

REPORT

STANDARDIZED EXPANDED NUTRITION SURVEY (SENS)

Dzaleka and Luwani Refugee Camps and the Host Communities,

Dowa and Neno Districts, Malawi

Survey Dates: 7th – 28th November 2016

Report finalised: 23 March 2017



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ACRONYMS AND ABBREVIATIONS

ANC	Ante Natal Clinic
CI	Confidence Interval
CMAM	Community Management of Acute Malnutrition
CSB	Corn-Soya Blend
DEFF	Design effect
ENA	Emergency Nutrition Assessment
Epi Info	Name of CDC software for epidemiological investigations
GAM	Global Acute Malnutrition
GFD	General Food Distribution
GFR	General Food Ration
HAZ	Height-for-Age z-score
Hb	Haemoglobin
HH	Household
IPs	Implementing Partners
IYCF	Infant and Young Child Feeding
IRS	Indoor Residual Spraying
JAM	Joint Assessment Mission
LLIN	Long-lasting insecticidal net
LNS	Lipid-based Nutrient Supplement
LPPPD	Litres Per Person Per Day
MAM	Moderate Acute Malnutrition
MCH	Maternal and Child Health
MOH	Ministry of Health
MUAC	Mid Upper Arm Circumference
ODK	Open Data Kit
OTP	Out-patient Therapeutic Programme
PPS	Probability Proportional to Size
ProGres	Registration database for refugee population data
RUTF	Ready-to-Use Therapeutic Food
SAM	Severe Acute Malnutrition
SD	Standard Deviation
SENS	Standardised Expanded Nutrition Survey
SFP	Supplementary Feeding Programme
SMART	Standardised Monitoring and Assessment of Relief and Transitions
TFP	Therapeutic Feeding Programme
U5	Children under 5 years old
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
VIP	Ventilated and Improved Latrine
VIP	Ventilated Improved Latrine
WASH	Water, Sanitation and Hygiene
WAZ	Weight-for-Age z-score
WHZ	Weight-for-Height z-score
WFP	World Food Programme
WHO	World Health Organization

ACKNOWLEDGEMENTS

The United Nations High Commission for Refugees (UNHCR) in Malawi is very grateful for the technical and logistical support provided by the UNHCR staff during the planning and implementation phases of the survey. Special acknowledgements go to the following members for their support to ensure smooth implementation of the surveys: Dr. Tewodros Wubayehu, Rose Eyoru, Dr. Prosper B. Matondi, Helen Mebrahtu in UNHCR Lilongwe; Elsie Mills-Tettey of Luwani and Dzaleka camp management. We would also like to thank Martin Ahimbisibwi from the World Food Programme (WFP) for providing support during the planning through providing electronic scales and height boards and MUAC tapes. In addition WFP helped in the design, pre-testing of survey instruments and review of draft reports.

We are also grateful for the support the survey team received from Camp authorities in identifying individuals who supported in the interpretations during data collection and providing data to allow us in conducting the cluster sampling. We also thank all the translators for the work done during the implementation of the survey. Further acknowledgements go to the survey team members whose dedication made the implementation of the survey possible.

We sincerely thank the refugee and host community population who participated in the survey and allowed us to measure their children.

Finally, our sincere appreciation goes to George Bello for leading the surveys; Melody Tondeur and Caroline Wilkinson for their remote technical support during the planning, implementation and data analysis, Asis Das for reviewing the draft report, Francis Vachon for supporting in training of survey teams and programming of questionnaires on mobile phones which eased data collection and processing greatly.

EXECUTIVE SUMMARY

INTRODUCTION

Malawi has been hosting refugees and asylum seekers in Dzaleka camp in Dowa district since 1994. By 2016 the camp reached a population of 25,202 refugees, most of whom live in the refugee camp (ProGres database). The refugees are mainly from the Great Lakes Region comprising of Democratic Republic of Congo (46%), Burundi (25%) and Rwanda (20%). About 8% of the remaining refugees come from Somalia, Ethiopia and other countries. Children under the age of 18 years constitute nearly 53% (13,309) and about 28% of them are aged below 5 years. Approximately 27% (6,702) of the camp population are women of childbearing age. The refugee population in the camp live in 9 zones led by leaders, and there are also community leaders representing nationalities from the countries of origin. Dzaleka camp is surrounded by 12 villages, and the United Nations High Commissioner for Refugees (UNHCR) Malawi mapped 11 villages with a total population of 37,412 for programming as host communities.

In March of 2016, the Government of Malawi opened Luwani Camp in Neno district to primarily host asylum seekers from Mozambique. With a growing population, the camp has nearly 2,200 persons of concern. The camp is surrounded by 6 villages with a total population of 4,614.

UNHCR and the World Food Programme (WFP) and partners have been working to ensure that food security and related needs of the refugees are adequately addressed in the two existing refugee camps. WFP is responsible for the provision of the general food ration while UNHCR and its partners provide health and protection services, water and sanitation, shelter, supplementary food to PSNs and other basic non-food items. The Government of Malawi has responsibility for the host communities through national plans, supported by a variety of NGO partners.

Due to foreseen pipeline breaks coupled with inadequate funding for the programmes and considerable delays in maintaining food supplies to the camp population, there was a great need to monitor the nutrition situation of the refugees in the two camps. In addition, similar surveys were felt necessary to be conducted in the host communities serving the two camps in order to have a better understanding of the health and nutrition situations in these communities for appropriate interventions. Thus, four nutrition surveys were conducted in the two camps and their host communities. The UNHCR – Malawi and partners envisage using this evidence to provide a strong basis for food security and nutrition advocacy as a basis for designing various interventions. At the same time, a long standing need is to advance the cause for mainstreaming refugee food delivery systems in policy and national planning system. In the immediate, key partners aim to ensure the situation in the camps and host communities does not decline to emergency thresholds.

SURVEY OBJECTIVES

The overall aim of the surveys were to assess the overall nutrition situation of the refugees and the host communities and to come up with appropriate recommendations for action.

Specifically, the objectives of the surveys were:

Primary objectives

1. To measure the prevalence of acute malnutrition among children 6-59 months.
2. To measure the prevalence of stunting among children 6-59 months.
3. To determine the coverage of measles vaccination among children 9-59 months.
4. To determine the coverage of vitamin A supplementation received during the last 6 months among children 6-59 months.
5. To assess the two-week period prevalence of diarrhoea among children 6- 59 months.
6. To assess the prevalence of anaemia among children 6-59 months and women of reproductive age (non-pregnant, 15-49 years).

7. To investigate Infant and Young Child Feeding (IYCF) practices among children 0-23 months.
8. To determine the coverage of ration cards and the duration the general food ration lasts for recipient households.
9. To determine the extent to which negative coping strategies are used by households.
10. To assess household dietary diversity.
11. To determine the population's access to, and use of, improved water, sanitation and hygiene facilities.
12. To determine the ownership of mosquito nets (all types and LLINs) in households.
13. To determine the utilisation of mosquito nets (all types and LLINs) by the total population, children 0-59 months and pregnant women.
14. To determine the household coverage of indoor residual spraying.
15. To establish recommendations on actions to be taken to address the situation.

Secondary objectives

16. To determine enrolment into Antenatal Care (ANC) clinic and coverage of iron-folic acid supplementation in pregnant women.

METHODOLOGY

Four nutrition surveys were conducted targeting refugee populations of Dzaleka and Luwani Camps and host communities of these camps. Four target groups were included to cover the six survey modules namely: 1. Anthropometry and Health, 2. Anaemia, 3. Infant and Young Child Feeding (IYCF), 4. Food Security, 5. Water Sanitation and Hygiene (WASH), and 6. Mosquito Net Coverage. The target groups were: 1. Children aged 6-59 months (Anthropometry, Health and Anaemia measurements), 2. Non-pregnant women of reproductive age (15-49 years) (Anaemia measurement); 3. Children aged 0-23 months (assessment of IYCF practices) and 4. All persons of concern (household as a whole) for assessment of food security, WASH and mosquito net coverage.

A two-stage cluster surveys were conducted in 3 of the survey areas (Dzaleka camp, two host communities) and an exhaustive method in Luwani Camp as the total population was below 2500. The first stage of the cluster surveys sampled the required number of clusters with probability proportional to size (PPS). The second stage used a systematic random sampling method to select the required number of households. The surveys were conducted based on the Standardised Monitoring and Assessment of Relief and Transitions (SMART) methodology (www.smartmethodology.org) and UNHCR Standardised Expanded Nutrition Survey (SENS) Guidelines for Refugee Populations (v 2, 2013) (<http://sens.unhcr.org>).

The sample sizes for the cluster surveys were based on the expected prevalence of Global Acute Malnutrition (GAM), desired precision, design effect, average household size, percentage of children under 5 years of age, and the non-response rate. The sample sizes were calculated using the ENA-for-SMART (July 9, 2015 version) software following UNHCR SENS methodology. Sample sizes were all corrected for small population size factor as the total the population of children under 5 years were below 10,000.

Following the SENS guidelines, all eligible children aged 0-59 months from all selected households were included in the Child Anthropometry and Health, Anaemia and IYCF modules, whilst half of the selected households were selected for the Food Security, Mosquito net coverage and Women questionnaire (including anaemia). All households were selected for WASH in all the surveys. The peripheral blood obtained in all sampled children 6-59 months and half of surveyed women were tested for haemoglobin using a portable HemoCue 301 analyser.

Android mobile phones and Open Data Kit (ODK) were used for data collection by six teams of five members each, with daily data transfer to an offline server at the end of each day, followed by daily data checks and feedback to survey teams. Data analysis for anthropometry data was conducted using ENA-for-SMART software (July 9, 2015 version), and data analysis for the other variables was conducted using EPI INFO 7 for Windows using the SENS analysis codes for each of the six modules.

SUMMARY OF RESULTS

Surveyed area	Dzaleka Refugee Camp	Dzaleka Host Communities	Luwani Refugee Camp*	Luwani Host Communities	Classification or target
Survey Date (2016)	14-19 Nov	7-13 Nov	21-24 Nov	23-28 Nov	
Children 6-59 months, % (95% C.I.)					
Acute malnutrition (WHO 2006 growth standards)					
N	479	328	383	276	Critical if $\geq 15\%$
Global Acute Malnutrition (GAM)	1.0 % (0.4 - 2.9)	0.9 % (0.3 - 2.8)	1.6 %	2.2 % (0.9 - 5.4)	
Moderate Acute Malnutrition (MAM)	1.0 % (0.4 - 2.9)	0.9 % (0.3 - 2.8)	1.6 %	2.2 % (0.9 - 5.4)	
Severe Acute Malnutrition (SAM)	0.0 % (0.0 - 0.0)	0.0 % (0.0 - 0.0)	0.0 %	0.0 % (0.0 - 0.0)	
Mid Upper Arm Circumference (MUAC): (n) % (95% CI)					
N	489	333	397	279	
MUAC <125 mm and/or oedema	0.8 % (0.3 - 2.2)	1.8 % (0.8 - 3.9)	1.8 %	1.4 % (0.4 - 4.8)	
MUAC 115-124 mm	0.4 % (0.1 - 1.7)	1.5 % (0.6 - 3.5)	1.5 %	1.1 % (0.2 - 4.7)	
MUAC <115 mm and/or oedema	0.4 % (0.1 - 1.7)	0.3 % (0.0 - 2.3)	0.3 %	0.4 % (0.0 - 2.8)	
Stunting (WHO 2006 growth standards)					
N	463	328	371	267	
Prevalence of stunting (<-2 z-score)	34.8 % (31.1 - 38.6)	35.4 % (29.7 - 41.5)	47.7 %	35.2 % (28.0 - 43.2)	Critical if $\geq 40\%$
Prevalence of moderate stunting (<-2 z-score and ≥ -3 z-score)	25.5 % (22.1 - 29.2)	27.4 % (22.9 - 32.5)	32.9 %	27.0 % (21.5 - 33.2)	
Prevalence of severe stunting (<-3 z-score)	9.3 % (7.2 - 11.9)	7.9 % (5.2 - 11.9)	14.8 %	8.2 % (4.4 - 14.9)	
Underweight (WHO 2006 Growth Standards): Children aged 6 - 59 months (n) % (95% CI)					
N	483	328	387	278	
Prevalence of underweight (<-2 z-score)	8.1 % (6.0 - 10.8)	13.4 % (9.4 - 18.8)	13.2 %	15.8 % (11.0 - 22.3)	Critical if $\geq 30\%$
Prevalence of moderate underweight (<-2 z-score and ≥ -3 z-score)	6.8 % (4.9 - 9.5)	12.2 % (8.5 - 17.2)	11.4 %	13.3 % (9.0 - 19.3)	
Prevalence of severe underweight (<-3 z-score)	1.2 % (0.6 - 2.6)	1.2 % (0.5 - 3.1)	1.8 %	2.5 % (1.1 - 5.6)	
Programme coverage: (n/N); % (95% CI)					
Measles vaccination with card (9-59 months)	(151/456) 33.1% (25.4- 40.8)	(202/315) 64.1% (55.8- 72.5)	(55/381) 14.4%	(150/259) 57.9% (45.7- 70.1)	Target of $\geq 95\%$
Measles vaccination with card or recall (9-59 months)	(422/456) 92.5% (89.7- 95.4)	(300/315) 95.2% (92.5-98.0)	(302/381) 79.3%	(248/259) 95.8% (92.8- 98.7)	Target of $\geq 95\%$
Vitamin A supplementation within past 6 months with card	(121/491) 24.6% (16.0- 33.3)	(146/333) 43.8% (33.5- 54.2)	(40/397) 10.1%	(93/279) 33.3% (20.5- 46.2)	Target of $\geq 90\%$
Vitamin A supplementation within past 6 months with card or recall	(429/491) 87.4% (84.1- 90.7)	(304/333) 91.3% (88.1- 94.5)	(298/397) 75.1%	(235/279) 84.2% (75.6- 92.9)	Target of $\geq 90\%$
Diarrhoea: (n/N); % (95% CI)					
Diarrhoea in last 2 weeks	(133/489) 27.2% (22.9 - 31.5)	(100/333) 30.0% (24.4- 35.6)	(138/394) 35.0%	(85/277) 30.7% (25.1- 36.3)	
Anaemia (6-59 months)					
N	488	331	394	279	
Total Anaemia (Hb <11 g/dl)	22.7% (17.9- 27.6)	26.9% (22.0- 31.8)	48.2%	50.9% (43.5- 58.3)	High if $\geq 40\%$
Mild (Hb 10-10.9)	16.4% (12.7- 20.1)	20.2% (15.7- 24.7)	29.7%	30.5% (24.9- 36.1)	
Moderate (Hb 7-9.9)	5.7% (3.2- 8.3)	6.3% (3.9- 8.8)	17.5%	20.1% (14.0- 26.1)	
Severe (Hb <7)	0.6% (0.0- 1.3)	0.3% (0.0- 0.9)	1.0%	0.4% (0.0-1.1)	
Moderate and Severe Anaemia (Hb<10.0 g/dL)	6.4% (3.7 -9.0)	6.6% (4.1 -9.2)	18.5%	20.4% (14.3 -26.6)	

Surveyed area	Dzaleka Refugee Camp	Dzaleka Host Communities	Luwani Refugee Camp*	Luwani Host Communities	Classification or target
Mean Hb, g/dL (95% CI) [range]	11.8 (11.6- 11.9) [5.7-14.9]	11.6 (11.5- 11.8) [6.6-14.9]	10.9 [5.6-14.6]	10.9 (10.7- 11.1) [6.5-13.9]	
Anaemia in children aged 6 - 23 months: (n) % (95% CI)					
N	183	111	134	113	
Total Anaemia (Hb <11 g/dl)	39.3% (31.0- 47.7)	47.7% (38.4- 57.1)	64.9%	69.0% (59.8- 78.2)	High if ≥ 40%
Mild (Hb 10-10.9)	26.2% (19.5- 32.9)	34.2% (26.5- 42.0)	35.1%	39.8% (31.9- 47.8)	
Moderate (Hb 7-9.9)	12.0% (6.5- 17.5)	12.6% (6.3- 18.9)	28.4%	28.3% (19.3- 37.4)	
Severe (Hb <7)	1.1% (-0.4- 2.6)	0.9% (0.0- 2.7)	1.5%	0.9% (0.0- 2.7)	
Moderate and Severe Anaemia (Hb<10.0 g/dL)	13.1% (7.1 - 19.1)	13.5% (6.9 - 20.1)	29.92%	29.2% (20.1 - 38.4)	
Mean Hb, g/dL (95% CI) [range]	11.242 (11.0- 11.5) [5.7-14.1]	11.023 (10.8-11.3) [6.6-13.6]	10.4 [6.6-13.3]	10.3 (10.1-10.6) [6.5-12.6]	
Anaemia in children aged 24 - 59 months: (n) % (95% CI)					
N	305	220	260	166	
Total Anaemia (Hb <11 g/dl)	12.8% (8.8- 16.8)	16.4% (1.0- 22.0)	39.6%	38.6% (29.8- 47.3)	High if ≥ 40%
Mild (Hb 10-10.9)	10.5% (6.7- 14.3)	13.2% (8.2- 18.2)	26.9%	24.1% (17.3- 30.9)	
Moderate (Hb 7-9.9)	2.0% (0.3- 3.7)	3.2% (1.1- 5.3)	11.9%	14.5% (8.1- 20.8)	
Severe (Hb <7)	0.3% (0.0- 1.0)	0.0%	0.8%	0.0%	
Moderate and Severe Anaemia (Hb<10.0 g/dL)	2.3% (0.5 - 4.1)	3.2% (1.1 - 5.3)	12.7%	14.5% (8.1 - 20.8)	
Mean Hb, g/dL (95% CI) [range]	12.1 (12.0-12.2) [6.9-14.9]	11.9 (11.8-12.1) [7.8-14.9]	11.1 [5.6-14.6]	11.2 (11.0-11.4) [8.1-13.9]	
Children 0-23 months					
IYCF indicators: (n/N); % (95% CI)					
Timely initiation of breastfeeding	(168/234) 71.8% (63.1- 80.6)	(120/158) 76.0% (65.4- 86.5)	(139/176) 79.0%	(110/135) 81.5% (71.9- 91.1)	
Exclusive breastfeeding under 6 months	(36/53) 67.9% (55.6- 80.3)	(34/49) 69.4% (52.8- 85.9)	(31/44) 70.5%	(13/24) 54.2% (34.0- 74.4)	
Continued breastfeeding at 1 year	(33/37) 89.2% (72.4-100.0)	(26/27) 96.3% (88.3-100.0)	(37/39) 94.9%	(26/27) 96.3% (88.3-100)	
Continued breastfeeding at 2 years	(14/38) 36.8% (21.9 -51.8)	(18/21) 85.7% (70.3 -100.0)	(21/30) 70.0%	(14/27) 51.9% (32.8-70.9)	
Introduction of solid, semi-solid or soft foods	(18/35) 51.4% (31.4- 71.4)	(12/18) 66.7% (46.1- 87.2)	(5/16) 31.3%	(7/20) 35.0% (12.6- 57.4)	
Consumption of iron-rich or iron-fortified foods	(105/185) 56.8% (46.4- 67.1)	(51/111) 45.9% (33.9- 58.0)	(71/134) 53.0%	(41/113) 36.3% (25.6- 47.0)	
Women 15-49 years					
Anaemia (non-pregnant)					
N	242	357	169	169	
Total Anaemia (Hb <12 g/dl)	(21.9% (15.9- 27.9)	18.5% (13.5- 23.4)	(75) 44.4%	46.7% (38.3- 55.2)	High if ≥ 40%
Mild (Hb 11-11.9)	11.2% (7.0- 15.4)	9.0% (5.8- 12.1)	(46) 27.2%	20.1% (13.1- 27.1)	
Moderate (Hb 8-10.9)	9.5% (4.4- 14.6)	8.7% (6.0- 11.4)	(29) 17.2%	21.9% (13.6- 30.2)	
Severe (Hb <8)	1.2% (0.0- 2.6)	0.8% (0.0- 2.5)	0.0%	4.7% (1.4- 8.1)	
Mean Hb, g/dL (95% CI) [range]	13.0 (12.7-13.3) [6.8-16.9]	12.9 (12.7 - 13.1) [5.6-16.6]	12.1 [8.3-14.7]	11.8 (11.5- 12.1) [5.9-16.0]	
Programme coverage (pregnant)					
Currently enrolled in ANC programme	(8/19) 42.1% (16.9-67.3)	(14/25) 56.0% (34.7- 77.3)	(8/12) 66.7%	(10/20) 50.0% (27.8- 72.2)	

Surveyed area	Dzaleka Refugee Camp	Dzaleka Host Communities	Luwani Refugee Camp*	Luwani Host Communities	Classification or target
Currently receiving iron-folic acid pills	(3/19) 15.8% (-1.2-32.8)	(11/25) 44.0% (22.7-65.3)	(8/12) 66.7%	(8/20) 40.0% (18.0- 62.0)	
FOOD SECURITY					
Food distribution					
Proportion of households with a ration card	(207/245) 84.5% (79.5- 89.5)	-	(223/224) 99.6%	-	
Average number of days general food ration lasts out of 30 days (mean [95% CI] or SD)	18.6 (17.5-19.7)	-	23.2±5.4	-	
Proportion of households reporting that the food ration lasts the entire duration of the cycle (≥30 days)	(18/194) 9.3% (3.8- 14.7)		(51/203) 25.1%		
Negative household coping strategies					
Proportion of households reporting using none of the negative coping strategies over the past month	(15) 6.1% (2.6 -9.6)	(43) 12.1% (8.6 -15.7)	(54/223) 24.2%	(16/236) 6.8% (3.6-9.9)	Critical Range: ≤49%
Household dietary diversity					
Average HDDS (mean (95%CI or ± SD)	4.5 (4.2-4.8)	4.6 (4.3-4.9)	4.6	4.540 (4.2-4.9)	Max HDDS is 12
Proportion of households not consuming any vegetables, fruits, meats, eggs, fish/seafood and milk/milk products	(38/245) 15.5% (10.4- 20.7)	(18/355) 5.1% (1.6- 8.5)	(60/224) 26.8%	(22/237) 9.3% (5.6- 13.0)	
Proportion of households consuming either a plant or animal source of vitamin A	(157/245) 64.1% (57.2- 71.0)	(288/355) 81.1% (75.8- 86.4)	(142/224) 63.4%	(200/237) 84.4% (78.6- 90.2)	
Proportion of households consuming organ meat/flesh meat, or fish/seafood	(53/245) 21.6% (15.5- 27.7)	(106/355) 29.9% (23.9- 35.8)	(52/244) 23.2%	(67/237) 28.3% (20.9- 35.6)	
WASH					
Water quality and storage					
N	501	669	450	456	
Proportion of households using an improved drinking water source	(498) 99.4% (98.5- 100)	(610) 91.2% (83.8- 98.5)	(450) 100%	(430) 94.3% (90.2- 98.4)	
Proportion of households that use a covered or narrow necked container for storing their drinking water	(239) 47.7% (39.0- 56.4)	(106) 15.8% (11.9- 19.8)	(268) 59.6%	(149) 32.7% (24.8- 40.5)	
Water quantity					
Proportion of households that use:					
N	501		450		
≥ 20 lpppd	(251) 50.1% (43.7- 56.5)	-	(254) 56.4%	-	
15 - <20 lpppd	(81) 16.2% (12.0- 20.3)	-	(69) 15.3%	-	
<15 lpppd	(169) 33.7% (27.9- 39.5)	-	(127) 28.2%	-	
Average water usage in lpppd	23.5 (21.1- 25.8)		23.9548		Target of ≥20

Surveyed area	Dzaleka Refugee Camp	Dzaleka Host Communities	Luwani Refugee Camp*	Luwani Host Communities	Classification or target
					lpppd
Safe excreta disposal					
Proportion of households that use:					
An improved excreta disposal facility (improved toilet facility, 1 household)	(184/499) 36.9% (31.3- 42.4)	(72/669) 10.8% (6.8- 14.7)	(133/434) 30.7%	(51/453) 11.3% (6.6-15.9)	
A shared family toilet (improved toilet facility, 2 households)	(61/499) 12.2% (8.2- 16.3)	(20/669) 3.0% (0.8- 5.2)	(17/434) 3.9%	(13/453) 2.9% (0.5-5.2)	
A communal toilet (improved toilet facility, 3 households or more)	(42/499) 8.4% (5.7- 11.1)	(5/669) 0.7% (0.1- 1.4)	(78/434) 18.0%	(7/453) 1.5% (0.3-2.8)	
An unimproved toilet (unimproved toilet facility or public toilet)	(212/499) 42.5% (34.9- 50.1)	(572/669) 85.5% (80.4- 90.6)	(206/434) 47.5%	(382/453) 84.3% (78.1-90.6)	
Proportion of households with children under 3 years of age that dispose of faeces safely	(254/269) 94.4% (91.6- 97.3)	(194/236) 82.2% (76.2- 88.2)	(238/248) 96.0%	(145/175) 82.9% (73.6- 92.2)	
MOSQUITO NET COVERAGE					
Mosquito net ownership					
Proportion of total households owning at least one mosquito net of any type	(80/249) 32.1% (24.5- 39.7)	(210/351) 59.8% (54.5- 65.1)	(204/227) 89.9%	114/236 48.3% (40.1- 56.5)	
Proportion of households owning at least one LLIN	(76/249) 30.5% (23.1- 38.0)	(199/351) 56.7% (51.2- 62.2)	192/227) 84.6%	(91/236) 38.6% (30.4- 46.7)	Target of >80%
Average number of persons per LLIN (mean)	(1544/132) 11.7	(1442/310) 4.7	(1080/412) 2.6	(981/128) 7.7	2 persons per LLIN
Mosquito net utilization					
Proportion of household members (all ages) who slept under a net of any type	(296/1544) 19.2%	(549/1442) 38.1%	(457/1080) 42.3%	(344/981) 35.1%	
Proportion of household members (all ages) who slept under an LLIN	(286/1544) 18.5%	(523/1442) 36.3%	(442/1080) 40.9%	(266/981) 27.1%	
Proportion of children 0-59 months who slept under a net of any type	(80/281) 28.5%	(127/221) 57.5%	(113/240) 47.1%	(77/158) 48.7%	
Proportion of children 0-59 months who slept under an LLIN	(77/281) 27.4%	(124/221) 56.1%	(107/240) 44.6%	(61/158) 38.6%	
Proportion of pregnant women who slept under a net of any type	(6/36) 16.7%	(15/36) 41.7%	(11/24) 45.8%	(5/21) 23.8%	
Proportion of pregnant women who slept under an LLIN	(6/36) 16.7%	(14/36) 38.9%	(11/24) 45.8%	(4/21) 19.0%	

INTERPRETATION

Acute and chronic malnutrition

- The overall nutrition situation based on GAM in 2016 in all the surveys is within the 'acceptable' level of < 5%. The acute malnutrition level found in Dzaleka Camp is low and similar to those levels found in the previous two surveys conducted in 2012 and 2014, indicating that the acute malnutrition situation at the camp is being contained. Luwani host community appears to have the highest level of GAM prevalence [2.2% (95% CI 0.9-5.4) which were comparable to the 2.5% (95% CI: 2.0- 3.3) obtained in the same livelihood zone assessed from the National Nutrition surveys coordinated by the Department of Nutrition, HIV and AIDS (DNHA) conducted in November-December 2016.
- The prevalence of stunting (chronic malnutrition) in children in all the survey areas was found to be high and well above the 'acceptable level' of <20%. The stunting results are in the 'serious' category (30-39%) according to WHO thresholds in three of the survey areas (Dzaleka camp, Dzaleka host community and Luwani host community) and in the 'critical' category ($\geq 40\%$) in Luwani camp. In Dzaleka Camp, chronic malnutrition remains high and the level is similar to the one obtained in 2014. Prevalence of stunting increased from 22.4% in 2012 to 36.1% in 2014 but slightly dropped to 34.8% in 2016. The difference between 2014 and 2016 are however not statistically significant ($p > 0.05$).
- The coverage of age documentation was very high in all 4 surveys. Hence, the stunting results can be considered to be reliable and of high quality. Luwani camp had the lowest coverage of age documentation with 11% of the surveyed children having no official age documentation.

