ZAMBIA SMART SURVEYS

FINAL REPORT

LUSAKA, CENTRAL WESTERN, NORTHWESTERN, EASTERN AND SOUTHERN PROVINCES

May 2024

Acknowledgement

The implementation of the seven integrated SMART surveys targeting six of the most drought-affected provinces followed the declaration of the 2024 drought as an emergency by His Excellency the Republican President of Zambia Mr. Hakainde Hichilema on 29th February 2024. The National Food and Nutrition Commission (NFNC) led this process with the assistance of highly dedicated Government staff from the nutrition line Ministries, Cooperating Partners, and Non-Governmental Organizations. The government of Zambia through the NFNC is highly indebted to the various institutions, organizations, and individuals who worked tirelessly to ensure the success of this survey.

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Acronyms

ACF	Action Against Hunger
AFI	Acute Food Insecurity
ARI	Acute Respiratory Infection
BSU	Basic Sampling Unit
cGAM	Combined Global Acute Malnutrition
CI	Confidence Interval
CMAM	Community Based Management of Acute Malnutrition
CMR	Crude Mortality Rate
cSAM	Combined Severe Acute Malnutrition
ENA	Emergency Nutrition Assessment
GAM	Global Acute Malnutrition
HAZ	Height for Age Z-Score
HH	Household
IEC	Information, Education and Communication
IPC	Integrated Food Security Phase Classification
IYCF	Infant and Young Child Feeding Practices
MAM	Moderate Acute Malnutrition
MUAC	Mid Upper Arm Circumference
NFNC	National Food and Nutrition Commission
ORS	Oral Rehydration Salts
OTP	Outpatient Therapeutic Program
PHC	Primary Health Care

PBW	Pregnant and Breastfeeding Women
PPS	Probability Proportional to Size
RC	Reserve Cluster
RUTF	Ready to Use Therapeutic Program
SAM	Severe Acute Malnutrition
SD	Standard Deviation
SDG	Sustainable Development Goals
SMART	Standardized Monitoring and Assessment of Relief and Transitions
TSFP	Targeted Supplementary Feeding Program
U5	Under 5 years children
U5MR	Under 5 Mortality Rate
UNICEF	United Nations Children Fund
WASH	Ware, Sanitation and Hygiene
WAZ	Weight for Age Z-Score
WHO	World Health Organization
WHZ	Weight for Height Z-Score
WRA	Women of Reproductive Age
ZAMSTAT	Zambia Statistics
ZDHS	Zambia Demographic Health Survey

Executive summary

Following the declaration of the 2024 drought as an emergency by the Government of Zambia, the National Food and Nutrition Commission (NFNC) of Zambia in May 2024 implemented seven integrated SMART+ surveys targeting six provinces likely to have been most affected by the drought. The data collection was conducted between May 1st -11th 2024 across the six provinces. The main objective of the SMART surveys was to assess the nutritional status of both children aged 6-59 months and women of reproductive age and determine the retrospective crude and under 5 mortality rates in the specific provinces. Additionally, the surveys assessed the water, sanitation and hygiene practices, specific morbidities for children 6-59 months and health seeking behaviours, coverage of health programs (vitamin A supplementation, deworming and measles immunization), infant and young child feeding practices, as well as the household hunger scale in the sampled households.

A total of seven (7) SMART surveys were conducted in 6 priority provinces which include Lusaka Province (2 surveys – Lusaka Rural and Lusaka Urban), Western, Eastern, Southern, Central and Northwestern provinces. The Standardized Monitoring and Assessment of Relief and Transitions (SMART) methodology was used adopting the SMART+ approach. A cross-sectional study design with two stage cluster sampling was applied. Stage one involved the random selection of clusters in every survey area using probability proportional to population size (PPS) approach, while stage two involved the selection of households using simple random sampling. A household was the basic sampling unit. The sampling process involved determining the sample size for children and household in the anthropometry survey, while the total population to be included and the corresponding households were determined for the mortality survey. the highest household sample of the two surveys (anthropometry and mortality) was used as the overall survey sample.

Prevalence of acute malnutrition based on weight-for-height z-scores and/or oedema by province

The prevalence of Global Acute Malnutrition (GAM) based on WHZ<-2 in the surveys ranged between very low (1.7% (0.9 - 3.4 95% CI) in Eastern province to Medium (6.2% (4.3 - 8.9 95% CI). The surveys showed a significant change in the nutrition situation in Southern and central provinces, while the other provinces recorded a prevalence in the same threshold as when last assessed in 2019/2020. The 2024 SMART surveys were however conducted in the harvest season (May 2024) compared to the lean season (November/December) when the previous surveys had been conducted hence the comparison of the findings needs to be done cautiously.

Table 1: Prevalence of acute malnutrition based on weight-for-height z scores and/or oedema by sex

Domain		Wasting by weight for height z-scores (and/or oedema) and by sex						
		N	GAM		Moderate		Severe	
			n	% (95% CI)	n	% (95% CI)	n	% (95% CI)

Lusaka Urban	All	293	11	3.8% (2.2-6.3 95% CI)	11	3.8% (2.2-6.3 95% CI)	0	0.0% (0.0 - 0.0 95% CI)
	Boys	149	9	6.0% (3.4-10.5 95% CI)	9	6.0% (3.4-10.5 95% CI)	0	0.0% (0.0 - 0.0 95% CI)
	Girls	144	2	1.4% (0.3-5.6 95% CI)	2	1.4% (0.3-5.6 95% CI)	0	0.0% (0.0 - 0.0 95% CI)
Lusaka Rural	All	352	15	4.3% (2.6-7.0 95% CI)	14	4.0% (2.3 - 6.7 95% CI)	1	0.3% (0.0 - 2.1 95% CI)
	Boys	180	7	3.9% (1.7-8.7 95% CI)	7	3.9% (1.7 - 8.7 95% CI)	0	0.0% (0.0 - 0.0 95% CI)
	Girls	172	8	4.7% (2.4-8.7 95% CI)	7	4.1% (2.0 - 8.2 95% CI)	1	0.6% (0.1 - 4.2 95% CI)
Northwestern Province	All	390	11	2.8% (1.5-5.2 95% CI)	9	2.3% (1.2 - 4.4 95% CI)	2	0.5% (0.1 - 2.1 95% CI)
	Boys	194	7	3.6% (1.8-7.0 95% CI)	5	2.6% (1.1 - 5.8 95% CI)	2	1.0% (0.2 - 4.2 95% CI)
	Girls	196	4	2.0% (0.8-5.2 95% CI)	4	2.0% (0.8 - 5.2 95% CI)	0	0.0% (0.0 - 0.0 95% CI)
Western Province	All	337	10	3.0% (1.4-6.1 95% CI)	9	2.7% (1.2 - 5.8 95% CI)	1	0.3% (0.0 - 2.3 95% CI)
	Boys	170	4	2.4% (0.9-6.1 95% CI)	3	1.8% (0.6 - 5.3 95% CI)	1	0.6% (0.1 - 4.4 95% CI)
	Girls	167	6	3.6% (1.5-8.4 95% CI)	6	3.6% (1.5 - 8.4 95% CI)	0	0.0% (0.0 - 0.0 95% CI)
Central Province	All	410	17	4.1% (2 .6-6.7 95%CI)	13	3.2% (1.9 - 5.4 95% CI)	4	1.0% (0.4 - 2.5 95% CI)
	Boys	204	11	5.4% (3.2-9.0 95% CI)	7	3.4% (1.7 - 6.9 95% CI)	4	2.0% (0.8 - 5.0 95% CI)
	Girls	206	6	2.9% (1.4-6.1 95% CI)	6	2.9% (1.4 - 6.1 95% CI)	0	0.0% (0.0 - 0.0 95% CI)
Southern Province	All	452	28	6.2% (4.3-8.9 95% CI)	27	6.0% (4.1 - 8.7 95% CI)	1	0.2% (0.0 - 1.7 95% CI)
	Boys	233	14	6.0% (3.4-10.4 95%CI)	14	6.0% (3.4 - 10.4 95%CI)	0	0.0% (0.0 - 0.0 95% CI)
	Girls	219	14	6.4% (3.5 - 11.3 95% CI)	13	5.9% (3.1 - 10.9 95%CI)	1	0.5% (0.1 - 3.4 95% CI)
Eastern Province	All	401	7	1.7% (0.9 - 3.4 95% CI)	7	1.7% (0.9 - 3.4 95% CI)	0	0.0% (0.0 - 0.0 95% CI)
	Boys	204	6	2.9% (1.4 - 6.1 95% CI)	6	2.9% (1.4 - 6.1 95% CI)	0	0.0% (0.0 - 0.0 95% CI)
	Girls	197	1	0.5% (0.1 - 3.5 95% CI)	1	0.5% (0.1 - 3.5 95% CI)	0	0.0% (0.0 - 0.0 95% CI)

Prevalence of underweight based on weight-for-age Z-scores by survey

Across all the survey areas, the prevalence of underweight was ranging from very low in northwest province (8.7% (6.1 - 12.4 95% CI) to low in Lusaka urban district (14.7% (11.1 - 19.3 95% CI) based on the WHO/UNICEF 2018 classification of malnutrition.

Table 2: Prevalence of underweight based on weight-for-age z-scores by sex

Domain		Underweight by weight for age z-scores and by sex						
		N	Global Underweight		Moderate Underweight		Severe Underweight	
			n	% (95% CI)	n	% (95% CI)	n	% (95% CI)

Lusaka Urban	All	292	43	14.7% (11.1 - 19.3 95% CI)	37	12.7% (9.3 - 17.0 95% CI)	6	2.1% (1.0 - 4.3 95% CI)
	Boys	147	28	19.0% (13.4 - 26.4 95% CI)	24	16.3% (10.8 - 23.9 95% CI)	4	2.7% (1.1 - 6.8 95% CI)
	Girls	145	15	10.3% (5.9 - 17.4 95% CI)	13	9.0% (4.9 - 15.8 95% CI)	2	1.4% (0.3 - 5.4 95% CI)
Lusaka Rural	All	351	40	11.4% (8.5 - 15.1 95% CI)	32	9.1% (6.5 - 12.6 95% CI)	8	2.3% (1.2 - 4.4 95% CI)
	Boys	180	26	14.4% (9.5 - 21.4 95% CI)	19	10.6% (6.4 - 17.0 95% CI)	7	3.9% (1.9 - 7.7 95% CI)
	Girls	171	14	8.2% (5.0 - 13.2 95% CI)	13	7.6% (4.5 - 12.6 95% CI)	1	0.6% (0.1 - 4.2 95% CI)
Northwestern Province	All	390	34	8.7% (6.1 - 12.4 95% CI)	32	8.2% (5.6 - 11.9 95% CI)	2	0.5% (0.1 - 2.1 95% CI)
	Boys	194	19	9.8% (6.4 - 14.7 95% CI)	17	8.8% (5.6 - 13.4 95% CI)	2	1.0% (0.2 - 4.2 95% CI)
	Girls	196	15	7.7% (4.5 - 12.7 95% CI)	15	7.7% (4.5 - 12.7 95% CI)	0	0.0% (0.0 - 0.0 95% CI)
Western Province	All	337	47	13.9% (10.0 - 19.1 95% CI)	42	12.5% (8.9 - 17.1 95% CI)	5	1.5% (0.4 - 5.4 95% CI)
	Boys	170	28	16.5% (11.5 - 23.0 95% CI)	25	14.7% (10.2 - 20.8 95% CI)	3	1.8% (0.4 - 7.6 95% CI)
	Girls	167	19	11.4% (7.2 - 17.6 95% CI)	17	10.2% (6.3 - 16.0 95% CI)	2	1.2% (0.3 - 4.9 95% CI)
Central Province	All	412	60	14.6% (11.2 - 18.7 95% CI)	40	9.7% (7.3 - 12.7 95% CI)	20	4.9% (3.0 - 7.9 95% CI)
	Boys	205	36	17.6% (12.8 - 23.5 95% CI)	21	10.2% (6.9 - 15.0 95% CI)	15	7.3% (4.4 - 12.0 95% I)
	Girls	207	24	11.6% (7.9 - 16.8 95% CI)	19	9.2% (6.2 - 13.5 95% CI)	5	2.4% (1.0 - 5.7 95% CI)
Southern Province	All	461	62	13.4% (10.1 - 17.7 95% CI)	49	10.6% (7.6 - 14.7 95% CI)	13	2.8% (1.5 - 5.2 95% CI)
	Boys	240	30	12.5% (8.3 - 18.3 95% CI)	25	10.4% (6.6 - 16.0 95% CI)	5	2.1% (0.8 - 5.5 95% CI)
	Girls	221	32	14.5% (9.9 - 20.7 95% CI)	24	10.9% (7.3 - 16.0 95% CI)	8	3.6% (1.6 - 8.2 95% CI)
Eastern Province	All	401	51	12.7% (8.4 - 18.8 95% CI)	47	11.7% (7.9 - 17.1 95% CI)	4	1.0% (0.4 - 2.6 95% CI)
	Boys	203	32	15.8% (9.6 - 24.9 95% CI)	30	14.8% (9.2 - 23.0 95% CI)	2	1.0% (0.3 - 3.8 95% CI)
	Girls	198	19	9.6% (5.3 - 16.9 95% CI)	17	8.6% (4.9 - 14.7 95% CI)	2	1.0% (0.2 - 4.1 95% CI)

Prevalence of stunting based on height-for-age Z-scores by Survey

The prevalence of stunting ranged from high in western province (26.1% (19.7 - 33.7 95% CI) to very high in Eastern Province (34.6% (28.4 - 41.3 95% CI). The prevalence of stunting was also very (high exceeding the 30% WHO threshold) in Lusaka urban survey, Northwestern and central provinces, while Lusaka rural districts, western and southern provinces had a high prevalence of stunting.

Table 3: Prevalence of stunting based on height-for-age z-scores by sex

Domain		Stunting by height for age z-scores and by sex						
		N	Global Stunting		Moderate Stunting		Severe Stunting	
			n	% (95% CI)	n	% (95% CI)	n	% (95% CI)
Lusaka Urban	All	289	99	34.3% (27.7 - 41.5 95% CI)	64	22.1% (17.6 - 27.5 95% CI)	35	12.1% (8.4 - 17.1 95% CI)
	Boys	148	61	41.2% (33.4 - 49.5 95% CI)	37	25.0% (19.4 - 31.5 95% CI)	24	16.2% (10.8 - 23.6 95% CI)
	Girls	141	38	27.0% (19.3 - 36.2 95% CI)	27	19.1% (13.2 - 27.0 95% CI)	11	7.8% (4.5 - 13.2 95% CI)
Lusaka Rural	All	347	101	29.1% (24.6 - 34.1 95% CI)	74	21.3% (17.4 - 25.9 95% CI)	27	7.8% (5.4 - 11.1 95% CI)
	Boys	176	64	36.4% (30.0 - 43.2 95% CI)	48	27.3% (21.4 - 34.0 95% CI)	16	9.1% (5.6 - 14.4 95% CI)
	Girls	171	37	21.6% (15.7 - 29.1 95% CI)	26	15.2% (10.3 - 21.9 95% CI)	11	6.4% (3.4 - 11.8 95% CI)
Northwestern Province	All	389	119	30.6% (26.1 - 35.5 95% CI)	95	24.4% (20.4 - 29.0 95% CI)	24	6.2% (4.1 - 9.3 95% CI)
	Boys	193	72	37.3% (31.8 - 43.1 95% CI)	56	29.0% (23.5 - 35.2 95% CI)	16	8.3% (5.1 - 13.3 95% CI)
	Girls	196	47	24.0% (18.3 - 30.7 95% CI)	39	19.9% (14.3 - 26.9 95% CI)	8	4.1% (1.9 - 8.7 95% CI)
Western Province	All	330	86	26.1% (19.7 - 33.7 95% CI)	66	20.0% (14.9 - 26.3 95% CI)	20	6.1% (3.5 - 10.2 95% CI)
	Boys	165	48	29.1% (21.2 - 38.4 95% CI)	37	22.4% (16.5 - 29.7 95% CI)	11	6.7% (3.4 - 12.7 95% CI)
	Girls	165	38	23.0% (16.1 - 31.8 95% CI)	29	17.6% (11.5 - 26.0 95% CI)	9	5.5% (2.7 - 10.6 95% CI)

Central Province	All	411	142	34.5% (29.6 - 39.8 95% CI)	94	22.9% (18.9 - 27.4 95% CI)	48	11.7% (8.9 - 15.2 95% CI)
	Boys	203	87	42.9% (36.9 - 49.0 95% CI)	55	27.1% (21.5 - 33.5 95% CI)	32	15.8% (11.1 - 21.9 95% CI)
	Girls	208	55	26.4% (20.8 - 32.9 95% CI)	39	18.8% (14.1 - 24.5 95% CI)	16	7.7% (4.8 - 12.0 95% CI)
Southern Province	All	448	127	28.3% (24.0 - 33.2 95% CI)	92	20.5% (16.3 - 25.5 95% CI)	35	7.8% (5.7 - 10.5 95% CI)
	Boys	232	74	31.9% (25.7 - 38.8 95% CI)	52	22.4% (16.1 - 30.3 95% CI)	22	9.5% (6.0 - 14.7 95% CI)
	Girls	216	53	24.5% (18.8 - 31.4 95% CI)	40	18.5% (13.4 - 25.1 95% CI)	13	6.0% (3.7 - 9.6 95% CI)
Eastern Province	All	393	136	34.6% (28.4 - 41.3 95% CI)	106	27.0% (22.0 - 32.6 95% CI)	30	7.6% (5.4 - 10.6 95% CI)
	Boys	198	76	38.4% (30.3 - 47.1 95% CI)	55	27.8% (21.6 - 35.0 95% CI)	21	10.6% (7.2 - 15.4 95% CI)
	Girls	195	60	30.8% (23.4 - 39.3 95% CI)	51	26.2% (20.1 - 33.2 95% CI)	9	4.6% (2.3 - 8.9 95% CI)

Retrospective crude and under 5 death rates

Across the six provinces, the crude and under-five death rates were below the WHO emergency threshold of 1/10,000/day and 2/10,000/day respectively. The crude death rates across all the provinces were below the SPHERE alert thresholds of 0.5/10,000/day

Table 4: Retrospective crude and under 5 death rates by Survey

Domain	Crude mortality rate		Under five mortality rates		Total Population Sampled	Number of households
	(total deaths /10,000 people / day)		(deaths in children under five / 10,000 children under five / day)			
	Rate [CI]	Design Effect	Rate [CI]	Design Effect		
Lusaka Urban	0.39 (0.20-0.77)	1	0.00 (0.00-12.02)	1	2230	451
Lusaka Rural	0.37 (0.18-0.77)	1.06	0.31 (0.05-1.82)	1	2576	487
Northwestern Province	0.08 (0.02-0.28)	1	0.00 (0.00-11.44)	1	3176	508
Western Province	0.30 (0.14-0.68)	1.17	0.63 (0.16-2.37)	1	2816	549
Central Province	0.38 (0.22-0.65)	1	0.80 (0.27-2.34)	1	3238	555
Southern Province	0.19 (0.08-0.43)	1	0.47 (0.13-1.74)	1	3203	578

Eastern Province	0.17 (0.07-0.43)	1	0.55 (0.14-2.05)	1	2832	514

Water, Sanitation and Hygiene results

According to findings at provincial level, handpumps or boreholes are the most common source of water for drinking and cooking at the households, except in the urban survey in Lusaka where public taps were the main source of water. Overall, more than half of the households in every survey area get drinking and cooking water from safe/protected sources ranging from 51.8% in central province to 100% in Lusaka Urban survey.

Table 5: Main sources of water for drinking and cooking

Domain	Main source of water for drinking and cooking														
	N	Public tap/stand pipe	Handpumps/ boreholes	Protected well	Water seller/ kiosks	Piped connection to house	Protected spring	Bottled water, water sachets	Tanker trucks	Unprotected hand-dug well	Surface water	Unprotected spring	Rain water collection	Other	Don't know
Lusaka urban	451	38.8% (174)	9.2% (41)	1.1% (5)	19.4% (87)	31.0% (139)	0.0% (0)	0.0% (0)	0.4% (2)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)
Lusaka Rural	487	3.5% (17)	70.2% (343)	7.4% (36)	0.2% (1)	0.6% (3)	0.0% (0)	0.0% (0)	0.0% (0)	9.2% (45)	6.8% (33)	2.1% (1)	0.0% (0)	0.0% (0)	0.0% (0)
Northwestern province	504	9.1% (46)	37.1% (187)	2.8% (14)	7.5% (38)	12.9% (65)	0.0% (0)	0.0% (0)	0.0% (0)	8.7% (44)	16.1% (81)	5.8% (29)	0.0% (0)	0.0% (0)	0.0% (0)
Western Province	549	2.2% (12)	37.2% (204)	1.6% (9)	3.1% (17)	18.9% (104)	0.0% (0)	0.0% (0)	0.4% (2)	27.7% (152)	3.6% (20)	4.2% (23)	0.0% (0)	1.1% (6)	0.0% (0)
Central Province	554	3.6% (20)	26.5% (147)	20.8% (115)	0.2% (1)	0.7% (4)	0.0% (0)	0.0% (0)	0.0% (0)	24.5% (136)	22.9% (127)	0.7% (4)	0.0% (0)	0.0% (0)	0.0% (0)
Southern Province	579	4.5% (26)	54.9% (318)	2.9% (17)	0.7% (4)	12.4% (72)	0.0% (0)	0.0% (0)	0.0% (0)	10.7% (62)	13.0% (75)	0.7% (4)	0.2% (1)	0.0% (0)	0.0% (0)
Eastern Province	514	6.8% (35)	60.9% (313)	3.9% (20)	0.0% (0)	3.5% (18)	0.0% (0)	0.0% (0)	0,2% (1)	17.9% (92)	4.7% (24)	2.1% (11)	0.0% (0)	0.0% (0)	0.0% (0)

The assessment of handwashing showed that only a few households had a specific handwashing station, with the highest proportion being 20.5% in Lusaka urban and 26.3% in Southern province. Among those households with a specific handwashing facility, there were varied proportions in the surveys of the households with both soap and water in the households with some low proportions in central province (17.6%) and eastern province (27.3%). Western province (82.4%) and Lusaka urban (75%) showed the notably high proportions of the households with a specific handwashing station with both soap and water. This translates to only small proportions of households practicing proper handwashing with soap and water.

Table 6: Handwashing device and agent

Domain	Type of handwashing device						Water availability for handwashing		Soap availability for handwashing		Soap and Water Availability	
	N	HH with a specific handwashing device	Sink with tap water	Buckets with taps	Pouring device	Other	n	Yes	n	Yes	n	Yes
Lusaka urban	448	20.5% (92)	56.5% (52)	20.7% (19)	13.0% (12)	9.8% (9)	85	92.40%	71	77.20%	69	75%
Lusaka Rural	487	9.7% (47)	25.5% (12)	8.5% (4)	57.4% (27)	8.5% (4)	41	87.20%	25	53.20%	24	51.10%
Northwestern Province	504	8.0% (40)	20.0% (8)	15.0% (6)	37.5% (15)	27.5% (11)	37	88.10%	19	45.20%	18	42.90%
Western province	549	2.9% (16)	68.7% (11)	18.8% (3)	6.3% (1)	6.3% (1)	15	88.20%	14	82.40%	14	82.40%
Central Province	553	3.2% (18)	5.6% (1)	27.8% (5)	55.6% (10)	11.1% (2)	13	76.50%	3	17.60%	3	17.60%
Southern Province	579	26.3% (152)	11.2% (17)	1.3% (2)	82.2% (125)	5.3% (8)	135	88.80%	89	58.60%	88	57.90%
Eastern Province	514	6.4% (33)	18.2% (6)	6.1% (2)	51.5% (17)	24.2% (8)	20	60.60%	9	27.30%	9	27.30%

Except for Lusaka Urban survey, the provincial surveys showed most of the households to be using unimproved sanitation facilities. In Lusaka urban, almost half of the households (48.1%) used a communal toilet

Table 7: Access to improved Sanitation facilities

Domain	No of Households	Improved Sanitation Facilities			unimproved Sanitation Facilities	Other
		Improved excreta disposal facility	A shared family toilet	A communal toilet	Unimproved toilet	Other
Lusaka urban	449	31.6% (142)	13.8% (62)	48.1% (216)	6.0% (27)	0.4% (2)
Lusaka Rural	487	25.9% (126)	5.7% (28)	3.9% (19)	63.9% (311)	0.6% (3)
Northwestern province	503	17.3% (87)	2.8% (14)	1.8% (9)	78.1% (393)	0.0% (0)
Western Province	549	7.3% (40)	5.3% (29)	2.0% (11)	85.4% (469)	0.0% (0)
Central Province	553	4.7% (26)	1.4% (8)	1.3% (7)	92.6% (512)	0.0% (0)
Southern Province	579	13.3% (77)	5.4% (31)	6.9% (40)	74.4% (431)	0.0% (0)
Eastern Province	514	8.0% (41)	2.1% (11)	0.8% (4)	88.9% (457)	0.2% (1)

Coverage of health programs

Overall, the coverage of Vitamin A supplementation among children 6-59 months was below the SPHERE 2018 recommendation of >95%, ranging from 71.9% in Lusaka province to 90.8% in Southern province. Effective Vitamin A coverage (reported by card) was low, ranging from 47.4% in Lusaka urban survey to 67.2% in the Northwestern province. Deworming rates (both by recall and by card) were similarly low ranging from 61.9% in central province to 90.7% in Eastern province. The proportion of children vaccinated against measles at 9 months was high (>95%) except in central province (78.9%), Eastern Province (92.5%) and Northwestern province (93.1%). However, effective immunization coverage as reported by an immunization card (documented) was below the SPHERE standards ranging from 62.1% in eastern province to 80.9% in Northwestern province. Documentation for the child health services was likely a gap with a notable proportion for supplementation and measles immunization reported by recall.

