevalence of GAM amongst boys at 8.8%, 7.1% and 6.7% respectively. Rushinga (6.1%), Chegutu (5.1%), Chimanimani (2.4%), Mwenezi (2.2%) and Zvishavane % had more girls affected by GAM as compared to boys.

Rates of illness in children during the survey period were higher than previously reported. This is likely a result of the timing of the survey. Diseases such as diarrhea are affected by seasonality as may have been the case with this survey that was conducted during a year with a atypically heavy and high rainfall across the country. Overally, all the 25 districts had crude mortality rates below the WHO cut-off point of 1 death per 10,000 population per day. Under-five deaths were reported in some district and whilst below emergency threshold, one death is still too many. Continued monitoring and strengthening lifesaving interventions required in order to keep these rates low.

CHAPTER 5: CONCLUSIONS

The prevalence of Global Acute Malnutrition was lower than the findings observed in the ZimVAC 2016. In this assessment, Binga and Kariba recorded the highest prevalence of GAM. Generally boys were more affected by malnutrition than girls in most districts. There is need for further research to ascertain why boys are more susceptible to malnutrition than girls.

The prevalence of Severe Acute Malnutrition (SAM) was highest in Chegutu and Gweru at 2.6%., with boys more affected than girls. This SAM rate is higher than the WHO 2% emergency threshold.

Chronic malnutrition rates from this survey are lower than rates from previous assessments such ZDHS 2015 and ZimVAC 2016, however it remains a public health challenges which require focused interventions during the 'window of opportunity' using a multi-sectoral approach.

Child feeding practices in all districts remain poor particularly minimum dietary diversity. This is further supported by low consumption of four star diet. This underscores the need to scale up both nutrition- specific interventions to promote intake and nutrition-sensitive interventions to promote production of diverse crops.

Despite districts having been trained in active screening growth monitoring uptake remain generally low therefore need to ensure active screening (case load identification) of children for malnourished children is strengthened beyond just training of staff.

Rates of illness in children during the survey period were higher than previously reported – likely a result of the timing of the survey which was carried out during the rainy season.

Save for Binga, coverage of Vitamin A supplementation for children falls far below the national target of 80%. This calls for utilisation of innovative strategies such as the use of Village health workers in administration vitamin A at community level and integration with other interventions that target the under-fives.

Binga had the highest proportion of children living in households that practice open defecation. In-depth research is required to understand the causal factors of the relatively high prevalence of open defecation.

Overall, all the 25 districts had crude mortality rates below the WHO cut-off point of 1 death per 10,000 population per day. Continued monitoring and strengthening lifesaving interventions required in order to keep these rates low.

RECOMMENDATIONS

- There is need for collaborative programming between Nutrition and WASH sector since there is a significant relationship between malnutrition and WASH with particular attention to hygiene education and optimal child feeding practices.
- The association between malnutrition and orphan hood underscores the need to consider direct and indirect nutritional support to orphaned children as vulnerable group.
- There is need for community Vitamin A supplementation to improve Vitamin A coverage found to be very low in some of the 25 districts that were assessed in this study.
- There is need to develop Information, Education and Communication strategy for Vitamin A Supplementation in order to improve caregiver's knowledge.
- Whereas rates or magnitude may be different, some districts that reported high levels of GAM during the May 2016 rural livelihood assessment also featured with relatively high rates of GAM in this survey. These include Guruve, Kariba, Shamva, Chegutu, Binga, and Gwanda. The coverage of current emergency interventions in these districts should be sustained and complemented by livelihood type (nutrition-sensitive) programs that aim to build community resilience.

  Child feeding practices remain sub-optimal across all the 25 districts that were assessed in this survey, with boys generally more affected by malnutrition than girls. That boys are more affected by malnutrition is not peculiar to this study and Zimbabwe alone but a phenomenon observed in studies across many countries and the reason for that is not well understood. Active case finding should be intensified where it is being undertaken and initiated where it is not yet taking place so as to identify and refer children early enough for treatment to prevent child deaths.

