STANDARDISED EXPANDED NUTRITION SURVEY REPORT

SURVEY SITES: BAHN, PTP AND LITTLE WLEBO REFUGEE CAMPS

SURVEY PERIOD: APRIL – MAY 2015

REPORT FINALIZED: SEPTEMBER 2015

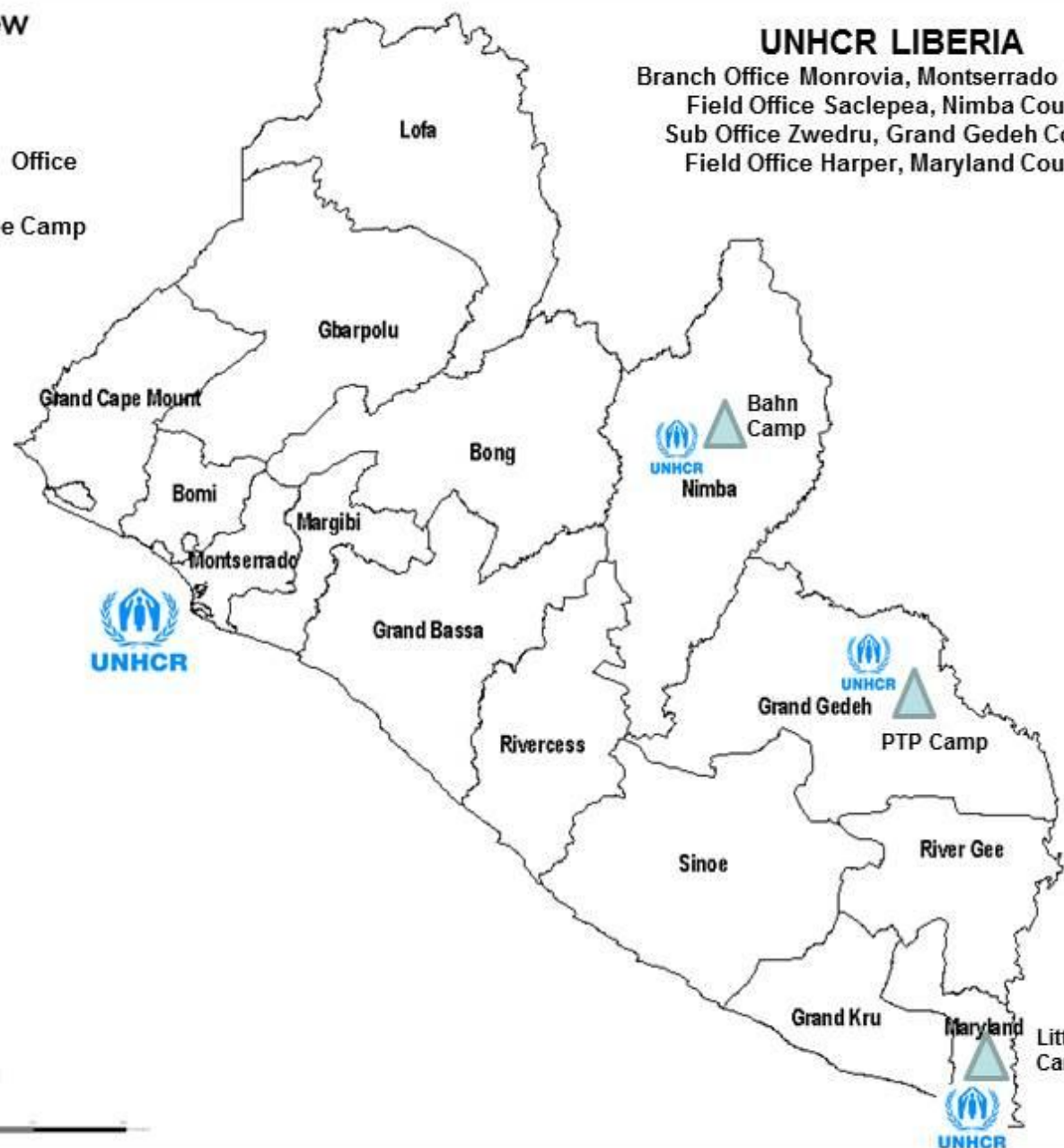**UNHCR IN COLLABORATION WITH WFP, UNICEF, AHA, CARE AND MOHSW/CHTs LIBERIA, WEST AFRICA**

Liberia Overview

UNHCR Office

Refugee Camp

UNHCR LIBERIA
Branch Office Monrovia, Montserrado County
Field Office Saclepea, Nimba County
Sub Office Zwedru, Grand Gedeh County
Field Office Harper, Maryland County

Lofa

Gbarpolu

Grand Cape Mount

Bong

Bomi

Margibi

Montserrado

Grand Bassa

Rivercess

Sinoe

River Gee

Grand Kru

Maryland

Bahn Camp

UNHCR

Nimba

Grand Gedeh

PTP Camp

Little Wlebo Camp

1:2,500,000

Legend

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ACRONYMS

AHA	African Humanitarian Action
BO–M	Branch Office – Monrovia (UNHCR)
CDI	Cote d'Ivoire
CHT	County Health Team
CI	Confidence Interval
CMAM	Community-based Management of Acute Malnutrition
CSB	Corn Soy Blend (renamed to SuperCereal)
ENA	Emergency Nutrition Assessment
EVD	Ebola Virus Disease
FANTA	Food and Nutrition Technical Assistance
FAO	Food and Agriculture Organization
GAM	Global Acute Malnutrition
HAZ	Height for Age in Z-score
HDDS	Household Dietary Diversity Score
IMAM	Integrated Management of Acute Malnutrition
IP	Implementing Partner
IPT	Intermittent Preventive Treatment
IYCF	Infant and Young Child Feeding Practices
JAM	Joint Assessment Mission
LLIN	Long Lasting Insecticidal Net
MAM	Moderate Acute Malnutrition
MNP	Micronutrient Powder
MoHSW	Ministry of Health and Social Welfare
MUAC	Mid-Upper Arm Circumference
NCHS	National Centre for Health Statistics
OP	Operational Partner
OTP	Outpatient Therapeutic Programme
PLW	Pregnant and Lactating Women
PRRO	Protracted Relief and Recovery Operations
SAM	Severe Acute Malnutrition

SENS	Standardised Expanded Nutrition Survey
SFP	Supplementary Feeding Programme
SMART	Standardized Monitoring and Assessment of Relief and Transitions
SNU	Special Nutrition Unit
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
WAZ	Weight for Age in Z-score
WASH	Water, Sanitation and Hygiene
WFP	World Food Programme
WHO	World Health Organisation
WHZ	Weight for Height in Z-score

EXECUTIVE SUMMARY

Introduction

Nutrition surveys were conducted in Bahn, PTP and Little Wlebo camps, which are located in Maryland, Grand Gedeh and Nimba counties lying along the border of Liberia and Côte d'Ivoire. The three camps were hosting close to 29,000 Ivorian refugees including approximately 5,000 children aged below five years[1]. The survey, which was organized by UNHCR in close collaboration with WFP, UNICEF, CARE, AHA and CHTs/MoHSW of the Republic of Liberia was conducted from 7th April to 2nd May 2015. Six modules of the UNHCR SENS, which include Anthropometry and health, anaemia among women and children, infant and young child feeding, food security, water, sanitation and hygiene, and mosquito net for malaria were covered. Findings from the survey were intended for inclusion in the PRRO proposal for the period of 2015/2016 that WFP was preparing for submission to USAID, the only donor which supports general food ration of Ivorian refugees in Liberia.