Table 8: Coverage of Vitamin A, deworming and measles

Domain	Children 6-59 months who received vitamin A last 6 months				Children 12-59 months who received deworming last 6 months			Children 9-59 months who received measles vaccine			
	Yes, card	Yes, recall	Not received Vitamin A	N	Yes	No	N	Yes, card	Yes, recall	Not vaccinated against measles	N
Lusaka Urban	47.4% (147)	24.5% (76)	28.1% (87)	310	70.8% (182)	29.2% (75)	257	67.9% (201)	27.0% (80)	5.1% (15)	296
Lusaka Rural	53.4% (190)	18.5% (66)	28.1% (100)	356	71.7% (218)	28.3% (86)	304	74.5% (251)	21.1% (71)	4.5% (15)	337
Northwestern Province	67.2% (269)	12.5% (50)	20.3% (81)	400	82.9% (276)	17.1% (57)	333	80.9% (305)	12.2% (46)	6.9% (26)	377
Western Province	57.3% (196)	31.3% (107)	11.4% (39)	342	78.9% (228)	21.1% (61)	289	69.6% (224)	25.5% (82)	5.0% (16)	322
Central Province	50.1% (209)	22.5% (94)	27.3% (114)	417	61.9% (211)	38.1% (130)	341	62.3% (248)	16.6% (66)	21.1% (84)	398
Southern Province	60.8% (284)	30.0% (140)	9.2% (43)	467	79.6% (323)	20.4% (83)	406	74.8% (333)	21.1% (94)	4.0% (18)	445
Eastern Province	59.1% (241)	29.4% (120)	11.5% (47)	408	90.7% (312)	9.3% (32)	344	62.1% (241)	30.4% (118)	7.5% (29)	388

Morbidity and health seeking results

The findings of the survey show that about a quarter of the children 6-59 months assessed had suffered watery diarrhea 2 weeks prior to the survey in most of the survey areas, with western and central province showing lower proportions (17.1% and 17.3% respectively). About a third (22.4%) of the children in eastern province had suffered diarrhea. The proportion of children who had presented with fever symptoms within the recall period ranged from 19.6% in western province to 52.9% in eastern province with proportions with Acute respiratory symptoms ranging from 0.2% in central province to 2.2% in Eastern province. Overall, children in eastern province appeared to suffer more from the different morbidities assessed compared to the other provinces assessed. Treatment seeking for the specific morbidities was similar with diarrhea treatment seeking for diarrhea ranging from 59.5% in Lusaka urban to 89.3% in Northwestern province, treatment seeking for fever ranging from 70.2% in Lusaka urban survey to 94.0% in Northwestern province and ARI treatment seeking being high except in central province where the only child who presented with such symptoms did not seek

treatment, and in Lusaka Urban where 1 child as well was not taken for treatment. Management of children with diarrhea with both Zinc and ORS was considerably low across the provinces, ranging from 8.3% in central province to 54.1% in Lusaka Urban district. Overall, caregivers in Northwestern province appeared to have better treatment seeking practices compared to the caregivers in the other survey areas.

Table 9: Morbidity information among children 6-59 months in the 7 surveys

Domain	Diarrhea treatment	ORS given	Zinc supplementation	Both ORS and Zinc		Fever treatment		Treatment of ARI Symptoms	
	Yes	Yes	Yes	Yes	No. of children with diarrhea	Yes	No. of children with fever	Yes	No. of children with ARI symptoms
Lusaka Urban	59.5% (44)	81.1 % (60)	62.2% (46)	54.1 % (40)	74 (23.9%)	70.2% (66)	94 (30.3%)	75% (3)	4 (1.3%)
Lusaka Rural	80.2% (81)	74.3 % (75)	61.4% (62)	49.5 % (50)	101 (28.2%)	85.2% (109)	128 (35.8%)	100% (4)	4 (1.1%)
Northwestern Province	89.3% (92)	84.5 % (87)	54.4% (56)	51.5 % (53)	103 (25.9%)	94.0% (141)	150 (37.5%)	100% (2)	2 (0.5%)
Western Province	70.2% (40)	62.1 % (36)	53.4% (31)	48.3 % (28)	58 (17.1%)	82.1% (55)	67 (19.6%)	100.0 % (3)	3 (0.9%)
Central Province	72.2% (52)	61.1 % (44)	11.1% (8)	8.3% (6)	72 (17.3%)	78.3% (112)	143 (34.3%)	0.0% (0)	1 (0.2%)
Southern Province	82.1% (92)	61.6 % (69)	47.3% (53)	40.2 % (45)	112 (24.0%)	72.2% (78)	108 (23.1%)	100.0 % (4)	4 (0.9%)
Eastern Province	83.8% (114)	68.4 % (93)	43.4% (59)	41.2 % (56)	136 (33.4%)	93.5% (202)	216 (52.9%)	88.9% (8)	9 (2.2%)

Infant and Young Child Feeding Practices

Breastfeeding practices

The proportion of children ever breastfed was high, above 95% in all the surveys except in Lusaka urban (92.9%). Timely initiation of breastfeeding within the first hour of birth varied greatly by survey but was lower than the recommended target of ≥80, In Northwestern and Lusaka Province surveys, with Lusaka urban District survey showing the lowest prevalence of 63.8%. Further, the proportion of children exclusively breastfed within the first 2 days of birth was above 80% in all the survey areas except in the Northwestern province with 73.6%. Exclusive breastfeeding rates within the first six months after birth were below the target of ≥80 in all the surveys. Only a

few mothers practiced mixed feeding in the first six months of life with rates not exceeding 7.1% in Lusaka urban district. Continued breastfeeding among children 12-23 months across the surveys was below the recommended ≥80%. Bottle feeding was highly practiced in Lusaka urban district (25.2%) with the other provinces having less than 10% of the children bottle fed.

Table 10: Breastfeeding practices among children 0-23 months

Domain	Ever breastfed	Early initiation of breastfeeding	Exclusively breastfed for the first 2 days after birth	Exclusive breastfeeding under 6 months	Mixed milk feeding under 6 months	Continued breastfeeding 12-23 months	Bottle feeding 0-23 months
Lusaka urban	92.9% (84.2-97.0)	63.8% (52.6-73.6)	81.1% (72.5-87.5)	46.4% (25.7-68.4)	7.1% (1.6-26.5)	44.3% (33.2-56.0)	25.2% (17.0-35.7)
Lusaka Rural	97.6% (92.1-99.3)	69.5% (59.1-78.3)	85.4% (78.1-90.5)	73.7% (57.3-85.4)	0.0% (0-0)	51.2% (40.0-62.2)	9.8% (5.6-16.4)
Northwestern	98.9% (95.7-99.7)	74.3% (60.1-84.8)	89.6% (82.9-93.9)	47.8% (31.1-65.1)	0.0% (0-0)	79.1% (67.6-87.3)	8.2% (2.1-26.8)
Western Province	98.1% (94.3-99.4)	92.6% (85.4-96.4)	73.6% (61.2-83.1)	52.3% (35.9-68.2)	2.3% (0.3-15.3)	71.3% (58.7-81.2)	5.5% (2.9-10.4)
Central Province	94.5% (88.7-97.4)	84.6% (75.4-90.8)	81.9% (71.9-88.9)	69.0% (49.1-83.6)	3.4% (0.4-22.4)	45.5% (34.0-57.6)	3.8% (2.0-7.3)
Southern Province	98.1% (94.9-99.3)	95.2% (90.8-97.5)	92.8% (87.4-96.0)	73.3% (57.5-84.8)	2.2% (0.3-15.4)	60.7% (49.7-70.7)	1.9% (0.7-5.1)
Eastern Province	93.1% (88.6-95.9)	80.0% (72.0-86.2)	83.4% (75.1-89.4)	74.2% (56.5-86.4)	3.2% (0.4-22.3)	68.7% (58.8-77.1)	8.0% (3.7-16.6)

Complementary feeding practices

In all the survey areas, more than 80% of the children 6-8 months surveyed had been introduced to soft, solid or semi solid foods, with Lusaka rural districts and eastern province having all the children in that category introduced to complementary foods. Throughout the survey areas, the dietary diversity for children 6-23 months was low, with some provinces indicating very low diversity. Lusaka Urban district and eastern province had a low diversity at 53.5% and 61.8% respectively with the rest ranging between 18.5% in western province and 37.9% in Central province. The minimum meal frequency for children 6-23 months was much below the recommended 80% in all the surveys. Moreover, the minimum milk feeding frequency for non-breastfed children was very low (5.9% to 17.5%). Across all the provinces, the minimum acceptable diet was very low varying between 2.5% in western province to 26.3% in Lusaka urban district.

The consumption of egg and flesh foods was also low with rates ranging 22.1% in Southern province to 68.7% in Lusaka Urban District. Sweet beverages were consumed by more than half (60.6%) of the children in Lusaka urban district, while for the other surveys, the consumption was ranging from 9.5% in Northwestern province to 28.6% in Lusaka Rural districts. Unhealth food consumption was notably reported in the Lusaka urban district (39.4%) and Lusaka rural districts (27.0%) with the other surveys reporting not more than 11.8% in central province. There was a notable proportion of children who did not consume any vegetable or fruit 24 hours prior to the survey, ranging from 13.9% in eastern province to 53.8% in western province.

Table 11: Complementary feeding practices

Domain	Introduction of solid, semi-solid or soft foods	Minimum dietary diversity	Minimum meal frequency children 6-23 months	Minimum milk feeding frequency for non-breastfed children 6-23 months	Minimum acceptable diet	Egg and or flesh food consumption	Sweet beverage consumption	Unhealthy food consumption	Zero vegetable or fruit consumption
Lusaka Urban	92.9% (56.5 -99.2)	53.5% (40.3- 66.3)	49.5% (37.9-61.1)	17.5% (7.7-34.9)	26.3% (17.0-38.3)	68.7% (56.8- 78.6)	60.6% (46.8-72.9)	39.4% (27.7-52.4)	28.3% (20.5-37.6)
Lusaka Rural	100.0% (100 - 100)	34.1% (22.7- 47.7)	31.0% (21.3-42.6)	2.3% (0.3-16.6)	12.7% (6.7-22.7)	50.0% (37.8- 62.2)	28.6% (20.2- 38.7)	27.0% (17.4- 39.3)	24.6% (17.8-33.0)
Northwestern Province	90.9% ((70.6-97.7)	30.7% (18.4- 46.4)	18.2% (10.6- 29.7)	0.0% (0-0)	11.7% (6.2-20.9)	32.1% (19.7- 47.7)	9.5% (5.3-16.3)	5.8% (1.6-19.4)	26.3% (17.7- 37.1)
Western Province	90.0% (62.2-98.0)	18.5% (10.0- 31.7)	18.5% (11.8-27.8)	7.7% (1.7-28.1)	2.5% (0.8-7.5)	24.4% (14.4- 38.2)	7.6% (3.4-16.1)	9.2% (3.9-20.3)	53.8% (38.1- 68.7)
Central Province	84.2% (57.8-95.4)	37.9% (27.3-49.8)	25.5% (18.1-34.6)	7.3% (2.8-17.8)	11.8% (6.8-19.6)	47.1% (36.4- 58.0)	24.2% (17.6-32.2)	11.8% (7.0-19.0)	20.9% (13.1-31.8)
Southern Province	81.8% (56.2-94.0)	12.3% (7.4-19.8)	27.0% (19.2- 36.5)	15.6% (7.0- 31.2)	6.1% (2.8-12.9)	22.1% (14.2- 32.7)	17.2% (10.2-27.6)	10.4% (5.4-19.2)	45.4% (34.8- 56.4)
Eastern Province	100.0% (100- 100)	61.8% (50.2-72.2)	32.6% (24.3-42.2)	5.9% (1.4-21.0)	24.3% (16.9- 33.6)	57.6% (48.5- 66.2)	16.0% (9.6-25.3)	13.2% (6.6-24.7)	13.9% (7.3-24.9)

Nutrition status of women of reproductive age

The prevalence of acute malnutrition among women of reproductive age, both in the Pregnant and breastfeeding and in the non-pregnant and non-breastfeeding categories was high, 3-5 times higher than the prevalence noted in children 6-59 months. With the pregnant and breastfeeding category, the prevalence of acute malnutrition ranged from 6.3% in Lusaka Urban district to 14.7% in

Central province, while for the non-pregnant and non-breastfeeding category, the prevalence was ranging from 8.7% in Lusaka urban to 15.6% in Western Province.

Table 12: Nutrition status among women of reproductive age

Domain	Prevalence of Acute Malnutrition Among Pregnant and Breastfeeding with infant less than 6 months			Prevalence of Acute Malnutrition Among non-pregnant and breastfeeding women of Reproductive age (15-49 years)		Number of Non pregnant and non-breastfeeding women aged 15-49 years
	Global Acute malnutrition (< 230 mm)	Severe Acute Malnutrition Among (MUAC < 210 mm)	No of PBW	Global Acute Malnutrition Among WRA (MUAC <230 mm)	Severe Acute Malnutrition Among WRA (MUAC < 210 mm)	
Lusaka urban	6.3% (4)	0.0% (0)	64	8.7% (41)	0.8% (4)	527
Lusaka Rural	10.3% (7)	0.0% (0)	68	10.5% (42)	1.7% (7)	401
Northwestern Province	9.3% (8)	0.0% (0)	86	11.2% (52)	1.7% (8)	464
Western Province	13.5% (12)	4.5% (4)	89	15.6% (64)	2.7% (11)	409
Central Province	14.7% (10)	2.9% (2)	68	14.1% (69)	3.9% (19)	488
Southern Province	10.4% (10)	1.0% (1)	96	10.7% (60)	1.2% (7)	561
Eastern province	9.2% (7)	0.0% (0)	76	10.2% (37)	1.1% (4)	364

Call to Action

1. **Early action** is urgently required in Southern, Western, North-Western and Central Provinces to avert a nutritional crisis.
2. Pregnant and breastfeeding women, and children under five should be prioritized in food distribution and/or emergency cash transfer interventions, with a **food package that includes both calories and protein**.
3. To further close a wide nutrient gap, pregnant and breastfeeding women and children under-five should receive **nutrient-dense supplementary foods**, and moderate wasting must be urgently managed to prevent further deterioration.
4. **Micronutrient supplementation** during pregnancy should go beyond iron and folate and provide an array of micronutrients of public health importance, through provision of multiple micronutrient supplements.
5. As the emergency evolves, it is critical to improve the completeness, quality and frequency of **routine data to monitor nutrition situation**, while timely identifying and treating children with malnutrition through active case finding.
6. **Expand treatment capacity** to every Primary Health Care facility ahead of the lean season, to prepare for anticipated increase in severe wasting.
7. Urgent action required to **improve measles vaccination** and vitamin A supplementation coverage.
8. Given the very large needs, there is a **need to prioritize those healthcare centres that lack water where children are being treated**. As climate change evidence shows us that the number of consecutive dry days will increase, there is a need to invest in long term programmes to ensure resilient WASH services.

1.0 **Introduction**

1.1 Background

Zambia is among countries facing the negative effects of the climate crisis and disease outbreaks on nutrition, with multiple determinants affecting the nutritional status of the population. In 2022/23, multiple hazards including floods, dry spells, food price inflation, army worm and cassava brown streak disease affected household food security across the country. The Zambia Vulnerability Assessment Committee report released in October 2023 projected that 1,975,843 people would be in critical food insecurity phase between October 2023 and March 2024 (Integrated Food Security Phase (IPC) Acute Food Security (AFI) Phase 3, Crisis), and another 58,400 in emergency food insecurity phase (IPC AFI Phase 4, Emergency), bringing total to 2,037,710 people (339,619 households) requiring humanitarian assistance. During this time, 64 districts were projected to be at IPC AFI Phase 3+ while 12 were projected to have communities at IPC AFI 4. The situation is expected to worsen as the next harvest season (April – June) will also be adversely affected by further anticipated climate hazards. On 29 February 2024, a national state of emergency has been declared because of a severe drought affecting over 50% of Zambia, resulting from the onset of El Niño conditions and climate change. The dry spell from mid-Jan 2024 is affecting most of the central and southern half of the country which has received substantially less than normal rainfall leaving:

- 84/116 districts (72%) severely affected in 7 provinces: Lusaka, Central, Copperbelt, Eastern, North-western, Western and Southern.
- 1M hectares (out of 2.2 million hectares) of planted areas for maize destroyed. Increases in commodity prices are expected.
- 430-megawatt power deficit, potentially reaching more than 520 mega-watts by December 2024 Ground & surface water availability levels are affected, with potential to increase the incidence of diseases among the affected population.
- 1M farming households (6 million people) impacted – among these 3 million are children aged under 18 and 1.2 million are children aged under 5. These households face prolonged food security, with heightened risks of common childhood illnesses, vaccine preventable disease outbreaks and malnutrition.
- 9,779,145 people are exposed while 6,552,027 people are adversely affected by the drought in 84 districts.

Zambia carries one of the high burdens of undernutrition in the region with approx. 1 million children stunted. An estimated 102,000 children are likely to suffer from severe wasting (also known as Severe Acute Malnutrition) in 2024, who need life-saving nutrition treatment services. More than 1.7 million pregnant women are estimated to be anaemic. Two out of every three children suffer from child food poverty (i.e. they do not get diverse diets), and two out of three children are not exclusively breastfed. More than 6 million people face severe food insecurity as per Disaster Management and Mitigation Unit estimation. Undernutrition represents the single largest killer of under 5 children being responsible for child death each year. With frequent emergencies, these number is likely to increase and at high risk of death.

1.2 Survey justification

Unfortunately, due to resource constraints, there is no recent reliable data on the prevalence of wasting in Zambia, which directly affects the ability to estimate the caseload requiring treatment. The last available prevalence of severe wasting and moderate wasting was from 2018 DHS and 2019/20 SMART surveys in some districts. Prevalence informs caseload estimation for treatment and needed urgent updating to use more current data. To meet the urgent need for timely, representative, and reliable data in Zambia, the Standardized Monitoring and Assessment of Relief and Transitions (SMART) survey methodology was recommended. The SMART survey would give an indication of where risks for malnutrition lie, to inform anticipatory actions ahead of the lean season. Additionally, the SMART surveys would assess the early effect of El-Nino induced drought on livelihoods, health and food security of the population assessed.

There were 7 SMART surveys conducted in 6 identified provinces which included Lusaka (2 surveys) Southern (1), Eastern (1), Western (1), Northwestern (1) and Central (1). The Surveys were conducted using the SMART+ approach with a capacity building component for the national SMART survey managers included.

1.3 Main objective

The main objective the 7 SMART surveys in Zambia was to generate representative province-level data on the nutrition status of children (6 to 59 months) and women (reproductive age), while also determining the current mortality situation.

1.3.1 Specific objectives

The specific objectives of the survey of SMART surveys included:

1. To estimate the prevalence of wasting (by WHZ and MUAC), chronic malnutrition (HAZ), and underweight (WAZ) among children 6-59 months.
2. To determine the nutritional status of Pregnant and Breastfeeding Women.
3. To estimate retrospective mortality rates (both crude mortality rates (CMR) and under-five mortality rates (U5MR)) in the target population.
4. To estimate retrospective morbidity (fever, diarrhoea, and cough) among children under five years.
5. To determine the coverage of measles vaccination among 9-59 months aged children and Vitamin A supplementation and deworming among 6-59 months and 12-59 months respectively.
6. To assess IYCF practices among households with children under two years of age in the target population.
7. To determine water, sanitation, and hygiene safety, access, and practices of the survey population.
8. To assess the current household hunger scale in the surveyed population.
9. To draw recommendations for addressing identified gaps to support advocacy, planning, decision making and monitoring purposes.

2.0 Methodology

2.1 Survey design

The SMART surveys adopted a cross-sectional study design using the two-stage cluster sampling based on the SMART methodology. Clusters were selected using probability proportional to population size (PPS). Stage one sampling involved sampling of clusters to be included in the survey while the second stage sampling involved the selection of households from the sampled clusters.

2.2 Target groups, inclusion, and exclusion criteria

The target population for the anthropometric survey was children aged 6-59 months, and women of reproductive age. Mothers or caregivers were interviewed to obtain information on water, sanitation and hygiene, childhood morbidity and health seeking behaviours, measles vaccination, vitamin A supplementation, and infant and young child feeding practices.

Table 13: Survey indicators and target groups

	Key indicators	Survey target
Nutrition status		
1.	Prevalence of wasting, stunting, and underweight	Children 6-59 months
2.	Prevalence of wasting among women of reproductive age	Women 15-49 years
	Death rates	
3.	Crude death rate	All household members in the surveyed area
4.	Under 5 death rate	All children under 5 in the surveyed HHs
	Food Security	
5	Household Hunger scale	All Households in the surveyed area
	WASH	
6	Access to safe/improved water for drinking and cooking	All Households in the surveyed area
7	Access to improved sanitation facilities	All Households in the surveyed area
8	Access to a handwashing system	All Households in the surveyed area
9	Access to sufficient quantity of water	All Households in the surveyed area
Health		
10	Child morbidity (e.g. Fever, ARI, Diarrhoea)	Children 6-59 months
11	Measles, mumps and rubella vaccination	Children 9-59 months
12	Vitamin A supplementation coverage	Children 6-59 months
13	Deworming coverage	Children 12-59 months
	IYCF	
14	Ever breastfed	Children 0-23 months
15	Early initiation of breastfeeding	Children 0-23 months
16	Exclusive breastfeeding for the first 2 days	Children 0-5 months
17	Exclusive breastfeeding under 6 months	Children 0-5 months
18	Mixed milk feeding under 6 months	Children 0-5 months
19	Continued breastfeeding 12-23 months	Children 12-23 months
20	Bottle feeding	Children 0-23 months
21	Introduction of solid, semi-solid or soft foods 6-8 months	Children 6-8 months

22	Minimum meal frequency for breastfed children 6-8 months	Children 6-8 months
23	Minimum meal frequency for breastfed children 9-23 months	Children 9-23 months
24	Minimum meal frequency for breastfed and non-breastfed children 6-23 months	Children 6-23 months
25	Minimum meal frequency for non-breastfed children 6-23 months	Children 6-23 months
26	Minimum milk feeding frequency for non-breastfed children	Children 6-23 months
27	Minimum dietary diversity	Children 6-23 months
28	Minimum acceptable diet	Children 6-23 months
29	Egg and/or flesh food consumption	Children 6-23 months
30	Sweet beverage consumption	Children 6-23 months
31	Unhealthy food consumption	Children 6-23 months
32	Zero vegetable or fruit consumption	Children 6-23 months

2.3 Cut offs for nutrition indices and malnutrition classification.

The analysis of anthropometry data for children 6-59 months was based on the internationally recognized indices based on the 2006 World health organization (WHO) growth Standards. The classification of malnutrition was based on the 2018 WHO/UNICEF classification of malnutrition as shown in table 16 below.