Diarrhea

- Diarrhea in the last 2 weeks as of November 2016 (according to mother's recall) is high in all 4 survey areas and ranges from 27% to 35% with Luwani camp having the highest value. Prevalence of diarrhoea in Dzaleka Camp (27.2%) was higher than that found in 2014 survey (21.9% (95% confidence interval (CI): 18.9 - 25.1%) but not significantly different.

Anaemia

Children aged 6-59 months

- The prevalence of anaemia among children 6-59 months is above the UNHCR target of <20% in all the 4 surveys, however very large differences were found between Dzaleka camp and its host community, and Luwani camp and its host community. The prevalence of anaemia was found to be very high and above the 40% threshold for defining a problem of high public health significance according to WHO in both Luwani camp (48.2%) and its host communities (50.9%). The prevalence of anaemia in Dzaleka camp (22.7%) and its host community (26.9%) is much lower and nearly half as compared to Luwani camp and its host community, and in the 'medium' category for classifying a problem of public health significance. By age group and in all 4 surveys, the prevalence of anaemia was the highest in the 6-23 months age group compared to those aged 24 months and above. Anaemia results are above 39% in all surveys in children aged 6-23 months which is alarming.
- The prevalence of anaemia in Dzaleka camp significantly dropped from 33.4% (95% CI 28.6-38.7%) obtained in 2014 to 22.7% (17.9-27.6%) obtained this year ($p < 0.05$).

Women of reproductive age (non-pregnant, 15-49 years)

- In women of reproductive age (non-pregnant), prevalence of anaemia was highest in Luwani camp (44.4%) and its host community (46.7%) and were above the critical threshold for intervention of 40%. The prevalence of anaemia in Dzaleka camp (21.9%) was similar to that obtained in 2014 (23.2%) (Figure 3).
- Severe anaemia is particularly high and concerning in Luwani host community [4.7% (95% CI 1.4-8.1%)].

- Pregnant women enrolment in ANC was found to be between 40-65% in all survey areas. Coverage of iron-folate tablets varied between survey areas and ranged from a lowest of 15.8% in Dzaleka camp to a high of 66.7% in Luwani camp.

Overall anaemia results

The higher anaemia prevalence results found in Luwani camp and its host community reflect a poorer situation in the Luwani area affecting anaemia status in young children and women requiring further investigation.

Programme coverage

- The coverage results of Vitamin A supplementation in the last 6 months and measles vaccination based on both card documentation and mother's recall were generally high (around 90%) across all the survey areas except at Luwani camp (around 75-80%). However, coverage based on card documentation alone was low in all the survey areas as most of the vitamin A supplementation and measles vaccination were received during national campaigns which are rarely documented in the child's card, necessitating deliberate policies on awareness raising by UNHCR and partners. The two host communities met the recommended target of 95% for measles vaccination based on card and mother's recall.

The results for both vitamin A supplementation and measles vaccination were lower in Luwani camp as compared to the other survey areas probably because most of the asylum seekers incrementally joined the camp from March of 2016. Over 40% of them were still in the reception area at the time of the survey in November/December 2016.

Infant and Young Child Feeding

- The proportion of children who were timely initiated on breast feeding and exclusively breastfed (below 6 months) averaged around 70-75% in all survey areas with a low of 54.2% to a high of 81.5% in Luwani community. Continued breastfeeding at 1 year was high in all areas (>89%) which shows wide breastfeeding practice during the first year while continued breastfeeding at 2 years ranged from a low of 36.8% to a high of 85.7% which shows varying practices in terms of breastfeeding into the second year.
- Introduction of solid, semi-solid or soft foods and consumption of iron-rich or iron-fortified foods were generally low in all areas (range from 30-65%).

Food security

- The average duration of the food ration (out of the theoretical duration of 30 days) ranged from 18.6 days in Dzaleka camp to 23.2 days in Luwani camp. These results show that the ration does not last the full month for the recipient households.
- The average household dietary diversity score (HDDS) was low across all the survey areas and was around 4.5 (out of a maximum of 12). In Dzaleka camp, there was no improvement in the average HDDS between 2014 and 2016 (4.3 vs 4.5, respectively).
- A very large proportion of households (as high as 93.9%) in all 4 survey areas use negative coping strategies such as borrowing cash, food or other items with or without interest, selling any assets that would not have normally been sold, requesting increased remittances or gifts as compared to normal and reducing the quantity and/or frequency of meals and snacks.

WASH

- The proportion of households using an improved drinking water source was high in all the surveys, ranging from 90-100%. However, the proportion of households safely storing the water in narrow necked containers was low and ranged from a lowest of 15.8% in Dzaleka host community to a highest of 59.6% in Luwani camp.
- The average daily water usage was above the target of 20 litres per person per day (lpppd) in the two camps. Nevertheless, only about half of the households in both were found to use enough water (≥ 20 lpppd). A large proportion of households in both camps (around 30%) were found to use less than 15 lpppd which might point out to a water supply / quantity issue.
- The proportion of households using an improved excreta disposal facility (improved toilet facility, 1 household) was low in all the survey areas (ranged from a lowest of 10.8% in Dzaleka host community to a highest of 36.9% in Dzaleka camp), necessitating targeted programme for toilet improvement in the host communities. The usage of an improved excreta disposal facility in Dzaleka camp did not greatly improve from the 34.1% result found in 2014. Safe disposal of children under 3 years faeces was practiced by the majority of households (>80%) in all 4 survey areas. There was no much difference between Luwani and Dzaleka host communities.
- Overall, WASH results were better in the camps as compared to the host communities.

Mosquito net coverage and utilisation

- Coverage for mosquito net ownership was generally low across the survey areas (range from 32-48%) except in Luwani camp with over 80% of the households owning at least one net of any type. Similarly, net utilisation by children under 5, pregnant women or the whole population was found to be generally low across the survey sites.
- All areas except for Luwani camp were far below the target of 80% for owning at least one LLIN and the target of 2 persons per LLIN. Luwani camp met the target of 80% for owning at least one LLIN and was close to the target of 2 persons of LLIN (2.6).
- Results suggest that major improvements are needed in terms of coverage and utilisation of nets, especially in Dzaleka camp and community, and Luwani community.

RECOMMENDATIONS AND PRIORITIES

1. GOM, UNHCR, WFP and partners should continue providing 100 % rations (2,100 kilo calories daily) to the whole population and an additional preventive supplementary food to children between 6-24 months to sustain the low levels of acute malnutrition and reduce chronic malnutrition until recommended targeting of POCs for humanitarian assistance takes effect.
2. Treatment services for both severe and moderate malnutrition to continue be provided in the Health facilities in or around the camps. This activities to be coupled with active case-finding to ensure timely identification of such cases.
3. GOM, UNHCR, WFP, and partners should implement interventions targeting all children aged 6-59 months to reduce stunting and anemia levels among the refugees and the host communities. Where resources are limited, children aged 6-24 months should be prioritized. Such interventions should include improving dietary diversity and promotion of consumption of foods rich in micronutrients such as iron, folic acid, zinc, vitamin A and vitamin C through support to kitchen gardening, use of fresh food vouchers / cash, support to income generating activities; providing information and education on anemia and micronutrient deficiencies.
4. GoM, UNHCR, WFP and Partners should conduct bi-annually blanket deworming campaigns targeting children 12-59 months.
5. There is need to investigate the possible main causes of much higher anemia prevalence in and around Luwani Camp through a health center- based assessment.

6. MoH, UNHCR and partners should ensure a more regular supply of iron and folic acid tablets for pregnant women in and around the camps throughout the year and raise awareness among pregnant women on the importance of taking the iron and folic acid tablets. Stakeholders should investigate the reasons behind the observed low uptake of iron and folic acids tablets among pregnant women.
7. Provide refresher training and/or new training to clinic-based laboratory staff on the diagnosis and treatment of anemia and malaria, and ensure a regular supply of supplies and drugs for diagnosis and treatment.
8. GoM, UNHCR, WFP and partners should explore sustainable livelihoods interventions such as promoting income earning, own food production for consumption, and livestock production to increase household food security in the camps to mitigate the effects of pipeline breaks and reduce use of negative coping strategies in and around the camps.
9. A follow-up investigation is needed to understand in more depth the use of negative coping strategies by the population in the camps and the host communities.
10. MoH, UNHCR and partners should strengthen the postnatal follow up activities through postnatal care (PNC) programmes in camps and host communities to promote and support optimal IYCF practices.
11. GoM, UNHCR and the district health offices should improve coverage of safe water storage at the camps and host communities, by providing or promoting the use of narrow necked or covered water storage containers proportional to the household size; and regularly monitor and promote the use of these containers at the household level.
12. MoH, UNHCR, the district health offices and partners should improve the coverage of improved latrine facilities in camps and host communities, raise awareness and sensitise the communities on the importance of using improved latrines.
13. MoH, UNHCR District Health Offices and partners should ensure an adequate distribution of LLINs to the camp and host communities and; promote regular use of LLINs in Luwani camp by strengthening awareness on the importance of using the mosquito nets.
14. MoH, UNHCR and partners should conduct an indoor residual spraying (IRS) campaign covering all households at least once a year in both camps.
15. UNHCR and WFP should regularly undertake the Nutrition Survey in the camps and host communities every two years. It is further recommended that the results of this survey be used in the sample size planning of future SENS surveys in the same locations-

1 Introduction

The United Nations High Commission for Refugees (UNHCR) in Malawi in collaboration with the World Food Programme (WFP) undertook a nutrition and food security survey in the operational sites. The main goal was to assess the situation of refugees and asylum seekers to inform the Malawi operational programme. A decision was made to include an assessment of host communities as a precursor to understand the nutrition, health and food security interventions that are possible within the resources capacity of the UNHCR. This is a major deviation from the past survey, as UNHCR – Malawi moves towards mainstreaming interventions in the districts of operations. This report provides evidence from the four nutrition surveys conducted in two refugee camps of Dzaleka and Luwani and their host communities in Dowa and Neno districts respectively from 7th – 28th November 2016. The main aim of the surveys were to assess the overall nutrition situation of the refugees and the host communities and to come up with appropriate recommendations for action.

1.1 Background

Malawi has been hosting refugees and asylum seekers in Dzaleka camp in Dowa district since 1994. By 2016 the camp reached a population of 25,202 refugees, most of whom live in the refugee camp (ProGres database). The refugees are mainly from the Great Lakes Region comprising of Democratic Republic of Congo (46%), Burundi (25%) and Rwanda (20%). About 8% of the remaining refugees come from Somalia, Ethiopia and other countries. Children under the age of 18 years constitute nearly 53% (13,309) and about 28% of them are aged below 5 years. Approximately 27% (6,702) of the camp population are women of childbearing age. The refugee population in the camp live in 9 zones led by leaders, and there are also community leaders representing nationalities from the countries of origin. Dzaleka camp is surrounded by several villages, and the UNHCR Malawi mapped some 11 villages with a total population of 37,412 for programming as host communities.

In March 2016, the Government of Malawi opened Luwani Camp in Neno district to primarily host asylum seekers from Mozambique. The camp has nearly 2,200 persons of concern and nearly 50% are females. Children under the age of 18 years constitute nearly 62% (1,321) and 22% of the population are children below 5 years. At the time of the survey, the refugee population lived in 10 zones and 1 reception area for new arrivals. The camp is surrounded by 6 villages with a total population of 4,614.

According the Standardised Expanded Nutrition Survey (SENS) conducted in 2014 in Dzaleka Camp and to the World Health Organisation (WHO) threshold to define a problem of public health significance, the overall nutrition situation in the camp was found to be ‘acceptable’ in terms of global acute malnutrition [2014 Global Acute Malnutrition (GAM): 1.1 (0.5-2.3%)] but ‘serious’ in terms of chronic malnutrition [2014: stunting 36.1% (30.2-42.5)]. In addition, the prevalence of anaemia in children aged 6-59 months was around 33% and was just below the 40% WHO threshold for defining a public health problem of high significance. The prevalence of anaemia in children aged 6-23 months was even higher (56.6%). The 2014 SENS results demonstrated that chronic malnutrition and anaemia in children aged 6-59 months was a major concern in the refugee population in Dzaleka camp.

UNHCR and the World Food Programme (WFP) have been working to ensure that food security and related needs of the refugees are adequately addressed in the two existing refugee camps. WFP is responsible for the provision of the general food ration (GFR) including the food basket for children 6-24 months and other vulnerable children and women, while UNHCR is involved in coordinating services offered to the refugees through its partners. The services offered include provision of health services, water and sanitation, shelter, security and basic non-food items. Health services provision in areas of UNHCR operations also extend to the host communities, where 60% of the services are utilised by Malawian.

At Dzaleka and Luwani camps, UNHCR works with a number of government (Ministry of Home Affairs and Ministry of Health) and non-governmental organisations. Ministry of Home Affairs is responsible for security, land allocation, camp coordination and management, refugee status determination, and registration of asylum seekers. While the Ministry of Health is responsible for provision of health services such as primary health care, reproductive health services, HIV and AIDS services and nutrition. The Jesuit Refugee Services (JRS) is responsible for education, psychosocial support, environmental protection, and ware house management. Plan Malawi is responsible for human rights issues such as child protection, reducing and eliminating sexual and gender based violence. Whereas, Participatory Rural Development Organisation (PRDO) is responsible for distribution of food and non-food items, water and sanitation. In addition, at Luwani camp, the UNHCR also works with World Vision for food distribution and Care International for shelter.

Due to foreseen pipeline breaks coupled with a lack of funding for the programmes and considerable delays in maintaining food supplies to the camp population, there was a great need to monitor the nutrition situation of the refugees in the two camps. This Nutrition and Health Survey was therefore designed as part of this monitoring process and planning for future programming in food provision. In addition, similar surveys were felt necessary to be conducted in the host communities adjacent the two camps. Thus, four nutrition surveys were conducted in the two camps and their host communities. It is hoped that this information will provide a strong basis for advocacy for designing various interventions and to ensure the situation in the camps does not decline to emergency thresholds.

1.2 Food Security

Refugees in Dzaleka and Luwani are largely dependent on the general ration distributed at monthly intervals by WFP as their main source of food¹. The ration scale is based on a monthly distribution system with the same rate for children and adults, and provides approximately 2100 kcal/person/day when the food basket is complete as shown in Table 1. The food basket normally consists of Cereals (13.5 Kgs), Pulses (1.5 Kgs), Corn Soya Blend (CSB) (1.5 Kgs), and Vegetable oil (0.75 Litres) per person per month. Children between the ages of 6 – 24 months receive 4 kgs of CSB+ per month.

No mainstreamed livelihoods interventions were promoted at a significant scale at the time of the assessment. However, some women are supported to promote vegetable growing by JRS. Some households grow vegetables of their own consumption and for sale when in excess though at a small scale which may not significant enough to achieve desired food security objectives.

Table 1: General food provision in the monthly basket

Commodity	Daily ration/person (grams)	Kcal	Protein (grams)	Fat (grams)
Cereals	450	1,575	45	18
Pulses	50	171	12.3	0.6
Vegetable oil	25	222	0	25
Super cereal	50	188	7.6	4
Super cereal+	100	394	16.3	10.2
TOTAL		2,155	64.9	47.6

1.3 Health and Nutrition

There is a health centre at each of the two camps serving a population (both refugees and Malawians) which is four times higher than what they are supposed to serve according UNHCR/WHO standards. Dzaleka Health Centre serves approximately over 62,723 persons of whom more than 62% are Malawians. Malaria is the top cause of morbidity at the health center in both camps followed by upper respiratory tract infections (URTI) and diarrheal disease². The Health Centre is supported by both the government of Malawi through the ministry of health and UNHCR, under the sub project of health and nutrition which is implemented by the ministry of health.

Government has a policy to permit all residents to have the same Health Care Services and emergencies on an equal basis. In this context, the government through Dowa District Health Office supplies drugs and medical equipment to the health centre and UNHCR only supplements these supplies when need arises. The laboratory

¹ A tiny minority produces food on small land areas (40x40 square meters) allocated in the camp. Some rent land outside, while other have a variety of livestock. They also produce vegetables for sale and consumption on rented land as well. Nonetheless the extent of the food supplement of such refugee driven solutions has not been assessed or adequately supported. The UNHCR Malawi is designing a livelihoods strategy to turn this opportunity to improve food and food diversity options for refugees and asylum seekers.

² UNHCR HIS

at Dzaleka is insufficiently equipped to test common infections beyond malaria, tuberculosis, rapid HIV test as well as haemoglobin. The Health Centre also provides growth monitoring, vitamin A supplementation, nutrition as well as immunization Services to a population of over 10,663 U/5 children. The immunisation services include BCG, Measles, pneumococcal vaccine (PCV), Polio, Hib, Rota.

1.3.1 Current Health and Nutrition Services and Activities

Health programmes and activities implemented by UNHCR through its partners (MOH) to address the issues of primary health care access are detailed below:

- Improve the health status of the population through
 - Increasing access of primary health care services to persons of concern (POC)
 - Establishing a referral mechanism
 - Provision of preventive and community based health care services.
 - Providing access to communicable diseases programmes
 - Providing access to non-communicable diseases programmes
 - Delivery of health services to under five children
 - Providing access to essential drugs
 - Providing laboratory services according to country standard operating procedures (SOPs).
- Optimal access to reproductive health through
 - Provision of comprehensive safe motherhood
 - Provision of care and treatment of persons of concern living with HIV/AIDS
 - Provisional of clinical management of rape
 - Establishing referral mechanism
 - Provision of preventive reproductive health and HIV services.
 - Provision of prevention of HIV mother to child transmission services.
 - Undertaking capacity building
- Improving Nutritional wellbeing
 - Promoting appropriate infant and young child feeding practice
 - Implementing and monitoring Community Management of Acute Malnutrition (CMAM) programs
- Population lives in satisfactory conditions of sanitation and hygiene
 - Provision of vector pest control services such as mosquito nets.
 - Provision of health education on personal and environmental hygiene

1.4 Survey Objectives

The nutrition surveys were conducted with the aim of assessing the following objectives:

Primary Objectives

1. To measure the prevalence of acute malnutrition among children aged 6-59 months.
2. To measure the prevalence of stunting among children aged 6-59 months.
3. To determine the coverage of measles vaccination among children aged 9-59 months.
4. To determine the coverage of vitamin A supplementation received during the last 6 months among children aged 6-59 months.
5. To assess the two-week period prevalence of diarrhoea among children aged 6- 59 months.
6. To assess the prevalence of anaemia among children 6-59 months and women of reproductive age (non-pregnant, 15-49 years).
7. To investigate Infant and Young Child Feeding (IYCF) practices among children aged 0-23 months.
8. To determine the coverage of ration cards and the duration the general food ration lasts for recipient households.

9. To determine the extent to which negative coping strategies are used by households.
10. To assess household dietary diversity.
11. To determine the population's access to, and use of, improved water, sanitation and hygiene facilities.
12. To determine the ownership of mosquito nets (all types and LLINs) in households.
13. To determine the utilisation of mosquito nets (all types and LLINs) by the total population, children aged 0-59 months and pregnant women.
14. To determine the household coverage of indoor residual spraying.
15. To establish recommendations on actions to be taken to address the situation.

Secondary objectives

16. To determine the coverage of selective feeding programme for children aged 6-59 months.
17. To determine enrolment into Antenatal Care (ANC) clinic and coverage of iron-folic acid supplementation in pregnant women.

2 Methodology

2.1 Survey population and target groups

Four nutrition surveys were conducted targeting refugee populations of Dzaleka and Luwani Camps and host communities of these camps. All refugee population in camps and the host community around the camp are represented in these surveys. In the host communities, status of the household members as to whether they are host community members, refugees or mixture of host community members and refugees was assessed (Appendix 1 for Maps of Camps).

In the surveys, four target groups were included which were: 1. Children aged 6-59 months (Anthropometry, Health and Anaemia measurements), 2. Non-pregnant women of reproductive age (15-49 years) (Anaemia measurement); 3. Children aged 0-23 months (assessment of IYCF practices) and 4. All persons of concern (household as a whole) for assessment of food security, WASH and mosquito net coverage.

2.2 Survey Design

The surveys were conducted using a cross-sectional survey design using a 2-stage cluster sampling method in 3 of the survey areas (Dzaleka camp, two host communities) and an exhaustive method in Luwani Camp as the total population was below 2500. The surveys were conducted based on the Standardised Monitoring and Assessment of Relief and Transitions (SMART) methodology (www.smartmethodology.org) and UNHCR Standardised Expanded Nutrition Survey (SENS) Guidelines for Refugee Populations (v 2, 2013) (<http://sens.unhcr.org>).

2.3 Sample size

Sample size calculation for the cluster surveys were based on the expected prevalence of GAM in children 6-59 months, desired precision, design effect, average household size, percentage of children under 5 years of age, and the non-response rate. The sample sizes were calculated using the ENA-for-SMART (July 9, 2015 version) software following UNHCR SENS methodology. The calculated sample sizes for anthropometric indicators were then used in all the survey modules to estimate the required number of individuals and households to be included in the surveys. Sample sizes were all corrected for small population size factor as the total the population of children under 5 years were below 10,000.

Using the SENS guidelines, all eligible children aged 0-59 months from all selected households were included in the Child Anthropometry and Health, Anaemia and IYCF modules, whilst half of the selected households were selected for the Food Security, Mosquito net coverage and Women questionnaire (including anaemia). All households were selected for WASH in all the surveys. Table 2 summarises the assumptions used and the required number of children and households included in the surveys based on the results found in previous surveys.

In the cluster surveys, the number of clusters was determined by dividing the total estimated number of households in the survey by the estimated number of households a team could cover in a day. In these surveys, it was estimated that teams could cover between 15-17 households in a day and therefore the number of households per survey area was divided by 17 to estimate the number of clusters.

Table 2: Sample size calculation

Survey Area	Estimated prevalence	Precision	Design effect	Average HH size	% children under 5	% Non-response rate	Children to be included	Households to be included	# clusters
Dzaleka Camp	2.5%	2.0%	1.3	5.0	14.8%	10.0%	302	503	30
Dzaleka Host	3.0%	2.0%	1.5	5.5	15.0%	10.0%	419	626	37
Luwani Camp	Exhaustive survey used and hence not sample size estimation								
Luwani Host	3.0%	2.0%	1.5	5.5	15.0%	10.0%	264	395	26

The estimated prevalence of GAM for the refugee population and the host communities were based on the upper confidence limit of the 2014 Dzaleka Nutrition Survey and 2016 National Nutrition Surveys, respectively. Desired precision and design effect were based on the SMART methodology guidance based on the 2014 Nutrition survey. Average household size and % children under 5 years for the camps and the host communities were based on the ProGres database and the 2016 National Nutrition Survey, respectively.