Objectives

Primary objectives

1. To measure the prevalence of acute malnutrition in children aged 6 – 59 months

2. To measure the prevalence of stunting in children aged 6 – 59 months

3. To measure the prevalence of anaemia in children aged 6 – 59 months and in women of reproductive age between 15 – 49 years (non-pregnant)

4. To determine the coverage of measles vaccination among children aged 9 – 59 months

5. To determine the coverage of vitamin A supplementation received during the last 6 months among children aged 6-59 months

6. To investigate IYCF practices among children aged 0 – 23 months

7. To determine the coverage of ration cards and the duration the general food ration lasts for recipient households

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[1] UNHCR ProGres, February 2015

8. To determine the extent to which negative coping strategies are used by households

9. To assess household dietary diversity

10. To determine the population's access to, and use of, improved water, sanitation and hygiene facilities

11. To determine the ownership of mosquito nets (all types and LLINs) in households

12. To determine the utilisation of mosquito nets (all types and LLINs) by the total population, children 0-59 months and pregnant women

Secondary objectives:

1. To determine the enrolment to outpatient therapeutic feeding and targeted supplementary feeding programmes for children 6 – 59 months

2. To determine enrolment into Antenatal Care clinic and coverage of iron-folic acid supplementation in pregnant women

3. To collate available information on the performance of the food aid system

4. To assess the two-week prevalence of diarrhoea among children aged 6 – 59 months

Methodology

Sample size calculation and sampling

Systematic sampling technique without list was desired for the survey across the three refugee camps. The UNHCR SENS guidelines for refugee populations and SMART methodology were used for planning. Required minimum sample sizes were calculated using ENA for SMART software depending on expected prevalence of acute malnutrition, desired precision, average household size, average under-five children and non-response rate. Random sampling in the ENA for SMART planning page was checked and correction for small population size was applied as population of under-fives in each of the three camps was <10,000[2]. This was done by entering the total population of the particular camp in the "population size" cell of the planning page and checking the "correction small population size". The calculated number of household to be surveyed was 411 to obtain

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[2] UNHCR SENS Pre-module v2, 2013

182 children aged 6 – 59 months in Bahn, 498 to obtain 219 children in PTP and 352 to obtain 206 children in Little Wlebo camp.

A six days training (four days theory and two days standardization test and piloting of data tool) was provided to 12 survey supervisors. They were also trained on how to collect data using mobile phones with pre-installed data collection forms Open Data Kit (ODK collect) apps. A two days training was conducted to 24 measurers divided in six teams of four per team (two for height, one for weight and MUAC and one translator).

Sampling interval was determined by dividing the total number of households in the entire camp to calculated sample size (number of households to be visited). Information on anthropometry and health, haemoglobin concentration in children aged 6 – 59 and feeding practice among children aged 0 – 23 months was collected in every household while Food security, WASH and Mosquito net was surveyed in every other household. If household members were not present in the selected household the survey team revisited the house two times and marked "absent" if not returned until the end of the day. Information was collected only from household in which members consented to participate in the survey. Those who refused were equally respected and appreciated. Collected data was synchronized from mobile phones to the server and downloaded to the desktop on a daily basis throughout the survey period. Plausibility check was performed for data quality control and feedback was provided to team members in the morning before they went to the field. Data cleaning and analysis was done and results were documented as indicated below.

SUMMARY OF KEY FINDINGS

Surveyed area	Bahn	PTP	Little Wlebo	Overall (weighted results)	Classification of public health significance or target (where applicable)
Survey Date	27th April - 2nd May 2015	20th - 25th April 2015	13th - 18th April 2015		
Sample size					
No of HH calculated	411	498	352	1261	
No of HH surveyed	216	354	214	784	
% response	52.6%	71.1%	60.8%	61%	
CHILDREN 6-59 months;					
Acute Malnutrition (WHO 2006 Growth Standards): (n) % (95% CI)					
N	261	358	252	871	Critical if ≥ 15%
Global Acute Malnutrition (GAM)	(5) 1.9% (0.8 - 4.4 95)	(15) 4.2% (2.6- 6.8)	(9) 3.6% (1.9 - 6.6)	3.6%	
Moderate Acute Malnutrition (MAM)	(5) 1.9% (0.8 - 4.4 95)	(15) 4.2% (2.6 - 6.8)	(9) 3.6% (1.9 - 6.6)	3.6%	
Severe Acute Malnutrition (SAM)	(0) 0.0% (0.0 - 1.5)	(0) 0.0% (0.0 - 1.1)	(0) 0% (0.0 - 1.5)	0%	
Oedema	(0) 0.0%	(0) 0.0%	(0) 0.0%	0%	
Mid Upper Arm Circumference (MUAC): (n) % (95% CI)					
N	261	358	252	871	
MUAC <125mm and/or oedema	(2) 0.8% (0.2 - 2.8)	(16) 4.5% (2.8 - 7.1)	(5) 2.0% (0.9 - 4.6)	3.1%	
MUAC 115-124 mm	(2) 0.8% (0.2 - 2.8)	(16) 4.5% (2.8 - 7.1)	(5) 2.0% (0.9 - 4.6)	3.1%	
MUAC <115 mm and/or oedema	(0) 0.0% (0.0 - 1.5)	(0) 0.0% (0.0 - 1.1)	(0) 0.0% (0.0 - 1.5)	0%	
Stunting (WHO 2006 Growth Standards): Children aged 6 - 59 months (n) % (95% CI)					