Table 14: Cut-offs for the indices of WHZ, HAZ, WAZ, and MUAC

Malnutrition Status	Malnutrition Status Classification			
	Acute Malnutrition (WHZ)		Chronic malnutrition (HAZ)	Underweight (WAZ)
	Weight/ Height [WHZ]	MUAC	Height/Age [HAZ]	Weight/Age [WAZ]
Global	WHZ< -2 SD and/or Oedema	MUAC< 125 mm and /or Oedema	HAZ< -2 SD	WAZ< -2 SD
Moderate	WHZ <- 2SD to ≥ -3 SD	115 mm≤ MUAC< 125 mm	HAZ <- 2SD to ≥ -3 SD	WAZ <- 2SD to ≥ -3 SD
Severe	WHZ < -3 SD and/or Oedema	MUAC< 115 mm and /or Oedema	HAZ < -3 SD	WAZ < -3 SD

Table 15: WHO/UNICEF Classification for the severity of malnutrition by prevalence

	Prevalence Thresholds Level [%][1]				
	Very high	High	Medium	Low	Very low

[1]WHO/UNICEF latest public health emergency thresholds for the prevalence of wasting, overweight and stunting in children under 5 years, August 2018

Wasting [WHZ]	≥ 15	10 – <15	5 - <10	2.5- <5	<2.5
Overweight [WHZ]	≥ 15	10 – <15	5 -<10	2.5- <5	<2.5
Stunting [HAZ]	≥ 30	20 - <30	10 -<20	2.5- <10	<2.5

2.4 Indicator measurements

Nutrition data

Age: Children 6-59 months from the selected households were considered eligible for the survey. Age was obtained from official written documents such as vaccination or birth registration cards. If documentation was unavailable, a local calendar of events was used to estimate age.

Sex: This will be recorded as either 'f' for female or 'm' for male.

Weight: Standardized SECA scales were used for weight measurement of children between 0 to 59 months. The weight was recorded to the nearest 100g (0.1 kg). Direct weighing option was used for older children who could easily stand while the double weighing option was applied for younger children or children who could not stand.

Height: Standard, height boards were used for taking length and height of children. Children less than 24 months were measured lying down, and children greater than or equal to 24 months were measured standing. The precision of the measurement was 0.1 cm

Mid Upper Arm Circumference (MUAC): Was measured using a flexible non-elastic tape, midway between the tip of the acromion process and the tip of the olecranon process of the left arm with the arm hanging freely by the child's/caregiver's side. MUAC measurements was recorded to the nearest 0.1 cm or 1.0 mm.

Bilateral Oedema: Was assessed by applying a moderate thumb pressure on both feet for three seconds. If oedema was present, a shallow pit remained after releasing pressure from the feet. Only children with bilateral oedema (oedema on both feet) were diagnosed positive for nutritional oedema. The team leader confirmed all cases of oedema and referred the cases for immediate inpatient care.

Maternal Nutrition: The nutritional status of women of reproductive age was assessed using MUAC measurements. The MUAC measurements were recorded to the nearest 0.1 cm or 1.0 mm.

Crude and under 5 death rates

The survey questionnaire included questions on deaths and demographic information during the recall period of approximately three months. Specifically, the survey collected the following data:

- Total number of people in the household
- Number of children under five years
- Number of people who left the household within the recall period (total and children under five years)

- Number of people who joined the household within the recall period (total and children under five years)
- Number of births in the household within the recall period
- Number of deaths in the household within the recall period (total and children under five years)
- Cause of deaths
- Location of deaths

Water, Sanitation and hygiene

Main source of water for drinking and cooking: This was assessed by asking respondents to identify their main water sources.

Type of toilet/latrine used: This was assessed in all the selected households by asking the respondents about the kind of latrine/toilet used.

Sharing of toilet/latrine with other households: This was assessed in all the selected households by asking the respondents whether they shared their sanitary facility with other households.

Type of hand washing device used by the household: This was assessed by asking the respondents and also observing to see the kind of hand washing device that was reported.

Availability of water at the hand washing place: This was assessed through observations.

Availability of water at the hand washing place: This was assessed through observations.

Morbidity

Retrospective morbidity: Mothers or caregivers were asked about illnesses that affected their children (6-59 months) in the past two weeks prior to the survey date.

Diarrhea: This was assessed among children 6-59 months by a two-week recall. Diarrhea was defined as the passage of three or more loose or liquid stools in a day.

Cough (with fast, short, rapid or difficulty breathing): This was assessed among children 6-59 months by a two-week recall. This indicator was used as a proxy for suspected ARI or pneumonia.

Fever (without cough and rash): This was assessed among children 6-59 months by a two-week recall, defined as fever in the absence of respiratory symptoms (cough).

Vitamin A supplementation, deworming, and measles vaccination

Measles vaccination: This was assessed among children 9-59 months by checking for the measles vaccine on the EPI card if available or by asking the caregiver to recall if no EPI card was available.

Vitamin A supplementation: This was assessed among children 6-59 months by checking the EPI card or health card if available or by asking the caregiver to recall if no card is available. A vitamin A capsule image will be shown to the caregiver when asked to recall.

Deworming: This was assessed among children 12-59 months by asking the caregiver to recall. A deworming tablet was shown to the caregiver when asked to recall.

Infant and Young Child Feeding

Infant and young child feeding practices were assessed based on the standard WHO guidelines of 2021 as follows:

1. Breastfeeding indicators

Ever breastfed: Percentage of children born in the last 24 months who were ever breastfed

$$\frac{\textit{Children 0-23 months who were ever breastfed}}{\textit{Children 0-23 months}}$$

Early initiation of breastfeeding: Percentage of children born in the last 24 months who were put to the breast within one hour of birth.

$$\frac{\textit{Children 0-23 months who were put to the breast within one hour of birth}}{\textit{Children 0-23 months}}$$

Exclusively breastfed for the first two days after birth: Percentage of children born in the last 24 months who were fed exclusively with breast milk for the first two days after birth

$$\frac{\textit{Children 0–23 months who were fed exclusively with breastmilk for the first two days after birth}}{\textit{Children 0–23 months}}$$

Exclusively breastfeeding under six months: Percentage of infants 0-5 months who were fed exclusively with breast milk during the previous day

$$\frac{\textit{Children 0-5 months who were fed exclusively with breastmilk during the previous day}}{\textit{Children 0-23 months}}$$

Mixed milk feeding under six months: Percentage of infants 0-5 months who were fed formula and/or animal milk in addition to breastmilk during the previous day.

$$\frac{\textit{Children 0–5 months who were fed formula and/or animal milk in addition to breastmilk during the previous day}}{\textit{Children 0–23 months}}$$

Continued breastfeeding 12-23 months: Percentage of children 12-23 months who were fed breastmilk during the previous day.

$$\frac{\textit{Children 12-23 months who were fed breastmilk during the previous day}}{\textit{Children 12-23}}$$

Bottle feeding 0-23 months: Percentage of children 0-23 months who were fed from a bottle with a nipple during the previous day

$$\frac{\textit{Children 0-23 months who were fed from a bottle with a nipple during the previous day}}{\textit{Children 0-23 months}}$$

2. Complementary feeding indicators

Introduction of solid, semi-solid or soft foods 6-8 months: Percentage of infants 6-8 months who consumed solid, semi-solid or soft foods during the previous day

$$\frac{\textit{Children 6-8 months who consumed solid, semi-solid or soft foods during the previous day}}{\textit{Children 6-8 months}}$$

Minimum dietary diversity 6-23 months: Percentage of children 6–23 months who consumed foods and beverages from at least five out of eight food groups during the previous day.

$$\frac{\textit{Children 6–23 months who consumed foods and beverages from ≥ 5 food groups during the previous day}}{\textit{Children 6–23 months of age}}$$

Minimum meal frequency 6-23 months: Percentage of children 6–23 months who consumed solid, semi-solid, or soft foods (but also including milk feeds for non-breastfed children) the minimum number of times or more during the previous day.

$$\frac{\textit{Children 6–23 months who consumed solid, semi-solid, or soft foods (but also including milk feeds for non-breastfed children) the minimum number of times or more during the previous day}}{\textit{Children 6-23 months of age}}$$

Minimum milk feeding frequency for non-breastfed children 6-23 months: Percentage of non-breastfed children 6–23 months who consumed at least two milk feeds during the previous day

$$\frac{\textit{Non-breastfed children 6–23 months who consumed at least two milk feeds during the previous day}}{\textit{Children 6–23 months of age}}$$

Minimum acceptable diet: Percentage of children 6–23 months who consumed a minimum acceptable diet during the previous day.

$$\frac{\textit{Children 6–23 months who consumed a minimum acceptable diet during the previous day}}{\textit{Children 6-23 months}}$$

Egg and/or flesh food consumption 6-23 months: Percentage of children 6–23 months who consumed egg and/or flesh foods during the previous day.

$$\frac{\textit{Children 6–23 months who consumed egg and/or flesh food during the previous day}}{\textit{Children 6-23 months}}$$

Sweet beverage consumption 6-23 months: Percentage of children 6–23 months who consumed a sweet beverage during the previous day.

$$\frac{\textit{Children 6–23 months who consumed a sweet beverage during the previous day}}{\textit{Children 6-23 months}}$$

Unhealthy food consumption 6-23 months: Percentage of children 6–23 months who consumed selected sentinel unhealthy foods during the previous day.

$$\frac{\textit{Children 6–23 months who consumed selected sentinel unhealthy foods during the previous day}}{\textit{Children 6-23 months}}$$

Zero vegetable or fruit consumption 6-23 months: Percentage of children 6–23 months who did not consume any vegetables or fruits during the previous day.

$$\frac{\textit{Children 6–23 months who did not consume any vegetables or fruits during the previous day}}{\textit{Children 6-23 months}}$$

2.5 Sample size determination

The provincial level sample sizes were calculated on the SMART+ platform which follows the ENA for SMART sampling approach. The sample sizes were based on the anthropometry module. Several parameters were taken into consideration including the expected GAM prevalence, desired precision, design effect, average household size, percentage of children under 5, and the percentage of nonresponse. For the mortality survey, the parameters considered included the estimated crude mortality rate (CDR), the desired precision, design effect, the recall period, average household size and the estimated nonresponse rate. The total sample size is expressed both in terms of the number of children and the number of households for anthropometry, while for mortality, it is expressed both as persons to be included and the households to be included for the survey as shown in the table below

Table 16: Anthropometry and mortality sample size calculation

Anthropometry sample size	Provinces							Rationale
Parameters	Southern province	Northwestern province	Eastern province	Central province	Western province	Lusaka Rural	Lusaka Urban	
Estimated prevalence of GAM	4.40	4.7	4.20	4.60	4.10	5.5	5.5	The estimated GAM prevalence for the surveys were based on the upper interval of the 2019 SMART surveys for most of the survey areas, with the ZDHS figures used in Northwestern and Lusaka province. The upper interval was considered in view of the prevailing drought situation
Precision (%)	3.00	3.00	3.00	3.00	3.00	3.0	3.0	Recommended precision for prevalence <5% and 5-10%
Design effect for WHZ	1.50	1.50	1.50	1.50	1.50	1.5	1.4	The provincial surveys have included several districts, in consideration of the IPC phase 3-4 for Acute food insecurity to ensure similar context in regard to the nutrition situation. Little differences are therefore expected within the districts hence the rule of thumb used

Sample Size Children	**293**	**312**	**280**	**306**	**274**	**362**	**338**	**As calculated on the SMART+ platform**
Average HH Size	4.90	5.00	5.00	5.10	4.70	5	4.8	Based on the 2022 census estimates for the provinces
% of under five children	16.00	19.50	20.36	18.00	16.70	16.1	16.4	Based on the 2022 census estimates for the provinces
Non-response households (%)	3.00	3.00	3.00	3.00	5.00	3	3	Little nonresponse expected in the provinces
Sample Size Households	**428**	**367**	**316**	**382**	**408**	**515**	**492**	**As calculated on the SMART+ platform**
Mortality sample size	**Provinces**							**Rationale**
Parameters	**Southern province**	**Northwestern province**	**Eastern province**	**Central province**	**Western province**	**Lusaka Rural**	**Lusaka Urban**	
Estimated Crude Death Rate	0.33	0.30	0.30	0.34	0.41	0.36	0.36	Based on either the 2019 SMART surveys or the 2018 ZDHS
Precision	0.30	0.30	0.30	0.30	0.35	0.35	0.35	Based on the estimated death rates
Design effect for CDR	1.50	1.50	1.50	1.50	1.50	1.5	1.5	Rule of thumb
Recall period in days	83.00	84.00	83.00	82.00	82.50	83	81	One recall event used for all the surveys (School opening on February 12th, 2024)
No of persons to be included	**2771**	**2489**	**2519**	**2890**	**2545**	**2221**	**2276**	As Calculated on the SMART+ platform
Average HH Size	4.90	5.00	5.00	5.10	4.70	5	4.8	Based on the 2022 census estimates for the provinces
Non-response households (%)	3.00	3.00	3.00	3.00	5.00	3	5	Anticipated non-response rate
Sample Size Households	**583**	**513**	**519**	**584**	**570**	**458**	**499**	As Calculated on the SMART+ platform

2.5.1 Number of households per cluster

The number of households to be completed in every cluster per day was determined according to the time the team could spend in the field excluding transportation, other procedures and break times. In consideration of the above, the number of households per cluster ranged from 11-14 households. Below is a sample of the detailed determination of the number of households per cluster for Western province. Based on the details in the table below, the total amount of time available for survey after deduction of time spend outside the survey was 460 minutes (600-120-60-20). The number of households a team can effectively do in Western province was therefore 13 (460/ (20+15) =13.1).

Parameter	Value (minutes)
Total time per day for field work	660
Travel time to cluster location (two way)	120
Duration for initial introduction and selection of household	60
Total duration of breaks	20
Travel time from one household to another	15
Average time in the household	20
Number of HH planned/day/team	**13**

Since each team should complete one cluster a day, the number of households a team can effectively survey in a day will constitute a cluster. Therefore, the total number of highest household sample between anthropometry and mortality in each survey was then divided by the number of households to be completed in one day to determine the number of clusters to be included for each survey. For instance, the household sample for anthropometry in western province was 408 while mortality survey had a household sample of 570 households. The mortality household sample was therefore used to come up with 44 clusters (570/13=43.8, rounded up to 44). The table below shows the total number of children, households, and clusters required from each survey.

Table 17: Sample sizes and clusters per Province (survey area)

Province	Required HHs per cluster	Anthropometry		Mortality		
		# of Children	Total HHs	Population	Total HHs	Clusters
Southern province	13	293	428	2771	**583**	45
Northwestern province	13	312	367	2489	**513**	40
Eastern province	11	280	316	2519	**519**	48

Central province	14	306	382	2890	**584**	42
Western province	13	274	408	2545	**570**	44
Lusaka Rural	12	362	**515**	2221	458	43
Lusaka Urban	12	338	**492**	2276	499	42

2.5.2 Sample size for additional indicators

The larger of the two samples calculated for both the anthropometry and mortality modules was considered as the final sample size for each survey. the assessment of the additional survey indicators (HHS, WASH, morbidity prevalence, measles, vitamin A, deworming, and IYCF) was based on the larger sample size calculated for either the anthropometry or mortality modules.

2.6 Sampling methodology

2.6.1 First stage sampling (selection of clusters)

Random selection of clusters (standard enumeration areas) was conducted from a master sampling frame, which was an updated list of all standard enumeration areas under the custody of the Zambia Statistics department (Zamstat). The required number of clusters were selected by applying the probability proportional to size method. Insecure areas were excluded from the final sampling frame. Reserve Clusters (RCs) were also selected. Reserve clusters would only be visited if 10% or more clusters or less than 80% of the children under five years were impossible to reach during the survey.

In each selected enumeration area, the local leader was approached and asked to help the survey teams to list down all the households and randomly select the required number. Selected clusters in the urban areas were segmented if they had >150 HHs, and rural clusters were segmented if they had >100 HHs. Cluster segmentation was done based on existing administrative boundaries, streets or natural landmarks such as a river, road, or public places like markets, schools, and mosques.

2.6.2 Second stage sampling (selection of households)

Simple random sampling was used to select the required number of households per cluster based on the determination done in each area. In each cluster, the survey team compiled a list of all households with the help of the village guide. The team leader working with the village leader used household enumeration lists to randomly select the required households. The teams would start the survey from any convenient household among the randomly selected households by administering the survey questionnaires and taking anthropometric measurements. All the children aged 6 to 59 months living in the selected household were included in the anthropometric survey. If more than one eligible child was found in a household, all the children were included. Children aged 0-23 months in a selected household took part in the IYCF survey. All the selected HHs were asked to respond to questions concerning the other indicators including water, sanitation and hygiene practices, household hunger, coverage of health programs, morbidity status and health seeking, and the measurement of MUAC for women of reproductive age.

The household was the basic sampling unit. The term household was defined as all the people living together and sharing food from the same pot. The teams also worked with the village leader to identify compounds, which were listed as a single household if members lived together and shared their meals, while in compounds where members lived together but did not share meals, households were listed separately.

2.7 Referral

All children identified as meeting the case definition for both moderate and severe acute malnutrition were referred to the nearest outpatient therapeutic feeding program (OTP) or health center. Women of reproductive age who were pregnant or breastfeeding with a child <6 months and had MUAC<230 mm were also referred to the nearest targeted supplementary feeding program (TSFP).

2.8 Special cases

a) **No children in the household:** Only the household questionnaire was administered. The survey teams were cautioned not to replace a household with no children.

b) **Abandoned household:** All abandoned households were removed before household listing and selection.

c) **Absent household:** The teams skipped absent households and continued to the next household according to the sampling procedure. The absent household were revisited before leaving the field. A household was only marked absent after at least two re-visits to the household had been made.

d) **Absent children:** If a child was absent at the time of the survey, the team collected the other household related data and told the mother that they would return later that day to look for the missing child before departure from the survey area.

e) **Children with disability/handicap:** All data that was not influenced by the disability was collected. The team determined if it was possible to measure all anthropometric indicators. If it was not possible to measure height and weight, the team gave the child an ID number and recorded data as missing and reported the reason.

A cluster control form was used to record the assessment outcome for every selected household.

2.9 Survey team composition, training and supervision

2.9.1 Survey team composition

In each of the survey area, the survey was implemented by 6 teams with survey team composed of the team leader (interviewer), a measurer, an assistant measurer, and the team supervisor. Each team member had designated roles as explained below:

1. **Team Leader:** He/she led the field survey team. The team leader organized a meeting with the village leader and local authorities to conduct cluster mapping and segmentation (if required), ensured complete HHs listing, ensured random HH selection during the second

stage of cluster sampling, monitoring and supervising anthropometric measurement, conducting household interviews, and filling the cluster control form.

2. **Measurer:** He/she measured weight, height, edema, and MUAC of children and women of reproductive age. The measurer also took proper care of measuring equipment and assisted the team leader with cluster mapping and other requested assistance.
3. **Assistant measurer:** He/she assisted the measurer in taking anthropometric measurements, taking proper care of the measuring equipment and carrying the equipment while in the field.
4. **Field supervisor:** The field supervisors were technical staff drawn from NFNC, MOH, Academia, Non-Governmental Organisations, DMMU, Zamstat and ACF who provided technical support including ensuring proper procedures were followed during household selection, ensuring interviews were done correctly and consistently in every household and ensuring data was captured accurately and providing feedback to the survey team while in the field.

2.10 Survey team training

The survey teams underwent a 5-day SMART survey enumerators training. an independent training was conducted for each survey area with the training being focused on the survey objectives, household selection techniques, demonstration of anthropometric measurements, familiarization with the questionnaire, and a session on how to use the SMARTcollect for data collection and standardization test. The training incorporated classroom lectures, discussions and practical sessions.

The quality of anthropometric measurements was assessed through a standardization test. The standardization test included a minimum of 10 healthy children under the age of 5 years in each survey. During the standardization test, a team of two enumerators measured each child twice to evaluate enumerators accuracy and precision of measurements.

In each survey area, a field test was conducted on the last day of training to assess survey teams' readiness for data collection. The team composition was based on performance of the enumerators during the standardization test to ensure each team had a strong measurer.

2.11 Survey equipment

Weight was measured using SECA electronic scales that allow for indirect measurement of the child's weight. Weight scales were calibrated every morning before starting data collection. Standard UNICEF height boards were used for measuring height. The mid upper arm circumference of both the children and women of reproductive age were measured using MUAC tapes.

2.12 Data collection

Data collection in the seven survey areas began on May 1st and continued until May 11th ending at different points for the specific surveys. In Lusaka province where 2 separate surveys were being conducted, the two different teams were combined to maximise on the available logistics

and resources for supervision, hence data collection lasted for 4 days in Lusaka urban and 5 days in the Lusaka rural districts.

2.13 Data entry and management

Data were collected offline using SMARTcollect, which is the first tool in the SMART+ Suite. Everyday when teams returned from the field, the team leader reviewed all the saved forms then connected the tablet to internet to submit the data to the SMART+ platform. The platform is customised to give a quick snapshot of the data quality and the data collection progress, which formed part of the feedback to give to the teams before they proceeded for data collection on the following day. All data was managed o the platform without the need for additional software for data entry or analysis.

2.14 Quality Assurance

Several measures were employed to ensure data quality including:

- Using the SMARTcollect application for digital data collection to minimize the possibility of errors when recording data. The application can prompt for remeasurement when values are likely to be flags.
- A five-day comprehensive training together with standardization test and field pretest for each survey area.
- Field supervision of the survey teams during data collection.
- Calibration and standardization of the survey equipment.
- Use of the cluster control forms to track the assessment outcome for every household.
- Daily plausibility checks and sharing of feedback with the teams for continuous improvement as data collection continued.

2.15 Data analysis, dissemination and report writing.

All the survey data was automatically analyzed on the SMART platform. SMART flags were used to exclude values that were out of range. Preliminary findings were shared with stakeholders in different forums for adoption and validation. A preliminary report on PowerPoint presentation and datasets were shared with stakeholders within one week of completing data collection. Feedback was incorporated in the preparation of the final report.

2.16 Ethical approval and considerations

Informed consent was obtained from all participants before data collection. Participation in the survey was voluntary. The survey objectives were clearly explained to the respondents before gathering data. Collected data were treated confidentially with no direct identifiers collected. Survey approval was sought from the relevant government institutions, the nutrition cluster technical working group, local authorities, and community leaders.

3 Survey results

3.1 Anthropometric results (based on WHO standards 2006)

3.1.1 Survey response rates

The minimum sample sizes in all the surveys were met, with all the surveys reaching above 90.0% of planned clusters, while the number of children surveyed was greatly above the minimum threshold of 80% across all the survey areas. The survey sought to achieve the minimum sample for both anthropometry and mortality survey and therefore the higher sample of households between the two surveys was used as the overall sample or the survey to ensure this. As a result, the mortality sample was higher in all the survey areas except in the Lusaka surveys, hence the anthropometry sample of children was notably overachieved in the five provinces since more households were visited than planned for in anthropometry.

Table 18: Surveys response rates

Domain	HHs planned	HHs reached	% achieved	Children planned	Children reached	% achieved	Eligible children in the HHs	Eligible children measured	Response rate	Clusters planned	Clusters reached	% achieved
Lusaka Urban	499	451	90.4%	338	298	88.2%	310	298	96.1%	42	40	95.2%
Lusaka Rural	515	483	93.8%	362	320	88.4%	358	353	98.6%	43	41	95.3%
Northwestern province	519	508	98.0%	312	390	124.9%	400	390	97.5%	40	40	100.0%
Western Province	570	549	96.3%	274	338	123.4%	342	338	98.8%	44	43	97.7%
Central Province	584	555	95.0%	306	417	136.3%	417	413	99.0%	42	42	100.0%
Southern Province	585	578	98.8%	293	467	159.3%	467	467	100.0%	45	45	100.0%
Eastern province	528	514	97.3%	280	404	144.3%	408	404	99.0%	48	48	100.0%

The surveys key outcome indicator was anthropometry for children 6-59 months, with also the IYCF indicators being of interest for programing purposes. The number of children reached in the survey areas based on the age groups of interest and overall are as shown in the table below.

Table 19: Number of children reached per age group

Survey domain	IYCF			Anthropometry	Total children
	0-5 Months	6-23 Months	0-23 Months	6-59 Months	0-59
Lusaka Urban	28	99	127	298	326
Lusaka Rural	38	126	164	353	390
Central province	29	153	182	413	440
Northwestern Province	46	137	183	390	436
Southern Province	45	163	208	467	506
Western Province	44	119	163	338	382
Eastern Province	31	144	175	404	434

3.1.2 Data quality report

The assessment of the anthropometric data quality showed excellent quality across all the survey areas. This is based on the ten statistical tests as determined in the SMART methodology and as used in anthropometric assessments. Interpretation of the findings can therefore be done confidently as the quality check shows there was neither selection nor measurement bias across all the surveys.