2.4 Sampling Procedure

2.4.1 Selection of Clusters and households in Cluster Surveys

A two-stage cluster sampling approach was used to randomly sample the clusters and households. In the first stage, a total of 93 clusters (30 for Dzaleka camp, 37 for Dzaleka host community and 26 for Luwani host community) were selected using probability proportional to size (PPS) in ENA for SMART software version 2011 (9 July 2015) using population data provided by UNHCR and the district councils (see Appendix 2 for selected clusters). At Dzaleka Camp, large clusters were further segmented into small clusters and one cluster was selected using PPS for the survey. About 10% of the total clusters were sampled as reserve clusters. All the reserve clusters were covered because the number of children 6-59 months was originally less than 80% of the target sample size in Dzaleka and Luwani host communities.

In the second stage, the team first conducted a household listing in all the survey clusters in consultation with community leaders. All duplicates and households that moved to other villages were excluded from the list before selecting the required 17 households using systematic sampling approach. The number of households per cluster were later adjusted to 18 to account for the increased number of households that were absent. The selected households were traced with the help of village leaders. In modules where only half of the households were to be interviewed, 50% of the households were randomly selected from the list of selected households by using simple random sampling.

2.4.2 Selection of households in Luwani Camp

Each survey team was allocated to each of the smaller zones. For larger zones or area, more than one team were assigned to the zones. All households in the camp were surveyed.

In all the surveys, a household was defined as a group of people who lived together and routinely ate from the same pot. Survey respondents were the mothers of children aged below 5 years or the primary caretaker of those children.

2.5 Survey Questionnaires and measurement methods

2.5.1 Questionnaires

The UNHCR SENS questionnaires were used in both the camps and host communities to generate information on the relevant indicators for the different target groups as per survey objectives and were adapted to suit the local conditions. The questionnaires were developed in English and administered in the language used by the household (Chichewa in host communities and Luwani camp, Swahili, Kirundi, Kinyarwanda, Chichewa and French, at Dzaleka camp). At Dzaleka camp, the questionnaires were administered via translators. All questionnaires were pre-tested before the survey and were programmed in mobile phones for data collection (see **Appendix 3** for SENS questionnaires). Questionnaires administered in the host communities slightly differed from the ones administered in the camps (details shown below).

The SENS questionnaire consisted of the following six modules:

Module 1 (Anthropometry and health): Data on anthropometry, oedema, enrolment in selective feeding programmes, measles vaccination, vitamin A supplementation in last six months, morbidity from diarrhoea in past two weeks for children 6-59 months.

Module 2 (Anaemia): Data on haemoglobin measurements for children 6-59 months and non-pregnant women 15-49 years, as well as data on pregnancy status, ANC enrolment and iron and folic acid pills coverage for pregnant women 15-49 years.

Module 3 (IYCF): Questions on infant and young children feeding practices such as breastfeeding initiation, exclusivity and duration and feeding practices for children aged 0-23 months.

Module 4 (Food Security): Data on access to food assistance and duration of the general food ration (in camps only), use of negative coping strategies and level of household dietary diversity.

Module 5 (WASH): Data on access to improved drinking water sources, storage of water, quantity of water used per household (in camps only), satisfaction with water supply (in camps only), type and quality of excreta disposal facility in use and safe disposal of young children's stools for households.

Module 6 (Mosquito Net Coverage): Data on mosquito net ownership (type and number) and on the members of household (all, U5, pregnant) who slept under a mosquito net last night (by type), and Indoor Residual Spraying (IRS) (in camps only).

Length of stay in the camp was added to the camp questionnaires.

2.5.2 Measurement methods

Sex: gender was recorded as male or female.

Birth date or age in months: the exact date of birth (day, month, year) was recorded from a child health card. If no reliable proof of age was available, age was estimated in months using a local events calendar (Appendix 4).

Weight: children were weighed without clothes whenever possible using a digital scale and recorded to the nearest 100 grams. The double-weighing technique was used to weigh young children unable to stand on their own.

Height/Length: children's height or length was taken to the closest millimetre using a UNICEF wooden height board. Children below 2 years were measured lying down (length) and children 2 years and above were measured standing up (height).

Oedema: presence or absence of oedema was measured by applying gentle thumb pressure on to the tops of both feet of the child for 3 seconds.

MUAC: MUAC was measured at the mid-point of the left upper arm between the elbow and the shoulder and taken to the closest millimetre using a standard MUAC tape.

Measles vaccination: measles vaccination was assessed in children 9-59 months by checking for the measles vaccine on the child's health card if available or by asking the caregiver to recall if no health card was available.

Vitamin A supplementation in last 6 months: whether the child received a vitamin A capsule over the past six months was recorded from the health card or by asking the caregiver to recall if no card was available.

Diarrhoea in last 2 weeks: caregivers were asked if their child had suffered from diarrhoea (3 or more loose or watery stools per day) in the past two weeks.

Haemoglobin (Hb) concentration in children 6-59 months and non-pregnant women 15-49 years: Hb concentration was assessed from the fingertip prick and recorded to the closest gram per decilitre or gram per litre using a portable HemoCue Hb 301+ machine. All measurements were then converted to gram per decilitre before final analysis.

Age of women 15-49 years: reported age was recorded in years for women.

ANC enrolment and iron-folic acid pills coverage: if the woman was pregnant, ANC programme enrolment and coverage of iron-folic acid pills was assessed by recall.

IYCF practices for children 0-23 months: were assessed using interviews with mothers or the main caregiver of young children.

WASH: variables were assessed using interviews with mothers or the main caretaker of young children and observation of specific WASH facilities.

Mosquito net coverage: variables were assessed using interviews with the mother or caregiver and through direct observation of the mosquito nets in the household.

Referrals: for children 6-59 months, referrals to the health centre were made for those with a MUAC <12.5cm and for those with oedema, and for children with Hb<7g/dl. For adult women, those with Hb<8g/dl were referred.

2.6 Case definitions, inclusion criteria and calculations

Indicators of Nutritional Status, Anaemia and other indicators

2.6.1 Nutritional status

Table 3 shows the definitions of nutritional indicators in children 6-59 months. The results for the nutrition status in children were calculated according to the WHO Growth Standards 2006.

Table 3: Nutritional Status in children 6-59 months, cut-offs used

	Indicators	Cut-offs
	Prevalence %	
Acute Malnutrition ¹	Global acute malnutrition	WHZ <-2 &/or oedema
	Moderate acute malnutrition	WHZ <-2 & ≥-3
	Severe acute malnutrition	WHZ <-3 &/or oedema
Stunting ¹	Total stunting	HAZ <-2
	Moderate stunting	HAZ <-2 & ≥-3
	Severe stunting	HAZ <-3
Underweight ¹	Total underweight	WAZ <-2
	Moderate underweight	WAZ <-2 & ≥-3
	Severe underweight	WAZ <-3
MUAC	<12.5cm &/or oedema	
	≥11.5cm & <12.5cm	
	<11.5cm &/or odema	

¹ Calculated using WHO Growth Standards 2006

² Source: WHO (1995) Physical Status: The Use and Interpretation of Anthropometry and WHO (2000) The Management of Nutrition in Major Emergencies

2.6.2 Anaemia

Table 4 shows the definitions of anaemia in children 6-59 months and non-pregnant women of child bearing age (15-49 years).

Table 4: Anaemia cut-offs in children 6-59 months and non-pregnant women 15-49 years

Prevalence %	Children 6-59 months	Non-pregnant women 15-49 years
Total anaemia	Hb <11.0 g/dL	Hb <12.0 g/dL
Mild anaemia	Hb 10.0 - 10.9 g/dL	Hb 11.0 - 11.9 g/dL
Moderate anaemia	Hb 7.0 - 9.9 g/dL	Hb 8.0 - 10.9 g/dL
Severe anaemia	Hb <7.0 g/dL	Hb <8.0 g/dL

2.6.3 Infant and Young Child Feeding (IYCF) Indicators (children 0-23 months)

Infant and young child feeding practices were calculated based on standard WHO recommendations (WHO, 2007) as follows:

- **Timely initiation of breastfeeding: WHO core indicator 1** - Proportion of children 0-23 months of age who were put to the breast within one hour of birth.

Children 0-23 months of age who were put to the breast within one hour of birth
Children 0-23 months of age

- **Exclusive breastfeeding under 6 months: WHO core indicator 2** – Proportion of infants 0–5 months of age who are fed exclusively with breast milk.

Infants 0–5 months of age who received only breast milk during the previous day
Infants 0–5 months of age

- **Continued breastfeeding at 1 year: WHO core indicator 3** - Proportion of children 12–15 months of age who are fed breast milk.

Children 12–15 months of age who received breast milk during the previous day
Children 12–15 months of age

- **Introduction of solid, semi-solid or soft foods: WHO core indicator 4** - Proportion of infants 6–8 months of age who receive solid, semi-solid or soft foods.

Infants 6–8 months who received solid, semi-solid or soft foods during the previous day
Infants 6–8 months of age

- **Consumption of iron-rich or iron-fortified foods: WHO core indicator 8** - Proportion of children 6–23 months of age who receive an iron-rich or iron-fortified food that is specially designed for infants and young children, or that is fortified in the home.

Children 6–23 months of age who received an iron-rich food or a food that was specially designed for infants and young children and was fortified with iron, or a food that was
fortified in the home with a product that included iron during the previous day
Children 6–23 months of age

- **Continued breastfeeding at 2 years: WHO optional indicator 10** - Proportion of children 20–23 months of age who are fed breast milk.

Children 20–23 months of age who received breast milk during the previous day
Children 20–23 months of age

- **Bottle feeding: WHO optional indicator 14** - Proportion of children 0–23 months of age who are fed with a bottle.

Children 0–23 months of age who were fed with a bottle during the previous day
Children 0–23 months of age

2.6.4 Household food security

- **Household dietary diversity score (HDDS)**

A household dietary diversity score was calculated by summing the number of food groups consumed by any household member in and outside the house over the last 24 hour period, out of a maximum of 12 food groups according SENS guidelines.

The 12 food groups were: 1. Cereals, 2. White roots and tubers, 3. Vegetables (combination of 3 Sub-groups: vitamin A rich vegetables and tubers, dark green leafy vegetables and other vegetables), 4. Fruits (combination of 2 sub-groups: vitamin A rich fruits and other fruits), 5. Meat (combination of 2 sub-groups: organ meat and flesh meat), 6. Eggs, 7. Fish and other seafood, 8. Legumes, nuts and seeds, 9. Milk and milk products, 10. Oils and fats, 11. Sweets, and 12. Spices, condiments and beverages.

2.6.5 WASH

Improved and Unimproved Sources of Drinking Water and Sanitation Facilities:

Table 5 provides the definitions of drinking water and sanitation facilities used in the survey

Table 5: Definitions of improved and unimproved sources of drinking water and sanitation

Drinking Water	Improved source	Unimproved source
	public tap/standpipe, borehole, protected dug well,	Unprotected dug well, tanker truck, bottled water, surface water eg river, other
Sanitation facility definition		
	Improved category	Unimproved category
	Flush to septic system, Pour-flush to pit, Ventilated Improved Pit (VIP)/ pit latrine with cement floor/slab	Pit latrine without cement floor/slab , No facility, field, bush, plastic bag
Sanitation facility classification based on definition and sharing		
Improved excreta disposal facility	A toilet in the above “improved” category AND one that is not shared with other families	
Shared family toilet	A toilet in the above “improved” category AND one used by 2 families / households only (for a maximum of 12 people)**	
Communal toilet	A toilet in the above “improved” category AND one used by 3 families / households or more	
Unimproved toilet	A toilet in the above “unimproved” category OR a public toilet which any member of the public can use e.g. in hospitals or markets	

Safe excreta disposal for children aged 0-3 years: The safe disposal of children’s faeces is of particular importance because children’s faeces are the most likely cause of faecal contamination to the immediate household environment. “Safe” is understood to mean disposal in a safe sanitation facility or by burying. This is the method that is most likely to prevent contamination from faeces in the household.

2.6.6 Long-lasting Insecticidal Net (LLIN):

A long-lasting insecticidal net is a factory-treated mosquito net. The net is supposed to retain its effective biological activity without re-treatment for at least 20 WHO standard washes under laboratory conditions and three years of recommended use.

2.7 Classification of public health problem and targets

2.7.1 Anthropometry and Anaemia

Table 6 shows the classification of the severity GAM, stunting and underweight in children 6-59 months based on WHO’s classification of public health significance (WHO, 2000). According to UNHCR, the target for the prevalence of GAM in children 6-59 months is <10% and severe acute malnutrition (SAM) is <2%.

Table 6: Classification of the severity of Malnutrition in children under-5¹

Prevalence %	Critical	Serious	Poor	Acceptable
Low weight-for-height	≥15	10-14	5-9	<5
Low height-for-age	≥40	30-39	20-29	<20
Low weight-for-age	≥30	20-29	10-19	<10

¹ Source: WHO (1995) Physical Status: The Use and Interpretation of Anthropometry and WHO (2000) The Management of Nutrition in Major Emergencies

Table 7 shows the classification of the severity anaemia in children 6-59 months and women of childbearing age (15-49 years) who are not pregnant based on WHO criteria (WHO, 2000). The targets for the prevalence of anaemia in children 6-59 months of age and in women 15-49 years of age is <20% based on UNHCR guidelines.

Table 7: Classification of the severity of anaemia¹

Prevalence %	High	Medium	Low
Total anaemia	≥40	20-39	5-19

¹ Source: WHO (2000) The Management of Nutrition in Major Emergencies

2.7.2 Measles vaccination and vitamin A supplementation in last 6 months coverage

Table 8: Recommended targets for measles vaccination and vitamin A supplementation in last 6 months (UNHCR SENS Guidelines)

Indicator	Target Coverage
Measles vaccination coverage (9-59m)	95% (also SPHERE)
Vitamin A supplementation in last 6 months coverage	90%

2.7.3 WASH

Table 9: UNHCR WASH Programme Standard

UNHCR Standard	Indicator
Average quantity of water available per person/day	> or = 20 litres

2.7.4 Mosquito nets:

Table 10: UNHCR Mosquito Net Programme Standards

UNHCR Standard	Indicator
Proportion of households owning at least one Long-Lasting Insecticide treated bed net (LLIN)	>80%
Average number of persons per LLIN	2 persons per LLIN

2.8 Recruitment, Training of Data collectors and Supervision

A total of 6 survey teams each consisting of 5 team members (anthropometry measurer, anthropometry assistant, haemoglobin measurer, interviewer and team leader) were recruited for data collection for the survey (see Appendix 5). In Dzaleka Camp, 12 translators among the refugee population were recruited who covered most of the main languages spoken at the camp. All the six survey team members participated in a 6 day standardised training led by the Consultant. Four days were allocated for the standardised survey training using UNHCR standard training manuals/slides. Two days of the training were allocated for standardisation exercise and piloting at Dzaleka camp where each team had to visit a minimum of two households. Feedback from the pilot testing informed the sampling design at the camp and challenges encountered were discussed in plenary. The training session, standardisation and piloting of the study methodology and the tools were supervised by two quality assurance advisors from UNHCR and two members of consulting team.

2.9 Data Collection

Data collection was carried out over 22 days from 7 – 28 November 2016 in all the four surveys. UNHCR and WFP provided technical support in supervising the field data collection. The two members of the Consulting team provided daily supervision and were supported by the Team leaders for daily data review before uploading. Twelve android mobile phones with Open Data Kit (ODK) software were used for data collection, with daily data checks and feedback to survey teams. The data were then transferred to an offline server at the end of each day when all issues related to the data collected were addressed.

2.10 Data analysis and data quality assessment

Data analysis for anthropometry data was conducted using ENA-for-SMART software (July 9, 2015 version), and data analysis for the other variables was conducted using EPI INFO 7 for Windows using the SENS analysis standard codes for each of the six modules.

All the data were cleaned before analysis. Use of the android phones with restrictions to reduce data entry errors helped to reduce the amount of cleaning needed. All flagged records for the anthropometry data based on SMART flags (i.e +/- 3 SD from the observed mean) were excluded from the analysis.

3 Results

3.1 Survey quality

The overall quality of the four surveys was **excellent** as per the SMART plausibility report, while the quality for Luwani Camp was classified as **good**. Table 11 and Appendix 6 present the plausibility values for each of the four surveys. The major reasons for the high data quality includes: in-depth training, optimal supervision, daily data plausibility checks, and daily debriefing meetings with all the team members throughout the data collection. In terms of sample reach, there was an excess of boys in both Dzaleka camp and Luwani camp based on the SMART Plausibility report though it may not affect survey data quality or validity. The survey was exhaustive in Luwani camp and mothers or care givers were eager to participate in the survey so it is most likely not due to a selection bias. There was also lower quality height and MUAC measurement data in Luwani camp primarily because of the very hot sunny conditions at the camp during the survey and there was no shade at the homes where children could be measured thereby slightly affecting the quality of measurements. These two issues resulted in lower overall scores on the SMART Plausibility report. Appendix 6 presents the overall plausibility reports for the four surveys.

Table 11: Overall Quality Value of Anthropometry Data by Survey area

	Overall Quality Value*	Interpretation (SMART Thresholds)
Dzaleka Camp	4%	Excellent
Dzaleka host community	2%	Excellent
Luwani camp	11%	Good
Luwani host community	4%	Excellent
*Overall Scores Thresholds: 0 – 9: Excellent; 10 – 14: Good; 15 – 24: Acceptable; >25: Problematic		

3.2 Sample sizes, response rate and demographic characteristics of the study population

Table 12 presents the demographic characteristics of the population surveyed in each of the four surveys. The average household sizes for the two host communities were below the estimated household size of 5.5 used in sample calculation which is the national average in Malawi. The number of children surveyed in Dzaleka host communities was below the expected 419 children even after surveying all the reserve clusters primarily because we overestimated average household size and percentage of children under 5 years during sample size calculation (see Table 2 for assumptions used in sample size calculation). Nevertheless, the achieved sample size is close to 80% (79.5%) of the target sample size, which is acceptable according to the UNHCR SENS Guidelines. It is recommended that the demographic figures shown below be used in the sample size planning of future SENS surveys in the same locations as surveyed here.

Table 12: Sample sizes, response rate and demographic characteristics of the study population

	Dzaleka camp	Dzaleka host*	Luwani camp**	Luwani host*
Expected number of children (6-59 m)	302	419	-	264
Number of children (6-59 m) surveyed	491	333	397	279
Response rate in children	162.6%	79.5%	-	105.7%
Expected number of households	503	626	-	395
Total households surveyed	501	669	450	456
Household response rate	99.6%	106.9%	-	115.4%
Total population surveyed***	3018	2759	1930	2028
Total U5 surveyed****	547	384	442	303
Average household size	6.0	4.1	4.2	4.5
% of U5	18.1	13.9	22.9	14.9
<p>* The Reserve clusters were utilized since the number of children from the initial clusters was below 80%.</p> <p>** An exhaustive survey was conducted.</p> <p>*** Derived from WASH module</p> <p>**** Derived from Child and IYCF module</p>				

3.3 Children 6-59 months

3.3.1 Distribution of age and sex of children

The coverage of age documentation was very high in all 4 surveys. Luwani camp had the lowest coverage of age documentation with 11% of the surveyed children having no official age documentation. The overall sex ratio ranged from 0.9 in Luwani host community to 1.2 in the two camps and therefore is within the recommended range (0.8-1.2). This suggests that both sexes were equally distributed and therefore household selection was unbiased (Table 13).

Table 13: Distribution of age and sex of sample – children 6-59 months

	Boys		Girls		Total		Ratio
Dzaleka Camp							
AGE (mo)	no.	%	no.	%	no.	%	Boy:girl
6-17	70	54.7	58	45.3	128	26.1	1.2
18-29	58	52.3	53	47.7	111	22.6	1.1
30-41	59	57.3	44	42.7	103	21.0	1.3
42-53	61	57.0	46	43.0	107	21.8	1.3
54-59	22	52.4	20	47.6	42	8.6	1.1
Total	270	55.0	221	45.0	491	100.0	1.2
Dzaleka Host							
6-17	51	65.4	27	34.6	78	23.4	1.9
18-29	34	49.3	35	50.7	69	20.7	1.0
30-41	39	52.0	36	48.0	75	22.5	1.1
42-53	32	43.8	41	56.2	73	21.9	0.8
54-59	19	50.0	19	50.0	38	11.4	1.0
Total	175	52.6	158	47.4	333	100.0	1.1
Luwani Camp							
6-17	53	55.2	43	44.8	96	24.2	1.2
18-29	57	61.3	36	38.7	93	23.4	1.6
30-41	52	52.5	47	47.5	99	24.9	1.1
42-53	40	50.0	40	50.0	80	20.2	1.0
54-59	16	55.2	13	44.8	29	7.3	1.2
Total	218	54.9	179	45.1	397	100.0	1.2
Luwani Host							
6-17	32	42.1	44	57.9	76	27.2	0.7
18-29	34	52.3	31	47.7	65	23.3	1.1
30-41	25	50.0	25	50.0	50	17.9	1.0
42-53	30	50.0	30	50.0	60	21.5	1.0
54-59	13	46.4	15	53.6	28	10.0	0.9
Total	134	48.0	145	52.0	279	100.0	0.9

3.3.2 Anthropometric results (based on WHO Growth Standards 2006)

3.3.2.1 Prevalence of acute malnutrition

Prevalence of acute malnutrition based on GAM show a similar situation in all 4 sites with Luwani host communities having the highest GAM (upper confidence interval of 5.4%) (Table 14). The GAM results in all surveys were low and were within the 'acceptable' level of < 5% according to WHO Classification (Table 6). The results met UNHCR target of a GAM below 10% (and SAM below 2%). However, amongst all the surveyed sites Luwani host community appears to have the highest level of GAM prevalence [2.2% (95% CI 0.9-5.4) which were comparable to the 2.5% (95% CI: 2.0- 3.3) obtained from the National Nutrition surveys conducted between November and December 2016 for the livelihood zone that includes Luwani community (ie. Rift valley escarpment Livelihood). However, the GAM results for Dzaleka community was lower than the 3.3% (95% CI: 2.0- 5.4) obtained from same National Nutrition Survey for livelihood zone of Kasungu Lilonwe Plain that included the Dzaleka community. The design effect in the three cluster surveys showed that malnutrition was quite homogenous (design effect smaller than 1.5). The acute malnutrition level found in Dzaleka Camp is low and similar to those levels found in the previous two surveys conducted in 2012 and 2014 as shown in Figure 1.

Table 14: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema).