ANNEXES

Annex I: Prevalence of Malnutrition by district

District	N	Prevalence of wasting			Prevalence of underweight			Prevalence of Stunting		
		GAM	MAM	SAM	All	Moderate	Severe	All	Moderate	Severe
		<-2SD	≥-3SD<-2	<-3SD	<-2SD	≥-3 SD<-2	<-3SD	<-2SD	≥-3 SD <-2	<-3SD
Chimanimani	236	2.1	2.1	0.0	8.5	6.4	2.1	30.8	21.8	9.0
Bindura	281	1.8	1.4	0.4	10.7	8.5	2.1	31.6	22.2	9.5
Guruve	226	3.5	3.1	0.4	10.6	9.7	0.9	27.4	19.5	8.0
Rushinga	223	4.0	2.7	1.0	7.2	5.8	1.3	24.7	19.3	5.4
Shamva	233	3.9	3.5	0.4	10.7	9.0	1.7	24.0	12.4	11.6
Mudzi	288	2.8	2.4	0.3	13.9	11.1	2.8	27.6	19.1	8.5
Chegutu	239	4.7	2.1	2.6	6.9	5.6	1.3	24.4	18.9	5.5
Kariba	237	5.1	2.5	2.5	11.4	9.7	1.7	17.7	13.1	4.6
Makonde	240	2.9	2.1	0.8	14.6	12.6	2.1	29.2	21.7	7.5
Zvimba	263	3.0	2.7	0.4	7.6	6.5	1.1	30.0	23.2	6.8
Chiredzi	240	3.3	2.5	0.8	10.0	7.5	2.5	27.5	20.0	7.5
Mwenezi	242	1.7	1.3	0.4	7.4	5.4	2.1	24.4	19.4	5.0
Binga	192	5.8	4.7	1.0	15.6	13.0	2.0	26.2	17.3	8.9
Hwange	256	2.8	2.4	0.4	7.8	6.6	1.2	22.4	15.3	7.1
Lupane	204	1.0	1.0	0.0	11.3	9.8	1.5	27.0	18.6	8.3
Nkayi	264	1.9	1.1	0.8	9.8	7.2	2.7	25.0	16.3	8.7
Umguza	199	1.0	0.5	0.5	10.1	8.0	2.0	26.8	20.2	6.6
Bulilima	225	2.7	2.7	0.0	13.3	12.4	0.9	29.6	21.5	8.1
Gwanda	181	4.4	3.3	1.1	7.2	6.1	1.1	19.0	13.4	5.6
Mangwe	180	2.8	2.8	0.0	13.9	12.2	1.7	20.1	13.4	6.7
Matobo	233	2.1	0.9	1.3	8.6	6.9	1.7	24.6	19.0	5.6
Umzingwane	223	4.0	1.8	2.2	9.4	7.6	1.8	27.0	17.1	9.9
Chirumanzu	195	4.1	4.1	0.0	8.8	8.2	0.5	23.1	15.9	7.2
Gweru	233	3.4	0.9	2.6	8.3	7.8	0.4	20.2	14.6	5.6
Zvishavane	235	0.4	0.4	0.0	6.4	4.7	1.7	18.3	14.5	3.8

Annex II: Prevalence of acute malnutrition based on MUAC and /or Oedema by district

Province and District	GAM	Moderate ≥115mm- to < 125mm	Severe <115mm	Oedema
Manicaland				
Chimanimani	1.7	1.7	0.0	0.0
Mashonaland Central				
Bindura	4.3	3.9	0.4	0.0
Guruve	0.9	0.9	0.0	0.0
Rushinga	0.9	0.9	0.0	0.0
Shamva	0.9	0.9	0.0	0.0
Mashonaland East				
Mudzi	2.8	2.1	0.7	0.0
Mashonaland West				
Chegutu	3.8	0.8	2.9	2.6
Kariba	2.1	2.1	0.0	0.0
Makonde	0.8	0.8	0.0	0.0
Zvimba	0.8	0.8	0.0	0.0
Masvingo				
Chiredzi	2.1	1.3	0.8	0.0
Mwenezi	0.0	0.0	0.0	0.0
Matebeleland North				
Binga	2.6	2.6	0.0	0.0
Hwange	1.2	1.2	0.0	0.0
Lupane	2.0	1.5	0.5	0.0
Nkayi	1.1	1.1	0.0	0.0
Umguza	4.5	4.0	0.5	0.0
Matebeleland South				
Bulilima	0.0	0.0	0.0	0.0
Gwanda	0.6	0.6	0.0	0.0
Mangwe	2.8	2.8	0.0	0.0
Matobo	3.4	2.6	0.9	0.0
Umzingwane	0.4	0.4	0.0	0.0
Midlands				
Chirumanzu	2.6	2.6	0.0	0.0
Gweru	2.6	1.3	1.3	1.3
Zvishavane	0.0	0.0	0.0	0.0

Annex III: Households with improved Toilet facilities/ or Unimproved/ No facility

District	Improved	Unimproved	No facility
Bindura	53.7	36.6	9.8
Binga	27	1	72
Bulilima	49.8	0.4	49.8
Chegutu	59.5	8.3	32.2
Chimanimani	82.6	14	3.4
Chiredzi	55.9	9	35.2
Chirumhanzu	47.7	8	44.2
Guruve	77.5	7	15.4
Gwanda	75.6	5.1	19.3
Gweru	54.9	13.5	31.6
Hwange	44.1	1.1	54.8
Kariba	31.4	3.1	65.5
Lupane	35.2	0	64.8
Makonde	56.5	21.8	21.8
Mangwe	63	5.2	31.8
Matobo	63.5	2.6	33.9
Mudzi	54.1	3.4	42.5
Mwenezi	49.6	2.1	48.3
Nkayi	45.8	0	54.2
Rushinga	49.3	7.6	43
Shamva	66.7	24.6	8.8
Umguza	60.7	0	39.3
Umzingwane	72.6	3.5	23.9
Zvimba	59.8	9.7	30.5
Zvishavane	64.8	2	33.2
All	55.9	7.9	36.2