Table 20: Plausibility report of data quality by Survey

Domain	Flagged data	Overall Sex ratio	Age ratio (6-29 vs 30-59)	Dig pref score - weight	Dig pref score - height	Dig pref score - MUAC	Standard Dev WHZ	Skewness WHZ	Kurtosis WHZ	Poisson dist WHZ-2	OVERALL SCORE WHZ	Overall scoring
	Score (% of out-of-range subjects)	Score (P value of chi square)	Score (P value of chi square)	Score (#)	Score (#)	Score (#)	Score (SD)	Score (#)	Score (#)	Score (P value)	%	

Lusaka Urban	0 (1.7%)	0 (p=0.820)	0 (p=0.536)	0 (5)	2 (11)	0 (7)	0 (0.97)	0 (0.05)	3 (0.59)	0 (p=0.883)	5	Excellent
Lusaka Rural	0 (0.0%)	0 (p=0.833)	0 (p=0.426)	0 (7)	0 (6)	0 (7)	0 (1.04)	0 (-0.10)	0 (-0.20)	0 (p=0.781)	0	Excellent
Northwestern province	0 (0.3%)	0 (p=0.764)	0 (p=0.429)	0 (3)	0 (2)	0 (2)	0 (0.95)	0 (0.05)	0 (0.07)	0 (p=0.350)	0	Excellent
Western Province	0 (0.3%)	0 (p=0.914)	0 (p=0.577)	0 (3)	2 (8)	0 (6)	0 (0.95)	0 (-0.02)	0 (-0.06)	1 (p=0.044)	3	Excellent
Central Province	0 (1.5%)	0 (p=0.961)	0 (p=0.157)	0 (4)	4 (15)	0 (7)	0 (1.01)	0 (0.15)	0 (0.12)	0 (p=0.570)	4	Excellent
Southern Province	0 (1.7%)	0 (p=0.353)	0 (p=0.793)	0 (4)	0 (5)	0 (4)	0 (1.05)	0 (-0.04)	1 (-0.33)	0 (p=0.208)	1	Excellent
Eastern Province	0 (0.5%)	0 (p=0.656)	0 (p=0.486)	0 (3)	2 (9)	0 (4)	0 (0.96)	1 (0.33)	0 (-0.08)	0 (p=0.718)	3	Excellent

3.1.3 Prevalence of acute malnutrition based on weight for height and by sex

The global acute malnutrition (GAM) was defined as <-2 z scores weight-for-height and/or oedema. Severe acute malnutrition (SAM) was defined as <-3z scores weight-for-height and/or oedema). The Exclusions of Z-scores before analysis were made using SMART flags (WHZ -3 to 3) which are based on the observed mean for four (4) surveys (Lusaka urban, Lusaka rural, Western, and Southern provinces), while WHO flags (WHZ -5 to 5) were used in three (3) surveys (Northwestern, Eastern and Central provinces). The choice to use the WHO flags in some surveys was due to the survey mean being close to zero and having the malnourished children just below -3. After determining that the children were real children and not flags, it was technically agreed that using WHO flags would be the most informative approach in estimating the prevalence of SAM and GAM.

The prevalence of global acute malnutrition WHZ<-2 and/or oedema in the surveys ranged from very low in Eastern province (1.7% (0.9 - 3.4 95% CI) to medium in Southern province (6.2% (4.3 - 8.9 95% CI). The classification for GAM was based on the 2018 WHO/UNICEF classification of malnutrition. In Lusaka urban district, the GAM prevalence of 3.8% (2.2-6.3 95% CI) was classified as low and was in the same threshold as the GAM prevalence of 4.3% (2.6 - 7.0 95% CI) noted in Lusaka rural districts. In Northwestern province, the GAM prevalence was 2.8% (1.5 - 5.2 95% CI), western province 3.0% (1.4 - 6.1 95% CI), while central province had a GAM prevalence of 4.1% (2 .6 - 6.7 95% CI), all classified as low.

Table 21: Prevalence of GAM, MAM and SAM based on weight-for-height Z-scores and/or oedema by sex

Domain		Wasting by weight for height z-scores (and/or oedema) and by sex						
		N	GAM		Moderate		Severe	
			n	% (95% CI)	n	% (95% CI)	n	% (95% CI)
Lusaka Urban	All	293	11	3.8% (2.2-6.3 95% CI)	11	3.8% (2.2-6.3 95% CI)	0	0.0% (0.0 - 0.0 95% CI)
	Boys	149	9	6.0% (3.4-10.5 95% CI)	9	6.0% (3.4-10.5 95% CI)	0	0.0% (0.0 - 0.0 95% CI)
	Girls	144	2	1.4% (0.3-5.6 95% CI)	2	1.4% (0.3-5.6 95% CI)	0	0.0% (0.0 - 0.0 95% CI)
Lusaka Rural	All	352	15	4.3% (2.6 - 7.0 95% CI)	14	4.0% (2.3 - 6.7 95% CI)	1	0.3% (0.0 - 2.1 95% CI)
	Boys	180	7	3.9% (1.7 - 8.7 95% CI)	7	3.9% (1.7 - 8.7 95% CI)	0	0.0% (0.0 - 0.0 95% CI)
	Girls	172	8	4.7% (2.4 - 8.7 95% CI)	7	4.1% (2.0 - 8.2 95% CI)	1	0.6% (0.1 - 4.2 95% CI)

Northwestern Province	All	390	11	2.8% (1.5 - 5.2 95% CI)	9	2.3% (1.2 - 4.4 95% CI)	2	0.5% (0.1 - 2.1 95% CI)
	Boys	194	7	3.6% (1.8 - 7.0 95% CI)	5	2.6% (1.1 - 5.8 95% CI)	2	1.0% (0.2 - 4.2 95% CI)
	Girls	196	4	2.0% (0.8 - 5.2 95% CI)	4	2.0% (0.8 - 5.2 95% CI)	0	0.0% (0.0 - 0.0 95% CI)
Western Province	All	337	10	3.0% (1.4 - 6.1 95% CI)	9	2.7% (1.2 - 5.8 95% CI)	1	0.3% (0.0 - 2.3 95% CI)
	Boys	170	4	2.4% (0.9 - 6.1 95% CI)	3	1.8% (0.6 - 5.3 95% CI)	1	0.6% (0.1 - 4.4 95% CI)
	Girls	167	6	3.6% (1.5 - 8.4 95% CI)	6	3.6% (1.5 - 8.4 95% CI)	0	0.0% (0.0 - 0.0 95% CI)
Central Province	All	410	17	4.1% (2 .6 - 6.7 95% CI)	13	3.2% (1.9 - 5.4 95% CI)	4	1.0% (0.4 - 2.5 95% CI)
	Boys	204	11	5.4% (3.2 - 9.0 95% CI)	7	3.4% (1.7 - 6.9 95% CI)	4	2.0% (0.8 - 5.0 95% CI)
	Girls	206	6	2.9% (1.4 - 6.1 95% CI)	6	2.9% (1.4 - 6.1 95% CI)	0	0.0% (0.0 - 0.0 95% CI)
Southern Province	All	452	28	6.2% (4.3 - 8.9 95% CI)	27	6.0% (4.1 - 8.7 95% CI)	1	0.2% (0.0 - 1.7 95% CI)
	Boys	233	14	6.0% (3.4 - 10.4 95% CI)	14	6.0% (3.4 - 10.4 95%CI)	0	0.0% (0.0 - 0.0 95% CI)
	Girls	219	14	6.4% (3.5 - 11.3 95% CI)	13	5.9% (3.1 - 10.9 95%CI)	1	0.5% (0.1 - 3.4 95% CI)
Eastern Province	All	401	7	1.7% (0.9 - 3.4 95% CI)	7	1.7% (0.9 - 3.4 95% CI)	0	0.0% (0.0 - 0.0 95% CI)
	Boys	204	6	2.9% (1.4 - 6.1 95% CI)	6	2.9% (1.4 - 6.1 95% CI)	0	0.0% (0.0 - 0.0 95% CI)
	Girls	197	1	0.5% (0.1 - 3.5 95% CI)	1	0.5% (0.1 - 3.5 95% CI)	0	0.0% (0.0 - 0.0 95% CI)

3.1.4 Prevalence of acute malnutrition based on MUAC cut off's and/or oedema by sex.

MUAC measurements can be done easily, quickly and affordably. In children aged 6-60 months, the Mid-Upper Arm Circumference (MUAC), with simple cut-offs, is at least as predictive of death

as WHZ[2]. MUAC is currently not recommended for use among infants aged below 6 months because of a lack of data on its reliability, measurement in practice and predictive value for death. However, it was recently reported that in rural Kenya the inter-observer reliability of MUAC among infants aged 0 to 6 months was greater than that of WFHZ[3].

The GAM prevalence based on MUAC (<125 mm) and/or oedema shows proportions of acute malnutrition ranging from 1.0% (0.2 - 4.6 95% CI) in eastern province to 5.1% (2.9 - 8.9 95% CI) in central province. The prevalences noted by MUAC were low, not exceeding 2.6% (0.9 - 6.9 95% CI) in Southern province and central province appearing to deviate from the other provinces with a GAM prevalence by MUAC of 5.1% (2.9 - 8.9 95% CI). The prevalences by MUAC were also notably lower compared to the prevalence by WHZ, and indication that WHZ detects more children with wasting than MUAC. There were very few children severely wasted by MUAC, with most of the survey areas not detecting any SAM by MUAC.

Table 22: Prevalence of GAM, MAM, and SAM in children 6-59 months based on MUAC by sex

Domain		Wasting by MUAC (and/or oedema) and by sex						
		N	GAM		Moderate		Severe	
			n	% (95% CI)	n	% (95% CI)	n	% (95% CI)
Lusaka urban	All	298	5	1.7% (0.6 - 4.6 95% CI)	4	1.3% (0.5 - 3.5 95% CI)	1	0.3% (0.0 - 2.4 95% CI)
	Boys	151	3	2.0% (0.5 - 8.2 95% CI)	2	1.3% (0.3 - 5.2 95% CI)	1	0.7% (0.1 - 4.7 95% CI)
	Girls	147	2	1.4% (0.3 - 5.4 95% CI)	2	1.4% (0.3 - 5.4 95% CI)	0	0.0% (0.0 - 0.0 95% CI)
Lusaka Rural	All	352	7	2.0% (0.7 - 5.3 95% CI)	5	1.4% (0.4 - 5.1 95% CI)	2	0.6% (0.1 - 2.3 95% CI)
	Boys	180	3	1.7% (0.5 - 5.2 95% CI)	3	1.7% (0.5 - 5.2 95% CI)	0	0.0% (0.0 - 0.0 95% CI)
	Girls	172	4	2.3% (0.7 - 7.2 95% CI)	2	1.2% (0.2 - 7.9 95% CI)	2	1.2% (0.3 - 4.6 95% CI)
Northwestern Province	All	390	5	1.3% (0.5 - 3.5 95% CI)	4	1.0% (0.3 - 3.3 95% CI)	1	0.3% (0.0 - 1.9 95% CI)
	Boys	194	5	2.6% (0.9 - 6.9 95% CI)	4	2.1% (0.6 - 6.5 95% CI)	1	0.5% (0.1 - 3.9 95% CI)
	Girls	196	0	0.0% (0.0 - 0.0 95% CI)	0	0.0% (0.0 - 0.0 95% CI)	0	0.0% (0.0 - 0.0 95% CI)
Western Province	All	337	4	1.2% (0.4 - 3.1 95% CI)	4	1.2% (0.4 - 3.1 95% CI)	0	0.0% (0.0 - 0.0 95% CI)
	Boys	169	2	1.2% (0.3 - 4.6 95% CI)	2	1.2% (0.3 - 4.6 95% CI)	0	0.0% (0.0 - 0.0 95% CI)
	Girls	168	2	1.2% (0.3 - 4.9 95% CI)	2	1.2% (0.3 - 4.6 95% CI)	0	0.0% (0.0 - 0.0 95% CI)

[2] Myatt M, Khara T, Collins S. A review of methods to detect cases of severely malnourished children in the community for their admission into community-based therapeutic care programs. Food Nutr Bull 2006; 27: S7-23 pmid: 17076211.

[3] Mwangome MK, Fegan G, Mbunya R, Prentice AM, Berkley JA. Reliability and accuracy of anthropometry performed by community health workers among infants under 6 month in rural Kenya. Trop Med Int Health 2012; 17: 622-9 doi: 10.1111/j.1365-3156.2012.02959.x.

Central Province	All	412	21	5.1% (2.9 - 8.9 95% CI)	20	4.9% (2.7 - 8.4 95% CI)	1	0.2% (0.0 - 1.8 95% CI)
	Boys	205	8	3.9% (1.6 - 9.1 95% CI)	8	3.9% (1.6 - 9.1 95% CI)	0	0.0% (0.0 - 0.0 95% CI)
	Girls	207	13	6.3% (3.2 - 12.0 95% CI)	12	5.8% (2.9 - 11.2 95% CI)	1	0.5% (0.1 - 3.6 95% CI)
Southern Province	All	464	12	2.6% (1.3 - 5.0 95% CI)	11	2.4% (1.2 - 4.6 95% CI)	1	0.2% (0.0 - 1.6 95% CI)
	Boys	241	3	1.2% (0.4 - 3.7 95% CI)	3	1.2% (0.4 - 3.7 95% CI)	0	0.0% (0.0 - 0.0 95% CI)
	Girls	223	9	4.0% (1.8 - 8.7 95% CI)	8	3.6% (1.6 - 7.9 95% CI)	1	0.4% (0.1 - 3.2 95% CI)
Eastern Province	All	404	4	1.0% (0.2 - 4.6 95% CI)	4	1.0% (0.2 - 4.6 95% CI)	0	0.0% (0.0 - 0.0 95% CI)
	Boys	205	2	1.0% (0.2 - 3.8 95% CI)	2	1.0% (0.2 - 3.8 95% CI)	0	0.0% (0.0 - 0.0 95% CI)
	Girls	199	2	1.0% (0.1 - 7.2 95% CI)	2	1.0% (0.1 - 7.2 95% CI)	0	0.0% (0.0 - 0.0 95% CI)

3.1.5 Prevalence of High-risk Moderate acute malnutrition based on MUAC cut off's

There is also growing recognition that treatment should target those at highest risk of death and deterioration. Recent trials have aligned the treatment of SAM and MAM by using RUTF as a single food product and suggest this could increase coverage, improve recovery, and simplify supply chains (12–14). However, providing RUTF to all wasted children, both severe and moderate, would be costly and thus difficult to implement at scale, hence the alignment of the treatment of high-risk MAM with that of SAM.

The analysis of the MAM cases based on MUAC cut offs showed only small proportions of the MAM to be high risk, with most of the MAM children noted to be low risk MAM.

Table 23: Analysis of High-Risk MAM

Domain	MAM based on MUAC				
	N	High Risk MAM (115mm-119mm)		Low Risk MAM (120mm-124mm)	
		n	% (95% CI)	n	% (95% CI)
Lusaka urban	298	0	0.0% (0.0 – 0.0, 95% CI)	4	1.3% (0.4 – 3.4, 95% CI)
Lusaka Rural	352	0	0.0% (0.0 – 0.0, 95% CI)	5	1.42% (0.6 – 3.3, 95% CI)
Northwestern Province	390	1	0.3% (0.1 – 1.4, 95% CI)	3	0.8% (0.3 – 2.2, 95% CI)
Western Province	337	1	0.3% (0.1 – 1.7, 95% CI)	3	0.9% (0.3 0 – 2.6, 95% CI)
Central Province	412	6	1.5% (0.7 – 3.1, 95% CI)	14	3.4% (2.0 – 5.6, 95% CI)
Southern Province	464	3	0.7% (0.2 – 1.9, 95% CI)	8	1.7% (0.9 – 3.4, 95% CI)
Eastern Province	404	1	0.3% (0.0-1.4, 95% CI)	3	0.7% (0.3-2.2,95% CI)

3.1.6 Prevalence of combined GAM and SAM based on WHZ and MUAC cut off's (and/or oedema) and by sex

The prevalence of combined Global Acute Malnutrition (cGAM) defined as WHZ<-2 and/or MUAC<125 mm and/or oedema revealed a prevalence higher than the one recorded for either WHZ or MUAC. This indicates that even though some children may have been malnourished by both, there are children in the survey area that are only malnourished by either criterion but not both. There is therefore the need to focus on all criteria while screening and admitting children to the program, as well as in program planning. Even though there are no documented thresholds for combined GAM estimates, the prevalences noted in most of the survey areas (except Western, Northwestern and eastern provinces) are in the medium thresholds with the upper interval in Southern and Central provinces being in the high threshold.

Table 24: Prevalence of combined GAM and SAM based on WHZ and MUAC cut off's by sex

Domain		Wasting by WHZ and MUAC (and/or oedema) and by sex				
		N	cGAM		cSAM	
			n	% (95% CI)	n	% (95% CI)
Lusaka urban	All	298	15	5.0 % (3.1 - 8.2 95% C.I.)	1	0.3 % (0.0 - 2.4 95% C.I.)
	Boys	151	11	7.3 % (4.2 - 12.4 95% C.I.)	1	0.7 % (0.1 - 4.7 95% C.I.)
	Girls	147	4	2.7 % (1.0 - 7.1 95% C.I.)	0	0.0 % (0.0 - 0.0 95% C.I.)
Lusaka Rural	All	352	19	5.4 % (3.4 - 8.6 95% C.I.)	2	0.6 % (0.1 - 2.3 95% C.I.)
	Boys	180	8	4.4 % (2.1 - 9.3 95% C.I.)	0	0.0 % (0.0 - 0.0 95% C.I.)
	Girls	172	11	6.4 % (3.6 - 11.0 95% C.I.)	2	1.2 % (0.3 - 4.6 95% C.I.)
Northwestern Province	All	390	13	3.3 % (1.7 - 6.3 95% C.I.)	2	0.5 % (0.1 - 2.1 95% C.I.)
	Boys	194	9	4.6 % (2.4 - 8.7 95% C.I.)	2	1.0 % (0.2 - 4.2 95% C.I.)
	Girls	196	4	(4) 2.0 % (0.8 - 5.2 95% C.I.)	0	0.0 % (0.0 - 0.0 95% C.I.)
Western Province	All	338	14	4.1 % (2.2 - 7.7 95% C.I.)	1	0.3 % (0.0 - 2.3 95% C.I.)
	Boys	170	6	3.5 % (1.4 - 8.5 95% C.I.)	1	0.6 % (0.1 - 4.5 95% C.I.)
	Girls	168	8	4.8 % (2.3 - 9.6 95% C.I.)	0	0.0 % (0.0 - 0.0 95% C.I.)
Central Province	All	412	32	7.8 % (5.1 - 11.7 95% C.I.)	5	1.2 % (0.5 - 2.8 95% C.I.)
	Boys	205	16	7.8 % (4.6 - 13.0 95% C.I.)	4	2.0 % (0.7 - 5.0 95% C.I.)
	Girls	207	16	7.7 % (4.4 - 13.2 95% C.I.)	1	0.5 % (0.1 - 3.6 95% C.I.)
Southern Province	All	465	37	8.0 % (5.8 - 10.9 95% C.I.)	2	0.4 % (0.1 - 1.8 95% C.I.)
	Boys	242	17	7.0 %	0	0.0 %

				(4.3 - 11.3 95% C.I.)		(0.0 - 0.0 95% C.I.)
	Girls	223	20	9.0 % (5.4 - 14.6 95% C.I.)	0	0.9 % (0.2 - 3.6 95% C.I.)
Eastern Province	All	404	10	2.5 % (1.0 - 5.9 95% C.I.)	0	0.0 % (0.0 - 0.0 95% C.I.)
	Boys	205	7	3.4 % (1.5 - 7.4 95% C.I.)	0	0.0 % (0.0 - 0.0 95% C.I.)
	Girls	199	3	1.5 % (0.3 - 6.3 95% C.I.)	0	0.0 % (0.0 - 0.0 95% C.I.)

3.1.7 Prevalence of underweight based on weight for age Z scores by sex

The percentage of children who have low weight for age (underweight) can reflect wasting (low weight for height), indicating acute weight loss, stunting, or both. Thus, underweight is a composite indicator for both acute and chronic malnutrition[4].

According to the findings, the prevalence of underweight was acceptable in Northwestern province (<10%) and poor in the other surveys (10% - 20%)

Table 25: Prevalence of global, moderate and severe underweight in children 6-59 months based on WAZ Scores by sex

Domain		Underweight by weight for age z-scores and by sex						
		N	Global underweight		Moderate Underweight		Severe Underweight	
			n	% (95% CI)	n	% (95% CI)	n	% (95% CI)
Lusaka Urban	All	292	43	14.7% (11.1 - 19.3 95% CI)	37	12.7% (9.3 - 17.0 95% CI)	6	2.1% (1.0 - 4.3 95% CI)
	Boys	147	28	19.0% (13.4 - 26.4 95% CI)	24	16.3% (10.8 - 23.9 95% CI)	4	2.7% (1.1 - 6.8 95% CI)
	Girls	145	15	10.3% (5.9 - 17.4 95% CI)	13	9.0% (4.9 - 15.8 95% CI)	2	1.4% (0.3 - 5.4 95% CI)
Lusaka Rural	All	351	40	11.4% (8.5 - 15.1 95% CI)	32	9.1% (6.5 - 12.6 95% CI)	8	2.3% (1.2 - 4.4 95% CI)
	Boys	180	26	14.4% (9.5 - 21.4 95% CI)	19	10.6% (6.4 - 17.0 95% CI)	7	3.9% (1.9 - 7.7 95% CI)
	Girls	171	14	8.2% (5.0 - 13.2 95% CI)	13	7.6% (4.5 - 12.6 95% CI)	1	0.6% (0.1 - 4.2 95% CI)
Northwestern province	All	390	34	8.7% (6.1 - 12.4 95% CI)	32	8.2% (5.6 - 11.9 95% CI)	2	0.5% (0.1 - 2.1 95% CI)
	Boys	194	19	9.8% (6.4 - 14.7 95% CI)	17	8.8% (5.6 - 13.4 95% CI)	2	1.0% (0.2 - 4.2 95% CI)
	Girls	196	15	7.7% (4.5 - 12.7 95% CI)	15	7.7% (4.5 - 12.7 95% CI)	0	0.0% (0.0 - 0.0 95% CI)
Western Province	All	337	47	13.9% (10.0 - 19.1 95% CI)	42	12.5% (8.9 - 17.1 95% CI)	5	1.5% (0.4 - 5.4 95% CI)
	Boys	170	28	16.5% (11.5 - 23.0 95% CI)	25	14.7% (10.2 - 20.8 95% CI)	3	1.8% (0.4 - 7.6 95% CI)

[4] World Health Organization (WHO). 2015 Global Reference List of 100 Core Health Indicators. 2015. http://apps.who.int/iris/bitstream/10665/173589/1/WHO_HIS_HSI_2015.3_eng.pdf

	Girls	167	19	11.4% (7.2 - 17.6 95% CI)	17	10.2% (6.3 - 16.0 95% CI)	2	1.2% (0.3 - 4.9 95% CI)
Central Province	All	412	60	14.6% (11.2 - 18.7 95% CI)	40	9.7% (7.3 - 12.7 95% CI)	20	4.9% (3.0 - 7.9 95% CI)
	Boys	205	36	17.6% (12.8 - 23.5 95% CI)	21	10.2% (6.9 - 15.0 95% CI)	15	7.3% (4.4 - 12.0 95% I)
	Girls	207	24	11.6% (7.9 - 16.8 95% CI)	19	9.2% (6.2 - 13.5 95% CI)	5	2.4% (1.0 - 5.7 95% CI)
Southern Province	All	461	62	13.4% (10.1 - 17.7 95% CI)	49	10.6% (7.6 - 14.7 95% CI)	13	2.8% (1.5 - 5.2 95% CI)
	Boys	240	30	12.5% (8.3 - 18.3 95% CI)	25	10.4% (6.6 - 16.0 95% CI)	5	2.1% (0.8 - 5.5 95% CI)
	Girls	221	32	14.5% (9.9 - 20.7 95% CI)	24	10.9% (7.3 - 16.0 95% CI)	8	3.6% (1.6 - 8.2 95% CI)
Eastern Province	All	401	51	12.7% (8.4 - 18.8 95% CI)	47	11.7% (7.9 - 17.1 95% CI)	4	1.0% (0.4 - 2.6 95% CI)
	Boys	203	32	15.8% (9.6 - 24.9 95% CI)	30	14.8% (9.2 - 23.0 95% CI)	2	1.0% (0.3 - 3.8 95% CI)
	Girls	198	19	9.6% (5.3 - 16.9 95% CI)	17	8.6% (4.9 - 14.7 95% CI)	2	1.0% (0.2 - 4.1 95% CI)

3.1.8 Prevalence of stunting based on height for age Z scores by sex.

A child is classified as stunted when their height-for-age is more than two standard deviations below the WHO Child Growth Standards median. Stunting, which is the impaired growth and development usually occurs when children consistently experience poor nutrition and repeated infections.