N	261	358	252	871	
Total Stunting	(99) 37.9% (32.3-44.0)	(193) 53.9% (48.7-59.0)	(81) 32.1% (32.1-42.9)	44.6%	**Critical if ≥ 40%**
Severe Stunting	(39) 14.9% (11.1-19.8)	(76) 21.2% (17.3-25.8)	(28) 11.1% (10.0-17.6)	17.1%	
Stunting (WHO 2006 Growth Standards): Children aged 6 - 23 months (n) % (95% CI)					
N	82	139	103	324	
Total Stunting	(23) 28.1%	(64) 46.1%	(24) 23.3%	36.2%	**Critical if ≥ 40%**
Severe Stunting	(9) 11.0%	(20) 14.4%	(8) 7.8%	11.9%	
Stunting (WHO 2006 Growth Standards): Children aged 24 - 59 months (n) % (95% CI)					
N	179	219	149	547	
Total Stunting	(76) 42.4%	(129) 58.9%	(57) 38.3%	49.9%	**Critical if ≥ 40%**
Severe Stunting	(30) 16.8%	(56) 25.6%	(20) 13.4%	20.4%	
Programme coverage: (n/N); % (95% CI)					
Measles vaccination with card or recall (9-59 months)	(239/267); 89.5%(85.2-92.9)	(413/429); 96.3% (93.9 - 97.8)	(202/249); 81.1% (75.7 - 85.8)	90.6%	**Target of ≥ 95%**
Vitamin A supplementation within past 6 months with card or recall	(266/281); 94.7%(91.3-97.0)	(441/465); 94.8% (92.3-96.6)	(202/273); 74.0% (68.4-79.10)	88.7%	**Target of ≥ 90%**
Diarrhoea: (n/N); % (95% CI)					
Diarrhoea in last 2 weeks	(29/273);10.6% (7.2 - 14.9)	(78/453); 17.2% (13.9 - 21.1)	(17/243); 7.0% (4.1-11.0)		
Anaemia in children aged 6 - 59 months: (n) % (95% CI)					
N	281	465	272	1018	
Total Anaemia (Hb <11 g/dl)	(138) 49.1% (43.1 - 55.1)	(364) 78.3% (74.2 - 81.9)	(157) 57.7% (51.6 - 63.7)	67.0%	**High if ≥ 40%**
Mild (Hb 10-10.9)	(66) 23.5% (18.7 - 28.9)	(144) 31.0% (26.8 - 35.4)	(84) 30.9% (25.4-36.7)	29.4%	
Moderate (Hb 7-9.9)	(71) 25.3% (20.3 - 30.8)	(213) 45.8% (41.2 -	(71) 26.1% (21.0 -	36.3%	

		50.5)	31.7)		
Severe (Hb <7)	(1) 0.4% (0.0 - 2.0)	(7) 1.5% (0.7 - 3.2)	(2) 0.7% (0.1 - 2.6)	1.1%	
Anaemia in children aged 6 - 23 months: (n) % (95% CI)					
N	87	158	110	355	
Total Anaemia (Hb <11 g/dl)	(44) 50.6% (39.6 - 61.5)	(112) 70.9% (63.1 - 77.8)	(68) 61.8% (52.1 - 70.9)	64.6%	**High if ≥ 40%**
Mild (Hb 10-10.9)	(19) 21.8 (13.7 - 32.0)	(42) 26.6% (19.9 - 34.2)	(34) 30.9% (22.4 - 40.4)	27.0%	
Moderate (Hb 7-9.9)	(25) 28.7% (19.5 - 39.4)	(69) 43.7% (35.8 - 51.8)	(34) 30.9% (22.4 - 40.4)	37.2%	
Severe (Hb <7)	(0) 0.0% (0.0 - 4.2)	(1) 0.6% (0.0 - 3.5)	(0) 0.0% (0.0 - 0.0)	0.3%	
Anaemia in children aged 24 - 59 months: (n) % (95% CI)					
N	194	307	162	663	
Total Anaemia (Hb <11 g/dl)	(94) 48.5% 41.2 - 55.7	(252) 82.1% 77.3 - 86.2	(89) 54.9% (46.9 - 62.8)	68.0%	**High if ≥ 40%**
Mild (Hb 10-10.9)	(47) 24.2% (18.4 - 30.9)	(102) 33.2% (28.0 - 38.8)	(50) 30.9% (23.9 - 38.6)	30.9%	
Moderate (Hb 7-9.9)	(46) 23.7% (17.9 - 30.3)	(144) 46.9% (41.2 - 52.7)	(37) 22.8% (16.6 - 30.1)	35.6%	
Severe (Hb <7)	(1) 0.5% (0.0 - 2.8)	(6) 2.0% (0.8 - 4.4)	(2) 1.2% (0.1 - 4.4)	1.5%	
CHILDREN 0-23 months					
IYCF indicators: (n/N); % (95% CI)					
Timely initiation of breastfeeding	(88/107);82.2% (73.7 - 89.0)	(111/183); 60.7 (53.2 - 67.8)	(85/143); 59.4% (50.9 - 67.6)	64.2%	
Exclusive breastfeeding under 6 months	(17/20); 85.0% (62.1 - 96.8)	(16/20); 80.0% (56.3 - 94.3)	(22/31); 71.0% (52.0 - 85.8)	78.3%	
Consumption of iron-rich or iron-fortified foods	(73/81); 90.1% (81.5 - 95.6)	(138/149); 92.6(87.2 - 96.3)	(74/111); 89.2% (80.4 - 94.9)	91.2%	
Bottle feeding	(13/106); 12.3% (6.7 - 20.1)	(35/180); 19.4% (19.9 - 26.0)	(24/139); 17.3% (11.4 - 24.6)	17.5%	
WOMEN 15-49 years					

Anaemia (non-pregnant)					
N	**114**	**167**	**134**	**415**	
Total Anaemia (Hb <12 g/dl)	(48) 42.1% (32.9 - 51.7)	(117) 70.1% (62.5 - 76.9)	(80) 59.7% (50.9 - 68.1)	62.0%	**High if ≥ 40%**
Mild (Hb 11-11.9)	(25) 21.9% (14.7 - 30.6)	(50) 29.9% (23.1 - 37.5)	(54) 40.3% (31.9 - 49.1)	31.5%	
Moderate (Hb 8-10.9)	(23) 20.2% (13.2 - 28.7)	(65) 38.9% (31.5 - 46.8)	(24) 17.9% (11.8 - 25.5)	29.4%	
Severe (Hb <8)	(0) 0.0%	(2) 1.2% (0.1 - 4.3)	(2) 1.5% (0.2 - 5.3)	1.1%	
FOOD SECURITY					
Food distribution					
Proportion of households with a ration card	(123/123); 100% (100 - 100)	(185/186); 99.5% (97.0 - 100)	(132/136); 97.1% (92.6 - 99.2)	98.9%	
Average number of days general food ration lasts out of 30 days (mean ± SD)	17.8 ± 4.7	18.8 ± 5.4	19.7 ± 8.9	18.9	
Negative household coping strategies					
Proportion of households reporting using none of the negative coping strategies over the past month	(3/122);2.5% (0.5 - 7.0)	(29/184);15.8% (10.8 - 21.8)	(3/130); 2.3% (0.5 - 6.6)	9.4%	**Critical Range: ≤49%**
Household dietary diversity					
Average HDDS (mean ± SD)	9.2 ± 2.2	9.1 ± 2.2	8.4 ± 2.9	8.9	**Max HDDS is 12**
WASH					
Water quality					
Proportion of households using improved drinking water source	(159/159);100.0% (100-100)	(185/185);100% (100.0 - 100.0)	(130/130); 100% (100.0 - 100.0)	100.0%	
Water quantity					
Proportion of households that use:					
N	**122**	**185**	**130**	**437**	
≥ 20 lpppd	(54); 44.3% (35.3 - 53.5)	(64); 34.6% (27,8 - 41.9)	(62); 47.7% (38.9 - 56.6)	40.2%	**Average quantity of**