Surveyed area	Dzaleka Camp (n) % (95% C.I.)	Dzaleka Host (n) % (95% C.I.)	Luwani Camp* (n) %	Luwani Host (n) % (95% C.I.)
N	479	328	383	276
Global Acute Malnutrition (GAM)	(5) 1.0 % (0.4 - 2.9)	(3) 0.9 % (0.3 - 2.8)	1.6 %	(6) 2.2 % (0.9 - 5.4)
Moderate Acute Malnutrition (MAM)	(5) 1.0 % (0.4 - 2.9)	(3) 0.9 % (0.3 - 2.8)	1.6 %	(6) 2.2 % (0.9 - 5.4)
Severe Acute Malnutrition (SAM)	(0) 0.0 % (0.0 - 0.0)	(0) 0.0 % (0.0 - 0.0)	0.0 %	0.0 % (0.0 - 0.0)

The prevalence of oedema is 0.0 %

* An exhaustive survey was conducted, hence no confidence intervals shown

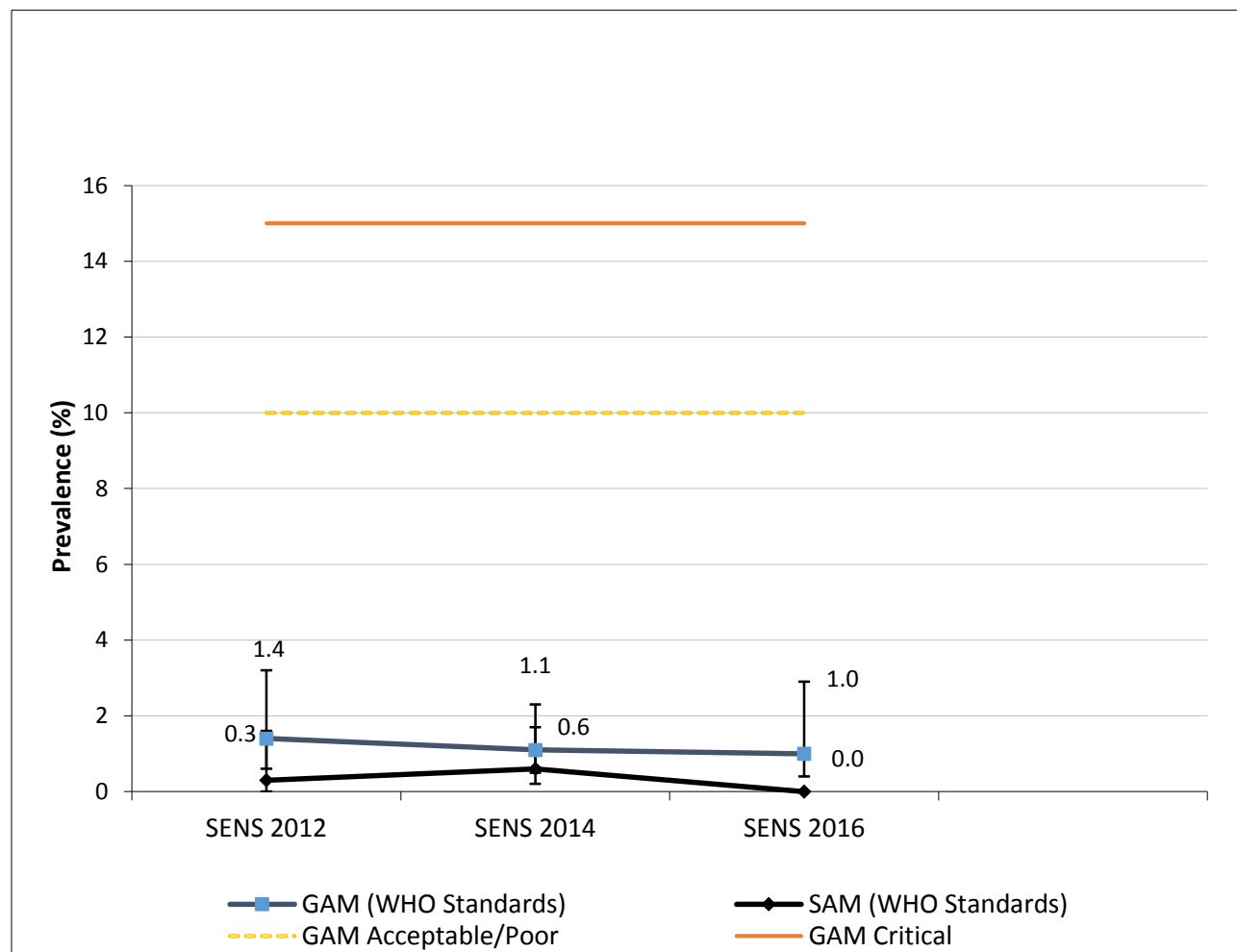


Figure 1: Trends in the prevalence of global and severe acute malnutrition in Dzaleka Camp based on WHO growth standards in children 6-59 months from 2012-2016

3.3.2.2 Acute malnutrition by sex and age of children

Table 15 present the prevalence of acute malnutrition by sex (gender), respectively. The rates appear to be higher in boys than girls in three survey areas (Dzaleka camp and its host community, Luwani camp) and higher girls than boys in Luwani host community. However, these results should be interpreted with caution due to the small sample size of children will acute malnutrition. None of the sampled children were found with oedema.

Table 15: Prevalence of acute malnutrition by sex, based on weight-for-height z-scores and/or oedema

	Dzaleka camp (n) % (95% C.I)		Dzaleka host (n) % (95% C.I)		Luwani camp* (n) %		Luwani host (n) % (95% C.I)	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
N	266	213	173	155	210	173	133	143
GAM (<-2 z-score and/or oedema)	(4) 1.5 % (0.6 - 4.0)	(1) 0.5% (0.1-3.5)	(2) 1.2%(0.3-4.6)	(1) 0.6 %(0.1-4.5)	(5) 2.4 %	(1) 0.6 %	(2) 1.5 %(0.4-6.2)	(4) 2.8% (1.0-7.5)
MAM (<-2 z-score and >= -3 z-score, no oedema)	(4) 1.5 % (0.6 - 4.0)	(1) 0.5%(0.1-3.5)	(2) 1.2%(0.3-4.6)	(1) 0.6 % (0.1-4.5)	(5) 2.4 %	(1) 0.6 %	(2) 1.5 %(0.4-6.2)	(4) 2.8 % (1.0-7.5)
SAM (<-3 z-score and/or oedema)	(0) 0.0 % (0.0 - 0.0)	(0) 0.0 % (0.0 - 0.0)	(0) 0.0 % (0.0 - 0.0)	(0) 0.0 % (0.0 - 0.0)	(0) 0.0 %	(0) 0.0 %	(0) 0.0 % (0.0 - 0.0)	(0) 0.0 % (0.0 - 0.0)

GAM=Global Acute Malnutrition, MAM=Moderate Acute Malnutrition, SAM=Severe Acute Malnutrition

* An exhaustive survey was conducted, hence no confidence intervals shown

Table 16 presents the prevalence of acute malnutrition by age group. In all the surveys, the younger age group of 6-17 months appeared to be most affected by moderate wasting corresponding to the weaning period in this age group. With the smaller number of cases that were malnourished, the results should be interpreted with caution.

Table 16: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema

		Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Dzaleka Camp									
Age (mo)	Total no.	No.	%	No.	%	No.	%	No.	%
6-17	123	0	0.0	3	2.4	120	97.6	0	0.0
18-29	109	0	0.0	0	0.0	109	100.0	0	0.0
30-41	102	0	0.0	0	0.0	102	100.0	0	0.0
42-53	105	0	0.0	1	1.0	104	99.0	0	0.0
54-59	40	0	0.0	1	2.5	39	97.5	0	0.0
Total	479	0	0.0	5	1.0	474	99.0	0	0.0
Dzaleka host community									
6-17	77	0	0.0	3	3.9	74	96.1	0	0.0
18-29	68	0	0.0	0	0.0	68	100.0	0	0.0
30-41	75	0	0.0	0	0.0	75	100.0	0	0.0
42-53	72	0	0.0	0	0.0	72	100.0	0	0.0
54-59	36	0	0.0	0	0.0	36	100.0	0	0.0
Total	328	0	0.0	3	0.9	325	99.1	0	0.0
Luwani Camp									
6-17	91	0	0.0	2	2.2	89	97.8	0	0.0
18-29	89	0	0.0	2	2.2	87	97.8	0	0.0
30-41	99	0	0.0	0	0.0	99	100.0	0	0.0

42-53	75	0	0.0	2	2.7	73	97.3	0	0.0
54-59	29	0	0.0	0	0.0	29	100.0	0	0.0
Total	383	0	0.0	6	1.6	377	98.4	0	0.0
Luwani host community									
6-17	75	0	0.0	3	4.0	72	96.0	0	0.0
18-29	65	0	0.0	2	3.1	63	96.9	0	0.0
30-41	49	0	0.0	0	0.0	49	100.0	0	0.0
42-53	59	0	0.0	0	0.0	59	100.0	0	0.0
54-59	28	0	0.0	1	3.6	27	96.4	0	0.0
Total	276	0	0.0	6	2.2	270	97.8	0	0.0

Figure 2 shows that the distribution for weight-for-height z-scores for the survey sample in each of the four surveys were generally similar to the reference population (international WHO Standard population of children aged 6-59 months).

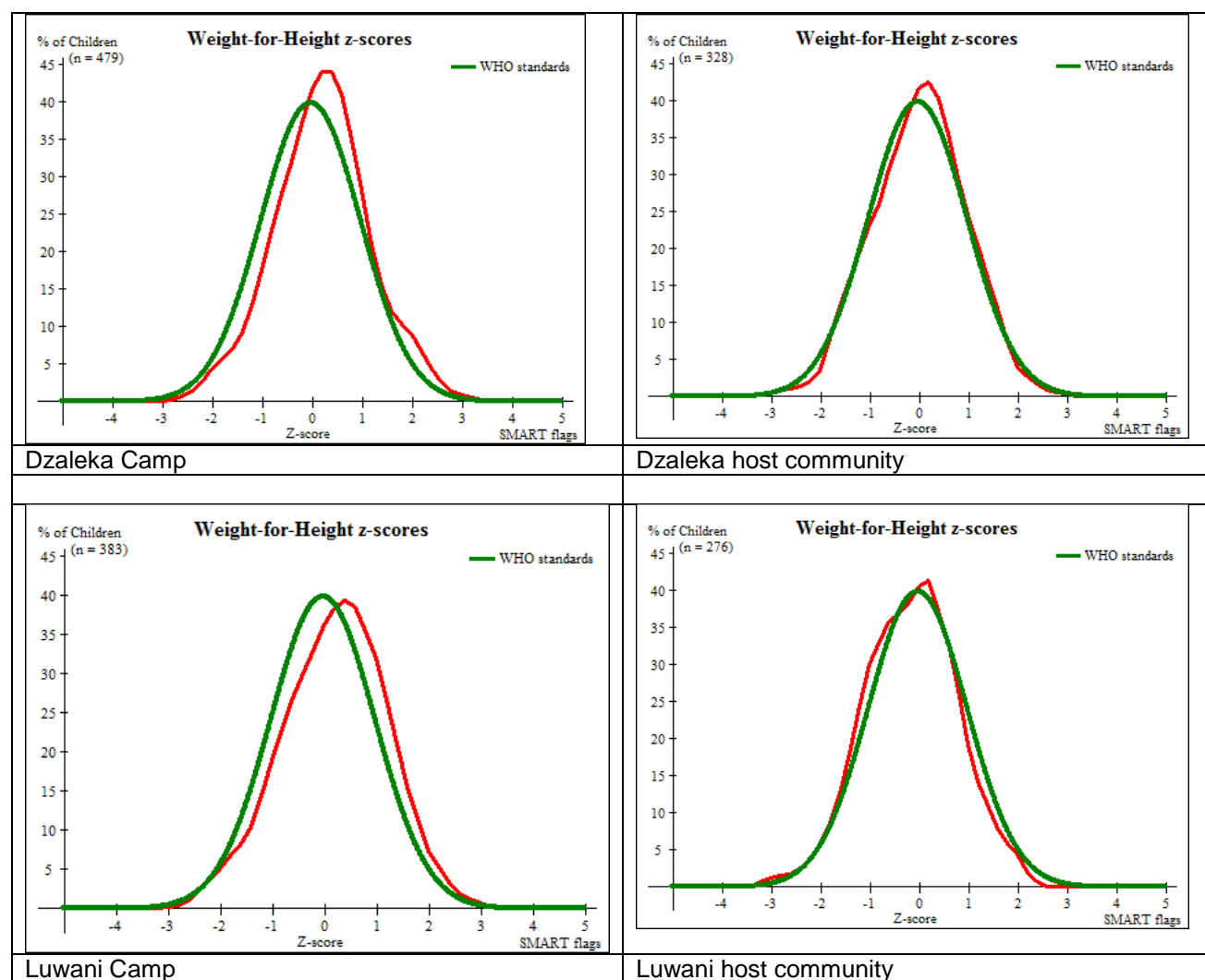


Figure 2: Distribution of weight-for-height z-scores of survey population (red) compared to reference population (green) (based on WHO Growth Standards)

3.3.3 MUAC malnutrition

Of the children screened for malnutrition based on MUAC measurements, the proportion of children classified as being malnourished were 0.8% (95% CI: 0.3 - 2.2), 1.8% (95% CI: 0.8 - 3.9), 1.8% (95% CI: 0.9 - 3.6) and 1.4% (95% CI: 0.4 - 4.8) in Dzaleka camp, Dzaleka host community, Luwani camp and Luwani host community respectively. Malnutrition rates based on MUAC were similar between boys and girls in all the surveys except Luwani host where girls were more likely to be malnourished than boys (Table 17).

Table 17: Prevalence of MUAC malnutrition in 6-59 months children by sex

(n) % (95% C.I.)	All	Boys	Girls
Dzaleka Camp	N =489	N =270	N =219
MUAC < 125 mm and/or oedema	(4) 0.8 % (0.3 - 2.2 95% C.I.)	(2) 0.7 % (0.2 - 3.1 95% C.I.)	(2) 0.9 % (0.2 - 3.7 95% C.I.)
MUAC < 125 mm and ≥ 115 mm, no oedema	(2) 0.4 % (0.1 - 1.7 95% C.I.)	(2) 0.7 % (0.2 - 3.1 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)
MUAC < 115 mm and/or oedema	(2) 0.4 % (0.1 - 1.7 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(2) 0.9 % (0.2 - 3.7 95% C.I.)
Dzaleka host	N =333	N =175	N =158
MUAC < 125 mm and/or oedema	(6) 1.8 % (0.8 - 3.9 95% C.I.)	(3) 1.7 % (0.5 - 5.3 95% C.I.)	(3) 1.9 % (0.6 - 5.6 95% C.I.)
MUAC < 125 mm and ≥ 115 mm, no oedema	(5) 1.5 % (0.6 - 3.5 95% C.I.)	(2) 1.1 % (0.3 - 4.6 95% C.I.)	(3) 1.9 % (0.6 - 5.6 95% C.I.)
MUAC < 115 mm and/or oedema	(1) 0.3 % (0.0 - 2.3 95% C.I.)	(1) 0.6 % (0.1 - 4.4 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)
Luwani Camp	N =397	N =218	N =179
MUAC < 125 mm and/or oedema	(7) 1.8 %	(4) 1.8 %	(3) 1.7 %
MUAC < 125 mm and ≥ 115 mm, no oedema	(6) 1.5 %	(3) 1.4 %	(3) 1.7 %
MUAC < 115 mm and/or oedema	(1) 0.3 %	(1) 0.5 %	(0) 0.0 %
Luwani host	N = 279	N = 134	N = 145
MUAC < 125 mm and/or oedema	(4) 1.4 % (0.4 - 4.8 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(4) 2.8 % (0.8 - 8.9 95% C.I.)
MUAC < 125 mm and ≥ 115 mm, no oedema	(3) 1.1 % (0.2 - 4.7 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(3) 2.1 % (0.5 - 8.8 95% C.I.)
MUAC < 115 mm and/or oedema	(1) 0.4 % (0.0 - 2.8 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(1) 0.7 % (0.1 - 5.3 95% C.I.)

3.3.4 Prevalence of Underweight in children 6-59 months

The prevalence of underweight (a composite indicator that may result from either the child being stunted, wasted or both) in children in all the survey areas except Dzaleka camp was found to be and above the 'acceptable level' of <10% (Table 18 and Table 6)). The prevalence of underweight were in the 'poor' category (10-19%) according to WHO severity criteria in Dzaleka host community, Luwani Camp and Luwani host community. The prevalence of 8.1% in Dzaleka Camp is within the 'acceptable' category (<10%) based on WHO criteria shown in Table 6. By sex, the prevalence of underweight tends to be higher in boys than in girls as shown in Table 18.

In Dzaleka Camp, underweight rates did not significantly change from the previous surveys of 2012 and 2014. The prevalence of underweight increased from 5.3 % (3.4 - 8.1) in 2012 to 9.7 % (7.0 - 13.3%) in 2014 but slightly dropped to 8.1 % (6.0 - 10.8) in 2016. The difference between 2014 and 2016 is however not statistically significant ($p < 0.05$).

Table 18: Prevalence of underweight based on weight-for-age z-scores by sex

(n) % (95% C.I.)	All	Boys	Girls
Dzaleka Camp	N = 483	N = 266	N = 217
Prevalence of underweight (<-2 z-score)	(39) 8.1 % (6.0 - 10.8 95% C.I.)	(24) 9.0 % (6.0 - 13.4 95% C.I.)	(15) 6.9 % (4.5 - 10.5 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(33) 6.8 % (4.9 - 9.5 95% C.I.)	(20) 7.5 % (4.8 - 11.5 95% C.I.)	(13) 6.0 % (3.7 - 9.6 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(6) 1.2 % (0.6 - 2.6 95% C.I.)	(4) 1.5 % (0.6 - 3.8 95% C.I.)	(2) 0.9 % (0.2 - 3.8 95% C.I.)
Dzaleka host	N = 328	N = 173	N = 155
Prevalence of underweight (<-2 z-score)	(44) 13.4 % (9.4 - 18.8 95% C.I.)	(27) 15.6 % (9.9 - 23.7 95% C.I.)	(17) 11.0 % (6.9 - 17.0 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(40) 12.2 % (8.5 - 17.2 95% C.I.)	(25) 14.5 % (9.2 - 22.0 95% C.I.)	(15) 9.7 % (5.8 - 15.6 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(4) 1.2 % (0.5 - 3.1 95% C.I.)	(2) 1.2 % (0.3 - 4.6 95% C.I.)	(2) 1.3 % (0.3 - 5.0 95% C.I.)
Luwani Camp	N = 387	N = 213	N = 174
Prevalence of underweight (<-2 z-score)	(51) 13.2 %	(37) 17.4 %	(14) 8.0 %
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(44) 11.4 %	(32) 15.0 %	(12) 6.9 %
Prevalence of severe underweight (<-3 z-score)	(7) 1.8 %	(5) 2.3 %	(2) 1.1 %
Luwani host	N = 278	N = 134	N = 144
Prevalence of underweight (<-2 z-score)	(44) 15.8 % (11.0 - 22.3 95% C.I.)	(23) 17.2 % (10.6 - 26.5 95% C.I.)	(21) 14.6 % (9.9 - 21.0 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(37) 13.3 % (9.0 - 19.3 95% C.I.)	(20) 14.9 % (8.4 - 25.2 95% C.I.)	(17) 11.8 % (7.6 - 17.8 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(7) 2.5 % (1.1 - 5.6 95% C.I.)	(3) 2.2 % (0.7 - 6.8 95% C.I.)	(4) 2.8 % (1.0 - 7.2 95% C.I.)

3.3.5 Prevalence of stunting in children 6-59 months

The prevalence of stunting (chronic malnutrition) due to long term poor nutritional factors in children in all the survey areas was found to be high (Table 20) and well above the 'acceptable level' of <20% based on WHO severity criteria shown in Table 6. The stunting results are in the 'serious' category (30-39%) according to WHO thresholds in three of the survey areas (Dzaleka camp, Dzaleka host community and Luwani host community) and in the 'critical' category ($\geq 40\%$) in Luwani camp. The coverage of age documentation was very high in all 4 surveys. Hence, the stunting results can be considered to be reliable and of high quality. Luwani camp had the lowest coverage of age documentation with 11% of the surveyed children having no official age documentation.

By sex, boys appeared to be more stunted than girls in all the survey areas (Table 19). By age group, stunting rates were highest in children aged 18 – 29 months in the two camps and in children aged 30-41 in the host communities (Table 20).

In Dzaleka Camp, chronic malnutrition remains high and the level is similar to the one obtained in 2014 as shown in Figure 3. The figure shows that the prevalence of stunting increased from 22.4% (95% CI: 18.3-27.1) in 2012 to 36.1% (95% CI: 30.2 - 42.5%) in 2014 but slightly dropped to 34.8% in 2016. The difference between 2014 and 2016 is however not statistically significant ($p < 0.05$).

Table 19: Prevalence of stunting based on height-for-age z-scores and by sex

(n) % (95% C.I.)	All	Boys	Girls
Dzaleka Camp	N = 463	N = 252	N = 211
Prevalence of stunting (<-2 z-score)	(161) 34.8 % (31.1 - 38.6 95% C.I.)	(94) 37.3 % (32.6 - 42.2 95% C.I.)	(67) 31.8 % (25.7 - 38.5 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(118) 25.5 % (22.1 - 29.2 95% C.I.)	(67) 26.6 % (22.3 - 31.4 95% C.I.)	(51) 24.2 % (18.6 - 30.8 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(43) 9.3 % (7.2 - 11.9 95% C.I.)	(27) 10.7 % (8.0 - 14.2 95% C.I.)	(16) 7.6 % (4.7 - 12.0 95% C.I.)
Dzaleka host	All n = 328	Boys n = 171	Girls n = 157
Prevalence of stunting (<-2 z-score)	(116) 35.4 % (29.7 - 41.5 95% C.I.)	(72) 42.1 % (35.4 - 49.1 95% C.I.)	(44) 28.0 % (21.2 - 36.1 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(90) 27.4 % (22.9 - 32.5 95% C.I.)	(56) 32.7 % (27.5 - 38.5 95% C.I.)	(34) 21.7 % (15.8 - 28.9 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(26) 7.9 % (5.2 - 11.9 95% C.I.)	(16) 9.4 % (5.6 - 15.3 95% C.I.)	(10) 6.4 % (3.3 - 12.1 95% C.I.)
Luwani Camp	All n = 371	Boys n = 205	Girls n = 166
Prevalence of stunting (<-2 z-score)	(177) 47.7 %	(110) 53.7 %	(67) 40.4 %
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(122) 32.9 %	(78) 38.0 %	(44) 26.5 %
Prevalence of severe stunting (<-3 z-score)	(55) 14.8 %	(32) 15.6 %	(23) 13.9 %
Luwani host	All n = 267	Boys n = 128	Girls n = 139
Prevalence of stunting (<-2 z-score)	(94) 35.2 % (28.0 - 43.2 95% C.I.)	(49) 38.3 % (29.8 - 47.5 95% C.I.)	(45) 32.4 % (21.9 - 44.9 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(72) 27.0 % (21.5 - 33.2 95% C.I.)	(34) 26.6 % (18.3 - 36.9 95% C.I.)	(38) 27.3 % (18.9 - 37.8 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(22) 8.2 % (4.4 - 14.9 95% C.I.)	(15) 11.7 % (6.2 - 21.0 95% C.I.)	(7) 5.0 % (1.7 - 14.2 95% C.I.)

Table 20: Prevalence of stunting by age based on height-for-age z-scores

		Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (>= -2 z score)	
Age (mo)	Total no.	No.	%	No.	%	No.	%
Dzaleka Camp							
6-17	118	8	6.8	31	26.3	79	66.9
18-29	104	18	17.3	35	33.7	51	49.0
30-41	100	10	10.0	22	22.0	68	68.0
42-53	102	4	3.9	22	21.6	76	74.5
54-59	39	3	7.7	8	20.5	28	71.8
Total	463	43	9.3	118	25.5	302	65.2
Dzaleka host							
6-17	77	6	7.8	23	29.9	48	62.3
18-29	68	9	13.2	16	23.5	43	63.2
30-41	75	7	9.3	23	30.7	45	60.0

42-53	71	3	4.2	19	26.8	49	69.0
54-59	37	1	2.7	9	24.3	27	73.0
Total	328	26	7.9	90	27.4	212	64.6
Luwani Camp							
6-17	86	16	18.6	20	23.3	50	58.1
18-29	88	11	12.5	37	42.0	40	45.5
30-41	95	13	13.7	31	32.6	51	53.7
42-53	74	11	14.9	23	31.1	40	54.1
54-59	28	4	14.3	11	39.3	13	46.4
Total	371	55	14.8	122	32.9	194	52.3
Luwani host community							
6-17	70	7	10.0	12	17.1	51	72.9
18-29	65	3	4.6	19	29.2	43	66.2
30-41	47	3	6.4	18	38.3	26	55.3
42-53	57	7	12.3	17	29.8	33	57.9
54-59	28	2	7.1	6	21.4	20	71.4
Total	267	22	8.2	72	27.0	173	64.8

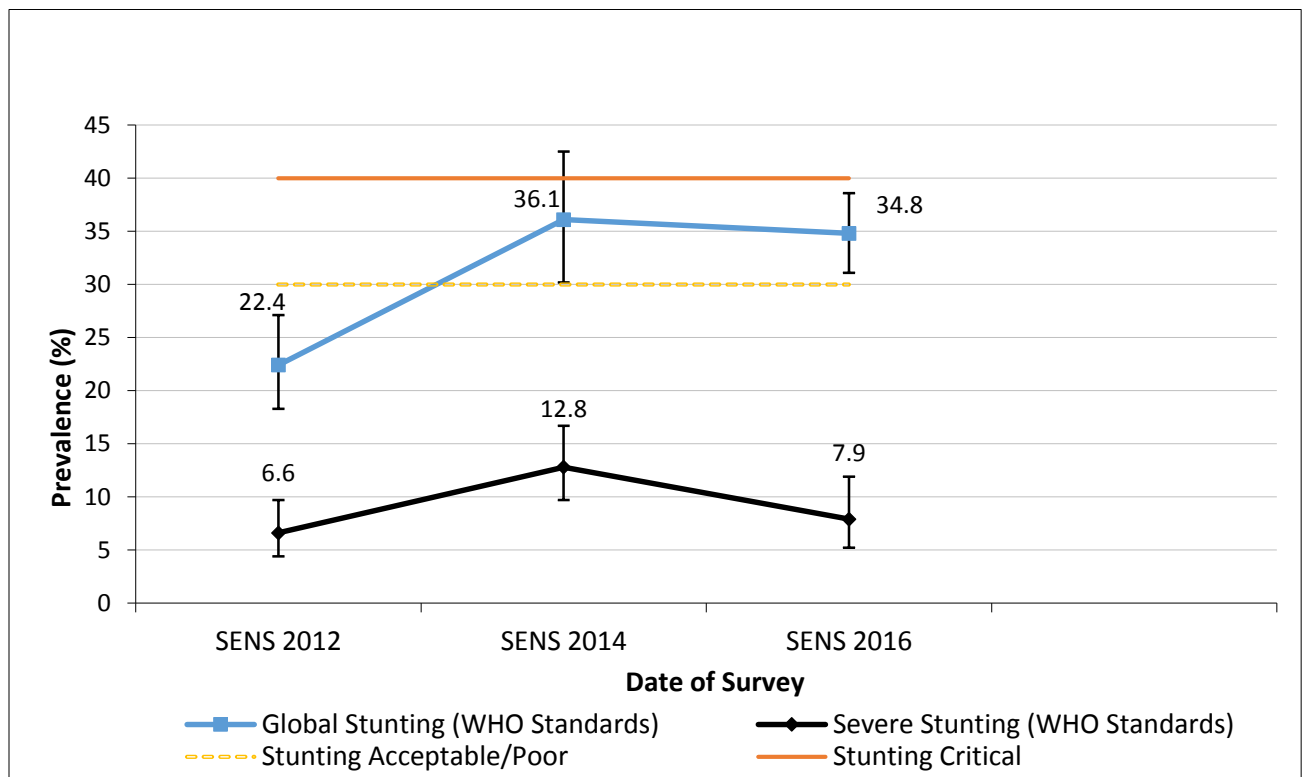


Figure 3: Trends in the prevalence of global and severe stunting in Dzaleka Camp based on WHO growth standards in children 6-59 months from 2012 - 2016.