The survey results show that all the survey areas had high, or very high levels of stunting based on the WHO/UNICEF 2018 classification of stunting. Stunting levels exceeded the 30% threshold in more than half the survey areas with only western province (26.1%), Southern province (28.3%) and Lusaka rural district (29.1%) being below the 30% threshold.

Table 26: Prevalence of global, moderate and severe stunting in children 6-59 months based on HAZ Scores by sex.

	Stunting by Height for Age z-scores and by sex							
		N	Global stunting		Moderate stunting		Severe stunting	
			n	% (95% CI)	n	% (95% CI)	n	% (95% CI)
Lusaka Urban	All	289	99	34.3% (27.7 - 41.5 95% CI)	64	22.1% (17.6 - 27.5 95% CI)	35	12.1% (8.4 - 17.1 95% CI)
	Boys	148	61	41.2% (33.4 - 49.5 95% CI)	37	25.0% (19.4 - 31.5 95% CI)	24	16.2% (10.8 - 23.6 95% CI)
	Girls	141	38	27.0% (19.3 - 36.2 95% CI)	27	19.1% (13.2 - 27.0 95% CI)	11	7.8% (4.5 - 13.2 95% CI)
Lusaka Rural	All	347	101	29.1% (24.6 - 34.1 95% CI)	74	21.3% (17.4 - 25.9 95% CI)	27	7.8% (5.4 - 11.1 95% CI)
	Boys	176	64	36.4% (30.0 - 43.2 95% CI)	48	27.3% (21.4 - 34.0 95% CI)	16	9.1% (5.6 - 14.4 95% CI)

	Girls	171	37	21.6% (15.7 - 29.1 95% CI)	26	15.2% (10.3 - 21.9 95% CI)	11	6.4% (3.4 - 11.8 95% CI)
Northwestern province	All	389	119	30.6% (26.1 - 35.5 95% CI)	95	24.4% (20.4 - 29.0 95% CI)	24	6.2% (4.1 - 9.3 95% CI)
	Boys	193	72	37.3% (31.8 - 43.1 95% CI)	56	29.0% (23.5 - 35.2 95% CI)	16	8.3% (5.1 - 13.3 95% CI)
	Girls	196	47	24.0% (18.3 - 30.7 95% CI)	39	19.9% (14.3 - 26.9 95% CI)	8	4.1% (1.9 - 8.7 95% CI)
Western Province	All	330	86	26.1% (19.7 - 33.7 95% CI)	66	20.0% (14.9 - 26.3 95% CI)	20	6.1% (3.5 - 10.2 95% CI)
	Boys	165	48	29.1% (21.2 - 38.4 95% CI)	37	22.4% (16.5 - 29.7 95% CI)	11	6.7% (3.4 - 12.7 95% CI)
	Girls	165	38	23.0% (16.1 - 31.8 95% CI)	29	17.6% (11.5 - 26.0 95% CI)	9	5.5% (2.7 - 10.6 95% CI)
Central Province	All	411	142	34.5% (29.6 - 39.8 95% CI)	94	22.9% (18.9 - 27.4 95% CI)	48	11.7% (8.9 - 15.2 95% CI)
	Boys	203	87	42.9% (36.9 - 49.0 95% CI)	55	27.1% (21.5 - 33.5 95% CI)	32	15.8% (11.1 - 21.9 95% CI)
	Girls	208	55	26.4% (20.8 - 32.9 95% CI)	39	18.8% (14.1 - 24.5 95% CI)	16	7.7% (4.8 - 12.0 95% CI)
Southern Province	All	448	127	28.3% (24.0 - 33.2 95% CI)	92	20.5% (16.3 - 25.5 95% CI)	35	7.8% (5.7 - 10.5 95% CI)
	Boys	232	74	31.9% (25.7 - 38.8 95% CI)	52	22.4% (16.1 - 30.3 95% CI)	22	9.5% (6.0 - 14.7 95% CI)
	Girls	216	53	24.5% (18.8 - 31.4 95% CI)	40	18.5% (13.4 - 25.1 95% CI)	13	6.0% (3.7 - 9.6 95% CI)
Eastern Province	All	393	136	34.6% (28.4 - 41.3 95% CI)	106	27.0% (22.0 - 32.6 95% CI)	30	7.6% (5.4 - 10.6 95% CI)
	Boys	198	76	38.4% (30.3 - 47.1 95% CI)	55	27.8% (21.6 - 35.0 95% CI)	21	10.6% (7.2 - 15.4 95% CI)
	Girls	195	60	30.8% (23.4 - 39.3 95% CI)	51	26.2% (20.1 - 33.2 95% CI)	9	4.6% (2.3 - 8.9 95% CI)

3.2 Death rates and demographic results

Generally, the crude death rates across the survey area were below the WHO emergency threshold of 1/10,000/day and below the alert levels of 0.5/10,000/day.

Table 27: Crude and under 5 death rates

Domain	Crude mortality rate (total deaths /10,000 people / day)		Under five mortality rates. (deaths in children under five / 10,000 children under five / day)		Total Population Sampled	Number of households
	Rate [CI]	Design Effect	Rate [CI]	Design Effect		
Lusaka Urban	0.39 (0.20-0.77)	1	0.00 (0.00-12.02)	1	2230	451
Lusaka Rural	0.37 (0.18-0.77)	1.06	0.31 (0.05-1.82)	1	2576	487
Northwestern Province	0.08 (0.02-0.28)	1	0.00 (0.00-11.44)	1	3176	508

Western Province	0.30 (0.14-0.68)	1.17	0.63 (0.16-2.37)	1	2816	549
Central Province	0.38 (0.22-0.65)	1	0.80 (0.27-2.34)	1	3238	555
Southern Province	0.19 (0.08-0.43)	1	0.47 (0.13-1.74)	1	3203	578
Eastern Province	0.17 (0.07-0.43)	1	0.55 (0.14-2.05)	1	2832	514

Table 28: Demographic profile of the population in the survey areas

Domain	Population Parameters			
	Average HH Size	U5 Prop (%)	In - migration	Out - migration
Lusaka Urban	5.08	15.87	5.86	6.97
Lusaka Rural	5.33	16.07	2.10	8.61
Northwestern Province	6.34	14.83	2.92	6.03
Western Province	5.14	14.52	1.26	7.15
Central Province	5.85	14.67	1.51	7.31
Southern Province	5.54	16.42	1.17	4.51
Eastern Province	5.52	16.38	2.89	4.76

3.3 Other survey results

3.3.1 Water, sanitation, and hygiene

The development of water supply, sanitation and hygiene is a vital component of humanitarian programmes. Over the last decade, several scoping and systematic studies have concluded that interventions in humanitarian crises involving water, sanitation and hygiene (WASH) can bring substantial health and social benefits to vulnerable communities affected[5][6]. The survey assessed some key WASH indicators which include access to drinking and cooking water, access to sanitation facilities and handwashing device and agent.

Water Access

Safe and promptly accessible water is significant for general wellbeing. Improved water supply and sanitation, and better administration of water assets, can help nations' financial development and can contribute greatly to poverty reduction. Sustainable Development Goal target 6.1 calls for universal and equitable access to safe and affordable drinking water. (WHO October 2019 Bulletin). Based on the survey findings, majority of the households in the urban survey use water from a public tap (38.8%) with 31.0% in the Lusaka urban survey also having water connected into their dwellings. In the provinces, most of the households get drinking and cooking water from handpumps or bores, unprotected hand-dug wells and surface water.

Table 29: Main sources of water for drinking and cooking

Domain	Main source of water for drinking and cooking														
	N	Public tap/standpipe	Handpumps/boreholes	Protected well	Water seller/kiosks	Piped connection to house	Protected spring	Bottled water, water sachets	Tanker trucks	Unprotected hand-dug well	Surface water	Unprotected spring	Rain water collection	Other	Don't know
Lusaka urban	451	38.8% (174)	9.2% (41)	1.1% (5)	19.4% (87)	31.0% (139)	0.0% (0)	0.0% (0)	0.4% (2)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)
Lusaka Rural	487	3.5% (17)	70.2% (343)	7.4% (36)	0.2% (1)	0.6% (3)	0.0% (0)	0.0% (0)	0.0% (0)	9.2% (45)	6.8% (33)	2.1% (1)	0.0% (0)	0.0% (0)	0.0% (0)

[5] Ramesh A, Blanchet K, Ensink JH, Roberts B. Evidence on the effectiveness of water, sanitation, and hygiene (WASH) interventions on health outcomes in humanitarian crises: a systematic review. PLoS One. 2015;10(9): e0124688

[6] Blanchet K, Ramesh A, Frison S, Warren E, Hossain M, Smith J, et al. Evidence on public health interventions in humanitarian crises. Lancet. 2017; 390:2287–96

Northwestern province	504	9.1% (46)	37.1% (187)	2.8% (14)	7.5% (38)	12.9% (65)	0.0% (0)	0.0% (0)	0.0% (0)	8.7% (44)	16.1% (81)	5.8% (29)	0.0% (0)	0.0% (0)	0.0% (0)
Western Province	549	2.2% (12)	37.2% (204)	1.6% (9)	3.1% (17)	18.9% (104)	0.0% (0)	0.0% (0)	0.4% (2)	27.7% (152)	3.6% (20)	4.2% (23)	0.0% (0)	1.1% (6)	0.0% (0)
Central Province	554	3.6% (20)	26.5% (147)	20.8% (115)	0.2% (1)	0.7% (4)	0.0% (0)	0.0% (0)	0.0% (0)	24.5% (136)	22.9% (127)	0.7% (4)	0.0% (0)	0.0% (0)	0.0% (0)
Southern Province	579	4.5% (26)	54.9% (318)	2.9% (17)	0.7% (4)	12.4% (72)	0.0% (0)	0.0% (0)	0.0% (0)	10.7% (62)	13.0% (75)	0.7% (4)	0.2% (1)	0.0% (0)	0.0% (0)
Eastern Province	514	6.8% (35)	60.9% (313)	3.9% (20)	0.0% (0)	3.5% (18)	0.0% (0)	0.0% (0)	0,2% (1)	17.9% (92)	4.7% (24)	2.1% (11)	0.0% (0)	0.0% (0)	0.0% (0)

Based on the water sources reported by the households, the survey assessed that most households used water from safe or protected sources. All the households in the Lusaka urban survey had water from safe sources, with 81.9% of the households in Lusaka rural districts accessing water from safe sources. In the other provinces, the proportion was lowest in central province at 51.8% and highest in southern province at 75.5%. The survey also assessed the proportion of households that used domestic water collected from protected/treated sources with protected containers only and in adequate quantities. This serves as an indication of the proportion of the population having access to adequate quantities of safe water. More than half of the households had access to adequate safe water in Lusaka urban (74.5%), Lusaka rural (61.1%), Northwestern province (55.5%), Southern province (63.4%) and in eastern province (65.2%). Most of the households in western and central provinces did not have access to safe adequate amount of water with only 38.3% and 37.3% respectively achieving this.

Table 30: Access to safe and sufficient water quantity

Domain	Access to safe/improved water for drinking and cooking		Access to sufficient quantity of water	
	Protected/treated water sources	Unprotected/untreated water sources	Proportion of households that use domestic water collected from protected/treated sources with protected containers only	
			≥ 15 lpppd	< 15 lpppd

Lusaka urban	100.0% (100-100)	0.0% (0 - 0)	74.5% (65.4 - 81.9)	25.5% (18.1- 34.6)
Lusaka Rural	81.9% (73.0 - 88.4)	18.1% (11.6 - 27.0)	61.1% (53.0 - 68.6)	38.9% (31.4- 47.0)
Northwestern Province	69.4% (56.9-79.7)	30.6% (20.3- 43.1%)	55.5% (45.2-65.3)	44.5% (34.7-54.8)
Western Province	63.4% (50.9-74.3)	36.6% (25.7- 49.1)	38.3% (29.3-48.1)	61.7% (51.9-70.7)
Central Province	51.8% (39.2-64.2)	48.2% (35.8-60.8)	37.3% (26.7-49.2)	62.7% (50.8-73.3)
Southern Province	75.5% (64.9-83.7)	24.5% (16.3-35.1)	63.4% (53.6-72.2)	36.6% (27.8-46.4)
Eastern Province	75.3% (62.7- 84.7)	24.7% (15.3-37.3)	65.2% (54.2-74.8%)	34.8% (25.2-45.8)

Access to a specific Handwashing Station

Handwashing with soap is the most effective way for preventing life threatening diarrhoeal diseases.[7] Having a specific handwashing station at home helps in promoting positive handwashing practices. Handwashing with soap and water helps prevent the spread if infectious diseases that can spread from one person to another by contaminated hands.

The assessment of handwashing showed that only a few households had a specific handwashing station, with the highest proportion being 20.5% in Lusaka urban and 26.3% in Southern province. Among those households with a specific handwashing facility, there were varied proportions in the surveys of the households with both soap and water in the households with some low proportions in central province (17.6%) and eastern province (27.3%). Western province (82.4%) and Lusaka urban (75%) showed the notably high proportions of the households with a specific handwashing station with both soap and water. This translates to only small proportions of households practicing proper handwashing with soap and water.

Table 31: Access to handwashing device

Domain	Type of handwashing device	Water availability for handwashing	Soap availability for handwashing	Soap and Water Availability

[7] Majorin F, Freeman MC, Barnard S, Routray P, Boisson S, Clasen T. Child Feces Disposal Practices in Rural Orissa: A Cross-Sectional Study. PLoS One, 2014; 9(2): e89551.

	N	HH with a specific handwashing device	Sink with tap water	Buckets with taps	Pouring device	Other	n	Yes	n	Yes	n	Yes
Lusaka urban	448	20.5% (92)	56.5% (52)	20.7% (19)	13.0% (12)	9.8% (9)	85	92.40 %	71	77.20%	69	75%
Lusaka Rural	487	9.7% (47)	25.5% (12)	8.5% (4)	57.4% (27)	8.5% (4)	41	87.20 %	25	53.20%	24	51.10 %
Northwestern Province	504	8.0% (40)	20.0% (8)	15.0% (6)	37.5% (15)	27.5 % (11)	37	88.10 %	19	45.20%	18	42.90 %
Western province	549	2.9% (16)	68.7% (11)	18.8% (3)	6.3% (1)	6.3% (1)	15	88.20 %	14	82.40%	14	82.40 %
Central Province	553	3.2% (18)	5.6% (1)	27.8% (5)	55.6% (10)	11.1 % (2)	13	76.50 %	3	17.60%	3	17.60 %
Southern Province	579	26.3% (152)	11.2% (17)	1.3% (2)	82.2% (125)	5.3% (8)	135	88.80 %	89	58.60%	88	57.90 %
Eastern Province	514	6.4% (33)	18.2% (6)	6.1% (2)	51.5% (17)	24.2 % (8)	20	60.60 %	9	27.30%	9	27.30 %

3.3.3 Access to sanitation facilities

Sanitation is defined as access to and use of facilities and services for the safe human urine and feces disposal. It is considered safe when it separates human excreta from human contact at all steps of the sanitation service chain from toilet capture and containment through emptying, transport, treatment (in-situ or off-site) and final disposal or end use[8]. Except for Lusaka Urban survey, the provincial surveys showed most of the households to be using unimproved sanitation facilities. In Lusaka urban, almost half of the households (48.1%) used a communal toilet

Table 32: Access to improved sanitation facilities

Domain	No of Households	Improved Sanitation Facilities	unimproved Sanitation Facilities	Other

[8] Guidelines on sanitation and health. Geneva: World Health Organization; 2018. Licence: CC BY-NC-SA 3.0 IGO.

		Improved excreta disposal facility	A shared family toilet	A communal toilet	Unimproved toilet	Other
Lusaka urban	449	31.6% (142)	13.8% (62)	48.1% (216)	6.0% (27)	0.4% (2)
Lusaka Rural	487	25.9% (126)	5.7% (28)	3.9% (19)	63.9% (311)	0.6% (3)
Northwestern province	503	17.3% (87)	2.8% (14)	1.8% (9)	78.1% (393)	0.0% (0)
Western Province	549	7.3% (40)	5.3% (29)	2.0% (11)	85.4% (469)	0.0% (0)
Central Province	553	4.7% (26)	1.4% (8)	1.3% (7)	92.6% (512)	0.0% (0)
Southern Province	579	13.3% (77)	5.4% (31)	6.9% (40)	74.4% (431)	0.0% (0)
Eastern Province	514	8.0% (41)	2.1% (11)	0.8% (4)	88.9% (457)	0.2% (1)

3.3.2 Measles immunization, vitamin A supplementation, and deworming

Measles Vaccination Results

Immunization is the most cost-effective single preventive health intervention (WHO 2015). Expanding access to immunization is crucial to achieving the Sustainable Development Goals (SDGs). It has a crucial role in achieving 14 of the 17 SDGs and is one of the most far-reaching health interventions; it closely reflects the ethos of the SDGs: "leaving no one behind"[9].

The proportion of children vaccinated against measles at 9 months was high (>95%) except in central province (78.9%), Eastern Province (92.5%) and Northwestern province (93.1%) considering the vaccination reported by both card and recall. However, effective coverage as reported by card only (documented) was below the SPHERE recommendation in all the survey areas, ranging from62.1$% in Eastern province to 80.9% in Northwestern province. There was a notable proportion of children whose caregivers reported to have received the measles jab through recall, ranging from 12.2% in Northwestern province to 30.4% in eastern province. Poor documentation of this key child health service may lead to a risk in duplication of the service as well as under or overreporting of the proportions immunized where there is a recall bias.

[9] https://www.gavi.org/our-alliance/global-health-development/sustainable-development-goals,accessed 31st March 2020

Deworming

Deworming of children routinely helps to combat soil-transmitted helminths that worsen child nutritional status through intestinal bleeding, loss of appetite, and mal-absorption of micronutrients. Periodic treatment (deworming) of children supported with improvement of water and sanitation, and health education can reduce the transmission of Schistosoma and soil-transmitted helminth infections[10]. Deworming was assessed for all the children aged 12-59 months old in the selected households. The reported rates were ranging from 61.9% in central province to 90.7% in Eastern province, hence lower compared to the SPHERE 2018 recommendations.

Vitamin A coverage

Vitamin A supplementation boosts child's immunity while reducing child morbidity and mortality in the long term. Low VAS coverage is associated with high prevalence of childhood illnesses Therefore, vitamin A supplementation is critical, not only for eliminating vitamin A deficiency as a public-health problem, but also as a central element for child survival.

Vitamin A supplementation was assessed among children 6-59 months. The primary caregivers were probed on whether their children had been supplemented with reference made to the child health card. Where documentation was not available, the caregiver was shown a vitamin A sample to help her recall if the child had been supplemented in the past 6 months. The coverage of Vitamin A supplementation among children 6-59 months across all the surveys was below the SPHERE 2018 recommendation of >95%, ranging from 71.9% in Lusaka province to 90.8% in Southern province. The proportion reporting vitamin A supplementation based on card (effective vitamin A supplementation) was low, ranging 47.4% in Lusaka urban survey to 67.2% in Northwestern Province. Notable proportions of the children supplemented with vitamin A were reported based on recall, which indicates a gap in documentation of Vitamin A services across the provinces. Its likely that most of the Vitamin A supplementation done outside the health service delivery points is not documented, hence a likelihood of duplication of the service and risk of toxicity to the concerned children.

Table 33: Coverage of Vitamin A, deworming and measles.

Domain	Children 6-59 months who received vitamin A last 6 months	Children 12-59 months who received deworming last 6 months	Children 9-59 months who received measles vaccine

[10] Hotez, P. J et al, Helminthic infections: soil-transmitted helminth infections and schistosomiasis, 2006. Oxford University Press and World Bank.

	Yes, card	Yes, recall	Not received Vitamin A supplementation	N	Yes	No	N	Yes, card	Yes, recall	Not immunized against measles	N
Lusaka Urban	47.4% (147)	24.5% (76)	28.1% (87)	310	70.8% (182)	29.2% (75)	257	67.9% (201)	27.0% (80)	5.1% (15)	296
Lusaka Rural	53.4% (190)	18.5% (66)	28.1% (100)	356	71.7% (218)	28.3% (86)	304	74.5% (251)	21.1% (71)	4.5% (15)	337
Northwestern Province	67.2% (269)	12.5% (50)	20.3% (81)	400	82.9% (276)	17.1% (57)	333	80.9% (305)	12.2% (46)	6.9% (26)	377
Western Province	57.3% (196)	31.3% (107)	11.4% (39)	342	78.9% (228)	21.1% (61)	289	69.6% (224)	25.5% (82)	5.0% (16)	322
Central Province	50.1% (209)	22.5% (94)	27.3% (114)	417	61.9% (211)	38.1% (130)	341	62.3% (248)	16.6% (66)	21.1% (84)	398
Southern Province	60.8% (284)	30.0% (140)	9.2% (43)	467	79.6% (323)	20.4% (83)	406	74.8% (333)	21.1% (94)	4.0% (18)	445
Eastern Province	59.1% (241)	29.4% (120)	11.5% (47)	408	90.7% (312)	9.3% (32)	344	62.1% (241)	30.4% (118)	7.5% (29)	388

3.3.3 Children's morbidity and caregivers' health seeking behaviour.

Malnutrition can make a person more susceptible to infection and on the other hand, infection contributes to malnutrition, which causes a vicious cycle of malnutrition and infections. A sick person's nutrition is further aggravated by diarrhea, mal-absorption, loss of appetite, diversion of nutrients for the immune response, and urinary nitrogen loss, all of which can lead to nutrient losses and further damage to defense mechanisms[11]. These, in turn, cause reduced dietary intake. It was therefore important to assess morbidity in the survey and determining its possible effect on malnutrition. Morbidity was assessed among all children aged 6-59 months based on the caregiver recall on whether the child had suffered any of the 3 specific morbidities (diarrhoea, Fever and ARI) 2 weeks prior to the survey. the assessment of diarrhoea showed about a quarter of the children having suffered watery diarrhoea 2 weeks prior to the survey, with the provincial estimates ranging 17.1% in western province to 33.4% in eastern province. A higher proportion of children had suffered from feverlike symptoms, ranging from 19.6% in western province to 52.9% in Eastern province while only a small proportion of children had

[11] Demissie S, Worku A. Magnitude and Factors Associated with Malnutrition in Children 6–59 Months of Age in Pastoral Community of Dollo Ado District, Somali Region, Ethiopia. Sci J Public Health. 2013;1(4):175–83. doi:10.11648/ j.sjph. 20130104.12.

suffered from ARI symptoms, not exceeding 2.2% in eastern province. Observations show that western province had the fewest cases of child morbidities while Eastern Province recorded the most.

Table 34: Morbidity among children 6-59 months

Domain	Type of illness among children aged 6-59 months in the past two weeks			
	Number of children 6-59 months	Diarrhoea	Fever	ARI Symptoms
Lusaka urban	310	23.9% (74)	30.3% (94)	1.3% (4)
Lusaka Rural	353	28.2% (101)	35.8% (128)	1.1 % (4)
Northwestern Province	400	25.9% (103)	37.5% (150)	0.5 (2)
Western Province	342	17.1% (58)	19.6% (67)	0.9% (3)
Central Province	417	17.3% (72)	34.3% (143)	0.2% (1)
Southern Province	467	24.0% (112)	23.1% (108)	0.9% (4)
Eastern province	408	33.4% (136)	52.9% (216)	2.2% (9)

For every morbidity reported, the caregiver was asked on if he/she sought treatment for that specific morbidity and the specific point of seeking treatment. For children that were reported to have suffered from diarrhoea, the caregiver was further asked on the management of the diarrhoeal episode with both zinc and ORS. Appropriate treatment seeking varied per survey area, with Lusaka urban having a low treatment seeking generally. Treatment for diarrhea in the urban survey was 59.5% while the other survey areas ranged from 70.2% in Western province to 89.3% in Northwestern province. The administration of ORS was moderately done, for 61.1% of the children in central province being the lowest and 84.5% in Northwestern province being the highest. Management of diarrhoea with zinc was low, with only 11.1% of the children with diarrhoea in central province (lowest) and 62.2% of the children in Lusaka urban survey (highest). Management by both ORS and Zinc were low, ranging from 8.3% in central province to 54.1% in Lusaka Urban province. Treatment seeking for children with fever was higher, ranging from 70.2% in Lusaka urban district to 94.0% in Northwestern province while almost all the children with ARI symptoms were taken for treatment.