15 - <20 lpppd	(22); 18.0% (11.7 - 26.0)	(37); 20.0% (14.5 - 26.5)	(27); 20.8% (14.2 - 28.8)	19.9%	**water available per person / day ≥ 20 litres**
<15 lpppd	(46); 37.7% (29.1 - 46.9)	(84); 45.4% (38.1 - 52.9)	(41); 31.5% (23.7 - 40.3)	39.9%	
Satisfaction with drinking water supply					
Proportion of households that say they are satisfied with drinking water supply	(117/122); 95.9% (90.7 - 98.7)	(177/185); 95.7% (91.7 - 98.1)	(129/130); 99.2% (95.8 - 100.0)	96.8%	
Safe excreta disposal					
Proportion of households that use:					
N	**109**	**179**	**127**	**415**	
An improved excreta disposal facility (improved toilet facility, 1 household)	(4); 3.7% (1.0 - 9.1)	(2); 1.1%(0.1 - 4.0)	(7); 5.5% (2.2 - 11.0)	2.9%	
A shared family toilet (improved toilet facility, 2 households)	(2); 1.8% (0.2 - 6.5)	(1); 0.6% (0.0 - 3.1)	(23); 18.1% (11.8 - 25.9)	5.9%	
A communal toilet (improved toilet facility, 3 households or more)	(73); 67.0% (57.3 - 75.7)	(114); 63.7% (56.2 - 70.7)	(66); 52.0% (42.9 - 60.9)	60.9%	
An unimproved toilet (unimproved toilet facility or public toilet)	(30); 27.5% (19.4 - 36.9)	(62); 34.6% (27.7 - 42.1)	(31); 24.4% (17.2 - 32.8)	30.3%	
MOSQUITO NET COVERAGE					
Mosquito net ownership					
Proportion of households owning at least one LLIN	(70/120); 58.3% (49.0 - 67.3)	(102/187); 54.5% (47.1 - 61.8)	(65/135); 48.1% (39.5 - 56.9)	53.3%	**Target of >80%**
Average number of persons per LLIN (mean)	5.9	6.9	6.8	6.7	**2 persons per LLIN**
Mosquito net utilization					
Proportion of household members (all ages) who slept under an LLIN	(289/651); 44.4%	(405/981); 41.3%	(257/651); 39.5%	41.3%	
Proportion of children 0-59 months who slept under an LLIN	(70/143); 52.2%	(111/253); 43.9%	(87/135); 64.4%	51.4%	
Proportion of pregnant women who slept under an LLIN	(6/18); 33.3%	(12/28); 42.9%	(6/17); 35.3%	38.9%	

Interpretation of results

Response rate was relatively low compared to the calculated figure apparently contributed by fear of Ebola in some of respondents. Some shelters were found to be closed and when available some respondents were not ready to cooperate with the survey teams in fear of what they called "Ebola vaccines" that they thought survey teams were carrying to infect their children. It should be noted that the survey was conducted almost at the end of the second wave of Ebola Virus Disease (EVD), a few weeks before declaration of "Liberia Ebola Free" by the World Health Organization. Despite the above challenges the number of surveyed children when compared to calculated figures was surpassed in each of the three camps – 261 vs. 182 in Bahn, 358 vs. 219 in PTP and 252 vs. 206 in Little Wlebo.

The prevalence of GAM remained within UNHCR and WHO standards. However, the weighted prevalence increased to 3.6% in 2015 from 2.7% recorded in 2013. Total stunting was 44.6% in children aged 6 – 59 months, 36% in children aged 6 – 23 and 50% among children aged 24 – 59 months. The prevalence of stunting was above the WHO cut-off point of ≤20% in all the three camps.

Vitamin A and Measles coverage has significantly increased between 2013 and 2015. The overall coverage has increased from 55% to 91% and from 59% to 89% for measles and vitamin A respectively. However, the coverage was below the level of ≥95% and ≥90% recommended by UNHCR and WHO.

The overall prevalence of anaemia in children aged 6 – 59 was 67%, decreased from 78% in 2013. The change might have been contributed by implementation of BSFP in children aged 6 – 23 months which started in July 2014, an interim measure aimed to combat anaemia and stunting in the above mentioned target group. This is also backed up by consumption of iron rich food which increased from 4% to above 90% mainly because of the blanket distribution of Nutributter® to younger children. Despite the decrease, overall prevalence of anaemia remained above 60%, classified as "public health emergency" by the WHO.

Prevalence of anaemia in women of child bearing age generally increased from 51% to 62% when the two surveys are compared. Blanket supplementary feeding to pregnant and

lactating women from the second trimester to six months post-delivery was introduced in December 2013 but stopped six months later because of inadequate resources. Other interventions including social mobilization of using mosquito net, antenatal care services during pregnancy and change of behaviour on eating patterns continued.

Household dietary diversity score (HDDS) slightly increased compared to the 2013 survey. Results however, indicated that over 90% of surveyed families were using negative coping strategies (begging, reduced quantity or frequency of meal, borrowing cash with conditions of interest on return, selling of non-food items etc.) to cover the gap of depleted food from general ration.

The average water consumption at household level was 19.9 liters per person per day (LPPPD), which is close to the minimum recommended level of water supply of ≥20 LPPPD according to UNHCR standards. This standard describes the overall quantity of water distributed to refugees and not the quantity of water consumed by the household, which may be less than the quantity that has been distributed due to several reasons.[3] The proportion of household using unimproved toilet was 30% compared to 22% in 2013. Decommissioning of filled latrines and replacement of new ones continued to be a challenge mainly due to funding constraints.

Ownership of Long Lasting Insecticide Mosquito net (LLIN) was 53.3% compared ≥80% UNHCR target. The average number of persons per LLIN was 6.7 compared to 2 persons recommended by UNHCR, and hence, low utilization; 51% in children, 38.9% among pregnant women and 41% in all ages. Despite the distribution of about 13,000 mosquito nets[4] in 2014, retention is still a major challenge among refugee communities. During the survey, some respondents associated selling of mosquito net with food depletion at the household level.

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[3] Global Strategy for Public Health (UNHCR, 2014)
[4] Camp reports (UNHCR, 2014)

Conclusions

The prevalence of global acute malnutrition remained within UNHCR and WHO standards despite the hit of EVD in Liberia. However, the maximum confidence limits of GAM in the two camps of PTP and Little Wlebo were above of the WHO recommendation of <5% indicating a possibility of poor nutritional status. In 2014, EVD caused high tension among the refugee community leading to reduced movements within and outside the camps thus, hampering positive coping strategies that refugees could embark on to cover the gap of food aid received from the general ration. There was no significant change in prevalence of stunting in children aged 6 – 59 months. The level remained >40%, categorised as "very high" by WHO.