Figure 4 shows that the distribution for height-for-age z-scores for the surveyed children in each of the four surveys shifted to the left of the reference population, suggesting a poorer stunting levels in our surveyed children than the international WHO Standard population of children aged 6-59 months.

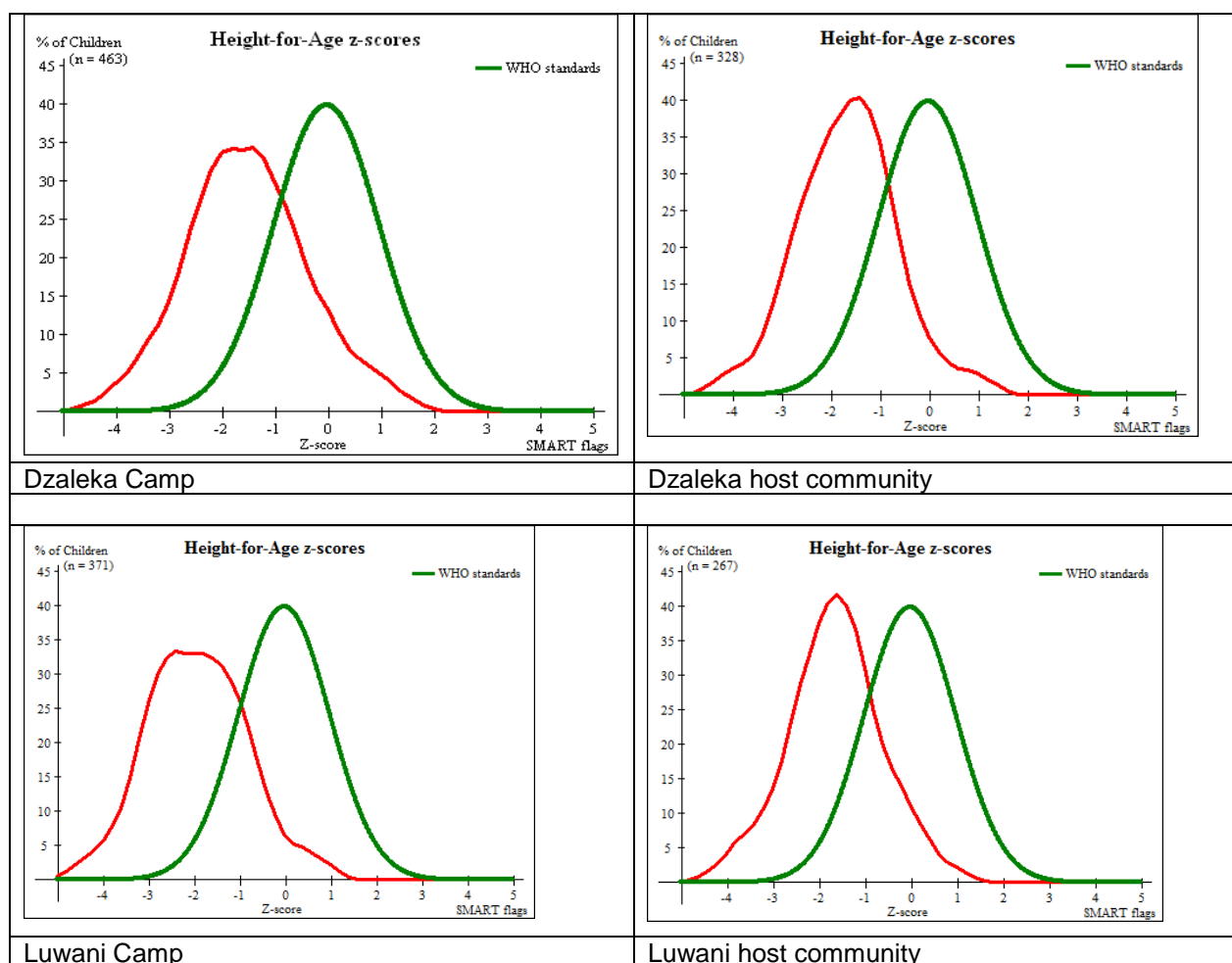


Figure 4: Distribution of height-for-age z-scores of survey population (red) compared to reference population (green)

The mean z-scores for acute malnutrition, stunting and underweight are presented in **Table 21**.

Table 21: Mean z-scores, design effects and excluded children

Indicator	n	Mean z-scores \pm SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Dzaleka Camp					
Weight-for-Height	479	0.23 \pm 0.95	1.31	6	6
Weight-for-Age	483	-0.62 \pm 0.99	1.00	2	6
Height-for-Age	463	-1.51 \pm 1.13	1.00	6	22
Dzaleka host					
Weight-for-Height	328	0.02 \pm 0.93	1.00	3	2
Weight-for-Age	328	-0.90 \pm 0.92	1.51	2	3
Height-for-Age	328	-1.66 \pm 1.00	1.23	2	3
Luwani Camp					
Weight-for-Height	383	0.20 \pm 0.98	1.00	2	12
Weight-for-Age	387	-0.95 \pm 0.98	1.00	0	10
Height-for-Age	371	-1.93 \pm 1.08	1.00	1	25
Luwani host					
Weight-for-Height	276	-0.15 \pm 0.92	1.26	0	3
Weight-for-Age	278	-1.00 \pm 0.98	1.57	0	1
Height-for-Age	267	-1.64 \pm 1.01	1.63	0	12

* contains for WHZ and WAZ the children with edema.

3.3.6 Programme coverage

3.3.6.1 Measles vaccination and Vitamin A supplementation coverage

The coverage results of Vitamin A supplementation in the last 6 months and measles vaccination based on both card documentation and mother's recall were generally high (around 90%) across all the survey areas except at Luwani camp (around 75-80%). However, coverage based on card documentation alone was low in all the survey areas as most of the vitamin A supplementation and measles vaccination were received during national campaigns which are rarely documented in the child's card. The two host communities met the recommended target of 95% for measles vaccination based on card and mother's recall (Table 22). The measles vaccination coverage rates in Dzaleka camp are slightly higher than the 88.5% (85.7-90.7%) obtained in 2014 though not significantly different ($p>0.05$) (see Figure 5).

The results for both vitamin A supplementation and measles vaccination were lower in Luwani camp as compared to the other survey areas probably because most of the asylum seekers had joined the camp in in waves since March 2016 and at the time of the survey in November 2016, over 40% of them were still in the reception area at the time of the survey.

Table 22: Measles vaccination and Vitamin A supplementation coverage

(n/N) % (95% C.I)	Dzaleka Camp	Dzaleka host	Luwani Camp	Luwani host
Measles vaccination with card (9-59 months)	(151/456) 33.1% (25.4- 40.8)	(202/315) 64.1% (55.8- 72.5)	(55/381) 14.4%	(150/259) 57.9% (45.7- 70.1)
Measles vaccination with card or recall (9-59 months)	(422/456) 92.5% (89.7- 95.4)	(300/315) 95.2% (92.5-98.0)	(302/381) 79.3%	(248/259) 95.8% (92.8- 98.7)
Vitamin A supplementation within past 6 months with card (6-59 months)	(121/491) 24.6% (16.0- 33.3)	(146/333) 43.8% (33.5- 54.2)	(40/397) 10.1%	(93/279) 33.3% (20.5- 46.2)
Vitamin A supplementation within past 6 months with card or recall (6-59 months)	(429/491) 87.4% (84.1- 90.7)	(304/333) 91.3% (88.1- 94.5)	(298/397) 75.1%	(235/279) 84.2% (75.6- 92.9)

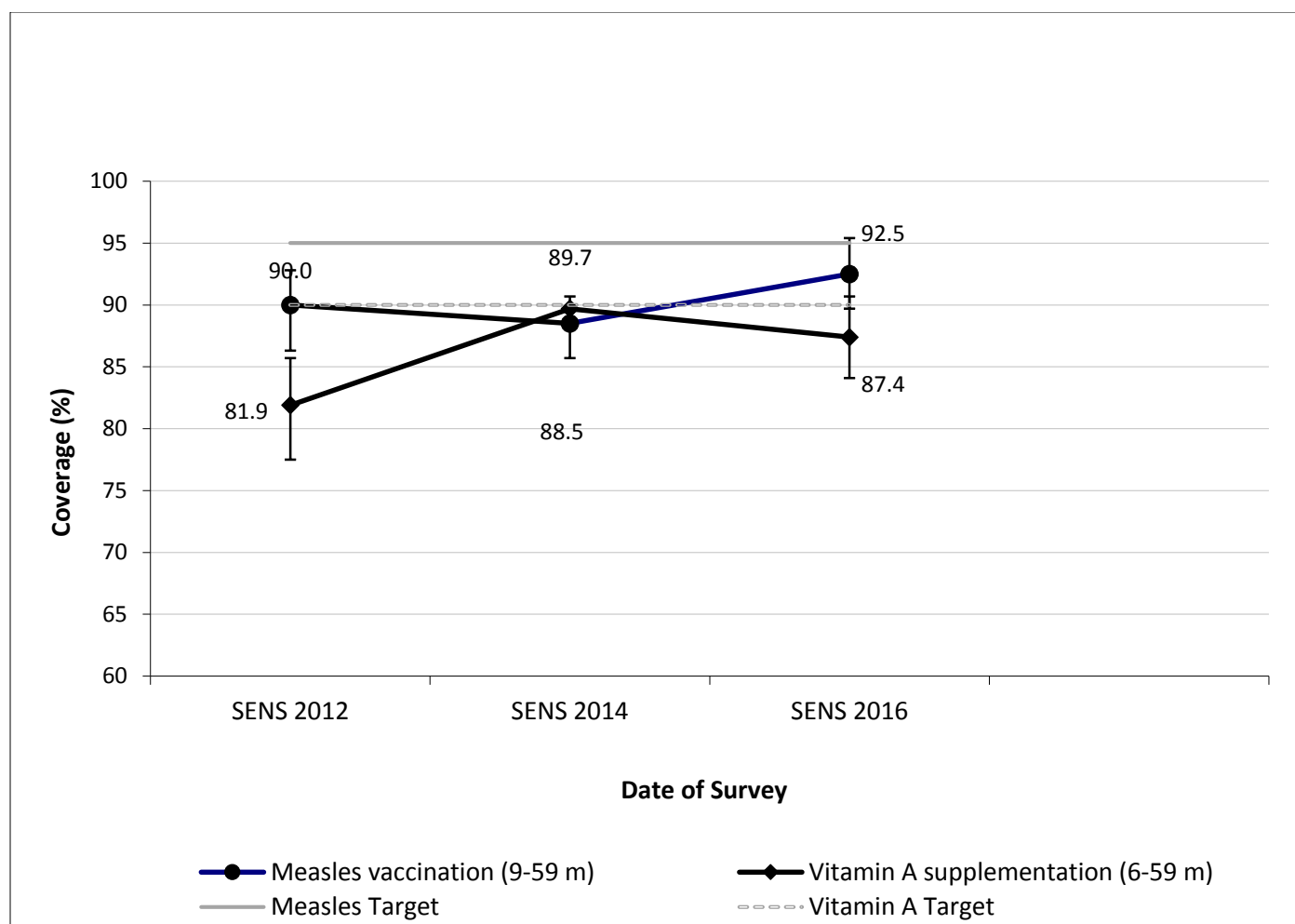


Figure 5: Trend in Coverage of Measles Vaccination and Vitamin A Supplementation in last 6 Months based on card or recall, Dzaleka Camp

3.3.7 Diarrhoea results

Table 23 shows the percentage of children 6-59 months with diarrheal episodes two weeks prior to the survey. The results show that almost one third of the surveyed children experienced diarrheal episodes. It was highest in Luwani Camp (35%) and lowest at Dzaleka Camp (27.2%). In Dzaleka camp, results were higher than those found in the 2014 survey (21.9% (18.9 - 25.1%) though not significantly different ($p>0.05$)).

Table 23: Period prevalence of diarrhea

(n/N) % (95% C.I.)	Dzaleka Camp	Dzaleka host	Luwani Camp	Luwani host
Diarrhoea in last 2 weeks	(133/489) 27.2% (22.9 - 31.5)	(100/333) 30.0% (24.4- 35.6)	(138/394) 35.0%	(85/277) 30.7% (25.1- 36.3)

3.3.8 Anaemia in children 6-59 months

Table 24 presents prevalence of anaemia in children 6-59 months. The prevalence of anaemia among children 6-59 months is above the UNHCR target of <20% in all the 4 surveys, however very large differences were found between Dzaleka camp and its host community, and Luwani camp and its host community. The prevalence of anaemia was found to be very high and above the 40% mark for defining a problem of high public health significance according to WHO criteria shown in Table 7 in both Luwani camp (48.2%) and its host communities (50.9%). The prevalence of anaemia in Dzaleka camp (22.7%) and its host community (26.9%) is much lower and nearly half as compared to Luwani camp and its host community, and in the 'medium' category for classifying a problem of public health significance.

The prevalence of anaemia in Dzaleka camp significantly dropped from 33.4% (95% CI 28.6-38.7%) obtained in 2014 to 22.7% (17.9-27.6%) obtained this year ($p<0.05$) (Figure 6).

Consideration of the age group factors in the 4 surveys, showed that the prevalence of anaemia was the highest in the 6-23 months age group compared to those aged 24 months and above. Anaemia results are above 39% in all surveys in children aged 6-23 months which is alarming and is in the high severity category).

Table 24: Prevalence of anemia and hemoglobin concentration in children 6-59 months of age

	6-59 months n % (95% CI)	6-23 months n % (95% CI)	24-59 months n % (95% CI)
Dzaleka camp	N=488	N=183	N=305
Total Anaemia (Hb<11.0 g/dL)	(111) 22.7% (17.9- 27.6)	(72) 39.3% (31.0- 47.7)	(39) 12.8% (8.8- 16.8)
Mild (Hb 10.0-10.9 g/dL)	(80) 16.4% (12.7- 20.1)	(48) 26.2% (19.5- 32.9)	(32) 10.5% (6.7- 14.3)
Moderate (7.0-9.9 g/dL)	(28) 5.7% (3.2- 8.3)	(22) 12.0% (6.5- 17.5)	2.0% (0.3- 3.7)
Severe (<7.0 g/dL)	(3) 0.6% (0.0- 1.3)	(2) 1.1% (-0.4- 2.6)	(1) 0.3% (0.0- 1.0)
Moderate & Severe (Hb<10.0 g/dL)	(31) 6.4% (3.7 -9.0)	(24) 13.1% (7.109 - 19.121)	(7) 2.3% (0.5 - 4.1)
Mean Hb (g/dL) (95% CI) [range]	11.8 (11.6- 11.9) [5.7-14.9]	11.2 (11.0- 11.5) [5.7-14.1]	12.1 (12.0-12.2) [6.9-14.9]
Dzaleka host	N=331	N=111	N=220
Total Anaemia (Hb<11.0 g/dL)	(89) 26.9% (22.0- 31.8)	(53) 47.7% (38.4- 57.1)	(36) 16.4% (1.0- 22.0)
Mild (Hb 10.0-10.9 g/dL)	(67) 20.2% (15.7- 24.7)	(38) 34.2% (26.5- 42.0)	(29) 13.2% (8.2- 18.2)
Moderate (7.0-9.9 g/dL)	(21) 6.3% (3.9- 8.8)	(14) 12.6% (6.3- 18.9)	3.2% (1.1- 5.3)
Severe (<7.0 g/dL)	(1) 0.3% (0.0- 0.9)	(1) 0.9% (0.0- 2.7)	(0) 0.0%
Moderate & Severe (Hb<10.0 g/dL)	(22) 6.6% (4.1 -9.2)	(15) 13.5% (6.9 - 20.1)	(7) 3.2% (1.1 - 5.3)
Mean Hb (g/dL) (95% CI) [range]	11.6 (11.5- 11.8) [6.6-14.9]	11.0 (10.8-11.3) [6.6-13.6]	11.9 (11.8-12.1) [7.8-14.9]
Luwani Camp	N=394	N=134	N=260

Total Anaemia (Hb<11.0 g/dL)	(190) 48.2%	(87) 64.9%	(103) 39.6%
Mild (Hb 10.0-10.9 g/dL)	(117) 29.7%	(47) 35.1%	(70) 26.9%
Moderate (7.0-9.9 g/dL)	(69) 17.5%	(38) 28.4%	(31) 11.9%
Severe (<7.0 g/dL)	(4) 1.0%	(2) 1.5%	(2) 0.8%
Moderate & Severe (Hb<10.0 g/dL)	(73) 18.5%	(40) 29.92%	(33) 12.7%
Mean Hb (g/dL) (95% CI) [range]	10.9 [5.6-14.6]	10.4 [6.6-13.3]	11.1 [5.6-14.6]
Luwani host	n=279	n=113	n=166
Total Anaemia (Hb<11.0 g/dL)	(142) 50.9% (43.5- 58.3)	(78) 69.0% (59.8- 78.2)	(64) 38.6% (29.8- 47.3)
Mild (Hb 10.0-10.9 g/dL)	(85) 30.5% (24.9- 36.1)	(45) 39.8% (31.9- 47.8)	(40) 24.1% (17.3- 30.9)
Moderate (7.0-9.9 g/dL)	(56) 20.1% (14.0- 26.1)	(32) 28.3% (19.3- 37.4)	(24) 14.5% (8.1- 20.8)
Severe (<7.0 g/dL)	(1) 0.4% (0.0-1.1)	(1) 0.9% (0.0- 2.7)	(0) 0.0%
Moderate & Severe (Hb<10.0 g/dL)	(57) 20.4% (14.3 -26.6)	(33) 29.2% (20.1 - 38.4)	(24) 14.5% (8.1 - 20.8)
Mean Hb (g/dL) (95% CI) [range]	10.9 (10.7- 11.1) [6.5-13.9]	10.3 (10.1-10.6) [6.5-12.6]	11.2 (11.0-11.4) [8.1-13.9]

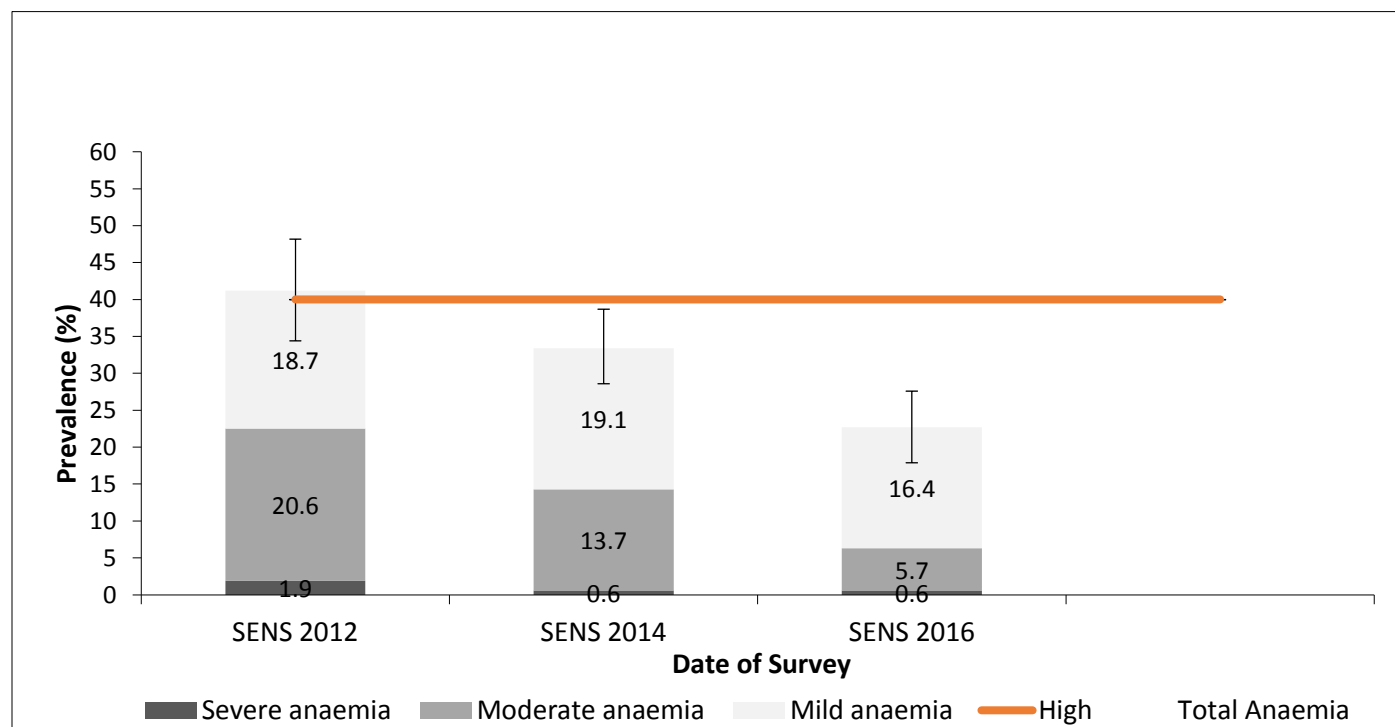


FIGURE 6: Anemia prevalence in Dzaleka camp in 2012, 2014, and 2016 in children 6-59 months at Dzaleka Camp

3.4 CHILDREN 0-23 MONTHS

Table 25 summarises the results of the IYCF indicators for the four surveys. The proportion of children who were timely initiated on breast feeding and exclusively breastfed (below 6 months) averaged around 70-75% in all survey areas with a low of 54.2% to a high of 81.5% in Luwani community.

Continued breastfeeding at 1 year was high in all areas (>89%) which shows wide breastfeeding practice during the first year while continued breastfeeding at 2 years ranged from a low of 36.8% to a high of 85.7% which shows varying practices in terms of breastfeeding into the second year.

Introduction of solid, semi-solid or soft foods at 6 months and consumption of iron-rich or iron-fortified foods in children 0-23 months were generally low in all areas (range from 31-67%). The proportion of children 0-23 months bottle fed was low in all the surveys (ranged from 1-4%) suggesting that few children were exposed to the risk of illness and infection that can be brought by bottle feeding.

Table 25: Prevalence of infant and young child feeding practices indicators

(n/N) % (95% C.I)	Dzaleka Camp	Dzaleka host	Luwani Camp	Luwani host
Timely initiation of breastfeeding (0-23 months)	(168/234) 71.8% (63.1- 80.6)	(120/158) 76.0% (65.4- 86.5)	(139/176) 79.0%	(110/135) 81.5% (71.9- 91.1)
Exclusive breastfeeding under 6 months	(36/53) 67.9% (55.6- 80.3)	(34/49) 69.4% (52.8- 85.9)	(31/44) 70.5%	(13/24) 54.2% (34.0- 74.4)
Continued breastfeeding at 1 year (12-15 months)	(33/37) 89.2% (72.4-106.0)	(26/27) 96.3% (88.285-104.307)	(37/39) 94.9%	(26/27) 96.3% (88.3-104.3)
Continued breastfeeding at 2 years (20-23 months)	(14/38) 36.8% (21.9 -51.8)	(18/21) 85.7% (70.3 -101.2)	(21/30) 70.0%	(14/27) 51.9% (32.8-70.9)
Introduction of solid, semi-solid or soft foods (6-8 months)	(18/35) 51.4% (31.4- 71.4)	(12/18) 66.7% (46.1- 87.2)	(5/16) 31.3%	(7/20) 35.0% (12.6- 57.4)
Consumption of iron-rich or iron-fortified foods (6-23 months)	(105/185) 56.8% (46.4- 67.1)	(51/111) 45.9% (33.9- 58.0)	(71/134) 53.0%	(41/113) 36.3% (25.6- 47.0)
Bottle feeding (0-23 months)	(9/239) 3.8% (0.5- 7.1)	(4/160) 2.5% (0.1- 4.9)	(2/179) 1.1%	(5/135) 3.7% (0.0- 8.5)

Prevalence of intake

Table 26 summarises the results of the IYCF intake indicators for the four surveys and they were low across the survey areas.

Table 26: Prevalence of intake in children aged 0-23 months

(n/N) % (95% C.I)	Dzaleka Camp	Dzaleka host	Luwani Camp	Luwani host
Proportion of children aged 0-23 months who receive infant formula (fortified or non-fortified)	(9/239) 3.8% (0.8- 6.8)	(0/160) 0.0%	(2/178) 1.1%	(1/137) 0.7% (0.0- 2.2)

3.5 WOMEN 15-49 YEARS

Table 27 shows the proportion of sampled women who were pregnant or not, and the mean age. All non-pregnant women were assessed for anaemia.