Table 35: Health seeking behavior by caregivers with sick children

Domain	Diarrhea treatment	ORS given	Zinc supplementation	Both ORS and Zinc		Fever treatment		Treatment of ARI Symptoms	
	Yes	Yes	Yes	Yes	No. of children with diarrhea	Yes	No. of children with fever	Yes	No. of children with ARI symptoms
Lusaka Urban	59.5% (44)	81.1% (60)	62.2% (46)	54.1% (40)	74	70.2% (66)	94	75% (3)	4
Lusaka Rural	80.2% (81)	74.3% (75)	61.4% (62)	49.5% (50)	101	85.2% (109)	128	100% (4)	4
Northwestern Province	89.3% (92)	84.5% (87)	54.4% (56)	51.5% (53)	103	94.0% (141)	150	100% (2)	2
Western Province	70.2% (40)	62.1% (36)	53.4% (31)	48.3% (28)	58	82.1% (55)	67	100.0 % (3)	3
Central Province	72.2% (52)	61.1% (44)	11.1% (8)	8.3% (6)	72	78.3% (112)	143	0.0% (0)	1
Southern Province	82.1% (92)	61.6% (69)	47.3% (53)	40.2% (45)	112	72.2% (78)	108	100.0 % (4)	4
Eastern Province	83.8% (114)	68.4% (93)	43.4% (59)	41.2% (56)	136	93.5% (202)	216	88.9% (8)	9

3.3.4 Infant and young child feeding practices.

Infant and young child feeding (IYCF) practices directly affect the health, development and nutritional status of children less than two years of age and, ultimately, impact child survival. Improving IYCF practices in children 0–23 months of age is therefore critical to improved nutrition, health and development. Improving IYCF practices in children 0–23 months of age is therefore critical to improved nutrition, health and development. Adequate nutrition during infancy and early childhood is essential to ensure the growth, health, and development of children to their full potential. Poor nutrition increases the risk of illness, and is responsible, directly or indirectly, for deaths in children less than 5 years of age[12].

Inappropriate nutrition can also lead to childhood obesity, which is an increasing public health problem in many countries. The first two years of life provide a critical window of opportunity for ensuring children's appropriate growth and development through optimal

[12] World Health Organization. The global burden of disease: 2004 update. Geneva: World Health Organization; 2008.

feeding. Based on evidence of the effectiveness of interventions, achievement of universal coverage of optimal breastfeeding could prevent 13% of deaths occurring in children less than 5 years of age globally, while appropriate complementary feeding practices would result in an additional 6% reduction in under-five mortality[13].

The 2024 provincial level surveys sought to understand the IYCF indicators in the provinces based on the WHO/UNICEF 2021 IYCF set of indicators. These were however analysed as proxies, as the survey was limited in the sample size with only children 0-23 months in the sampled households included.

Breastfeeding practices

The proportion of children ever breastfed was high, above 95% in all the surveys except in Lusaka urban (92.9%). Timely initiation of breastfeeding within the first hour of birth varied greatly by survey but was lower than the recommended target of ≥80, In Northwestern and Lusaka Province surveys, with Lusaka urban District survey showing the lowest prevalence of 63.8%. Further, the proportion of children exclusively breastfed within the first 2 days of birth was above 80% in all the survey areas except in the Northwestern province with 73.6%. Exclusive breastfeeding rates within the first six months after birth were below the target of ≥80 in all the surveys. Only a few mothers practiced mixed feeding in the first six months of life with rates not exceeding 7.1% in Lusaka urban district. Continued breastfeeding among children 12-23 months across the surveys was below the recommended ≥80%. Bottle feeding was highly practiced in Lusaka urban district (25.2%) with the other provinces having less than 10% of the children bottle fed.

Table 36: Breastfeeding practices among infant and young children 0-23 months survey area

Domain	Ever breastfed	Early initiation of breastfeeding	Exclusively breastfed for the first 2 days after birth	Exclusive breastfeeding under 6 months	Mixed milk feeding under 6 months	Continued breastfeeding 12-23 months	Bottle feeding 0-23 months
Lusaka urban	92.9% (84.2-97.0)	63.8% (52.6-73.6)	81.1% (72.5-87.5)	46.4% (25.7-68.4)	7.1% (1.6-26.5)	44.3% (33.2-56.0)	25.2% (17.0-35.7)
Lusaka Rural	97.6% (92.1-99.3)	69.5% (59.1-78.3)	85.4% (78.1-90.5)	73.7% (57.3-85.4)	0.0% (0-0)	51.2% (40.0-62.2)	9.8% (5.6-16.4)
Northwestern	98.9% (95.7-99.7)	74.3% (60.1-84.8)	89.6% (82.9-93.9)	47.8% (31.1-65.1)	0.0% (0-0)	79.1% (67.6-87.3)	8.2% (2.1-26.8)
Western Province	98.1% (94.3-99.4)	92.6% (85.4-96.4)	73.6% (61.2-83.1)	52.3% (35.9-68.2)	2.3% (0.3-15.3)	71.3% (58.7-81.2)	5.5% (2.9-10.4)

[13] Black RE, et al. Maternal and child undernutrition: global and regional exposures and health consequences. Lancet. 2008;371:243–60. [PubMed]

Central Province	94.5% (88.7-97.4)	84.6% (75.4-90.8)	81.9% (71.9-88.9)	69.0% (49.1-83.6)	3.4% (0.4-22.4)	45.5% (34.0-57.6)	3.8% (2.0-7.3)
Southern Province	98.1% (94.9-99.3)	95.2% (90.8-97.5)	92.8% (87.4-96.0)	73.3% (57.5-84.8)	2.2% (0.3-15.4)	60.7% (49.7-70.7)	1.9% (0.7-5.1)
Eastern Province	93.1% (88.6-95.9)	80.0% (72.0-86.2)	83.4% (75.1-89.4)	74.2% (56.5-86.4)	3.2% (0.4-22.3)	68.7% (58.8-77.1)	8.0% (3.7-16.6)

Complementary feeding practices

In all the survey areas, more than 80% of the children 6-8 months surveyed had been introduced to soft, solid or semi solid foods, with Lusaka rural districts and eastern province having all the children in that category introduced to complementary foods. Throughout the survey areas, the dietary diversity for children 6-23 months was low, with some provinces indicating very low diversity. Lusaka Urban district and eastern province had a low diversity at 53.5% and 61.8% respectively with the rest ranging between 18.5% in western province and 37.9% in Central province. The minimum meal frequency for children 6-23 months was much below the recommended 80% in all the surveys. Moreover, the minimum milk feeding frequency for non-breastfed children was very low (5.9% to 17.5%). Across all the provinces, the minimum acceptable diet was very low varying between 2.5% in western province to 26.3% in Lusaka urban district.

The consumption of egg and flesh foods was also low with rates ranging 22.1% in Southern province to 68.7% in Lusaka Urban District. Sweet beverages were consumed by more than half (60.6%) of the children in Lusaka urban district, while for the other surveys, the consumption was ranging from 9.5% in Northwestern province to 28.6% in Lusaka Rural districts. Unhealth food consumption was notably reported in the Lusaka urban district (39.4%) and Lusaka rural districts (27.0%) with the other surveys reporting not more than 11.8% in central province. There was a notable proportion of children who did not consume any vegetable or fruit 24 hours prior to the survey, ranging from 13.9% in eastern province to 53.8% in western province.

Table 37: Complementary feeding practices among children 6-23 months by survey area

	Introduction of solid, semi-solid or soft foods	Minimum dietary diversity	Minimum meal frequency children 6-23 months	Minimum milk feeding frequency for non-breastfed children 6-23 months	Minimum acceptable diet	Egg and or flesh food consumption	Sweet beverage consumption	Unhealthy food consumption	Zero vegetable or fruit consumption

Lusaka Urban	92.9% (56.5 -99.2)	53.5% (40.3- 66.3)	49.5% (37.9-61.1)	17.5% (7.7-34.9)	26.3% (17.0-38.3)	68.7% (56.8- 78.6)	60.6% (46.8-72.9)	39.4% (27.7-52.4)	28.3% (20.5-37.6)
Lusaka Rural	100.0% (100 - 100)	34.1% (22.7- 47.7)	31.0% (21.3-42.6)	2.3% (0.3-16.6)	12.7% (6.7-22.7)	50.0% (37.8- 62.2)	28.6% (20.2- 38.7)	27.0% (17.4- 39.3)	24.6% (17.8-33.0)
Northwestern Province	90.9% ((70.6-97.7)	30.7% (18.4- 46.4)	18.2% (10.6-29.7)	0.0% (0-0)	11.7% (6.2-20.9)	32.1% (19.7- 47.7)	9.5% (5.3-16.3)	5.8% (1.6-19.4)	26.3% (17.7- 37.1)
Western Province	90.0% (62.2-98.0)	18.5% (10.0- 31.7)	18.5% (11.8-27.8)	7.7% (1.7-28.1)	2.5% (0.8-7.5)	24.4% (14.4- 38.2)	7.6% (3.4-16.1)	9.2% (3.9-20.3)	53.8% (38.1- 68.7)
Central Province	84.2% (57.8- 95.4)	37.9% (27.3-49.8)	25.5% (18.1-34.6)	7.3% (2.8-17.8)	11.8% (6.8-19.6)	47.1% (36.4- 58.0)	24.2% (17.6-32.2)	11.8% (7.0-19.0)	20.9% (13.1-31.8)
Southern Province	81.8% (56.2-94.0)	12.3% (7.4-19.8)	27.0% (19.2-36.5)	15.6% (7.0- 31.2)	6.1% (2.8-12.9)	22.1% (14.2- 32.7)	17.2% (10.2-27.6)	10.4% (5.4-19.2)	45.4% (34.8- 56.4)
Eastern Province	100.0% (100- 100)	61.8% (50.2-72.2)	32.6% (24.3-42.2)	5.9% (1.4-21.0)	24.3% (16.9-33.6)	57.6% (48.5- 66.2)	16.0% (9.6-25.3)	13.2% (6.6-24.7)	13.9% (7.3-24.9)

3.3.5 Nutritional status of women of reproductive age

Nutrition status by MUAC

Maternal diet at preconception and during pregnancy have significant effect on the outcome of pregnancy and fetal growth. SPHERE 2018 recommend classification of MUAC global acute malnutrition (<230 mm), 185-229 mm for MAM and <185 mm SAM[14]. The Zambia CMAM guidelines classify wasting in women as MUAC <230mm with the women <210mm severely wasted. The management protocols for Pregnant and breastfeeding women recommend admission of all the Pregnant and breastfeeding women with children <6 months for admission to the supplementary feeding program.

The prevalence of acute malnutrition among women of reproductive age, both in the Pregnant and breastfeeding and in the non-pregnant and non-breastfeeding categories was high, 3-5 times higher than the prevalence noted in children 6-59 months. With the pregnant and breastfeeding category, the prevalence of acute malnutrition ranged from 6.3% in Lusaka Urban district to 14.7% in Central province, while for the non-pregnant and non-breastfeeding category, the prevalence was ranging from 8.7% in Lusaka urban to 15.6% in Western Province.

[14] Sphere handbook, 2018

Table 38: Nutrition status among women of reproductive age

Domain	Prevalence of Acute Malnutrition Among Pregnant and Breastfeeding with infant less than 6 months			Prevalence of Acute Malnutrition Among non-pregnant and breastfeeding women of Reproductive age (15-49 years)		Number of Non pregnant and non-breastfeeding women aged 15-49 years
	Global Acute malnutrition (< 230 mm)	Severe Acute Malnutrition Among (MUAC < 210 mm)	No of PBW	Global Acute Malnutrition Among WRA (MUAC <230 mm)	Severe Acute Malnutrition Among WRA (MUAC < 210 mm)	
Lusaka urban	6.3% (4)	0.0% (0)	64	8.7% (41)	0.8% (4)	527
Lusaka Rural	10.3% (7)	0.0% (0)	68	10.5% (42)	1.7% (7)	401
Northwestern Province	9.3% (8)	0.0% (0)	86	11.2% (52)	1.7% (8)	464
Western Province	13.5% (12)	4.5% (4)	89	15.6% (64)	2.7% (11)	409
Central Province	14.7% (10)	2.9% (2)	68	14.1% (69)	3.9% (19)	488
Southern Province	10.4% (10)	1.0% (1)	96	10.7% (60)	1.2% (7)	561
Eastern province	9.2% (7)	0.0% (0)	76	10.2% (37)	1.1% (4)	364

3.3.6 Food Security and Livelihoods

Household Hunger Scale

The hunger scale of households is a proxy measure of access to food and is based on 3 questions about different degrees of hunger and the number of times hunger was felt in the past 30 days. Across the survey areas, access to food at the household level appears to be limited as shown in the table below. Except the Lusaka urban survey, all the other survey areas showed that more than half the households assessed had experienced hunger at the household 30 days prior to the survey. the proportion of households experiencing moderate hunger in the household ranged from 25.2% in Lusaka urban to 72.0% in Northwestern province. Severe hunger was experience in the households ranging from 2.7% in Lusaka urban to 48.2% in Western province. Generally, more than half of the households surveyed in the all the survey areas except in Lusaka urban had experienced either moderate or severe hunger in the household.

Table 39: Household Hunger Scale

Domain	Household Hunger Score by category			
	Number of Households	Little to no hunger in the household	Moderate Hunger in the household	Severe Hunger in the household
Lusaka urban	**448**	72.1% (323)	25.2% (113)	2.7% (12)
Lusaka Rural	**486**	42.4% (206)	47.3% (230)	10.3% (50)
Northwestern province	**503**	15.7% (79)	72.0% (362)	12.3% (62)
Western province	**544**	11.4% (62)	40.4% (220)	48.2% (262)
Central province	**554**	44.4% (246)	52.5% (291)	3.1% (17)
Southern Province	**578**	26.8% (155)	55.4% (320)	17.8% (103)
Eastern Province	**512**	29.9% (153)	58.8% (301)	11.3% (58)

4 Discussion

Acute malnutrition

The observed prevalence of Acute malnutrition in the provinces ranges from very low (1.7%) in eastern province) to medium in Southern province (6.2%). Most of the provinces indicate a low prevalence of Acute malnutrition based on WHZ <-2. The prevalence of combined GAM (cGAM) indicates a prevalence that is low to medium across all the survey areas, which indicates that looking at all the admission criteria, the prevalence of children malnourished is still low to medium. However, the analysis takes note of the observed combined prevalence in Southern province (8.0 % (5.8 - 10.9 95% C.I.) and Central province (7.8 % (5.1 - 11.7 95% C.I.) which are both assumed[15] medium thresholds but upper intervals indicating a high threshold. Observations and comparisons between the previous surveys conducted in the two provinces show that the prevalence in Central province in January 2020 was 1.1% (0.4-2.9 95% CI) while the survey conducted in May 2024 has a prevalence of 4.1% (2 .6 - 6.7 95% CI). The survey conducted in Southern Province in February 2020 was 2.5% (1.4- 4.4 95% CI) while the GAM prevalence observed in May 2024 was 6.2% (4.3 - 8.9 95% CI). The significance test on the two surveys in each area yielded a P value=0.0094 and P value =0.0078 for Central and Southern Province respectively. This shows a significant change in the acute nutrition situation in the areas. It is however important to interpret the change carefully as the two surveys were conducted in different seasons for malnutrition. In the 2019/2020 round of assessments, the surveys were conducted at the peak of the 2018-2020 drought while the 2024 surveys were conducted at the early stages of the drought, during the usual harvest season when the nutrition status of children under five years is expected to be good.

The prevalence of acute malnutrition among pregnant and breastfeeding women, as well as in non pregnant and non breastfeeding women aged 15-49 years can be described as high, ranging from 6.3% - 14.1% among the pregnant and breastfeeding while among the non pregnant and non breastfeeding, the prevalence ranges from 8.7% - 15.6%. Even though there are no globally recognized thresholds for acute malnutrition for this group, the prevalence is noted to be three or more times higher than that of children 6-59 months which ranges from 1.7% - 6.2%.

Chronic malnutrition

All the surveys unveiled high to very high stunting prevalences, ranging from high in western (26.1%) to very high in Eastern province (34.6%). Stunting was also high/critical in the Lusaka urban district (34.3%) and the Northwestern province (30.6%). The findings from the May 2024 surveys show similar thresholds to 2019/2020 SMART surveys as well as the Zambia demographic health survey findings for 2018. This may indicate stunting as a chronic issue in the surveyed areas, with the efforts to bring the prevalences lower not bearing much fruit. There may also be a need to conduct a nutrition causal analysis to further understand the precise causes of stunting in the survey areas as well as give practical solutions based on the findings.

[15] There are no established thresholds for combined GAM prevalence, hence this discussion assumes the thresholds for WHZ

Household Hunger Scale

The findings on the household hunger scale indicate that the households have limited access to food at the household level. Except in the Lusaka urban survey, the other survey areas showed more than half the households having experienced moderate to severe hunger in the household 30 days prior to the survey. Hypothetically, the urban population assessed in the Lusaka survey accesses food from the markets while the rural population in the provinces access their food from their farms. The findings may indicate the markets still functioning however with likely increased prices, while the rural households suffering the effects of the ongoing drought that has affected the projected harvest and hence the food availability at the household.

Death rates

Generally, the crude death rates in all the survey areas were below the WHO emergency threshold of 1/10,000/day as well as below 0.5/10,000/day which are classified as alert as per the SPHERE recommendations. Similarly, the under-five death rates were below the WHO emergency threshold of 2/10,000/day in all the survey areas.

Infant and young child feeding practices.

The proxy IYCF indicators assessed in the survey showed mixed performance, with some indicators performing well while others showed a gap. The proportion of children even breastfed was notably high, ranging from 92.9% in the Lusaka urban survey to 98.1% in the western province survey. however, early initiation to breastfeeding (within 1 hour after birth) was notably low in some survey areas such as in Lusaka urban (63.8%), Lusaka rural survey (69.5%) and Northwestern province (74.3%), with the other provinces recording proportions higher than 80%. There were notable proportions of children 0-5 months who had not been breastfed exclusively in the first 2 days after birth, with the Lusaka urban survey showing close to 20% not exclusively breastfed during this time. exclusive breastfeeding for children under 6 months was below 80% across all the survey areas. It was notable that the worst affected survey is Lusaka Urban with also the lowest rates of continued breastfeeding beyond 6 months (44.3%), 7.1% practicing mixed feeding and notably high rate of bottle feeding (25.2%). Despite most of the children 6-8 months having been introduced to complementary foods, the frequency of the feeds was lower than expected with only proportions ranging from 18.2% in Northwestern province to 49.5% in Lusaka urban having met the required frequency. Most of the children did not report to achieve the minimum dietary diversity with only the Lusaka urban survey and the Eastern province survey reporting proportions exceeding 50%, and subsequently very low proportions having achieved the minimum acceptable diet, rates not exceeding 26.3% in Lusaka urban. Similarly, the consumption of flesh food, fruits and vegetables was low across all the surveys. For the Lusaka urban survey, more than a third of the children 6-23 months (39.4%) had consumed unhealthy foods while almost two thirds (60.6%) had consumed sweet beverages. Overall, there is an evident gap on IYCF practices in caregivers living in Lusaka urban, both on breastfeeding and complementary feeding practices.

Water, sanitation, and hygiene

Most of the households in the surveyed areas get their drinking and cooking water from protected sources. This ensures the households get water that is free from contaminants and encouraging to see many households having sufficient supply of safe water. The proportion of households that were consuming adequate and safe amounts of water was notably high above 50% in all the survey areas except in Western and central provinces. In the urban survey, the main point of getting water was the public tap at central points in the residential areas (38.8%) while 31% had water piped connection piped into the house, with another notable proportion (19.4%) buying water from water Kiosks. In the rural provinces, the main source of water was handpumps/boreholes with proportions accessing water from the same ranging from 26.5% in Central province to 70.2% in Lusaka rural districts. This is followed by surface water ranging from 8.7% in Northwestern province to 24.5% in central province. The main sources of water in the provinces is prone to drying up or the quantities available to the households significantly going down with the drought advancing. Uptake of handwashing practice appears to be poor with only small proportions in the surveys having handwashing devices at home, not exceeding 26.3% in Eastern province and as low as 2.9% in Western province. Even among the few households with a handwashing station, the presence of soap and water in the handwashing stations was notably low in most of the provinces except western province (82.4%) and Lusaka urban district (75%). Additionally, most of the households in the provinces reported to use unimproved sanitation facilities, ranging from 63.9% in Lusaka rural districts to 92.6% in Central province.

Measles vaccination, vitamin A and deworming

Measles coverage was above the WHO target of 85% in all the provinces except central province where the coverage was 78.9%. however, the coverage was below the SPHERE 2018 recommendation of >95% except in Lusaka rural districts and Southern Province with coverage of 95.5% and 96% respectively. The coverage of vitamin A was lower than the WHO target of >80% except in Western, Southern and Eastern provinces. Deworming coverage was also below 80% except in Northwestern and Eastern Province. Notably for the three services, there was a gap in documentation, with notable proportions reporting key services such as measles vaccination by recall.

Morbidity and health seeking

There were almost similar proportions of children with diarrhea across the provinces, varying slightly except in western and central province that had lower rates of 17.1% and 17.3% respectively. The prevalence may not be considered high but notably, around a quarter of the children in the survey had suffered diarrhea which would be a matter of concern, considering the effects diarrhea has on the nutrition status of the child under 5 years. The practice of managing diarrhea with both zinc and ORS was low, with just about half of the children in Lusaka urban and Northwestern province and less than half in all the other survey areas. About a third of the children on average had reported to have fer like malaria symptoms while only very small proportions of children reported to have ARI symptoms. Treatment seeking for all the morbidities was high, above 80% in most of the survey areas.

5.0 Conclusion

The prevalence of Acute Malnutrition in the provinces is currently not high as evidenced by the GAM prevalence ranging from Very low (1.7%) to medium (6.2%). Except for Southern Province, which was at a medium threshold, all the other surveyed areas are having a GAM prevalence below the 5% threshold. The prevalence in Southern and central Province is twice as high compared to the SMART survey data from the 2019/2020 drought, whereas the other survey areas show wasting prevalence like the 2019/2020 findings. It is to be noted that 2024 measurement was during harvest season, while 2019/20 measurement was during lean season, indicating likelihood that acute malnutrition will be higher in 2024/25 lean season compared to the last drought. Even though wasting (acute malnutrition) among young children is not currently high, without the right preventive measures, there is a high risk that children in heavily affected districts (Western, Southern, Central, North-Western) will become malnourished. Over the next 12 months, an estimated 51,948 under-fives will have severe wasting and 276,805 will have moderate wasting. Timely action to manage moderate wasting will prevent a rapid transition of children from moderate wasting to severe wasting. A high number, 111,921 of pregnant and breastfeeding women (PBW) are estimated to have wasting during the same period.

The Household hunger scale indicates that a nutrition crisis is likely to unfold in Southern and Western Provinces, followed by North- Western and Central Provinces where hunger scale and nutrient gaps are high, if timely concrete preventive actions are not taken now. In 6 of the 7 surveys done (in the 6 provinces), more than half of households are already experiencing moderate to severe hunger. Hunger scale (moderate and severe) is highest in Western, North-Western and Southern Provinces. In Western Province almost half of the households are already experiencing severe hunger. Too many children are eating less than recommended amounts, quality and frequency of food required for their development, which puts them at increased risk of malnutrition and other illnesses. The lowest proportion of children 6-23 months meeting minimum requirements are in Western, Southern, North-Western and Central. Exclusive breastfeeding for children under 6 months is worryingly low, though it is a critical preventive intervention against illnesses before, during and after crisis. The proportions exclusively breastfed are low across all the provinces.

Diarrhoea and fever in the 30 days prior to the survey among children 6-59 months were prevalent in all the surveyed Provinces. Priority preventive health services coverage (measles, vitamin A supplementation and deworming) was low across all provinces. This poor service coverage of these critical interventions creates higher risk of disease outbreaks.