Despite the decrease of anaemia in children aged 6 – 59 months, prevalence in both groups (children and women) remained at "critical" level of >60%, classified as "Public Health Emergency" according to WHO. Older children aged 24 – 59 months were the most affected group compared to younger children aged 6 – 23 months. The latter group was targeted for blanket supplementary feeding program since July 2014, while older children were not part of the program because of inadequate resources.

Households were facing serious food insecurity that forced refugees to embark on negative coping strategies including selling of non-food items and harmful activities. Only 9% of the surveyed households did not use any of the negative coping strategies.

There was an increase in the proportion of households using unimproved latrines in the camps due to insufficient sanitation facilities. The use of unimproved latrines, which include open defecation and utilizing nearby bushes, may cause serious outbreaks leading to loss of refugee lives.

Ownership and utilization of mosquito nets was far below the UNHCR standards and may highly contribute to contracting malaria among the refugee community, and hence, hampering efforts to contain the critical levels of anaemia.

Recommendations and priorities

Immediate term:

1. UNHCR in collaboration with WFP and UNICEF to continue providing nutrient supplements to children aged between 6 – 23 months, as it has already shown a significant decrease of prevalence of anaemia in Bahn and Little Wlebo camps mainly due to provision of Nutributter®. Where possible children aged between 24 – 59 months should be included.

2. Medical supplies including micro-cuvettes, safety lancets, etc. to be availed all the time at camp clinics for identification and monitoring of anaemia cases.

3. WFP to appeal to donors to maintain full ration of at least 2100kcal per person per day with recommended level of micronutrients especially iron, vit A, B1, B2 & C in the general food ration and ensure constant supply.

4. On-site food basket and post food distribution monitoring mechanisms to be strengthened and regularly conducted to refugees in all the three camps.

5. WFP and UNHCR to resume blanket supplementary feeding to pregnant and lactating women from the second trimester until 6 months post-delivery.

6. Livelihood and health partners to continue providing awareness to refugee community on proper use of the supplementary foods including consumption of green leafy vegetables.

7. UNHCR to allocate budget, procure and supply sufficient LLIN to cover the gap of about 47% deficit and reduce the current average of 6.7 persons sleeping under one LLIN to 2 persons in refugee communities.

8. WASH and health partners to continue sensitizing the communities on importance of LLIN to ensure high retention and proper utilization.

9. UNHCR, WASH partner and LRRRC to continue promoting refugee community to engage and participate in construction of sanitation facilities. This would increase coverage and reduce the proportion of refugees that use unimproved latrines including open defecation and bushes around them.

Medium term:

1. UNHCR in collaboration with WFP and UNICEF to continue supplying Ready-to-Use nutrition items for nutrition programmes in refugee camps.

2. Health partner with the support from UNHCR and UNICEF to continue promoting IYCF practices in children aged 0 – 23 months on optimal feeding including early initiation of newborns to breast milk, exclusive breastfeeding until 6 months, continued breastfeeding together with complementary foods until two years.

3. UNHCR to allocate funds for improvement of sanitation facilities coverage and maintenance including decommissioning of filled latrines and replacement with new ones.

4. Food security at household level to be improved through livelihood activities including small scale farming, vocational skills, empowering petty traders and women groups for income-generating activities. This would improve not only the household dietary diversity at household level but also nutritional status of women and children as well as retention and utilisation of mosquito nets thereby reducing the burden of malaria and anaemia.

5. Health partners in collaboration with UNHCR to continue imparting knowledge to healthcare providers through formal and informal trainings on anaemia, IYCF, malaria etc.

6. UNHCR and health partner in collaboration with CHT to investigate possible barriers of early initiation to breastfeeding among women upon delivery.

Long term:

1. UNHCR to consider the next SENS in 2016 for continued monitoring of trends and planning of interventions in the refugee camps accordingly.

1. INTRODUCTION

1.1 Geographic description of survey area

Liberia is one among the West African Countries which borders with Sierra Leone to its west, Guinea to its north, and Côte d'Ivoire (CDI) to its east. The country has fifteen counties of which Nimba, Grand Gedeh, River Gee and Maryland are located in the eastern and south eastern parts are involved. The area lies along with part of Cestos River and then Cavalla River flowing south to form more than three quarters of the Liberia–CDI border before it enters the Atlantic Ocean. In November 2010, thousands of Ivorian fled their country, crossing the border into Liberia following the civil war resulted from the second round of presidential election in CDI. In September 2011, around 140,000 Ivoirians were registered as refugees in Liberia and August in 2012 close to 35,000 were living in refugee camps namely Bahn, Dougee, Solo, PTP and Little Wlebo.

1.2 Description of the population

At the beginning of 2015, three camps of the five opened in 2012 were operational (Bahn, PTP and Little Wlebo – after the further closure of Dougee and Solo camps following repatriation of a number of refugees back to CDI. In February 2015 Liberia was hosting approximately 38,109 Ivorian refugees whom 29,038 (77.2%) were residing in camps and 9,071 (22.8%) in host communities. At the time of the survey the number of refugees living in the camps was 5,257 in Bahn, 15,300 in PTP and 8,481 in Little Wlebo in Nimba, Grand Gedeh and Maryland County respectively. The total number of underfives was 5,070 including 826 in Bahn, 2,676 in PTP and 1,568 Wlittle Wlebo camp[5].

There are a number of ethnic groups along the swathes of Liberia and CDI, which accelerates interaction between people living in the border belt. These include Kru (Klao) who lives along the southern coast bordering CDI, the Grebo lives along the coast in Eastern Liberia, on both sides of the Cavalla River, which serves as a border between Liberia and CDI. Others are Grebo migrated to Liberia during the sixteenth century and the Krahn lives in Nimba, Grand Gedeh and Sinoe Counties, along the border with CDI[6].

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[5] UNHCR weekly notes, BO Monrovia, 1 – 7th February 2015
[6] World Directory of Minorities and Indigenous Peoples

1.3 Food security situation

WFP and UNHCR continued providing in-kind food distribution to refugees in four camps from January to March and in three camps from April to December 2014. Solo camp was closed in March 2014 following repatriation of refugees back to CDI and the residual caseload was relocated into PTP camp in Grand Gedeh County.

The WFP food pipeline was not stable, resulting in a reduction of the ration in the refugee food basket. The annual average ration received was 78% of WHO (2100kcal per person per day) recommended level. Micronutrients remained inadequate throughout the year distributed at an average of 0% Vit C, 13% Riboflavin, 21% Vit A and Iron at 41% of the daily recommended allowance. Supercereal plus, that contains most of the micronutrients was permanently removed from the refugee food basket following JAM recommendations in 2012. Vegetable oil, which is fortified with Vitamin A that prevents night blindness in children was included in only five out of twelve food distributions conducted over the year.