Table 27: Pregnancy status and age

Physiological status	Dzaleka Camp	Dzaleka host	Luwani Camp	Luwani host
N	263	383	184	193
Non-pregnant	19 (7.2%)	25 (6.5%)	12 (6.5%)	20 (10.4%)
Pregnant	243 (92.4%)	357 (93.2%)	172 (93.5%)	172 (89.1%)
Don't know	1 (0.4)	1 (0.3%)	0	1 (0.5%)
Mean age (range)	26.9 (15-48)	28.0 (15-49)	28.6 (15-48)	28.6 (15-49)

3.5.1 Anemia in non-pregnant women (15-49 years)

The prevalence of anaemia among non-pregnant women aged 15-49 years is above the UNHCR target of <20% in 3 of the 4 surveys (Dzaleka Camp, Luwani Camp and Luwani host community) as shown in Table 28. There were very large differences in anaemia prevalence rates between Dzaleka camp and its host community, and Luwani camp and its host community as observed in children 6-59 months. The prevalence of anaemia was found to be very high and above the 40% mark for defining a problem of high public health significance according to WHO in both Luwani camp (44.4%) and its host communities (46.7%). The prevalence of anaemia in Dzaleka camp (21.9%) and its host community (18.5%) is much lower and nearly half as compared to Luwani camp and its host community. The anaemia prevalence in Dzaleka Camp is in the 'medium' category of '20-39' and in Dzaleka host community is in the 'poor' category of '<19' for classifying a problem of public health significance as per WHO severity criteria presented in Table 7. In all the surveys, most of the women were either mild or moderately anaemic.

The prevalence of anaemia in Dzaleka camp significantly dropped from 33.4% (95% CI 28.6-38.7%) obtained in 2014 to 22.7% (17.9-27.6%) obtained this year ($p<0.05$) (Figure 7).

Table 28: Prevalence of anemia and haemoglobin concentration in non-pregnant women of reproductive age (15-49 years)

(n) % (95% C.I)	Dzaleka Camp	Dzaleka host	Luwani Camp	Luwani host
N	242	357	169	169
Total Anaemia (Hb <12 g/dl)	(53) 21.9% (15.9- 27.9)	(66) 18.5% (13.5- 23.4)	(75) 44.4%	(79) 46.7% (38.3- 55.2)
Mild (Hb 11-11.9)	(27) 11.2% (7.0- 15.4)	(32) 9.0% (5.8- 12.1)	(46) 27.2%	(34) 20.1% (13.1- 27.1)
Moderate (Hb 8-10.9)	(23) 9.5% (4.4- 14.6)	(31) 8.7% (6.0- 11.4)	(29) 17.2%	(37) 21.9% (13.6- 30.2)
Severe (Hb <8)	(3) 1.2% (0.0- 2.6)	(3) 0.8% (0.0- 2.5)	(0) 0.0%	(8) 4.7% (1.4- 8.1)
Mean Hb, g/dL (95% CI) [range]	13.0 (12.7-13.3) [6.8-16.9]	12.9 (12.7 - 13.1) [5.6-16.6]	12.1 [8.3-14.7]	11.8 (11.5- 12.1) [5.9-16.0]

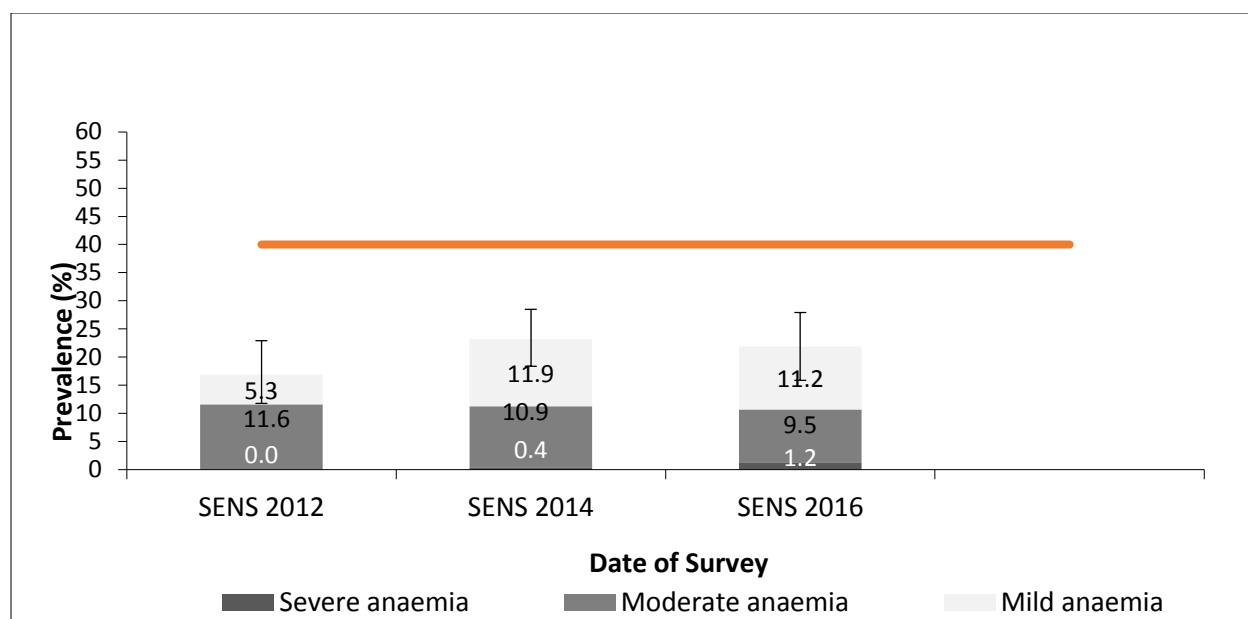


FIGURE 7: Anemia prevalence in Dzaleka camp in 2012, 2014, and 2016 in non-pregnant women 15-49 years

3.5.2 Programme coverage for pregnant women

Pregnant women enrolment in ANC was found to be between 40-65% in all survey areas (Table 28). Coverage of iron-folate pills varied between survey areas and ranged from a lowest of 15.8% in Dzaleka camp to a high of 66.7% in Luwani camp. The coverage for iron-folate pills in Dzaleka camp significantly dropped from 60.3% (95% CI 47.7 - 72.0) obtained in 2014 ($p < 0.05$), suggesting enhanced attention to address the iron-folate coverage at the camp.

Table 29: ANC enrolment and iron-folic acid pills coverage among pregnant women (15-49 years)

(n) % (95% C.I)	Dzaleka Camp	Dzaleka host	Luwani Camp	Luwani host
N	19	25	12	20
Currently enrolled in ANC programme	(8) 42.1% (16.9-67.3)	(14) 56.0% (34.7- 77.3)	(8) 66.7%	(10) 50.0% (27.8- 72.2)
Currently receiving iron-folic acid pills	(3) 15.8% (-1.2-32.8)	(11) 44.0% (22.7-65.3)	(8) 66.7%	(8) 40.0% (18.0- 62.0)

3.6 FOOD SECURITY

3.6.1 General Food Distribution Ration

Coverage of ration cards for all households interviewed in the two camps was high and ranged from 84.5% in Dzaleka camp to 99.6% in Luwani camp. The average duration of the food ration (out of the theoretical duration of 30 days) ranged from 18.6 days in Dzaleka camp to 23.2 days in Luwani camp (Table 30). The proportion of households that reported that their food ration lasted for the entire duration of 30 days was low in the two camps (ranged from 9.3% at Dzaleka camp to 25.1% at Luwani camp). About 12.4% of all the households in Dzaleka Camp and 46.8% in Luwani Camp reported that the general food ration received in the previous distribution cycle lasted more than the 23 days of the cycle (Table 30). These results show that the ration does not last long enough for the recipient households.

Table 30: Ration card coverage and duration food ration lasts

(n/N) % (95% C.I.)	Dzaleka Camp	Luwani Camp
Proportion of households with a ration card	(207/245) 84.5% (79.5- 89.5)	(223/224) 99.6%
Average number of days general food ration lasts out of 30 days (mean [95% CI] or SD)	18.6 (17.5-19.7)	23.2±5.4
Proportion of households reporting that the food ration lasts the entire duration of the cycle (>=30 days)	(18/194) 9.3% (3.8- 14.7)	(51/203) 25.1%
Proportion of households reporting that the food ration lasted: (n) % (95% C.I.)	N=194	N=203
≤75% of the cycle 30 days (≤23 days)	(170) 87.6% (82.0- 93.2)	(108) 53.2%
>75% of the cycle 30 days (>23 days)	(24) 12.4% (6.8 - 18.0)	(95) 46.8%

3.6.2 Negative coping strategies results

Table 31 shows the coping strategies used by households. The most common negative coping strategy used by household members was to reduce the quantity and/or frequency of meals and snacks eaten per day followed by borrowing cash, and food or other items with or without interest. Selling of assets that would not have normally been sold was more common at Dzaleka Camp (51.8%) than the other sites (ranged: 23.2-34.9%). Begging is usually asked as a negative coping strategy within the SENS survey questionnaire. Results for begging were found to be very high and in three of the four sites were above 50% which may not reflect the reality on the ground and therefore we excluded those results from the present report because it was felt that the question might not have been well understood by the respondents or that the respondents did not give a true response. Follow-up work should be done on this issue.

Table 31: Coping strategies used by the surveyed population over the past month

Proportion of households reporting using the following coping strategies over the past month: (n) % (95% C.I.)	Dzaleka Camp N=245	Dzaleka host N=355	Luwani Camp N=224	Luwani host N=237
Borrowed cash, food or other items with or without interest	(135) 55.1% (47.6 - 62.6)	(164) 46.2% (39.7- 52.7)	(97) 43.3%	(124/236) 52.5% (45.7- 59.4)
Sold any assets that would not have normally sold (furniture, seed stocks, tools, other NFI, livestock etc.)	(127) 51.8% (45.0- 58.7)	(124) 34.9% (29.4- 40.4)	(52) 23.2%	(75) 31.6% (25.0- 38.3)
Requested increased remittances or gifts as compared to normal	(38) 15.5% (10.7- 20.3)	(95) 26.8% (22.5- 31.1)	(23/223) 10.3%	(48) 20.3% (13.4- 27.1)
Reduced the quantity and/or frequency of meals and snacks	(190) 77.6% (70.4-84.7)	(216) 60.8% (55.3- 66.4)	(137) 61.2%	(192) 81.0% (75.5- 86.6)
Engaged in potentially risky or harmful activities	(8) 3.3% (0.9- 5.6)	(9) 2.5% (0.8- 4.3)	(5) 2.2%	(5) 2.1% (0.0- 4.3)
Proportion of households reporting using none of the negative coping strategies over the past month	(15) 6.1% (2.6 -9.6)	(43) 12.1% (8.6 -15.7)	(54/223) 24.2%	(16/236) 6.8% (3.6-9.9)

3.6.3 Household dietary diversity results

Household dietary diversity is a useful proxy for dietary intake and household food access. It is a measure of the quality of diet consumed and reflects the number of different food groups rather than individual food items

consumed at the household. The mean household dietary diversity score (HDDS) was low across all the survey areas and was around 4.5 (out of a maximum of 12), suggesting that the majority of the households had poor dietary diversity (Table 32). Primarily the diets comprised of cereals, vegetables, fruits and pulses and consumption of foods with oils or fats was higher in the camp-based surveys than in the community-based surveys (Table 33). In Dzaleka camp, there was no improvement in the average HDDS between 2014 and 2016 (4.3 vs 4.5, respectively).

The proportion of households not consuming any vegetables, fruits, meat, eggs, fish, and milk/milk products in the previous 24 hours was fairly low though the proportion in Luwani Camp was high (26.8%) compared to the other survey areas. While the proportion of households consuming either a plant or animal source of vitamin A in the previous 24 hours was generally high in all surveys areas (range from 63.4%-84.4%). However, the proportion of households consuming organ meat/flesh meat, or fish (food sources of haem iron) in the previous 24 hours was low across the survey areas ranging from 21.6% to 29.9% (Table 32).

Table 32: Household dietary diversity

(n) % (95% C.I)	Dzaleka Camp N=245	Dzaleka host n=355	Luwani Camp n=224	Luwani host n=237
Average HDDS (mean (95%CI or \pm SD)	4.5 (4.2-4.8)	4.6 (4.3-4.9)	4.6	4.540 (4.2-4.9)
Proportion of households not consuming any vegetables, fruits, meats, eggs, fish/seafood and milk/milk products	(38) 15.5% (10.4- 20.7)	(18) 5.1% (1.6- 8.5)	(60) 26.8%	(22) 9.3% (5.6- 13.0)
Proportion of households consuming either a plant or animal source of vitamin A	(157) 64.1% (57.2- 71.0)	(288) 81.1% (75.8- 86.4)	(142) 63.4%	(200) 84.4% (78.6- 90.2)
Proportion of households consuming organ meat/flesh meat, or fish	(53) 21.6% (15.5- 27.7)	(106) 29.9% (23.9- 35.8)	(52) 23.2%	(67) 28.3% (20.9- 35.6)

Table 33: Proportion of households consuming different food groups within last 24

Proportion of households reporting consuming in the past 24 hours: n (%)	Dzaleka Camp n=245	Dzaleka host n=355	Luwani Camp n=224	Luwani host n=237
Cereals	235 (95.9%)	350 (98.6%)	221 (98.7%)	230 (97.1%)
Vegetables (vitamin A rich, green leafy and other vegetables)	197 (80.4%)	318 (89.6%)	129 (57.6%)	185 (78.1%)
Oils and fats	188 (76.7%)	133 (37.5%)	203 (90.6%)	106 (44.7%)
Spices, condiments and beverages	190 (77.6%)	249 (70.1%)	194 (86.6%)	198 (83.5%)
Fruits (vitamin A rich and other fruits)	66 (26.9%)	166 (46.8%)	93 (41.5%)	146 (61.6%)
Meat (organ and flesh meat)	6 (2.5%)	55 (15.5%)	8 (3.6%)	25 (10.6)
White root and tubers	30 (12.2%)	54 (15.2%)	10 (4.5%)	12 (5.1%)
Eggs	9 (3.7%)	30 (8.5%)	7 (3.1%)	17 (7.2%)
Fish	49 (20.0)	64 (18.0%)	48 (21.4%)	46 (19.4%)
Pulse	96 (39.2%)	138 (38.9%)	105 (46.9%)	80 (33.8%)
Milk	5 (2.0%)	19 (5.4%)	0	12 (5.1%)
Sweets, sweetened soda, or juice drinks and sugary foods	28 (11.4%)	66 (18.6%)	7 (3.1%)	19 (8.0%)

3.7 WATER, SANITATION AND HYGIENE

3.7.1 Water quality and storage

The proportion of households using an improved drinking water source was high in all the surveys, ranging from 90-100%. However, the proportion of households safely storing the water was low and ranged from a lowest of 15.8% in Dzaleka host community to a highest of 59.6% in Luwani camp (Table 34).

The proportion of households being satisfied with the water sources were higher in Luwani camp (89.3%) than in Dzaleka camp (52.4%) as shown in Table 34. For those not satisfied with the water sources in Dzaleka camp, the main reasons cited were long waiting queues at water supply points (64.5%) and bad water quality (20.3%). At Luwani Camp, the reasons cited were also long waiting queues (62.5%) and bad taste (17.5%).

Table 34: Water quality, safe water storage and satisfaction with water source

(n) % (95% C.I)	Dzaleka Camp	Dzaleka host	Luwani Camp	Luwani host
N	501	669	450	456
Proportion of households using an improved drinking water source	(498) 99.4% (98.5- 100.3)	(610) 91.2% (83.8- 98.5)	(450) 100%	(430) 94.3% (90.2- 98.4)
Proportion of households that use a covered or narrow necked container for storing their drinking water	(239) 47.7% (39.0- 56.4)	(106) 15.8% (11.9- 19.8)	(268) 59.6%	(149) 32.7% (24.8- 40.5)
Proportion of households that say they are satisfied with drinking water supply	(262) 52.4% (45.8 - 59.0)	-	(402) 89.3%	-

3.7.2 Water quantity

The average daily water usage was above the target of 20 litres per person per day (lpppd) in the two camps. Nevertheless, only about half of the households in both were found to use enough water (≥ 20 lpppd). A large proportion of households in both camps (around 30%) were found to use less than 15 lpppd which might point out to a water supply / quantity issue (Table 35).

Table 35: Water Quantity: Amount of liters of water used per person per day

(n) % (95% C.I)	Dzaleka Camp N=501	Luwani Camp N=450
Proportion of households that use:		
≥ 20 lpppd	(251) 50.1% (43.7- 56.5)	(254) 56.4%
15 - <20 lpppd	(81) 16.2% (12.0- 20.3)	(69) 15.3%
<15 lpppd	(169) 33.7% (27.9- 39.5)	(127) 28.2%
Average water usage in lpppd	23.5 (21.1- 25.8)	23.9548

3.7.3 Safe excreta disposal

The proportion of households using an improved excreta disposal facility (improved toilet facility, 1 household) was low in all the survey areas (ranged from a lowest of 10.8% in Dzaleka host community to a highest of 36.9% in Dzaleka camp) as shown in Table 36. The usage of an improved excreta disposal facility in Dzaleka camp did

not greatly improve from the 34.1% (95% CI: 30.2-38.3%) result found in 2014 ($p>0.05$). Safe disposal of children under 3 years faeces was practiced by the majority of households (>80%) in all 4 survey areas.

Table 36: Safe excreta disposal

(n) % (95% C.I)	Dzaleka Camp	Dzaleka host	Luwani Camp	Luwani host
Proportion of households that use:	n=499	n=669	n=434	n=453
An improved excreta disposal facility (improved toilet facility, 1 household)	(184) 36.9% (31.3- 42.4)	(72) 10.8% (6.8- 14.7)	(133) 30.7%	(51) 11.3% (6.6-15.9)
A shared family toilet (improved toilet facility, 2 households)	(61) 12.2% (8.2- 16.3)	(20) 3.0% (0.8- 5.2)	(17) 3.9%	(13) 2.9% (0.5-5.2)
A communal toilet (improved toilet facility, 3 households or more)	(42) 8.4% (5.7- 11.1)	(5) 0.7% (0.1- 1.4)	(78) 18.0%	(7) 1.5% (0.3-2.8)
An unimproved toilet (unimproved toilet facility or public toilet)	(212) 42.5% (34.9- 50.1)	(572) 85.5% (80.4- 90.6)	(206) 47.5%	(382) 84.3% (78.1-90.6)
Proportion of households with children under 3 years of age that dispose of faeces safely	(254/269) 94.4% (91.6- 97.3)	(194/236) 82.2% (76.2- 88.2)	(238/248) 96.0%	(145/175) 82.9% (73.6- 92.2)

3.8 MOSQUITO NET COVERAGE

3.8.1 Mosquito net ownership

Ownership of mosquito nets was generally low across the survey areas (range from 32-48%) except in Luwani camp with over 80% of the households owning at least one net of any type. Similarly, ownership of long lasting insecticide treated mosquito nets (LLIN), showed that all areas except for Luwani camp were far below the target of 80% for owning at least one LLIN and the target of 2 persons per LLIN. Luwani camp met the target of 80% for owning at least one LLIN and was close to the target of 2 persons of LLIN (2.6) as shown in Table 37. According to program data, all households at Luwani were given LLINs on arrival and hence all households were supposed to have the LLINs. The low coverage at Luwani could as a result of some households selling the nets.

Table 37: Household mosquito net ownership

(n/N) % (95% C.I)	Dzaleka Camp	Dzaleka host	Luwani Camp	Luwani host
Proportion of total households owning at least one mosquito net of any type	(80/249) 32.1% (24.5- 39.7)	(210/351) 59.8% (54.5- 65.1)	(204/227) 89.9%	114/236) 48.3% (40.1- 56.5)
Proportion of households owning at least one LLIN	(76/249) 30.5% (23.1- 38.0)	(199/351) 56.7% (51.2- 62.2)	192/227) 84.6%	(91/236) 38.6% (30.4- 46.7)
Average number of persons per LLIN (mean)	11.7	4.7	2.6	7.7
Average LLNs per household (mean)	1.7	1.5	2.0	1.1

3.8.2 Mosquito net utilization

Because of the generally low mosquito net ownership, the proportion of household members (total, under five and pregnant women) who slept under a mosquito net of any type was low across the survey areas (ranged from 19.2%-42.3%) (Table 38). The high ownership of nets in Luwani Camp did not translate to high net utilisation with only 42.3% of the household members had used the nets (any type) in the previous night. Similarly, utilisation of insecticide treated mosquito nets by children under 5, pregnant women or the whole population was found to be generally low across the survey sites (Table 39). Furthermore, the proportion of households covered by IRS in the two camps was low (Dzaleka =3.2% and Luwani=2.6%) because the IRS was implemented in selected households at Dzaleka Camp in the past six months prior the survey. The results suggest that major improvements are needed in terms of coverage and utilisation of nets, especially in Dzaleka camp and community, and Luwani community.

Table 38: Proportion of household members using mosquito nets by type in the previous night.

	Dzaleka Camp	Dzaleka host	Luwani Camp	Luwani host
Proportion of household members (all ages) who slept under a net of any type	(296/1544) 19.2%	(549/1442) 38.1%	(457/1080) 42.3%	(344/981) 35.1%
Proportion of household members (all ages) who slept under an LLIN	(286/1544) 18.5%	(523/1442) 36.3%	(442/1080) 40.9%	(266/981) 27.1%
Proportion of children 0-59 months who slept under a net of any type	(80/281) 28.5%	(127/221) 57.5%	(113/240) 47.1%	(77/158) 48.7%
Proportion of children 0-59 months who slept under an LLIN	(77/281) 27.4%	(124/221) 56.1%	(107/240) 44.6%	(61/158) 38.6%
Proportion of pregnant women who slept under a net of any type	(6/36) 16.7%	(15/36) 41.7%	(11/24) 45.8%	(5/21) 23.8%
Proportion of pregnant women who slept under an LLIN	(6/36) 16.7%	(14/36) 38.9%	(11/24) 45.8%	(4/21) 19.0%
Proportion of households covered by IRS	(8/249) 3.2% (0.0-6.7)	-	(6/227) 2.6%	

4 Limitations

- **Data quality:** The overall quality of the data collected was good as indicated by the ENA plausibility report (see Appendix 6). However, there was uneven sex distribution in Dzaleka and Luwani camps indicating more boys than girls were surveyed. The survey in Luwani camp was conducted in very hot days with minimal shading and therefore measurements were taken hurriedly which might have affected the final plausibility score in that survey.
- **Accuracy of population data:** UNHCR's ProGres data was used for planning the Dzaleka camp survey. However, the initial planned sampling design of simple random sampling could not be implemented because most of the households could not be identified during pretesting time and hence the design was changed to cluster sampling. The national estimate for household size used for sample size calculation in the cluster surveys in the host communities was higher than the actual one that was found. This underestimated the required households to be reached to meet the required number of children 6-59 months. This resulted in conducting surveys in all reserve clusters because the number of children could not be met after planned households.

- **Sample sizes for the various modules:** Sample sizes for the other 5 modules were based on the sample size calculated based on GAM for children aged 6-59 months. This therefore led to small sample sizes for some indicators such as feeding programme coverage results for meaningful interpretation.

5 Discussion

5.1 Nutritional status of young children

The GAM results of the four 2016 nutrition surveys were all within the 'acceptable' level of < 5% according to WHO severity criteria though there was a high reported prevalence of diarrhea which is likely to compromise the nutritional status of children. Nevertheless, the prevalence of GAM in Luwani host community appears to be the highest (2.2% [0.9-5.4]) and was twice the other survey sites. The prevalence of GAM in Luwani host community is comparable to national levels of 2.5% (95% CI: 2.0 – 3.3)³. The acute malnutrition situation in Dzaleka Camp remains low and similar to the results in the previous two surveys in 2012 and 2014, indicating that the acute malnutrition situation at the camp is being contained. This suggests that current programmes are functioning well and are protecting the nutritional status of children 6-59 months. The blanket feeding targeting the children aged 6-24 months using CSB+ food supplementation may have contributed to the stable nutritional situation. Thus, continued efforts are needed to ensure the nutrition situation is maintained.

Stunting, a deficit in height relative to age, has been used as a measure of chronic under nutrition or ill health as well as micronutrient deficiencies such as Vitamin A, zinc, calcium or folate⁴. The assessment has shown that prevalence of stunting in children in all the survey areas was high and well above the 'acceptable level' of <20%, with over 8% of the children were severely stunted. The stunting results in three of the survey areas (Dzaleka camp, Dzaleka host community and Luwani host community) were in the 'serious' category (30-39%) according to WHO classification and in the 'critical' category (≥40%) in Luwani camp. The high rates of stunting could be as a result of the general poor household food diversity coupled with the high prevalence of anaemia among children 6-59 months observed in the four surveys. In Dzaleka Camp, Stunting levels remains high and the level is similar to the 2014 results [36.1% (95% CI: 30.2 - 42.5%) in 2014 vs 34.8 % (95% CI: 31.1 - 38.6) in 2016]. The coverage of age documentation was very high in all 4 surveys. Hence, the stunting results can be considered to be reliable and of high quality. Luwani camp had the lowest coverage of age documentation with 11% of the surveyed children having no official age documentation. The stunting rates in three of the four surveys (Dzaleka camp, Dzaleka host community and Luwani camp) are lower than the national average of 44.6% (95% CI: 42.0 – 47.2) obtained in the National Nutrition survey conducted between November and December 2016.