6.0 Recommendations

Survey findings	Possible contributing factors	Recommendation
Change in the nutrition situation in Southern and central provinces. Cases of extremely malnourished cases in Luangwa district, Southern and western provinces High levels of acute malnutrition among the women of reproductive age, both PBW and non PBW	• Inadequate dietary intake by young children (under five years) • Weak mechanisms for detection and referral of malnourished children • Inadequate training of health workers on the management of acute malnutrition • Poor consumption of diversified diets among women of reproductive age	Strengthen the ongoing treatment of malnourished children across all the provinces
		Increase advocacy efforts to the nutrition cluster and donor network on more investment for nutrition interventions
		Identify hotspot areas for malnutrition to conduct mass screening and referral of malnourished children using all the admission criteria (WHZ, Oedema and MUAC)
		Build treatment capacity closer to the children: every PHC facility should provide treatment (latest data showed 35% of the facilities in the 84 districts provide treatment). • Skills to treat • Equipment to monitor nutritional status • Supplies to treat
		Targeted interventions needed for PBW, including emergency-protein supplementation.
Very high levels of stunting in Lusaka urban, Northwestern, Central and Eastern provinces	• Lack of proper childcare practices • Inadequate access to child health services • Lack of diversified diets for young children.	Strengthen or intensify Multi-sectoral interventions focusing on maternal nutrition, improved access to child health services, IYCF programing, Water, sanitation and hygiene practices.
		Improve the household food security through livelihood programming, kitchen gardening for

		diversity, and emergency distribution of diversified food items to the affected households.
High levels of hunger at the household level	• Lack of food at the household level due to a poor harvest as a result of the drought • Low purchasing power at the household level	Provide emergency food rations to affected households with PBW and children under two. This needs to factor in the calorie composition and quantity to ensure the households, including young children get a diversified diet.
		Provide High energy-high protein supplements for PBW and young children from households determined to be vulnerable
Poor IYCF practices among caregivers, especially in the urban population Low intake of diversified diets and low proportion taking the minimum acceptable diet Consumption of sweet foods and unhealth foods in the urban population Low consumption of flesh foods, fruits and vegetables.	• Cultural practices around young child feeding • Unavailability of diversified foods at the household level due to the drought and/or low income of the households • Lack of adequate knowledge about childcare and feeding as well as knowledge on healthy feeding.	Strengthen the conveying of key messages on IYCF at both the facility and community level
		Scale up IYCF Programming in the urban areas where practices such as consumption of unhealthy foods and sweet beverage consumption are prevalent
		In all affected areas, link the households with low income to food security and social protection interventions
		Scale up the support to mother groups for improved knowledge transmission in the community in the community, while keeping them engaged with income generating activities such as kitchen gardens which can help avail diversified foods to their young children
Low Vitamin A supplementation, deworming and measles vaccination	• Poor documentation services at both the health facility and lack of documentation for community level	Increase health campaigns to improve coverage of vitamin A supplementation, deworming, and measles vaccination especially in less accessible areas

Poor documentation of health services	activities • Possible high workload on the health workers inhibiting proper documentation.	At the facility level, there is need to improve on the documentation to avoid duplication of services, as well as improving on the monitoring of the performance of the health services.
		Procurement of adequate supplies of Vitamin A and deworming tablets
Poor handwashing practice by the households	• Low sensitization of the community on handwashing	Training of the community members on setting up handwashing stations using locally available resources such as tippy taps
		Scale up education on handwashing at the community level using different media such as radio, IEC materials in public places and community resource persons

7.0 **Appendices**

Annex 1: Selected Clusters for the 6 provinces

PROV_NAME	PROV_CODE	DIST_NAME	CONST_NAME	WARD_NAME	DIST_CODE	CONST_CODE	WARD_CODE	GEOID	REG	HH	CLUSTER
CENTRAL	01	CHITAMBO	CHITAMBO	CHALILO	0103	01031	0103101	0103101100 9	1	170	01030093
CENTRAL	01	CHITAMBO	CHITAMBO	CHIPUNDU	0103	01031	0103102	0103102101 3	1	111	01030098
CENTRAL	01	CHITAMBO	CHITAMBO	CHITAMBO	0103	01031	0103103	0103103100 5	1	65	01030042
CENTRAL	01	CHITAMBO	CHITAMBO	CHITAMBO	0103	01031	0103103	0103103102 2	1	55	01030143
CENTRAL	01	CHITAMBO	CHITAMBO	KATONGA	0103	01031	0103106	0103106100 9	1	127	01030082
CENTRAL	01	CHITAMBO	CHITAMBO	LUOMBWA	0103	01031	0103108	0103108100 5	1	142	01030088
CENTRAL	01	CHITAMBO	CHITAMBO	LUSENGA	0103	01031	0103109	0103109100 7	1	76	01030070
CENTRAL	01	CHITAMBO	CHITAMBO	LUSHIBASHI	0103	01031	0103110	0103110100 4	1	105	01030154
CENTRAL	01	CHITAMBO	CHITAMBO	MPELEMBE	0103	01031	0103112	0103112100 9	1	86	01030037
CENTRAL	01	CHITAMBO	CHITAMBO	SERENJE	0103	01031	0103116	0103116100 6	1	95	01030172
CENTRAL	01	LUANO	MKUSHI SOUTH	CHIMIKA	0106	01061	0106101	0106101100 1	1	60	01060038
CENTRAL	01	LUANO	MKUSHI SOUTH	KAMIMBYA	0106	01061	0106104	0106104100 2	1	89	01060035
CENTRAL	01	LUANO	MKUSHI SOUTH	KATUKUTU	0106	01061	0106105	0106105100 8	1	123	01060041
CENTRAL	01	LUANO	MKUSHI SOUTH	LWAMBULU	0106	01061	0106107	0106107100 2	1	104	01060046
CENTRAL	01	LUANO	MKUSHI SOUTH	MUNDA	0106	01061	0106109	0106109103 0	1	200	01060106

CENTRAL	01	LUANO	MKUSHI SOUTH	NKOMASHI	0106	01061	0106112	010611210004	1	74	01060068
CENTRAL	01	NGABWE	LUFUBU	CHILWA	0109	01091	0109101	010910110002	1	76	01090082
CENTRAL	01	NGABWE	LUFUBU	CHISANGWA	0109	01091	0109103	010910310008	1	95	01090044
CENTRAL	01	NGABWE	LUFUBU	IWONDE	0109	01091	0109105	010910510012	1	158	01090054
CENTRAL	01	NGABWE	LUFUBU	IWONDE	0109	01091	0109105	010910510013	1	121	01090055
CENTRAL	01	SERENJE	MUCHINGA	CHIBALE	0110	01101	0110101	011010110023	1	87	01100223
CENTRAL	01	SERENJE	MUCHINGA	CHIBALE	0110	01101	0110101	011010110010	1	69	01100034
CENTRAL	01	SERENJE	SERENJE	IBOLELO	0110	01102	0110202	011020220037	2	188	01100275
CENTRAL	01	SERENJE	SERENJE	IBOLELO	0110	01102	0110202	011020220045	2	149	01100308
CENTRAL	01	SERENJE	SERENJE	IBOLELO	0110	01102	0110202	011020220005	2	137	01100107
CENTRAL	01	SERENJE	SERENJE	IBOLELO	0110	01102	0110202	011020220024	2	103	01100191
CENTRAL	01	SERENJE	SERENJE	KABAMBA	0110	01102	0110203	011020310005	1	83	01100077
CENTRAL	01	SERENJE	SERENJE	KABAMBA	0110	01102	0110203	011020310010	1	59	01100206
CENTRAL	01	SERENJE	SERENJE	KASHISHI	0110	01102	0110204	011020410009	1	233	01100325
CENTRAL	01	SERENJE	MUCHINGA	MASANINGA	0110	01101	0110105	011010510005	1	79	01100052
CENTRAL	01	SERENJE	MUCHINGA	MASANINGA	0110	01101	0110105	011010510023	1	74	01100292
CENTRAL	01	SERENJE	SERENJE	MILENJE	0110	01102	0110207	011020710022	1	42	01100299
CENTRAL	01	SERENJE	SERENJE	MUCHINDA	0110	01102	0110208	011020810016	1	166	01100136
CENTRAL	01	SERENJE	SERENJE	MUCHINDA	0110	01102	0110208	011020810014	1	121	01100134

CENTRAL	01	SERENJE	SERENJE	MUCHINDA	0110	01102	0110208	01102081013	1	110	01100133
CENTRAL	01	SERENJE	SERENJE	MUCHINDA	0110	01102	0110208	01102081037	1	97	01100295
CENTRAL	01	SERENJE	SERENJE	MUCHINDA	0110	01102	0110208	01102081003	1	91	01100123
CENTRAL	01	SHIBUYUNJI	MWEMBEZHI	CHABOTA	0111	01111	0111101	01111011009	1	110	01110087
CENTRAL	01	SHIBUYUNJI	MWEMBEZHI	CHABOTA	0111	01111	0111101	01111011004	1	79	01110081
CENTRAL	01	SHIBUYUNJI	MWEMBEZHI	CHIKONKA	0111	01111	0111102	01111021009	1	85	01110133
CENTRAL	01	SHIBUYUNJI	MWEMBEZHI	KALUNDU	0111	01111	0111103	01111031016	1	147	01110192
CENTRAL	01	SHIBUYUNJI	MWEMBEZHI	KALUNDU	0111	01111	0111103	01111031003	1	123	01110020
CENTRAL	01	SHIBUYUNJI	MWEMBEZHI	MAKOMBWE	0111	01111	0111106	01111061006	1	170	01110157
CENTRAL	01	SHIBUYUNJI	MWEMBEZHI	MUTOMBE	0111	01111	0111108	01111081006	1	69	01110126
CENTRAL	01	SHIBUYUNJI	MWEMBEZHI	NAMPEYA	0111	01111	0111110	01111101002	1	53	01110051
CENTRAL	01	SHIBUYUNJI	MWEMBEZHI	NAMPUNDWE	0111	01111	0111111	01111112036	2	93	01110196
CENTRAL	01	SHIBUYUNJI	MWEMBEZHI	SALA	0111	01111	0111112	01111121004	1	100	01110060
EASTERN	03	CHADIZA	CHADIZA	BWANUNKHA	0301	03011	0301102	03011021004	1	106	03010046
EASTERN	03	CHADIZA	CHADIZA	CHAMANDALA	0301	03011	0301104	03011041003	1	83	03010006
EASTERN	03	CHADIZA	CHADIZA	CHILENGA	0301	03011	0301106	03011061003	1	136	03010067
EASTERN	03	Chama	Chama North	Kamphemba	0302	03021	0302103	03021032013	1	188	03020212
EASTERN	03	Chama	Chama North	Kamphemba	0302	03021	0302103	03021032014	1	121	03020213
EASTERN	03	Chama	Chama North	Kaozi	0302	03021	0302104	03021041004	1	102	03020187

EASTERN	03	Chama	Chama South	Mapamba	0302	03022	0302211	030221110 09	1	87	03020 141
EASTERN	03	Chama	Chama North	Mbazi	0302	03021	0302108	030210810 03	1	64	03020 172
EASTERN	03	CHIPANGALI	CHIPANGALI	KASENGA	0304	03041	0304102	030410210 26	1	112	03040 086
EASTERN	03	CHIPANGALI	CHIPANGALI	MSANDILE	0304	03041	0304105	030410510 23	1	142	03040 054
EASTERN	03	CHIPANGALI	CHIPANGALI	MSANDILE	0304	03041	0304105	030410510 37	1	80	03040 178
EASTERN	03	CHIPANGALI	CHIPANGALI	NTHOPE	0304	03041	0304106	030410610 22	1	164	03040 231
EASTERN	03	CHIPANGALI	CHIPANGALI	NTHOPE	0304	03041	0304106	030410610 21	1	126	03040 230
EASTERN	03	CHIPANGALI	CHIPANGALI	NTHOPE	0304	03041	0304106	030410610 11	1	98	03040 220
EASTERN	03	KASENENGWA	KASENENGWA	CHIPARAMBA	0306	03061	0306102	030610210 06	1	100	03060 137
EASTERN	03	KASENENGWA	KASENENGWA	MBOZA	0306	03061	0306106	030610610 07	1	134	03060 117
EASTERN	03	KASENENGWA	KASENENGWA	NGSONGWE	0306	03061	0306109	030610910 07	1	151	03060 083
EASTERN	03	KASENENGWA	KASENENGWA	NGSONGWE	0306	03061	0306109	030610910 17	1	114	03060 093
EASTERN	03	KASENENGWA	KASENENGWA	NGSONGWE	0306	03061	0306109	030610910 12	1	81	03060 088
EASTERN	03	LUMEZI	LUMEZI	CHAMTOWA	0308	03081	0308101	030810110 18	1	143	03080 215
EASTERN	03	LUMEZI	LUMEZI	DIWA	0308	03081	0308103	030810310 29	1	97	03080 123
EASTERN	03	LUMEZI	LUMEZI	DIWA	0308	03081	0308103	030810310 65	1	86	03080 288
EASTERN	03	LUMEZI	LUMEZI	DIWA	0308	03081	0308103	030810310 28	1	74	03080 122
EASTERN	03	LUMEZI	LUMEZI	KACHAMA	0308	03081	0308104	030810410 09	1	113	03080 183
EASTERN	03	LUMEZI	LUMEZI	KAZEMBE	0308	03081	0308108	030810810 10	1	54	03080 253

EASTERN	03	LUNDAZI	LUNDAZI	CHIMALIRO	0309	03091	0309102	03091021018	1	90	03090208
EASTERN	03	LUNDAZI	LUNDAZI	LUNEVWA	0309	03091	0309103	03091031015	1	109	03090075
EASTERN	03	LUNDAZI	LUNDAZI	LUNEVWA	0309	03091	0309103	03091031028	1	74	03090286
EASTERN	03	LUNDAZI	LUNDAZI	MNYAMAZI	0309	03091	0309105	03091051004	1	166	03090132
EASTERN	03	LUNDAZI	LUNDAZI	MPHAMBA	0309	03091	0309106	03091061017	1	126	03090057
EASTERN	03	LUSANGAZI	MSANZALA	LUTWAZI	0310	03101	0310105	03101051010	1	93	03100141
EASTERN	03	LUSANGAZI	MSANZALA	LUTWAZI	0310	03101	0310105	03101051012	1	72	03100143
EASTERN	03	LUSANGAZI	MSANZALA	MATEYO MZEKA	0310	03101	0310106	03101061012	1	174	03100158
EASTERN	03	LUSANGAZI	MSANZALA	MATEYO MZEKA	0310	03101	0310106	03101061026	1	113	03100233
EASTERN	03	MAMBWE	MALAMBO	KAKUMBI	0311	03111	0311106	03111061015	1	124	03110218
EASTERN	03	MAMBWE	MALAMBO	MNKHANYA	0311	03111	0311111	03111111005	1	147	03110016
EASTERN	03	MAMBWE	MALAMBO	MSORO	0311	03111	0311113	03111131011	1	99	03110163
EASTERN	03	MAMBWE	MALAMBO	NSEFU	0311	03111	0311115	03111151019	1	82	03110148
EASTERN	03	NYIMBA	NYIMBA	CHINAMBI	0312	03121	0312102	03121021014	1	104	03120232
EASTERN	03	NYIMBA	NYIMBA	CHINAMBI	0312	03121	0312102	03121021023	1	90	03120241
EASTERN	03	NYIMBA	NYIMBA	MPHUNDWE	0312	03121	0312110	03121101025	1	129	03120267
EASTERN	03	NYIMBA	NYIMBA	NYIMBA	0312	03121	0312113	03121131008	2	191	03120076
EASTERN	03	NYIMBA	NYIMBA	VIZIMUMBA	0312	03121	0312114	03121141009	1	74	03120021
EASTERN	03	SINDA	KAPOCHE	KAMWAZA	0314	03141	0314103	03141031009	1	129	03140114

EASTERN	03	SINDA	KAPOCHE	KAPOCHE	0314	03141	0314104	03141041004	1	173	03140031
EASTERN	03	SINDA	KAPOCHE	MATAMBAZI	0314	03141	0314107	03141071019	1	104	03140121
EASTERN	03	SINDA	KAPOCHE	MATAMBAZI	0314	03141	0314107	03141071005	1	76	03140051
EASTERN	03	SINDA	KAPOCHE	NCHINGILIZYA	0314	03141	0314110	03141101007	1	148	03140119
EASTERN	03	SINDA	SINDA	NYAMASONKHO	0314	03142	0314207	03142071019	1	93	03140370
EASTERN	03	SINDA	SINDA	SINDA	0314	03142	0314208	03142082010	2	230	03140330
EASTERN	03	SINDA	KAPOCHE	SIWVA	0314	03141	0314111	03141111015	1	117	03140174
EASTERN	03	VUBWI	VUBWI	MBOZI	0315	03151	0315105	03151052013	2	91	03150040
EASTERN	03	VUBWI	VUBWI	VUBWI	0315	03151	0315108	03151082010	2	138	03150076
LUSAKA	05	KAFUE	KAFUE	CHIKUPI	0503	05031	0503102	05031021005	1	114	05030146
LUSAKA	05	KAFUE	KAFUE	CHIKUPI	0503	05031	0503102	05031021004	1	75	05030135
LUSAKA	05	KAFUE	KAFUE	CHIKUPI	0503	05031	0503102	05031021007	1	70	05030148
LUSAKA	05	KAFUE	KAFUE	CHIKUPI	0503	05031	0503102	05031021010	1	68	05030282
LUSAKA	05	KAFUE	KAFUE	CHISANKANE	0503	05031	0503104	05031042002	1	79	05030002
LUSAKA	05	KAFUE	KAFUE	CHIYABA	0503	05031	0503106	05031061006	1	93	05030239
LUSAKA	05	KAFUE	KAFUE	CHIYABA	0503	05031	0503106	05031061008	1	76	05030361
LUSAKA	05	KAFUE	KAFUE	KABWEZA	0503	05031	0503107	05031071007	1	95	05030259
LUSAKA	05	KAFUE	KAFUE	KABWEZA	0503	05031	0503107	05031071002	1	62	05030151
LUSAKA	05	KAFUE	KAFUE	KAFUE	0503	05031	0503108	05031081034	1	101	05030363

LUSAKA	05	KAFUE	KAFUE	LUKOLONGO	0503	05031	0503111	050311110002	1	132	05030164
LUSAKA	05	KAFUE	KAFUE	MAGOBA	0503	05031	0503112	050311210009	1	187	05030137
LUSAKA	05	KAFUE	KAFUE	MAGOBA	0503	05031	0503112	050311210016	1	162	05030153
LUSAKA	05	KAFUE	KAFUE	MAGOBA	0503	05031	0503112	050311210017	1	96	05030265
LUSAKA	05	KAFUE	KAFUE	MAGOBA	0503	05031	0503112	050311210002	1	58	05030075
LUSAKA	05	KAFUE	KAFUE	MALUNDU	0503	05031	0503113	050311310034	1	120	05030381
LUSAKA	05	KAFUE	KAFUE	MALUNDU	0503	05031	0503113	050311310017	1	94	05030200
LUSAKA	05	KAFUE	KAFUE	MUNGU	0503	05031	0503115	050311510010	1	89	05030284
LUSAKA	05	KAFUE	KAFUE	SHIMABALA	0503	05031	0503118	050311810005	1	134	05030223
LUSAKA	05	KAFUE	KAFUE	SHIMABALA	0503	05031	0503118	050311810007	1	100	05030255
LUSAKA	05	LUANGWA	FEIRA	CHIKOMA	0504	05041	0504101	050410110001	1	72	05040012
LUSAKA	05	LUANGWA	FEIRA	CHIRIWE	0504	05041	0504102	050410210001	1	105	05040006
LUSAKA	05	LUANGWA	FEIRA	KABOWO	0504	05041	0504104	050410410001	1	74	05040076
LUSAKA	05	LUANGWA	FEIRA	KALULUZI	0504	05041	0504105	050410510006	1	52	05040074
LUSAKA	05	LUANGWA	FEIRA	LUNYA	0504	05041	0504110	050411010001	1	107	05040011
LUSAKA	05	LUANGWA	FEIRA	PHWAZI	0504	05041	0504117	050411710004	1	95	05040048
LUSAKA	05	LUSAKA	MUNALI	CHAINDA	0505	05057	0505701	050570120052	2	121	05052117
LUSAKA	05	LUSAKA	MANDEVU	CHAISA	0505	05055	0505501	050550120017	2	159	05052051
LUSAKA	05	LUSAKA	MANDEVU	CHAISA	0505	05055	0505501	050550120014	2	129	05050254

LUSAKA	05	LUSAKA	MUNALI	CHAKUNKULA	0505	05057	0505702	05057022026	2	195	05050281
LUSAKA	05	LUSAKA	CHAWAMA	Chawama	0505	05051	0505101	05051012062	2	216	05050352
LUSAKA	05	LUSAKA	CHAWAMA	Chawama	0505	05051	0505101	05051012085	2	193	05051700
LUSAKA	05	LUSAKA	CHAWAMA	Chawama	0505	05051	0505101	05051012033	2	180	05050323
LUSAKA	05	LUSAKA	CHAWAMA	Chawama	0505	05051	0505101	05051012047	2	166	05050337
LUSAKA	05	LUSAKA	CHAWAMA	Chawama	0505	05051	0505101	05051012007	2	139	05050297
LUSAKA	05	LUSAKA	KANYAMA	GARDEN PARK	0505	05053	0505302	05053022003	2	117	05050877
LUSAKA	05	LUSAKA	KANYAMA	Harry Mwanga Nkumbula	0505	05053	0505303	05053032061	2	161	05050503
LUSAKA	05	LUSAKA	KANYAMA	Harry Mwanga Nkumbula	0505	05053	0505303	05053032141	2	114	05052783
LUSAKA	05	LUSAKA	MANDEVU	JUSTIN KABWE	0505	05055	0505502	05055022037	2	182	05052997
LUSAKA	05	LUSAKA	MANDEVU	KABANANA	0505	05055	0505503	05055032022	2	190	05051521
LUSAKA	05	LUSAKA	LUSAKA CENTRAL	KABULONGA	0505	05054	0505402	05054022030	2	208	05050123
LUSAKA	05	LUSAKA	LUSAKA CENTRAL	KABULONGA	0505	05054	0505402	05054022023	2	204	05050116
LUSAKA	05	LUSAKA	LUSAKA CENTRAL	KABULONGA	0505	05054	0505402	05054022045	2	172	05050138
LUSAKA	05	LUSAKA	MUNALI	KALIKILIKI	0505	05057	0505703	05057032120	2	145	05052837
LUSAKA	05	LUSAKA	MUNALI	KALIKILIKI	0505	05057	0505703	05057032131	2	110	05053294
LUSAKA	05	LUSAKA	MUNALI	KALIKILIKI	0505	05057	0505703	05057032001	2	101	05050194
LUSAKA	05	LUSAKA	MUNALI	KALINGALINGA	0505	05057	0505704	05057042029	2	185	05050623

LUSAKA	05	LUSAKA	MUNALI	KALINGALINGA	0505	05057	0505704	05057042001	2	93	05050595
LUSAKA	05	LUSAKA	KABWATA	KAMULANGA	0505	05052	0505203	05052032010	2	224	05050654
LUSAKA	05	LUSAKA	KANYAMA	Kanyama	0505	05053	0505304	05053042022	2	151	05050751
LUSAKA	05	LUSAKA	MATERO	KAPWEPWE	0505	05056	0505601	05056012007	2	147	05050930
LUSAKA	05	LUSAKA	MATERO	LIMA	0505	05056	0505602	05056022048	2	126	05051025
LUSAKA	05	LUSAKA	KANYAMA	MAKENI VILLA	0505	05053	0505305	05053052125	2	155	05052710
LUSAKA	05	LUSAKA	MATERO	MATERO	0505	05056	0505603	05056032042	2	177	05051106
LUSAKA	05	LUSAKA	MATERO	MATERO	0505	05056	0505603	05056032036	2	164	05051100
LUSAKA	05	LUSAKA	MANDEVU	MPULUNGU	0505	05055	0505504	05055042109	2	201	05051911
LUSAKA	05	LUSAKA	MANDEVU	MPULUNGU	0505	05055	0505504	05055042003	2	198	05051114
LUSAKA	05	LUSAKA	MANDEVU	MPULUNGU	0505	05055	0505504	05055042098	2	174	05051802
LUSAKA	05	LUSAKA	MANDEVU	MPULUNGU	0505	05055	0505504	05055042179	2	157	05053110
LUSAKA	05	LUSAKA	MANDEVU	MPULUNGU	0505	05055	0505504	05055042073	2	149	05051186
LUSAKA	05	LUSAKA	MUNALI	MTENDERE	0505	05057	0505705	05057052049	2	170	05051697
LUSAKA	05	LUSAKA	MUNALI	MTENDERE	0505	05057	0505705	05057052047	2	134	05051690
LUSAKA	05	LUSAKA	MATERO	MUCHINGA	0505	05056	0505604	05056042076	2	153	05053246
LUSAKA	05	LUSAKA	MUNALI	MUNALI	0505	05057	0505706	05057062041	2	74	05051297
LUSAKA	05	LUSAKA	MATERO	MWEMBESHI	0505	05056	0505605	05056052005	2	211	05050010
LUSAKA	05	LUSAKA	MATERO	MWEMBESHI	0505	05056	0505605	05056052092	2	141	05052859