Figure 1:   Quarterly percentages of rations received against the target for 2014
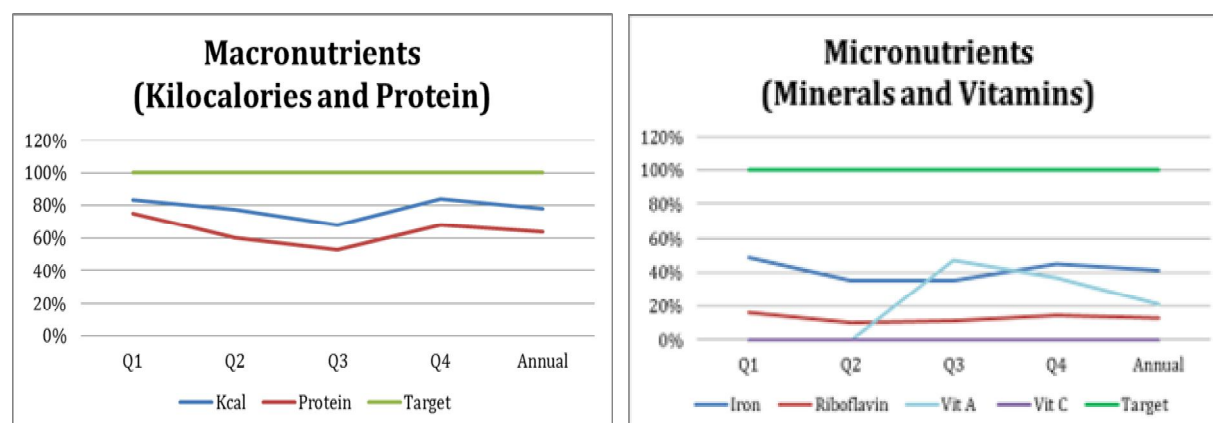
Throughout of the first quarter of 2015, refugees were receiving full ration in terms of macronutrients while micronutrient continued to be distributed at lower amount. Monthly distributed ration was 12kg rice, 1.95kg pulses, 1.05kg vegetable oil and 0.15kg salt, equal to 15.15kg per person. The above ration was providing 1968kcal (94%), 41g of protein (78%), 12.1mg Iron (55%), 315µgRE Vit A (63%), 0.26mg riboflavin (19%), and 0mg Vit C (0%) per person per day. The recommended daily allowance per person is 2100kcal of energy, 52.5g of protein, 22mg of iron, 500µgRE of vitamin A, 1.4mg of riboflavin and 28mg of vitamin C.

1.4 Health service

Refugees continued enjoying basic and comprehensive health services in the camps and to the secondary and tertiary health care centers through referral. However, referral remains a major challenge due to the weak public health infrastructure in the country. Services provided as comprehensive primary health care in the camps include curative, preventive, nutrition, HIV/AIDS and reproductive health. African Humanitarian Action (AHA) was implementing the health program in Bahn while International Rescue Committee (IRC) was in PTP and Little Wlebo camps in 2014. AHA is covering the three camps since the beginning of 2015.

According to the Health Information System report from January to December 2014, the total number of consultations in camp clinics was 35,700 of which 23% was confirmed and 9% suspected malaria cases. Crude mortality rate (CMR) was 0.1 deaths/1000/month, under-fives mortality rate (U5MR) of 0.2 deaths/1000/month and Neonatal Mortality Rate (NNMR) of 6.9 deaths/1000livebirths. The three indicators were all within the recommended UNHCR standard of <0.75 deaths/1000/month for CMR, <1.5 deaths/1000/month for U5MR, and <20/1000livebirths for NNMR. According to HIS coverage for long-lasting insecticide treated net (LLIN) was 0.9 person/LLIN while UNHCR standard is 2 person/LLIN implying that coverage was within the recommended range.

The number of consultations in camp clinics was significantly reduced due to outbreak of EVD from 500/week to 240/week in Bahn clinic for example, the major reason being fear of transmission of EVD from contacts with clinic staff or other patients. The number of referral cases had also decreased and was limited only to emergency cases. Referrals for patients with chronic conditions were halted because of a severe shortage of clinical staff and medical supplies in government health facilities and to limit hospital consultations in order to mitigate the risk of transmission of Ebola. However, the refugee camp clinics remained fully operational with adequate number of staff.

1.5 Water, Sanitation and Hygiene

In 2014 WASH services were implemented by CARE International in PTP and Bahn and by the Danish Refugee Council (DRC) in Little Wlebo camp. DRC thereafter pulled out at the

end of the year and CARE took over in Little Wlebo, thus, running the services in the three camps.

Throughout 2014 and the first quarter of 2015, refugees in the camps had access to potable water as per the minimum SPHERE standards. In the first and second quarter of 2014 the average water consumption was 19.9 liters / person / day, ranging from 19.0 in Little Wlebo, 19.3 in PTP and 21.6 liters per /person /day in Bahn camp. Later, water consumption was increased to 26.6 liters/person/day due to hand hygiene as a preventive measure for EVD, which also resulted in increased fuel consumption due to increased water pumping hours.

1.6 Nutrition

In 2014, nutritional screening for under-fives continued through the routine measurement of mid upper arm circumference (MUAC) in all camps. Screenings were carried out in the refugee community and health facilities at out-patient department (OPD) and maternal and child clinics (MCH) through outreach team and health facility-based staffs respectively. Treatment of acute malnutrition was carried out in supplementary feeding programmes (SFP) and Outpatient care (OTP) in all the three camps through provision of ready-to-use nutrition items (Plumpy'Sup® and Plumpy'Nut®). Feeding programme performance indicators which include recovery rates, death rates and default rates for both SFP and OTP were within the recommended WHO standards. However, children seemed to stay longer in both programmes when compared to recommended length of stay. Programme coverage was also below the recommended level in both SFP and OTP, which was probably linked to the EVD hit in Liberia in the first three months and last six months of 2014.