5.2 Programme coverage

The sustained low levels of acute malnutrition in children under 5 years may be a result of high programme coverage. In the assessment, the coverage results of Vitamin A supplementation in the last 6 months and measles vaccination based on both card documentation and mother's recall were generally high (around 90%) across all the survey areas except at Luwani camp. However, the results for both vitamin A supplementation and measles vaccination were lower in Luwani camp as compared to the other survey areas. As pointed out above, the low coverage rates for measles vaccination and vitamin A supplementation may be due to a large proportion of the asylum seekers had joined the camp and not yet covered by the national measles vaccination and vitamin A supplementation campaign which also covers the refugee camps in Malawi.

However, the UNHCR target of >95% of children being vaccinated against measles was only met in the two host communities of Dzaleka and Luwani camps and Vitamin A supplementation coverage (by card or recall) target of >90% was only met in Dzaleka host communities. However, coverage rates for measles vaccination and vitamin A supplementation based on card documentation alone was low, despite the high card coverage which documents child vaccinations and other health issues. This was particularly so because most of the vitamin A supplementation and measles vaccination were received during national campaigns which are rarely documented in the child's card.

³ National Nutrition Survey, June 2016

⁴Allen LH. Nutritional influences on linear growth: a general review, Eur J Clin Nutr 1994; 48:S75-S89.

With the very few children with acute malnutrition in all the surveys, nutrition programme coverage was not analysed and therefore the results not included in this report.

5.3 Anaemia in young children and women

The prevalence of anaemia among children 6-59 months is above the UNHCR target of <20% in all the 4 surveys, however very large differences were found between Dzaleka camp and its host community, and Luwani camp and its host community. The prevalence of anaemia was found to be very high and above the 40% mark for defining a problem of high public health significance according to WHO in both Luwani camp (48.2%) and its host communities (50.9%). The prevalence of anaemia in Dzaleka camp (22.7%) and its host community (26.9%) is much lower and nearly half as compared to Luwani camp and its host community, and in the 'medium' category for classifying a problem of public health significance.

In women of reproductive age (non-pregnant), prevalence of anaemia showed similar patterns as for the children 6-59 months. Prevalence of anaemia was the highest in Luwani camp (44.4%) and its host community (46.7%) and were above the critical threshold for intervention of 40%. The higher anaemia prevalence results found in Luwani camp and its host community reflect a poorer nutritional situation in the Luwani area in general affecting anaemia status in young children and women requiring further investigation.

ANC enrolment among pregnant women was found to be between 40-65% in all survey areas. Coverage of iron-folate pills varied substantially between survey areas with Dzaleka Camp being the lowest (15.8%). The coverage for iron-folate pills in Dzaleka camp significantly dropped from 60.3% (95% CI 47.7 - 72.0) obtained in 2014 ($p<0.05$), necessitating a greater attention to address the iron-folate coverage at the camp.

5.4 IYCF indicators

Infant and young child feeding practices directly affect the nutritional status of children under two years of age, and can impact upon child survival. Improving IYCF indicators in children under two years will result improving nutrition, health and development of the children.

The assessment showed that some IYCF indicators showed fairly good practices across the surveys areas. Timely breastfeeding initiation, children exclusively breastfed and continued breastfeeding at 1 year were in generally high in all the surveys (54.2 – 96.3%). However, introduction of solid, semi-solid or soft foods, consumption of iron-rich or iron-fortified foods and continued breastfeeding at 2 years varied from low (31.3%) to high (85.7%) between sites. The current IYCF indicators at Dzaleka camp are worse off compared to the 2014 surveys, suggesting that more efforts are needed to improve these indicators.

5.5 Food security and negative coping strategies

Availability of ration cards provided by WFP that enabled the refugee population to receive the food basket was found to be close to 100% in Luwani camp (99.6%) but was found to be lower in Dzaleka camp and close to 85% by the time of the survey. This was so because there were new arrivals at Dzaleka who were not registered at the time of the survey. The food basket was inadequate and did not last the entire duration of 30 days as evidenced by the fact that the average duration of the general food ration ranged from 18.6 days in Dzaleka camp to 23.2 days in Luwani camp. Furthermore, the average household dietary diversity (HDDS) scores, a measure of food access and consumption problems at the population level, were in general low in all 4 surveys (close to 4.5). In Dzaleka camp, no improvement in the average HDDS between 2014 and 2016 was noted.

A very large proportion of households (as high as 93.9%) in all 4 survey areas use negative coping strategies. The most common negative coping strategy used included reducing the quantity and/or frequency of meals and snacks eaten per day and borrowing cash, food or other items with or without interest. At Dzaleka camp, there

was general lower negative coping mechanisms in 2016 compared to the 2014 survey though the proportion of households reporting using none of the coping strategies over the past month was similar between the two surveys [6.1% (4.3-8.4%) in 2014 compared to 6.1% (2.6 – 9.6%) in 2016].

5.6 WASH

Improved water, sanitation and hygienic practices reduces the risk of water borne diseases such as diarrhoea and thereby positively enhancing the health and nutrition situation of children as well as the general population. Coverage of improved drinking water source was high in all the surveys, as most of them got water from boreholes which are regarded as safe water sources. However, coverage of safe water storage in all the surveys was low indicating that the majority of the households had a greater risk of contaminating the water despite sourcing it from safe water sources. Interventions that aim to improve storage coverage of water in the survey areas are warranted.

According to UNHCR guidelines, a minimum water quantity target of 20 lpppd (or 15 lpppd according to Sphere standards and out-of-camp settings) is necessary for improved hygiene and health. The average daily water usage found in the surveys (23.5 lpppd in Dzaleka camp and 24.0 lpppd in Luwani camp) was above the target of 20 litres per person per day (lpppd) in the two camps. Although the average water usage met the target of 20 lpppd, only half of the households met the target. This is pointing out to a water distribution issue but it also suggests a wide variation in the water usage which may be due to variation in the availability of water containers among households, which therefore may need further attention.

Safe disposal of excreta is critical to prevent contamination of water supplies or the food chain. Assessment of the use of improved excreta disposal facilities was generally low in all the areas. In Dzaleka camp, the usage of an improved excreta disposal facility did not greatly improve from the coverage rates obtained in 2014 survey [34.1% (95% CI: 30.2-38.3%) in 2014 vs 36.9% (31.3- 42.4) in 2016], suggesting more is required to change the status quo if we are to improve the situation. On a positive note, the safe disposal of children under 3 years faeces was practiced by the majority of households (>80%) in all 4 survey areas. This is particularly good considering that children's faeces are the most likely cause of faecal contamination to the immediate household environment.

5.7 Mosquito net coverage

Results of mosquito net ownership and utilisation by children under 5 and pregnant women were generally low across the survey areas. This suggests that major improvements are needed in terms of coverage and utilisation of nets, especially in Dzaleka camp and community, and Luwani community. However, in Luwani camp the target of 80% was met for owning at least one LLIN though slightly missed the target of 2 persons per LLIN. Despite the high net ownership in Luwani camp, about half of them (47%) were not using the nets suggesting that increased awareness and education on the importance of this is needed.

With the need to improve universal coverage of mosquito net utilisation rather than just the vulnerable population of under-fives and pregnant women, the surveys assessed net utilisation across the general population. Just as in the under-five children, net utilisation in the general population was low in all the survey areas, suggesting that more efforts are needed to scale up availability and utilisation of nets in the survey areas for them to have a greater impact to reduce malaria and consequently anaemia levels. Mainstreaming strategies with national health plans to improve net availability and utilisation in the households especially the vulnerable populations (children and pregnant women) through health center facilities could be explored. LLINs should be made available on time and that malaria fevers are detected and treated on time. UNHCR and partners should conduct an insecticide spraying campaign in the two camps and spots within the host communities.

6 CONCLUSION

The overall nutrition situation based on the prevalence of global acute malnutrition in 2016 in all the surveys is within the WHO 'acceptable' level of < 5%. The acute malnutrition level in Dzaleka Camp is similar to those levels found in 2012 and 2014 surveys. However, chronic malnutrition in children in all the surveys was high and well above the 'acceptable level' of <20%. The stunting was in the 'serious' category (30-39%) in Dzaleka camp, Dzaleka host community and Luwani host community and in the 'critical' category ($\geq 40\%$) in Luwani camp. In Dzaleka Camp, chronic malnutrition remains high and the level is similar to the one obtained in 2014.

Prevalence of anaemia in both children and non-pregnant women is above the UNHCR target of <20% in all the 4 surveys but Dzaleka host communities with 18.5% total anaemia among non-pregnant women. Prevalence of anaemia was highest in Luwani camp and its host community and were above the critical WHO threshold of 40% in both children and non-pregnant women. However, prevalence of anaemia in Dzaleka camp among children significantly dropped from 33.4% (95% CI 28.6-38.7%) obtained in 2014 to 22.7% (17.9-27.6%) but remained the same among non-pregnant women.

The coverage rate for measles vaccination and vitamin A supplementation based on card and recall was generally high (around 90%) across all the survey areas except at Luwani camp (around 75-80%). The two host communities met the recommended target of 95% for measles vaccination. Vitamin A supplementation and measles vaccination coverage were lowest in Luwani camp.

The infant and young child feeding indicators especially related to breastfeeding practices were fairly high especially continued breastfeeding at 1 year. While timely initiation of breast feeding and exclusive breastfeeding (below 6 months) averaged around 70-75% with a low of 54.2% to a high of 81.5% in Luwani community. Introduction of solid, semi-solid or soft foods and consumption of iron-rich or iron-fortified foods were generally low in all areas (range from 30-65%).

The household dietary diversity among the refugee population was low across all the survey areas and was around 4.5 (out of a maximum of 12). In Dzaleka camp, there was no improvement in the average HDDS between 2014 and 2016 (4.3 vs 4.5, respectively). For the refugee population receiving food ration, their ration did not last long enough and the average duration of the food ration ranged from 18.6 days in Dzaleka camp to 23.2 days in Luwani camp. A very large proportion of households in all 4 survey areas use negative coping strategies.

The majority of the households used improved drinking water sources and the proportion ranged from 90-100%. However, the proportion of households safely storing the water was low and ranged from a lowest of 15.8%-59.6% in Luwani camp, indicating a high chance of water contamination during storage due to poor storage containers. The average daily water usage was above the target of 20 litres per person per day (lpppd) in the two camps. Use of improved excreta disposal facility (improved toilet facility, 1 household) was low in all the survey areas (ranged 10.8% - 36.9%). The usage of an improved excreta disposal facility in Dzaleka camp did not greatly improve from the 34.1% result found in 2014. Overall, WASH results were better in the camps as compared to the host communities.

Ownership and utilisation of mosquito nets was generally low across the survey areas (range from 32-48% for those owning nets) except in Luwani camp with over 80% of the households owning at least one net of any type. All areas except for Luwani camp were far below the target of 80% for owning at least one LLIN. Results suggest that major improvements are needed in terms of coverage and utilisation of nets, especially in Dzaleka camp and community, and Luwani community.

7 RECOMMENDATIONS

1. GOM, UNHCR, WFP and partners should continue providing 100 % rations (2,100 kilo calories daily) to the whole population and preventive supplementary food to children between 6-24 months to sustain the low levels of acute malnutrition and reduce chronic malnutrition until recommended targeting of POCs for humanitarian assistance takes effect.
2. Treatment services for both severe and moderate malnutrition to continue be provided in the Health facilities in or around the camps. These activities to be coupled with active case-finding to ensure timely identification of such cases.
3. GOM, UNHCR, WFP, and partners should implement interventions targeting all children aged 6-59 months to reduce stunting and anemia levels among the refugees and the host communities. Where resources are limited, children aged 6-24 months should be prioritized. Such interventions should include improving dietary diversity and promotion of consumption of foods rich in micronutrients such as iron, folic acid, zinc, vitamin A and vitamin C through support to kitchen gardening, use of fresh food vouchers / cash, support to income generating activities; providing information and / education on anemia and micronutrient deficiencies.
4. GoM, UNHCR, WFP and Partners should conduct bi-annually blanket deworming campaigns targeting children 12-59 months.
5. There is need to investigate the possible main causes of much higher anemia prevalence in and around Luwani Camp through a health center- based assessment.
6. MoH, UNHCR and partners should ensure a more regular supply of iron and folic acid tablets for pregnant women in and around the camps throughout the year and raise awareness among pregnant women on the importance of taking the iron and folic acid tablets. Stakeholders should investigate the reasons behind the observed low uptake of iron and folic acids tablets among pregnant women.
7. Provide refresher training and/or new training to clinic-based laboratory staff on the diagnosis and treatment of anemia and malaria, and ensure a regular supply of supplies and drugs for diagnosis and treatment.
8. GoM, UNHCR, WFP and partners should explore sustainable livelihoods interventions such as promoting income earning, own food production for consumption, and livestock production to increase household food security in the camps to mitigate the effects of pipeline breaks and reduce use of negative coping strategies in and around the camps.
9. A follow-up investigation is needed to understand in more depth the use of negative coping strategies by the population in the camps and the host communities.
10. MoH, UNHCR and partners should strengthen the postnatal follow up activities through postnatal care (PNC) programmes in camps and host communities to promote and support optimal IYCF practices.
11. GoM, UNHCR and the district health offices should improve coverage of safe water storage at the camps and host communities, by providing or promoting the use of narrow necked or covered water storage containers proportional to the household size; and regularly monitor and promote the use of these containers at the household level.
12. MoH, UNHCR, the district health offices and partners should improve the coverage of improved latrine facilities in camps and host communities, raise awareness and sensitise the communities on the importance of using improved latrines.
13. MoH, UNHCR District Health Offices and partners should ensure an adequate distribution of LLINs to the camp and host communities and; promote regular use of LLINs in Luwani camp by strengthening awareness on the importance of using the mosquito nets.

14. MoH, UNHCR and partners should conduct an indoor residual spraying (IRS) campaign covering all households at least once a year in both camps.
15. UNHCR and WFP should regularly undertake the Nutrition Survey in the camps and host communities every two years. It is further recommended that the results of this survey be used in the sample size planning of future SENS surveys in the same locations-

8 Appendices

Appendix 1: Map of Malawi where Dzaleka and Luwani camps are

MALAWI



Location :

Central Region : Dowa District :- Dzaleka Camp

Southern Region : Neno District :- Luwani Camp

Appendix 2: Selected clusters for cluster surveys

	Camp Zone/Village	Population size	Cluster numbers
Dzaleka Camp			
1	Blantyre	1592	1,2,RC,3,4
2	Karonga	2227	5,6,RC,7,8,9,10
3	Katubzya	998	11,12,13
4	Kawale 1	2561	14,15,RC,16,17,18,19,20
5	Kawale 2	722	21,22
6	Likuni 1	537	23,24
7	Likuni 2	524	25
8	Lisungwi	1201	RC,26,27,28
9	Zomba	472	29,30
Dzaleka host community			
1	Kakowa	212	1,2,3,4
2	Lilambwe Chibwana	249	5,6,7,8,9,10
3	Mpindangombe	182	11,12,13,14
4	Kawolamwazi	163	15,16,17,18
5	Mengwe Thunduzi	89	19,RC
6	Besela	56	20
7	Kakunguni	59	21
8	Manzi	51	22
9	Jumbe	410	23,24,25,RC,26,27,RC,28,29
10	Mtanda	141	30,RC,31,32
11	Mengwe	86	33
12	Fwindu	143	34,35,36,37
Luwani host community			
1	Mgwenyama	878	1,2,3,4,RC,5
2	Ndelema	745	6,RC,7,8
3	Mathotho	285	9,10
4	Liyenda	585	11,12,13,14
5	Lembani	578	15,16,17
6	Mbemba	1543	RC,18,19,20,21,22,23,24,25,26

HOUSE HOLDS PER ZONE IN LUWANI FOR THE EXHAUSITIVE SURVEY

VILLAGE NAME	# of households		
SWAZILAND	33	ZAMBIA	30
TANZANIA	47	ZIMBABWE	57
KENYA	64	CAMEROON	84
BOTSWANA	42	NIGERIA	123
RSA	25	RECEPTION	290
GHANA	45	ANGOLA	38
		DRC	89
		TOTAL	967

Appendix 3 – SENS Questionnaires

1A: UNHCR Standardised Expanded Nutrition Survey (SENS) Questionnaire for the Camp

Greeting and reading of rights:

THIS STATEMENT IS TO BE READ TO THE HEAD OF THE HOUSEHOLD OR, IF THEY ARE ABSENT, ANOTHER ADULT MEMBER OF THE HOUSE BEFORE THE INTERVIEW. DEFINE HEAD OF HOUSEHOLD AS MEMBER OF THE FAMILY WHO MANAGES THE FAMILY RESOURCES AND IS THE FINAL DECISION MAKER IN THE HOUSE.

Hello, my name is _____ and I work with *UNHCR*. We would like to invite your household to participate in a survey that is looking at the nutrition and health status of people living in this camp.

- UNHCR is sponsoring this nutrition survey.
- Taking part in this survey is totally your choice. You can decide to not participate, or if you do participate you can stop taking part in this survey at any time for any reason. If you stop being in this survey, it will not have any negative effects on how you or your household is treated or what assistance you receive.
- If you agree to participate, I will ask you some questions about your family and I will also measure the weight and height of all the children in the household who are older than 6 months and younger than 5 years. In addition to these assessments, I will test a small amount of blood from the finger of the children and women to see if they have anaemia. You will be referred to the facility for anaemia testing.
- Before we start to ask you any questions or take any measurements, we will ask you to give us your verbal consent. Be assured that any information that you will provide will be kept strictly confidential.
- You can ask me any question that you have about this survey before you decide to participate or not.
- If you do not understand the information or if your questions were not answered to your satisfaction, do not declare your consent on this form. Thank you.

Note that in some camps, the words 'block' and 'section' may not be used and other words may be used for these. Adapt the wording accordingly.

CAPITAL LETTERS refer to instructions for the surveyors and should not be read to the respondent.

CHILDREN 6-59 MONTHS ANTHROPOMETRY, HEALTH AND ANAEMIA: 1 questionnaire per cluster / zones / sections (This questionnaire is to be administered to all children between 6 and 59 months of age)

Zone: _____ Nationality: _____ Date of interview (dd/mm/yyyy): ____/____/____/____/____/____
 Cluster Number ____ Team number ____ Sex of HH head: M/F

CH 1	CH2	CH3	CH4	CH5	CH6	CH7	CH8	CH9	CH10	CH11	CH12	CH13	CH14	CH15		
ID	HH	Consent given 1=Yes 2=No 3=Absent	Sex (m/f)	Birthdate* dd/mm/yy yy	Age** (months)	Weight (kg) ±100g	Height (cm) ±0.1cm	Oedema (y/n)	MUAC (mm)	Child enrolled 1=SFP 2=TFP 3=None	Measles (9-59m) 1=Yes card 2=Yes recall 3=No or don't know	Vit. A in past 6 months (SHOW CAPSULE) 1=Yes card 2=Yes recall 3=No or don't know	Diarrhoea in past 2 weeks 1=Yes 2=No 3=Don't know	Hb (g/dL)	Hb (g/L)	When did [NAME OF CHILD] arrive in the camp?*
01				/ /												
02				/ /												
<p>*The exact birth date should only be taken from an age documentation showing day, month and year of birth. It is only recorded if an official age documentation is available; if the mother recalls the exact date, this is not considered to be reliable enough. Leave blank if no official age documentation is available.</p> <p>**If no age documentation is available, estimate age using local event calendar. If an official age documentation is available, record the age in months from the date of birth.</p> <p>*** Before Jan 2016, Jan, Feb, Mar, April, May, Jun, Jul, Aug, Sept, Oct,</p>																

OMEN ANAEMIA: 1 questionnaire per cluster / zones / sections (THIS QUESTIONNAIRE IS TO BE ADMINISTERED TO ALL WOMEN AGED BETWEEN 15 AND 49 YEARS IN THE SELECTED HOUSEHOLD)

Zone: _____ Nationality: _____ Date of interview (dd/mm/yyyy): |__|__|/|__|__|/|__|__||__|__|

Cluster Number |__|__| Team number |__|

WM 1	WM 2	WM3	WM4	WM5	WM6	WM7	WM 8		
ID	HH	Cons ent given 1=Yes 2=No 3=Abs ent	Age (year s)	Are you pregnant? 1=Yes 2=No (GO TO HB) 8=Don't know (GO TO HB)	Are you currently enrolled in the ANC programme? 1=Yes 2=No 8=Don't know	Are you currently receiving iron-folate pills (<i>SHOW PILL</i>)? 1=Yes (STOP NOW) 2=No (STOP NOW) 8=Don't know (STOP NOW)	Hb (g/dL)	Hb (g/L)	When did [NAME OF WOMAN] arrive in the camp?*
01									
02									
03									
04									
05									
06									
07									
08									
09									
10									
11									

* Before Jan 2016, Jan, Feb, Mar, April, May, Jun, Jul, Aug, Sept, Oct, for the surveyors and should not be read to the respondent.

CHILDREN 6-59 MONTHS ANTHROPOMETRY, HEALTH AND ANAEMIA: 1 questionnaire per cluster / zones / sections (This questionnaire is to be administered to all children between 6 and 59 months of age)

Zone: _____ Nationality: _____ Date of interview (dd/mm/yyyy): |__|_|_|/|__|_|_|/|__|_|_|||__|_|_|

Cluster Number |__|_|_| Team number |__|_|_| Village _____ HH # (selected) _____

CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8	CH9	CH10	CH11	CH12	CH13	CH14	CH15		Child status
ID	HH	Consent given 1=Yes 2=No 3=Absent	Sex (m/f)	Birthdate* dd/mm/yyyy	Age** (months)	Weight (kg) ±100g	Height (cm) ±0.1cm	Oedema (y/n)	MUAC (mm)	Child enrolled 1=SFP 2=TFP 3=None	Measles (9-59m) 1=Yes card 2=Yes recall 3=No or don't know	Vit. A in past 6 months (SHOW CAPSULE) 1=Yes card 2=Yes recall 3=No or don't know	Diarrhoea in past 2 weeks 1=Yes 2=No 3=Don't know	Hb (g/dL)	Hb (g/L)	1=non refugee 2=refugee
01				/ /												
02				/ /												
03				/ /												
<p>*The exact birth date should only be taken from an age documentation showing day, month and year of birth. It is only recorded if an official age documentation is available; if the mother recalls the exact date, this is not considered to be reliable enough. Leave blank if no official age documentation is available.</p> <p>**If no age documentation is available, estimate age using local event calendar. If an official age documentation is available, record the age in months from the date of birth.</p>																

WOMEN ANAEMIA: 1 questionnaire per cluster / zones / sections (THIS QUESTIONNAIRE IS TO BE ADMINISTERED TO ALL WOMEN AGED BETWEEN 15 AND 49 YEARS IN THE SELECTED HOUSEHOLD)

Zone: _____ **Nationality:** _____ **Date of interview (dd/mm/yyyy):** _____

|_|_|_|/|_|_|_|/|_|_|_|

Cluster Number |_|_|_|

Team number |_|_|

WM1	WM2	WM3	WM4	WM5	WM6	WM7	WM8		Woman status
ID	HH	Consent given 1=Yes 2=No 3=Absent	Age (years)	Are you pregnant? 1=Yes 2=No (GO TO HB) 8=Don't know (GO TO HB)	Are you currently enrolled in the ANC programme? 1=Yes 2=No 8=Don't know	Are you currently receiving iron-folate pills (<i>SHOW PILL</i>)? 1=Yes (STOP NOW) 2=No (STOP NOW) 8=Don't know (STOP NOW)	Hb (g/dL)	Hb (g/L)	1=non refugee 2=refugee
01									
02									
03									
04									
05									
06									
07									
08									
09									
10									
11									
12									

IYCF: 1 questionnaire per child 0-23 months (THIS QUESTIONNAIRE IS TO BE ADMINISTERED TO THE MOTHER OR THE MAIN CAREGIVER WHO IS RESPONSIBLE FOR FEEDING THE CHILD AND THE CHILD SHOULD BE BETWEEN 0 AND 23 MONTHS OF AGE)

Zone: _____ **Nationality:** _____ **Consent :** yes / no / absent

Child status _____ 1=non-refugee 2 = Refugees

Date of interview (dd/mm/yyyy)	Cluster Number (in cluster survey only)	
____/____/____	____	
Team Number	ID Number	HH Number
____	____	____