LUSAKA	05	LUSAKA	MATERO	MWEMBESHI	0505	05056	0505605	05056052064	2	123	05050091
LUSAKA	05	LUSAKA	MANDEVU	NGWERERE	0505	05055	0505506	05055062036	2	132	05051366
LUSAKA	05	LUSAKA	CHAWAMA	Nkoloma	0505	05051	0505104	05051042065	2	187	05051444
LUSAKA	05	LUSAKA	CHAWAMA	Nkoloma	0505	05051	0505104	05051042089	2	168	05051880
LUSAKA	05	LUSAKA	CHAWAMA	Nkoloma	0505	05051	0505104	05051042077	2	136	05051456
LUSAKA	05	LUSAKA	MANDEVU	ROMA	0505	05055	0505508	05055082011	2	143	05051552
LUSAKA	05	LUSAKA	MANDEVU	ROMA	0505	05055	0505508	05055082079	2	106	05052819
LUSAKA	05	RUFUNSA	RUFUNSA	BUNDA_BUNDA	0506	05061	0506101	05061011011	1	113	05060033
LUSAKA	05	RUFUNSA	RUFUNSA	BUNDA_BUNDA	0506	05061	0506101	05061011016	1	109	05060099
LUSAKA	05	RUFUNSA	RUFUNSA	BUNDA_BUNDA	0506	05061	0506101	05061011020	1	92	05060103
LUSAKA	05	RUFUNSA	RUFUNSA	BUNDA_BUNDA	0506	05061	0506101	05061011027	1	88	05060162
LUSAKA	05	RUFUNSA	RUFUNSA	BUNDA_BUNDA	0506	05061	0506101	05061011028	1	67	05060174
LUSAKA	05	RUFUNSA	RUFUNSA	KABUYU	0506	05061	0506104	05061041001	1	122	05060010
LUSAKA	05	RUFUNSA	RUFUNSA	KABUYU	0506	05061	0506104	05061041003	1	119	05060084
LUSAKA	05	RUFUNSA	RUFUNSA	KANKUMBA	0506	05061	0506105	05061051003	1	129	05060024
LUSAKA	05	RUFUNSA	RUFUNSA	MULAMBA	0506	05061	0506107	05061071004	1	86	05060055
LUSAKA	05	RUFUNSA	RUFUNSA	MULAMBA	0506	05061	0506107	05061071018	1	84	05060129
LUSAKA	05	RUFUNSA	RUFUNSA	MWACHILELE	0506	05061	0506108	05061081005	1	91	05060089
LUSAKA	05	RUFUNSA	RUFUNSA	MWACHILELE	0506	05061	0506108	05061081001	1	85	05060035

LUSAKA	05	RUFUNSA	RUFUNSA	NYAMANONGO	0506	05061	0506109	050610911010	1	81	05060095
LUSAKA	05	RUFUNSA	RUFUNSA	NYAMANONGO	0506	05061	0506109	050610911003	1	77	05060040
LUSAKA	05	RUFUNSA	RUFUNSA	NYANGWENA	0506	05061	0506110	050611010010	1	111	05060108
LUSAKA	05	RUFUNSA	RUFUNSA	NYANGWENA	0506	05061	0506110	050611010007	1	103	05060015
LUSAKA	05	RUFUNSA	RUFUNSA	NYANGWENA	0506	05061	0506110	050611010011	1	98	05060109
LUSAKA	05	RUFUNSA	RUFUNSA	NYANGWENA	0506	05061	0506110	050611010012	1	87	05060111
LUSAKA	05	RUFUNSA	RUFUNSA	RUFUNSA	0506	05061	0506111	050611110011	1	136	05060077
LUSAKA	05	RUFUNSA	RUFUNSA	RUFUNSA	0506	05061	0506111	050611110006	1	125	05060052
LUSAKA	05	RUFUNSA	RUFUNSA	RUFUNSA	0506	05061	0506111	050611110007	1	83	05060068
LUSAKA	05	RUFUNSA	RUFUNSA	SHIKABETA	0506	05061	0506112	050611210001	1	116	05060001
NORTHWESTERN	08	CHAVUMA	CHAVUMA	CHIYEKE	0801	08011	0801104	080110420007	2	159	08010037
NORTHWESTERN	08	CHAVUMA	CHAVUMA	CHIYEKE	0801	08011	0801104	080110420005	2	125	08010034
NORTHWESTERN	08	CHAVUMA	CHAVUMA	CHIYEKE	0801	08011	0801104	080110420008	2	107	08010044
NORTHWESTERN	08	CHAVUMA	CHAVUMA	LINGUNDU KAYINDA	0801	08011	0801109	080110910004	1	140	08010046
NORTHWESTERN	08	CHAVUMA	CHAVUMA	LINGUNDU KAYINDA	0801	08011	0801109	080110910003	1	76	08010045
NORTHWESTERN	08	CHAVUMA	CHAVUMA	SEWE MUNGOLE	0801	08011	0801115	080111520002	2	96	08010005
NORTHWESTERN	08	KABOMPO	KABOMPO	CHIFUWE	0803	08031	0803101	080310110003	1	129	08030040
NORTHWESTERN	08	KABOMPO	KABOMPO	KABOMPO	0803	08031	0803104	080310420023	2	230	08030109
NORTHWESTERN	08	KABOMPO	KABOMPO	KABOMPO	0803	08031	0803104	080310420020	2	158	08030083

NORTHWESTERN	08	KABOMPO	KABOMPO	KAMAFWAFWA	0803	08031	0803107	080310711008	1	93	08030066
NORTHWESTERN	08	KABOMPO	KABOMPO	KAMISAMBA	0803	08031	0803108	080310811003	1	83	08030044
NORTHWESTERN	08	KABOMPO	KABOMPO	MAVEVE	0803	08031	0803115	080311511001	1	103	08030022
NORTHWESTERN	08	KABOMPO	KABOMPO	MUMBEJI	0803	08031	0803116	080311611014	1	70	08030094
NORTHWESTERN	08	KABOMPO	KABOMPO	NKULWASHI	0803	08031	0803117	080311711002	1	115	08030112
NORTHWESTERN	08	MANYINGA	MANYINGA	DIHAMBA	0806	08061	0806104	080610411002	1	115	08060002
NORTHWESTERN	08	MANYINGA	MANYINGA	DIHAMBA	0806	08061	0806104	080610411004	1	106	08060105
NORTHWESTERN	08	MANYINGA	MANYINGA	KASHINAKAJI	0806	08061	0806107	080610711001	1	129	08060004
NORTHWESTERN	08	MANYINGA	MANYINGA	KAULA	0806	08061	0806108	080610811009	1	91	08060059
NORTHWESTERN	08	MANYINGA	MANYINGA	LOLOMA	0806	08061	0806110	080611011009	2	207	08060068
NORTHWESTERN	08	MANYINGA	MANYINGA	MANYINGA	0806	08061	0806112	080611221005	2	141	08060053
NORTHWESTERN	08	MANYINGA	MANYINGA	MANYINGA	0806	08061	0806112	080611221001	2	126	08060011
NORTHWESTERN	08	MANYINGA	MANYINGA	MANYINGA	0806	08061	0806112	080611221013	2	99	08060112
NORTHWESTERN	08	MANYINGA	MANYINGA	MANYINGA	0806	08061	0806112	080611211012	1	80	08060111
NORTHWESTERN	08	MUFUMBWE	MUFUMBWE	KALAMBU	0807	08071	0807103	080710322022	2	209	08070127
NORTHWESTERN	08	MUFUMBWE	MUFUMBWE	KALAMBU	0807	08071	0807103	080710323003	2	181	08070024
NORTHWESTERN	08	MUFUMBWE	MUFUMBWE	KALAMBU	0807	08071	0807103	080710322014	2	156	08070113
NORTHWESTERN	08	MUFUMBWE	MUFUMBWE	KALENGWA	0807	08071	0807104	080710411002	1	114	08070010
NORTHWESTERN	08	MUFUMBWE	MUFUMBWE	KAMABUTA	0807	08071	0807105	080710522008	2	99	08070061

NORTHWESTERN	08	MUFUMBWE	MUFUMBWE	KINKONGE	0807	08071	0807110	080711010003	1	131	08070156
NORTHWESTERN	08	MUFUMBWE	MUFUMBWE	MATUSHI	0807	08071	0807112	080711210018	1	124	08070141
NORTHWESTERN	08	MUFUMBWE	MUFUMBWE	MATUSHI	0807	08071	0807112	080711210016	1	107	08070139
NORTHWESTERN	08	MUFUMBWE	MUFUMBWE	MATUSHI	0807	08071	0807112	080711210019	1	90	08070142
NORTHWESTERN	08	MUFUMBWE	MUFUMBWE	MILUJI	0807	08071	0807113	080711310007	1	77	08070101
NORTHWESTERN	08	MUFUMBWE	MUFUMBWE	MUSHIMA	0807	08071	0807115	080711510002	1	85	08070012
NORTHWESTERN	08	ZAMBEZI	ZAMBEZI EAST	CHILENG A CHIZENZI	0811	08111	0811101	081110120012	2	88	08110135
NORTHWESTERN	08	ZAMBEZI	ZAMBEZI EAST	DIPALATA	0811	08111	0811103	081110310002	1	114	08110004
NORTHWESTERN	08	ZAMBEZI	ZAMBEZI EAST	KASESI CHIVWEJI	0811	08111	0811104	081110420004	2	121	08110028
NORTHWESTERN	08	ZAMBEZI	ZAMBEZI EAST	LUNKUNYI	0811	08111	0811105	081110510007	1	78	08110100
NORTHWESTERN	08	ZAMBEZI	ZAMBEZI EAST	LWITADI LWATEMBU	0811	08111	0811106	081110610005	1	66	08110122
NORTHWESTERN	08	ZAMBEZI	ZAMBEZI EAST	NYAKULENG'A	0811	08111	0811109	081110910008	1	106	08110106
NORTHWESTERN	08	ZAMBEZI	ZAMBEZI EAST	ZAMBEZI	0811	08111	0811110	081111020005	2	186	08110108
NORTHWESTERN	08	ZAMBEZI	ZAMBEZI EAST	ZAMBEZI	0811	08111	0811110	081111020016	2	150	08110159
NORTHWESTERN	08	ZAMBEZI	ZAMBEZI EAST	ZAMBEZI	0811	08111	0811110	081111020010	2	127	08110113
NORTHWESTERN	08	ZAMBEZI	ZAMBEZI EAST	ZAMBEZI	0811	08111	0811110	081111020014	2	97	08110126
SOUTHERN	09	CHIKANKATA	CHIKANKATA	CHAKANZA	0901	09011	0901101	090110110005	1	130	09010073
SOUTHERN	09	CHIKANKATA	CHIKANKATA	NAMALUNDU	0901	09011	0901110	090111010007	1	81	09010128
SOUTHERN	09	CHIKANKATA	CHIKANKATA	NANSENGA	0901	09011	0901111	090111110004	1	95	09010017

SOUTHERN	09	CHIKANKATA	CHIKANKATA	NZINGU	0901	09011	0901112	090111210 12	1	121	09010 169
SOUTHERN	09	CHIKANKATA	CHIKANKATA	UPPER KALEYA	0901	09011	0901114	090111410 16	1	108	09010 172
SOUTHERN	09	CHIRUNDU	Chirundu	CHIRUNDU	0902	09021	0902101	090210120 18	2	179	09020 054
SOUTHERN	09	CHIRUNDU	Chirundu	CHIRUNDU WEST	0902	09021	0902102	090210220 02	2	138	09020 066
SOUTHERN	09	CHIRUNDU	Chirundu	KAPULULIRA	0902	09021	0902105	090210510 01	1	88	09020 003
SOUTHERN	09	CHIRUNDU	Chirundu	MUSAYA	0902	09021	0902107	090210710 02	1	117	09020 025
SOUTHERN	09	GWEMBE	GWEMBE	CHAAMWE	0904	09041	0904102	090410210 03	1	114	09040 064
SOUTHERN	09	GWEMBE	GWEMBE	LUUMBO	0904	09041	0904112	090411210 16	1	75	09040 170
SOUTHERN	09	GWEMBE	GWEMBE	MAKUYU	0904	09041	0904113	090411310 06	1	93	09040 137
SOUTHERN	09	GWEMBE	GWEMBE	SINAFALA	0904	09041	0904115	090411510 05	1	152	09040 016
SOUTHERN	09	KAZUNGULA	KATOMBOLA	CHOOMA	0907	09071	0907102	090710210 01	1	148	09070 005
SOUTHERN	09	KAZUNGULA	KATOMBOLA	KANCHELE	0907	09071	0907103	090710310 15	1	109	09070 093
SOUTHERN	09	KAZUNGULA	KATOMBOLA	KAZUNGULA CENTRAL	0907	09071	0907106	090710610 17	2	201	09070 223
SOUTHERN	09	KAZUNGULA	KATOMBOLA	KAZUNGULA CENTRAL	0907	09071	0907106	090710610 16	2	133	09070 222
SOUTHERN	09	KAZUNGULA	KATOMBOLA	MANDIA	0907	09071	0907107	090710710 11	1	118	09070 284
SOUTHERN	09	KAZUNGULA	KATOMBOLA	NGUBA	0907	09071	0907111	090711110 11	1	64	09070 016
SOUTHERN	09	KAZUNGULA	KATOMBOLA	SEKUTE	0907	09071	0907114	090711410 01	1	86	09070 078
SOUTHERN	09	KAZUNGULA	KATOMBOLA	SIKAUNZWE	0907	09071	0907115	090711510 02	1	167	09070 069
SOUTHERN	09	KAZUNGULA	KATOMBOLA	SIKAUNZWE	0907	09071	0907115	090711510 01	1	98	09070 001

SOUTHERN	09	NAMWALA	NAMWALA	BAAMBWE	0911	09111	0911101	091110113003	1	91	09110014
SOUTHERN	09	NAMWALA	NAMWALA	BAAMBWE	0911	09111	0911101	091110113015	1	85	09110145
SOUTHERN	09	NAMWALA	NAMWALA	CHITONGO	0911	09111	0911102	091110213013	1	118	09110266
SOUTHERN	09	NAMWALA	NAMWALA	CHITONGO	0911	09111	0911102	091110213009	1	109	09110175
SOUTHERN	09	NAMWALA	NAMWALA	MBEZA	0911	09111	0911109	091110913009	1	78	09110226
SOUTHERN	09	NAMWALA	NAMWALA	MOOBOLA	0911	09111	0911110	091111013018	1	101	09110211
SOUTHERN	09	NAMWALA	NAMWALA	NAMWALA CENTRAL	0911	09111	0911114	091111422015	2	132	09110115
SOUTHERN	09	PEMBA	PEMBA	DEMU	0912	09121	0912101	091210113018	1	104	09120186
SOUTHERN	09	PEMBA	PEMBA	HAMAUNDU	0912	09121	0912104	091210418008	1	81	09120029
SOUTHERN	09	PEMBA	PEMBA	MAAMBO	0912	09121	0912108	091210818008	1	92	09120172
SOUTHERN	09	PEMBA	PEMBA	NACHIBANGA	0912	09121	0912110	091211012022	2	122	09120142
SOUTHERN	09	SIAVONGA	SIAVONGA	KARIBA	0913	09131	0913101	091310122031	2	192	09130087
SOUTHERN	09	SIAVONGA	SIAVONGA	NABUTEEZI	0913	09131	0913108	091310817007	1	111	09130118
SOUTHERN	09	SIAVONGA	SIAVONGA	SIMAMBA	0913	09131	0913111	091311112002	1	134	09130025
SOUTHERN	09	SIAVONGA	SIAVONGA	SINADAMBWE	0913	09131	0913112	091311218008	1	70	09130067
SOUTHERN	09	SINAZONGWE	SINAZONGWE	CHIYABI	0914	09141	0914101	091410114004	1	130	09140146
SOUTHERN	09	SINAZONGWE	SINAZONGWE	MALIMA	0914	09141	0914104	091410414004	1	119	09140133
SOUTHERN	09	SINAZONGWE	SINAZONGWE	NANGOMBE	0914	09141	0914111	091411111001	1	96	09140108
SOUTHERN	09	SINAZONGWE	SINAZONGWE	NANGOMBE	0914	09141	0914111	091411112002	1	86	09140109

SOUTHERN	09	SINAZONGWE	SINAZONGWE	NKANDABBWE	0914	09141	0914112	091411210015	2	148	09140168
SOUTHERN	09	SINAZONGWE	SINAZONGWE	NKANDABBWE	0914	09141	0914112	091411210030	1	103	09140287
SOUTHERN	09	SINAZONGWE	SINAZONGWE	SINAZONGWE	0914	09141	0914114	091411420026	2	109	09140229
SOUTHERN	09	SINAZONGWE	SINAZONGWE	SINENGE	0914	09141	0914115	091411510020	1	73	09140313
SOUTHERN	09	ZIMBA	MAPATIZYA	KANYANGA	0915	09151	0915104	091510410014	1	118	09150154
SOUTHERN	09	ZIMBA	MAPATIZYA	KANYANGA	0915	09151	0915104	091510410001	1	77	09150078
SOUTHERN	09	ZIMBA	MAPATIZYA	LUYABA	0915	09151	0915105	091510510012	1	110	09150050
SOUTHERN	09	ZIMBA	MAPATIZYA	SIAMAFUMBA	0915	09151	0915110	091511010011	1	93	09150175
SOUTHERN	09	ZIMBA	MAPATIZYA	SIMWATACHELA	0915	09151	0915111	091511110005	1	135	09150026
WESTERN	10	KALABO	LIUWA	KUULI	1001	10012	1001201	100120110003	1	125	10010080
WESTERN	10	KALABO	LIUWA	LIKULUNDUNDU	1001	10012	1001203	100120310007	1	92	10010162
WESTERN	10	KALABO	LIUWA	MISHULUNDU	1001	10012	1001205	100120510004	1	112	10010087
WESTERN	10	KALABO	KALABO CENTRAL	MUCHATANGA	1001	10011	1001110	100111020022	2	76	10010213
WESTERN	10	KALABO	KALABO CENTRAL	NG'UMA	1001	10011	1001113	100111310008	1	40	10010170
WESTERN	10	LIMULUNGA	LUENA	MABILI	1003	10031	1003105	100310510005	1	110	10030018
WESTERN	10	LIMULUNGA	LUENA	NDANDA	1003	10031	1003111	100311110003	1	86	10030078
WESTERN	10	LUKULU	LUKULU EAST	KASHAMBA	1005	10051	1005105	100510510009	1	74	10050155
WESTERN	10	LUKULU	LUKULU EAST	MWANDI	1005	10051	1005112	100511220025	2	149	10050095
WESTERN	10	LUKULU	LUKULU EAST	MWANDI	1005	10051	1005112	100511220046	2	87	10050118

WESTERN	10	LUKULU	LUKULU EAST	MWANDI	1005	10051	1005112	10051121002	1	108	10050058
WESTERN	10	MITETE	MITETE	LUPUI	1006	10061	1006106	10061061004	1	89	10060023
WESTERN	10	MITETE	MITETE	NYAALA	1006	10061	1006113	10061131009	1	192	10060059
WESTERN	10	MONGU	MONGU CENTRAL	IMWIKO	1007	10071	1007102	10071022001	2	198	10070047
WESTERN	10	MONGU	MONGU CENTRAL	IMWIKO	1007	10071	1007102	10071022006	2	173	10070087
WESTERN	10	MONGU	MONGU CENTRAL	IMWIKO	1007	10071	1007102	10071022018	2	101	10070186
WESTERN	10	MONGU	MONGU CENTRAL	KAMBULE	1007	10071	1007105	10071052005	2	120	10070068
WESTERN	10	MONGU	MONGU CENTRAL	KAMBULE	1007	10071	1007105	10071052023	2	111	10070325
WESTERN	10	MONGU	MONGU CENTRAL	LEALUI UPPER	1007	10071	1007109	10071092001	2	132	10070042
WESTERN	10	MONGU	MONGU CENTRAL	LEWANIKA	1007	10071	1007110	10071102005	2	148	10070073
WESTERN	10	MONGU	NALIKWANDA	MUTONDO	1007	10072	1007206	10072061001	1	86	10070129
WESTERN	10	MONGU	NALIKWANDA	MUTONDO	1007	10072	1007206	10072061010	1	48	10070224
WESTERN	10	MONGU	NALIKWANDA	NAKATO	1007	10072	1007208	10072081004	1	72	10070169
WESTERN	10	MULOBEZI	MULOBEZI	MACHILE	1008	10081	1008105	10081051013	1	89	10080111
WESTERN	10	MULOBEZI	MULOBEZI	SICHILI	1008	10081	1008109	10081091022	1	49	10080125
WESTERN	10	MWANDI	MWANDI	CHISU	1009	10091	1009102	10091021007	1	83	10090054
WESTERN	10	NALOLO	NALOLO	LYAMAKUMBA	1010	10101	1010105	10101051017	1	97	10100099
WESTERN	10	NALOLO	NALOLO	NANJUCHA	1010	10101	1010109	10101091007	1	126	10100096
WESTERN	10	NALOLO	NALOLO	SHEKELA	1010	10101	1010110	10101101003	1	79	10100040

WESTERN	10	NALOLO	NALOLO	SHEKELA	1010	10101	1010110	10101101009	1	55	10100046
WESTERN	10	NKEYEMA	NKEYEMA	LITOYA	1011	10111	1011101	10111011002	1	69	10110020
WESTERN	10	NKEYEMA	NKEYEMA	NAMILANGI	1011	10111	1011105	10111051001	1	98	10110058
WESTERN	10	NKEYEMA	NKEYEMA	SHIMANO	1011	10111	1011107	10111071010	1	55	10110104
WESTERN	10	NKEYEMA	NKEYEMA	SHISHAMBA	1011	10111	1011108	10111081015	1	85	10110048
WESTERN	10	SENANGA	SENANGA	IMATANDA	1012	10121	1012101	10121012030	2	141	10120138
WESTERN	10	SENANGA	SENANGA	IMATONGO	1012	10121	1012102	10121021006	1	110	10120022
WESTERN	10	SENANGA	SENANGA	LUMBE	1012	10121	1012105	10121051006	1	73	10120094
WESTERN	10	SENANGA	SENANGA	MUWESWA	1012	10121	1012108	10121081010	1	53	10120254
WESTERN	10	SENANGA	SENANGA	NALUYWA	1012	10121	1012110	10121101011	1	91	10120175
WESTERN	10	SESHEKE	SESHEKE	KATIMA	1013	10131	1013103	10131032005	2	139	10130040
WESTERN	10	SESHEKE	SESHEKE	MAONDO	1013	10131	1013106	10131061002	1	107	10130015
WESTERN	10	SESHEKE	SESHEKE	SILUMBU	1013	10131	1013110	10131101002	1	75	10130011
WESTERN	10	SHANG'OMBO	SINJEMBELA	MULANGU	1014	10141	1014106	10141061014	1	54	10140142
WESTERN	10	SHANG'OMBO	SINJEMBELA	SIMU	1014	10141	1014110	10141102013	2	155	10140089
WESTERN	10	SHANG'OMBO	SINJEMBELA	SIMU	1014	10141	1014110	10141101009	1	100	10140083
WESTERN	10	SHANG'OMBO	SINJEMBELA	SIMU	1014	10141	1014110	10141102034	1	82	10140185
WESTERN	10	SIOMA	SIOMA	MUTOMENA	1016	10161	1016107	10161071019	1	58	10160155
WESTERN	10	SIOMA	SIOMA	SIOMA	1016	10161	1016111	10161111009	1	106	10160071

WESTERN	10	SIOMA	SIOMA	WATEMBO	1016	10161	1016112	10161121004	1	85	10160037