Table 1: Feeding Programme Performance Indicators

Programme	Indicator	Bahn	PTP	LWC	Average	Standard
SFP	New admissions	60	159	91	310	N/A
	Recovery rate	91.2%	96.9%	98%	95.4%	>75%
	Death rate	0.0%	0.4%	0.0%	0.1%	<3%
	Default rate	0%	2.2%	0%	0.7%	<15%
	Programme Coverage (U5)	107%	49%	45%	67.0%	>90%

	Mean length of stay (weeks)	8.3	12.3	18.8	13.1	<12
OTP/CTC	Recovery rate	92.1%	97.9%	95%	95.0%	>75%
	Death rate	0%	0%	2.5%	0.8%	<10%
	Default rate	2.7%	2.1%	0%	1.6%	<15%
	Programme Coverage (U5)	20%	21%	87%	42.7%	>90%
	Mean length of stay (days)	38.3	30.4	54.8	41.2	<60
	Average wt gain (g/kg/day)	5.4	2.9	5.5	4.6	>4

In 2014, several interventions were carried out to address anaemia and stunting as it was revealed in the 2013 nutrition survey. Prevalence of anaemia among children aged 6 – 23 months was 82% while in children aged 6 – 59 months it was 78% and 50% among women of child bearing age. Prevalence of stunting (chronic malnutrition) was 43% compared to 20% recommended by WHO. Among recommendations made during the 2013 nutrition survey was implementation of blanket supplementary feeding programme (BSFP) children aged 6 – 23 months, expectant and lactating mothers from first trimester to six months post-delivery. UNHCR and WFP carried out BSFP to expectant and lactating women for about six months from December 2013 and the project was halted following depletion of resources from WFP. The vulnerable group was targeted for pre-mix of CSB 200g, fortified vegetable oil 20g and sugar 15g per person per day which provides around 1000kcal, 36g protein and 32g fat collected from the camp clinic on a weekly basis.

To address the critical levels of anaemia and stunting among children aged 6 – 23 months, UNHCR procured 7.5MT of Nutributter® for blanket supplementation of the targeted group. The project started in July 2014 and was operational even during data collection of 2015 nutrition survey. The UNHCR operational guidance on use of special nutritional products to reduce micronutrient deficiencies and malnutrition in refugee population was used to set-up the project. Monthly monitoring report showed significant improvement of the level of haemoglobin in children enrolled in the programme.

Distribution of LLIN was conducted in all three camps, aiming to reduce the high prevalence of malaria as it also contributes to depletion of haemoglobin level in the blood. The 2014 camp reports indicated over 13,000 mosquito nets distributed. The last nutrition survey conducted in 2013 indicates that while ownership of ITN was 78%, utilization rate was as low as 66% compared to 80% recommended by WHO. In view of the above, UNHCR through partners conducted a number of sensitization meetings to refugee communities to ensure that retention and utilization rates are improved.

Comprehensive maternal and child care services including sensitization of women of child bearing age to attend the clinic as soon as they conceive; provision of quality services to all pregnant women (antenatal care) and lactating women attending health clinics; routine provision of intermittent presumptive treatment (IPT) ferrous sulphate and folic acid to pregnant women and vitamin A to lactating mothers; promoting optimal breastfeeding and immunization; and strengthening existing nutrition programmes are among the key activities conducted.

Adventist Development and Relief Agency (ADRA) was contracted by UNHCR specifically to carry out livelihood activities including agriculture and vocational skills with major focus of enhancing food supplementation and income generation, and thus, improving food security among refugee community. Promotion of home backyard gardening for green leafy vegetables, small scale poultry and animal husbandry was targeted to improve household food diversity score (HDDS) from 6.6 revealed in the 2013 nutrition to 12 recommended by UNHCR.

In antagonism to a number of efforts invested to improve health and nutrition status of women and children, two waves of Ebola Virus Disease (EVD) outbreak hit Liberia communities from January to March and June to December 2014. Although EVD did not touch a single individual residing in the camps, presence of the deadly virus in the host community halted movements of refugees and thus impacted their initiatives on positive coping strategies to improve household food security.

This nutrition survey, therefore, aimed to assess health and nutrition situation of refugees in view of the invested resources against pertained barriers, and thus, generate information which would provide a roadmap to help better planning to improve health and nutritional status of the UNHCR people of concern.

2. OBJECTIVES

2.1 Primary objectives

1. To measure the prevalence of acute malnutrition in children aged 6 – 59 months
2. To measure the prevalence of stunting in children aged 6 – 59 months
3. To measure the prevalence of anaemia in children aged 6 – 59 months and in women of reproductive age between 15 – 49 years (non-pregnant)
4. To determine the coverage of measles vaccination among children aged 9 – 59 months
5. To determine the coverage of vitamin A supplementation received during the last 6 months among children aged 6-59 months
6. To investigate IYCF practices among children aged 0 – 23 months
7. To determine the coverage of ration cards and the duration the general food ration lasts for recipient households
8. To determine the extent to which negative coping strategies are used by households
9. To assess household dietary diversity
10. To determine the population's access to, and use of, improved water, sanitation and hygiene facilities
11. To determine the ownership of mosquito nets (all types and LLINs) in households
12. To determine the utilisation of mosquito nets (all types and LLINs) by the total population, children 0-59 months and pregnant women

2.2 Secondary objectives:

1. To determine the coverage of outpatient therapeutic feeding and targeted supplementary feeding programmes for children 6 – 59 months

2. To determine enrolment into Antenatal Care clinic and coverage of iron-folic acid supplementation in pregnant women

3. To collate available information on the performance of the food aid system

4. To assess the two-week prevalence of diarrhoea among children aged 6 – 59 months

3. METHODOLOGY

3.1 Sample size

A systematic sampling technique without list was applied in this survey. UNHCR SENS guidelines for refugee populations (version2, 2013) and the Standardized Monitoring and Assessment of Relief and Transitions (SMART) methodology version 2 released on 11th January 2015 was used to plan the required sample size. ENA for SMART software was used for calculation of the minimum sample size required for each camp.

Despite that weighted prevalence of GAM was 2.7% in the 2013 survey, the hit of EVD in Liberia was presumed to have negatively affected nutritional status of under-fives and hence, expected prevalence of acute malnutrition was elevated and set at 6% in all camps. During sample size calculation precision of 3% was desired, non-response and absentees was set at 10% bearing in mind of EVD outbreak in Liberia. Average household size and percentage of under-fives was considered from individual camp based on the 2013 nutrition survey. Correction for small population size was applied during sample size calculation given the population of under-fives is <10,000[7].

The table below shows calculated sample size by individual camp based on the population figure extracted from ProGres as of 1st February 2015.

Table 2: Sample size calculations

Description	Bahn	PTP	LWC	Total
Expected prevalence, %	6	6	6	6
Desired precision, +/-%	3.0	3.0	3.0	3.0
Total households (ProGres)	1,504	4,869	2,161	8,534
Total population	5,288	15,300	8,495	29,083
Total population under 5	826	2,676	1,568	5,070
Average household size	3.5	3.1	3.9	3.5
% population under five	15.6	17.5	18.5	17.2
% non-response households	10	10	10	10
Number of children to be included per camp	182	219	206	607
Number of hh to be included per camp	411	498	352	1,261
Sampling interval	4	10	6	7

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[7] UNHCR SENS Pre-module v2, 2013

Six modules of the UNHCR SENS; Anthropometric and health, Anaemia, Infant and young children feeding, Food security, WASH and Mosquito net coverage were covered during the survey. The guideline was also used to determine whether a full or sub-sample of the above calculated household were to be visited in reference to systematic sampling technique. **See annex 4**

3.2 Sampling procedure: selecting households and individuals

Households were selected based on sampling interval but also depending on whether the modules requires full or sub-sample. The child questionnaire which sought information from children aged from 0 – 59 months was administered in every household while anaemia for women, food security, WASH and mosquito net was administered in every-other household. Team members were guided by the control sheets of which households to be skipped and which one should all the questionnaires administered. Households with odd numbers were interviewed for all information while those with even number were interviewed with only a child questionnaire.