No	QUESTION	ANSWER CODES	
SECTION IF1			
IF0	Child status	Non Refugee 1 Refugee 2	
IF1	Sex	Male 1 Female 2	____
IF2	Birthdate RECORD FROM AGE DOCUMENTATION. LEAVE BLANK IF NO VALID AGE DOCUMENTATION.	Day/Month/Year.....____/____/____	
IF3	Child's age in months	IF AGE DOCUMENTATION NOT AVAILABLE, ESTIMATE USING EVENT CALENDAR. IF AGE DOCUMENTATION AVAILABLE, RECORD THE AGE IN MONTHS FROM THE DATE OF BIRTH.	____ ____
IF4	Has [NAME] ever been breastfed?	Yes 1 No 2 Don't know 8	____ IF ANSW ER IS 2 or 8 GO TO IF7
IF5	How long after birth did you first put [NAME] to the breast?	Less than one hour 1 Between 1 and 23 hours 2 More than 24 hours 3 Don't know 8	____
IF6	Was [NAME] breastfed yesterday during the day or at night?	Yes 1 No 2 Don't know 8	____
SECTION IF2			
IF7	Now I would like to ask you about liquids that [NAME] may have had yesterday during the day and at night. I am interested in whether your child had the item even if it was combined with other foods. Yesterday, during the day or at night, did [NAME] receive any of the following? ASK ABOUT EVERY LIQUID. IF ITEM WAS GIVEN, CIRCLE '1'. IF ITEM WAS NOT GIVEN, CIRCLE '2'. IF CAREGIVER DOES NOT KNOW, CIRCLE '8'. EVERY LINE MUST HAVE A CODE. Yes No DK		
	7A. Plain water	7A.....1 8	2
	7B. Infant formula, for example lactogen, S26, Nan	7B.....1 8	2
	7C. Milk such as tinned, powdered, or fresh animal milk: for example NIDO, Keri gold, Cremora, Vega, Ching'ombe, First Choice Cowbell	7C.....1 8	2
	7D. Juice or juice drinks, such as Davita, YES, Orange squash, Guava, Malambe juice	7D.....1 8	2
	7E. Clear broth example water solution	7E.....1 8	2
	7F. Sour milk or yogurt, for example Chambiko, yogi	7F.....1	2 8

	7G. Thin porridge, for example thobwa, maheu	7G.....1 2 8	
	7H. Tea or coffee with milk	7H.....1 2 8	
	7I. Any other water-based liquids, for example sodas, other sweet drinks, herbal infusion (eg chidede), gripe water, clear tea with no milk, black coffee, ritual fluids.	7I.....1 2 8	
IF8	Yesterday, during the day or at night, did [NAME] eat solid or semi-solid (soft, mushy) food (e.g nsima or ugali)?	Yes.....1 No.....2 Don't know.....8	<input type="checkbox"/>
SECTION IF3			
IF9	Did [NAME] drink anything from a bottle with a nipple yesterday during the day or at night?	Yes.....1 No.....2 Don't know.....8	<input type="checkbox"/>
SECTION IF4			
IF10	IS CHILD AGED 6-23 MONTHS? REFER TO IF2 / IF3	Yes.....1 No.....2	<input type="checkbox"/> IF ANSW ER IS 2 STOP NOW
IF11	Now I would like to ask you about some particular foods [NAME] may have eaten. I am interested in whether your child had the item even if it was combined with other foods. Yesterday, during the day or at night, did [NAME] consume any of the following? ASK ABOUT EVERY ITEM. IF ITEM WAS GIVEN, CIRCLE '1'. IF ITEM WAS NOT GIVEN, CIRCLE '2'. IF CAREGIVER DOES NOT KNOW, CIRCLE '8'. EVERY LINE MUST HAVE A CODE. If a category of IRON-RICH food (11A-11H) is not available in the setting, delete it from the questionnaire BUT KEEP THE original QUESTION NUMBERS and do not change. Yes No DK		
	11A. Meat, Fish, Poultry, and liver/organ flesh foods example beef, goat, lamb, mutton, pork, rabbit, chicken, duck, liver, kidney, heart, bonya, usipa,)	11A.....1 2 8	
	11B. Corn Soya Blend and Wheat Soya Blend, LikhuniPhala	11B.....1 2 8	
	11C. Fortified Blended Foods ++ such as Corn Soya Soya Blend++	11C.....1 2 8	
	11D. Ready to use therapeutic food (RUTF) products example Chiponde (SHOW SACHET)	11D.....1 2 8	
	11F. Lipid-based Nutrient supplements (LNS) such as Nutributter® and Plumpy'doz® (SHOW SACHET / POT)	11F.....1 2 8	
	11G. Iron fortified infant formula example Nan, S26, infant formula, Lactogen, Infant Nido	11G.....1 2 8	
	11H. Any iron fortified solid, semi-solid, or soft foods designed specifically for infants and young children example Cerelac, Weetabix, NESTUM	11H.....1 2 8	

WASH: 1 questionnaire per household (This questionnaire is to be administered to the Main Caretaker or, if they are absent, another adult member of the household)

Zone: _____ Nationality: _____ Consent : yes / no / absent

Date of interview (dd/mm/yyyy)	Cluster Number (in cluster survey only)
_ _ _ / _ _ _ / _ _ _ _ _ _ _	_ _ _
Team Number	HH Number
_ _	_ _ _ _

No	QUESTION	ANSWER CODES
SECTION WS1		
WS0	HH status	1=host community members only 2 = Refugees 3 = Mix of refugees and host community members
WS1	How many people live in this household and slept here last night?	_ _ _
WS2	What is the main source of drinking water for members of your household? DO NOT READ THE ANSWERS SELECT ONE ONLY	Public tap/standpipe 02 borehole (& pump) 03 Protected dug well 04 Protected spring 05 Rain water collection 06 Unprotected spring 08 Unprotected dug well 09 Surface water (e.g. river, pond) 13 Other 96 Don't know 98
WS5	What kind of toilet facility does this household use? DO NOT READ THE ANSWERS SELECT ONE ONLY	Flush to piped sewer system 01 Flush to septic system 02 Pour-flush to pit 03 VIP/ pit latrine with cement floor/slab 04 Composting/dry latrine 05 Flush or pour-flush elsewhere 06 Pit latrine without cement floor/slab 07 Service or bucket latrine 08 Hanging toilet/latrine 09 No facility, field, bush, plastic bag 10
WS6	How many households share this toilet? THIS INCLUDES THE SURVEYED HOUSEHOLD	RECORD NUMBER OF HOUSEHOLDS IF KNOWN (RECORD 96 IF PUBLIC TOILET OR 98 IF UNKNOWN) SUPERVISOR SELECT ONE ONLY Not shared (1 HH) 1 Shared family (2 HH) 2 Communal toilet (3 HH or more) 3 Public toilet (in market or clinic etc.) 4 Don't know 8
WS7	Do you have children under three years old?	Yes 1 No 2
WS8	The last time [NAME OF YOUNGEST CHILD] passed stools, what was done to dispose of the stools? DO NOT READ THE ANSWERS	Child used toilet/latrine 01 Put/rinsed into toilet or latrine 02 Buried 03 Thrown into garbage 04 Put/rinsed into drain or ditch 05

	SELECT ONE ONLY	Left in the open Other Don't know	06 96 98	
SECTION WS2				
Observation Based Questions (done after the initial questions to ensure the flow of the interview is not broken)				
No	OBSERVATION / QUESTION	ANSWER		
W S 1 0	Please show me where you store your drinking water. ARE THE DRINKING WATER CONTAINERS COVERED OR NARROW NECKED?	All are covered or narrow necked 1 Some are covered or narrow necked None are covered or narrow necked	2 3	<input type="text"/>

FOOD SECURITY: 1 questionnaire per household (This questionnaire is to be administered to the Main Caretaker WHO IS RESPONSIBLE FOR COOKING THE MEALS)

Zone: _____ Nationality: _____ Consent : yes / no / absent

Date of interview (dd/mm/yyyy)	Cluster Number (in cluster survey only)
_ _ _ / _ _ _ / _ _ _ _ _ _ _	_ _ _
Team Number	HH Number
_ _	_ _ _ _

No	QUESTION	ANSWER CODES	
SECTION FS1			
FS0	HH status	1=host community members only 2 = Refugees 3 = Mix of refugees and host community members	
FS5	In the last month, have you or anyone in your household borrowed cash, food or other items with or without interest?	Yes 1 No 2 Don't know 8	_ _
FS6	In the last month, have you or anyone in your household sold any assets that you would not have normally sold (furniture, seed stocks, tools, other non- food items, livestock etc.)?	Yes 1 No 2 Don't know 8	_ _
FS7	In the last month, have you or anyone in your household requested increased remittances or gifts as compared to normal?	Yes 1 No 2 Don't know 8	_ _
FS8	In the last month, have you or anyone in your household reduced the quantity and / or frequency of meals and snacks?	Yes 1 No 2 Don't know 8	_ _
FS9	In the last month, have you or anyone in your household begged?	Yes 1 No 2 Don't know 8	_ _
FS10	In the last month, have you or anyone in your household engaged in such behaviours as stealing, prostitution, drug dealing, gambling, smuggling, human trafficking, or any other risky or harmful activities?	Yes 1 No 2 Don't know 8	_ _
SECTION FS2			
FS11	Now I would like to ask you about the types of foods that you or anyone else in your household ate yesterday during the day and at night. I am interested in whether you or anyone else in your household had the item even if it was combined with other foods. I am interested in knowing about meals, beverages and snacks eaten or drank inside or outside the home. READ THE LIST OF FOODS AND DO NOT PROBE. PLACE A "1" IN THE BOX IF ANYONE IN THE HOUSEHOLD ATE THE FOOD IN QUESTION, PLACE A "0" IN THE BOX IF NO ONE IN THE HOUSEHOLD ATE THE FOOD.		
	1. Any food made from cereals such as wheat, corn/maize, likuni phala, millet, rice, sorghum, or any foods made from these such as bread, porridge, noodles, ugali, nsima, paste)	1..... _ _	
	2. Any white roots and tubers such as green bananas, plantains, white potatoes, white yam, white cassava, white sweet potato or any foods made from roots such as chikande, kondowole/ntandasya	2..... _ _	
	3A. Any vitamin A rich vegetables and tubers such as carrot, pumpkin/butternut squash, red sweet pepper, or sweet potato that are orange inside	3A..... _ _	

	3B. Any dark green leafy vegetables and vitamin A rich leaves such as amaranth (bonongwe), cassava leaves, kale, spinach, luni, nkhwani, khwanya)	3B..... _
	3C. Any other vegetables such as cabbage, green pepper, tomato, onion, eggplant	3C..... _
	4A. Any vitamin A rich fruits such as mangoes, papaya, jambula, mkundi, and 100% fruit juice made from these (e.g. mango (ripe, fresh and dried), ripe papaya, passion fruit (ripe), dried peach)	4A..... _
	4B. Any other fruits such as bwemba, thunza, majendajenda, mphipsya, matowo, peaches, mpoza, berries (eg mabulosi, strawberries) and 100% fruit juice made from these (e.g. apple, avocados, banana, coconut flesh, lemon, orange)	4B..... _
	5A. Any organ meat or blood-based foods such as liver, kidney, heart, spleen (kapamba), uwende	5A..... _
	5B. Any flesh meat such as beef, goat, lamb, mutton, pork, rabbit, chicken, duck, cane rat (ntchenzi), guinea pig, rat, cat, mbewa, insects	5B..... _
	6. Any eggs from chicken, duck, guinea fowl, eggs from other birds	6..... _
	7. Any fresh, dried or canned fish or shellfish such as chambo, usipa, utaka, mcheni, bombe, milamba, mbaba, bonya,	7..... _
	8. Any legumes, nuts, and seeds such as soya, groundnuts, dried peas, dried beans, lentils, nuts, seeds (eg. pumpkin seeds), sawawa or any foods made from these such as peanut butter	8..... _
	9. Any milk and milk products such as milk, infant formula, cheese, yogurt, chambiko	9..... _
	10. Any oils and fats such as avocado pear, oils, animal fat added to food or used for cooking (e.g. vegetable oil, ghee or butter oil, edible fat)	10..... _
	11. Any sweets, sweetened soda or juice drinks and sugary foods such as sugar, honey, soda drinks, chocolates, sweet biscuits and cakes	11..... _
	12. Any spices, condiments and beverages such as salt, chillies, soy sauce, hot sauce, ginger, herbs, ketchup, coffee, tea, beer, alcoholic beverages like wine, hard spirits	12..... _

MOSQUITO NET COVERAGE: 1 questionnaire per household (This questionnaire is to be administered to the head of the household or, if they are absent, another adult member of the household).

Zone: _____ Nationality: _____ Consent : yes / no / absent

HH status _____ 1=host community members only 2 = Refugees 3 = Mix of refugees and host community members

Date of interview (dd/mm/yyyy)	Cluster Number (in cluster survey only)
_ _ _ / _ _ _ / _ _ _ _ _ _ _	_ _ _
Team Number	HH Number
_ _	_ _ _ _

No	QUESTION	ANSWER CODES	
SECTION TN1			
TN1	How many people live in this household and slept here last night?	INSERT NUMBER	_ _ _
TN2	How many children 0-59 months live in this household and slept here last night? INSERT NUMBER		_ _ _

TN3	How many pregnant women live in this household and slept here last night? INSERT NUMBER				
TN5	Do you have mosquito nets in this household that can be used while sleeping?	Yes 1 No 2			 IF ANSWER IS 2 STOP NOW
TN6	How many of these mosquito nets that can be used while sleeping does your household have? INSERT NUMBER	IF MORE THAN 4 Nets, enter the number and use ADDITIONAL NET questionnaire sheets entering the number of the nets sequentially at the top.			 Nets
TN7	ASK RESPONDENT TO SHOW YOU THE NET(S) IN THE HOUSEHOLD. IF NETS ARE NOT OBSERVED → CORRECT TN6 ANSWER	NET #	NET #	NET #	NET #
TN8	OBSERVE NET AND RECORD THE BRANDNAME OF NET ON THE TAG. IF NO TAG EXISTS OR IS UNREADABLE RECORD 'DK' FOR DON'T KNOW.				
TN9	For surveyor/supervisor only (not to be done during interview): WHAT TYPE OF NET IS THIS? BASED ON THE TAG INDICATE IF THIS IS A LLIN OR OTHER TYPE OF NET OR DK.	1=LLIN 2=Other/DK 	1=LLIN 2=Other/DK 	1=LLIN 2=Other/DK 	1=LLIN 2=Other/DK
TN10	For surveyor/supervisor only (not to be done during interview): RECORD THE TOTAL NUMBER OF LLINs IN HOUSEHOLD BY COUNTING THE NUMBER OF '1' IN TN9.				 LLINs

SECTION TN2							
Line no	Household members	Sex	Age	Pregnancy status	Slept under net	Which net	Type of net
#	COL1	COL 2	COL3	COL4	COL5	COL6	COL7
	Please give me the names of the household members who live here and who slept here last night	Sex m/f	Age years	FOR WOMEN 15-49 YEARS, ASK: Is (NAME) currently pregnant? (CIRCLE NOT APPLICABLE OR N/A'99' IF FEMALE <15- >49 YEARS OR MALE) Yes No/DK N/A	Did (NAME) sleep under a net last night? Yes No/DK	Ask the respondent to physically identify which of the observed nets they slept under. WRITE THE NUMBER CORRESPONDING TO THE NET THEY USED.	For surveyor/ supervisor only: Based on the observed netbrandname recorded (TN8), indicate if it is an Llin or other / don't know (DK). LLIN OTHER/DK
01		m f	<5 ≥5	1 0 99	1 0	_ _	1 2
02		m f	<5 ≥5	1 0 99	1 0	_ _	1 2
03		m f	<5 ≥5	1 0 99	1 0	_ _	1 2
04		m f	<5 ≥5	1 0 99	1 0	_ _	1 2
05		m f	<5 ≥5	1 0 99	1 0	_ _	1 2
06		m f	<5 ≥5	1 0 99	1 0	_ _	1 2
07		m f	<5 ≥5	1 0 99	1 0	_ _	1 2
08		m f	<5 ≥5	1 0 99	1 0	_ _	1 2
Mosquito net summary (for surveyor / supervisor only, not to be done during interview)							
	Total household members		Total <5		Total Pregnant		
Slept under a net of any type	Count the number of '1' in COL5	TN11 _ _	For children < 5 (COL3 is '<5'), count the number of '1' in COL5		TN13 _ _	For pregnant women (COL4 is '1'), count the number of '1' in COL5	
Slept under an LLIN	Count the number of '1' in COL7	TN12 _ _	For children <5 (COL3 is '<5'), count the number of '1' in COL7		TN14 _ _	For pregnant women (COL4 is '1'), count the number of '1' in COL7	

Appendix 4: Local event calendar

Religious holiday	Local event	Other local events	Month/ year	Age
			November 2016	0
	Mothers' Day		October 2016	1
			September 2016	2
			August 2016	3
		Malawi independence day	July 2016	4
			June 2016	5
	Mass administration for bilharzia	Kamuzu Day	May 2016	6
	Start of influx of refugees from Mozambique		April 2016	7
	Martyrs' Day		March 2016	8
	Valentines day		February 2016	9
New year		Chilembwe Day	January 2016	10
Christmas			December 2015	11
	Measles and Vitamin A campaign		November 2015	12
	Mothers' Day		October 2015	13

			September 2015	14
			August 2015	15
		Malawi independence day	July 2015	16
		World refugee day	June 2015	17
	Mass administration for bilharzia	Kamuzu Day	May 2015	18
Easter	Measles and Vitamin A campaign		April 2015	19
	Martyrs' Day		March 2015	20
			February 2015	21
New year		Chilembwe Day	January 2015	22
Christmas		World aids day	December 2014	23
	Measles and Vitamin A campaign		November 2014	24
	Mothers' Day		October 2014	25
			September 2014	26
			August 2014	27
		Malawi independence day	July 2014	28
		World refugee celebration	June 2014	29
	Tripartite General Elections	Kamuzu Day	May 2014	30
Easter	Measles and Vitamin A campaign		April 2014	31
			March 2014	32
	Martyrs' Day		February 2014	33
New year	Chilembwe Day	New Year,	January 2014	34
Christmas			December 2013	35
	Measles and Vitamin A campaign		November 2013	36
	Mothers' Day	Cashgate break out	October 2013	37
		Mphwiyo shooting	September 2013	38
			August 2013	39
		Malawi independence day	July 2013	40
		World Refugee Day	June 2013	41
	Mass administration for bilharzia	Kamuzu Day	May 2013	42
Easter	Measles and Vitamin A campaign		April 2013	43
	Martyrs' Day		March 2013	44
			February 2013	45
New year	Chilembwe Day	New Year, President Obama came to power (20/01),	January 2013	46
Christmas			December 2012	47
	Measles and Vitamin A campaign		November 2012	48
	Mothers' Day		October 2012	49
			September 2012	50
			August 2012	51
	Malawi independence day		July 2012	52
			June 2012	53
	Death Bingu Wa Mutharika,		May 2012	54
Easter	Measles and Vitamin A campaign		April 2012	55
	Martyrs' Day		March 2012	56
			February 2012	57
New year	Chilembwe Day	New Year	January 2012	58
Christmas			December 2011	59

Appendix 5 – Survey Team Members and Contributors

Survey coordination / team supervision / technical team

1. George Bello
2. Prosper Matondi
3. Tewodros Wubayehu
4. Rose Eyoru
5. Martin [add last name]
6. Caroline Wilkinson
7. Mélody Tondeur

Survey Team Leaders and Enumerators

	Team Leaders	Anthropometrists		Interviewer	HB
1	Brian Dzanja	Edrine Sibande	Phonex John/Brian Dzanja	Chifundo Mwawa	Allan Chitenje
2	Richard Mmanga	Ellen Majawa	Jarson Chigamba	Imran Kazembe	Alfred Grey Banda
3	Alex Dambolachepa	Mphatso Mbewe	Alex Dambolachepa	Duncan nazombe	Samuel Kankhande
4	Chrissy Kaunda	Halidi Majawa	Peter Moffat	Dalitso Mpeketula	Wambwene Mwangomba
5	Misheck Pelani	Jean Simkoko	William Mwalabu	Vitumbiko Kaunda	Misheck Pelani
6	Onester Kapesi	Sanudi Matukuta	Linda Chisi	Rajab Kawanga	Ishmael Mbutukwa

Appendix 6: Plausibility report

Plausibility check for: Dzaleka_Camp.as

Standard/Reference used for z-score calculation: WHO standards 2006

(If it is not mentioned, flagged data is included in the evaluation. Some parts of this plausibility report are more for advanced users and can be skipped for a standard evaluation)

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	Score
Flagged data (% of out of range subjects)	Incl	%	0-2.5	>2.5-5.0	>5.0-7.5	>7.5	
			0	5	10	20	0 (1.2 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1	>0.05	>0.001	<=0.001	
			0	2	4	10	4 (p=0.027)
Age ratio(6-29 vs 30-59) (Significant chi square)	Incl	p	>0.1	>0.05	>0.001	<=0.001	
			0	2	4	10	0 (p=0.225)
Dig pref score - weight	Incl	#	0-7	8-12	13-20	> 20	
	0	2	4	10	0	(5)	
Dig pref score - height	Incl	#	0-7	8-12	13-20	> 20	
	0	2	4	10	0	(5)	
Dig pref score - MUAC	Incl	#	0-7	8-12	13-20	> 20	
	0	2	4	10	0	(5)	
Standard Dev WHZ .	Excl	SD	<1.1	<1.15	<1.20	>=1.20	
.	and	and	and	or			
	Excl	SD	>0.9	>0.85	>0.80	<=0.80	
	0	5	10	20	0	(0.95)	
Skewness WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
	0	1	3	5	0	(0.03)	
Kurtosis WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
	0	1	3	5	0	(0.16)	
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<=0.001	
	0	1	3	5	0	(p=0.146)	
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	4 %

The overall score of this survey is 4 %, this is excellent.

Plausibility check for: Dzaleka_Host.as

Standard/Reference used for z-score calculation: WHO standards 2006

(If it is not mentioned, flagged data is included in the evaluation. Some parts of this plausibility report are more for advanced users and can be skipped for a standard evaluation)

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	Score
Flagged data (% of out of range subjects)	Incl	%	0-2.5	>2.5-5.0	>5.0-7.5	>7.5	
			0	5	10	20	0 (0.6 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1	>0.05	>0.001	<=0.001	
			0	2	4	10	0 (p=0.352)
Age ratio(6-29 vs 30-59) (Significant chi square)	Incl	p	>0.1	>0.05	>0.001	<=0.001	
			0	2	4	10	0 (p=0.509)
Dig pref score - weight	Incl	#	0-7	8-12	13-20	> 20	
	0	2	4	10	0	(6)	
Dig pref score - height	Incl	#	0-7	8-12	13-20	> 20	
	0	2	4	10	0	(7)	
Dig pref score - MUAC	Incl	#	0-7	8-12	13-20	> 20	
	0	2	4	10	2	(9)	
Standard Dev WHZ .	Excl	SD	<1.1	<1.15	<1.20	>=1.20	
.		and	and	and	or		
	Excl	SD	>0.9	>0.85	>0.80	<=0.80	
	0	5	10	20	0	(0.93)	
Skewness WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
	0	1	3	5	0	(-0.09)	
Kurtosis WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
	0	1	3	5	0	(-0.08)	
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<=0.001	
	0	1	3	5	0	(p=0.561)	
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	2 %

The overall score of this survey is 2 %, this is excellent.

Plausibility check for: Luwani_camp.as

Standard/Reference used for z-score calculation: WHO standards 2006

(If it is not mentioned, flagged data is included in the evaluation. Some parts of this plausibility report are more for advanced users and can be skipped for a standard evaluation)

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	Score
Flagged data (% of out of range subjects)	Incl	%	0-2.5	>2.5-5.0	>5.0-7.5	>7.5	
			0	5	10	20	5 (3.0 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1	>0.05	>0.001	<=0.001	
			0	2	4	10	2 (p=0.050)
Age ratio(6-29 vs 30-59) (Significant chi square)	Incl	p	>0.1	>0.05	>0.001	<=0.001	
			0	2	4	10	0 (p=0.507)
Dig pref score - weight	Incl	#	0-7	8-12	13-20	> 20	
	0	2		4	10		0 (6)
Dig pref score - height	Incl	#	0-7	8-12	13-20	> 20	
	0	2		4	10		2 (9)
Dig pref score - MUAC	Incl	#	0-7	8-12	13-20	> 20	
	0	2		4	10		2 (8)
Standard Dev WHZ .	Excl	SD	<1.1	<1.15	<1.20	>=1.20	
.	and	and	and	or			
	Excl	SD	>0.9	>0.85	>0.80	<=0.80	
	0	5		10	20		0 (0.98)
Skewness WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
	0	1		3	5		0 (-0.19)
Kurtosis WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
	0	1		3	5		0 (-0.14)
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<=0.001	
	0	1		3	5		0 (p=)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	11 %

Plausibility check for: Luwani_Host.as

Standard/Reference used for z-score calculation: WHO standards 2006

(If it is not mentioned, flagged data is included in the evaluation. Some parts of this plausibility report are more for advanced users and can be skipped for a standard evaluation)

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	Score
Flagged data (% of out of range subjects)	Incl	%	0-2.5	>2.5-5.0	>5.0-7.5	>7.5	
			0	5	10	20	0 (1.1 %)
Overall Sex ratio	Incl	p	>0.1	>0.05	>0.001	<=0.001	

The overall score of this survey is 4 %, this is excellent.