In each particular camp, blocks were listed with corresponding number of households. The number of households surveyed by one team was determined by the total number of households in that particular block. Each team was assigned the number of households to be surveyed according to calculated sampling interval. Team members walked to the particular block and determined which corner of the block and the direction to take. Pieces of paper were cut and assigned numbers equivalent to calculated sampling interval. The folded pieces were mixed and spread and a team member was asked to pick one folded piece of paper and loudly read the number which determines the first household to be selected. Team leader introduced its members in each of selected household and asked the head of household to consent participation in the survey. If consented, further question on whether there was a child aged below 5years and/or woman aged 15-49 year belongs to that particular household was asked. All children and women in the household who are eligible were surveyed. If no targeted children or women in any selected household, the household was marked "no eligible sample" on the household control sheet but still included in the questionnaire and were not replaced in any case. In the second household only modules allowable for full sample were administered (anthropometry and health,

anaemia in children and IYCF). Anaemia in women, Food security, WASH and Mosquito net questionnaires were skipped and administered household number three, five etc. If there was no respondent in a selected house at the time of survey, the household was revisited the same day. If in that same day still was difficult to have information the household was counted and marked "absent" in the questionnaire and control sheet, and no replacement of that particular household was allowed.

3.3 Questionnaire and measurement methods

3.3.1 Questionnaire

The standard UNHCR SENS global questionnaires were used with local adaptations to the Liberian context. The five electronic forms used on mobile phones (child, women, food security, WASH and mosquito net) were developed by CartONG in English with alternative of changing the language to French and sent to the field. The UNHCR Associate Nutrition Officer uploaded the forms in ODK collect apps in the fourteen Lonestar mobile phones through pre-installed server in one of the laptop which was used over the period of data collection. The fourteen mobile phones were assigned two per team for six teams and two were reserved as backup just in case one was not functioning. Modules covered were as shown below;

SENS Modules 1-2: Children 6-59 months – Anthropometric status, oedema, enrolment in selective feeding programmes, immunization (measles), vitamin A supplementation in the last six months, morbidity from diarrhoea in past two weeks, haemoglobin level.

SENS Module 2: Women 15-49 years – Pregnancy status, coverage of antenatal services including iron-folic acid pills for pregnant women and haemoglobin assessment for non-pregnant women.

SENS Module 3: Children 0-23 months – Questions on infant and young children feeding practices.

SENS Module 4: Food Security – Access and use of the general food ration (GFR), negative coping strategies and household food dietary diversity using the food consumption score.

SENS Module 5: Water, sanitation and hygiene – Access to improved drinking water

source, storage of water, quantity of water used per household, satisfaction with the water supply, type and quality of excreta disposal facilities in use and safe disposal of young children's stools.

SENS Module 6: Mosquito Net Coverage – Ownership of mosquito nets and utilization of nets of all types including long-lasting insecticidal net (LLIN)

There was one translator in each team to ensure communication between the team leader/members and respondent. Questions to respondents were asked in either French or dialects and answers were recorded in English in the mobile phones. Questionnaires were piloted in refugee community prior to data collection in the first camp and where applicable adjustments were made.

3.3.2 Measurement methods

Household level indicators

Food security, WASH and Mosquito net: The questionnaire was based on the global SENS questionnaires.

Individual level indicators

Sex of children: Gender was recorded as male or female.

Birth date or age in months for children 0-59 months: The exact date of birth (day, month, year) was recorded from either a child health card or birth notification if available. If no reliable proof of age was available, age was estimated in months using a local event calendar or by comparing and was recorded in months on the mobile phone. If the child's age could absolutely not be determined by using a local events calendar or by probing, the child's length/height was measured and a cut off between 65 and 110cm was used for inclusion.

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

Weight of children 6-59 months: Measurements were taken to the nearest 100 grams using an electronic scale (SECA scale 877). No wooden board were used to stabilise scale on the ground since they had adjustment knob to stabilize themselves. Children were undressed during weighing although where necessary, light undergarments were allowed.

The double-weighing technique was used to weigh young children unable to stand on their own or unable to understand instructions not to move while on the scale. Each team had one scale and there were two more standby scales for backup.

Height/Length of children 6-59 months: Children's height/length was taken to the closest millimetre using a wooden height/length measuring board. Age was used to decide on whether a child should be measured lying down (length) or standing up (height). Children less than two years were measured lying down, while those above or equal to two years were measured standing up.

Oedema in children 6-59 months: The presence of bilateral oedema was determined by applying gentle thumb pressure on to the tops of both feet of the child for three seconds. The time was estimated by counting 1001, 1002 and 1003 while applying gentle thumb pressure on the feet. If a shallow indent remained in both feet, oedema was recorded as present. It was agreed by all teams to call survey supervisors for verification of the case before it is recorded in the questionnaire.

MUAC of children 6-59 months: 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 standard tapes. Since the survey was carried during EVD period, a onetime MUAC tape was used for measurement to only one child and disposed to ensure infection prevention and control measures.

Child enrolment in selective feeding programme for children 6-59 months: This was assessed for the outpatient therapeutic programme and for the supplementary feeding programme by showing sachets of Plumpy'Nut® and Plumpy'Sup® to the mother or caregiver.

Measles vaccination in children 9-59 months: Measles vaccination was assessed by checking for the measles vaccine on the EPI card or by carers recall if no EPI card was available. For ease of data collection, all children aged 6-59 months were assessed for measles but analysis was only done on children aged 9-59 months.

Vitamin A supplementation in last 6 months in children 6-59 months: Whether the child received a vitamin A capsule within the last six months was recorded from an EPI

card. If health card was not available the mother or caregiver was shown sample of vitamin A capsule and asked to recall.

Haemoglobin (Hb) concentration in children 6-59 months and women 15-49 years (non-pregnant): Hb concentration was taken from a capillary blood sample from the fingertip and recorded in gram per litre by using the portable HemoCue Hb 301 system.

Diarrhoea in last 2 weeks in children 6-59 months: an episode of diarrhoea was defined as three loose stools or more in 24 hours. Caregivers were asked if their child had suffered episodes of diarrhoea in the past two weeks.

ANC enrolment and iron and folic acid pills coverage in pregnant women: Whether the woman was enrolled in the ANC programme and was receiving iron-folic acid pills was assessed by recall. An iron-folic acid pill was shown to the pregnant woman when asked to recall.

Infant and young child feeding (IYCF) practices in children 0-23 months: IYCF practices were assessed based on standard WHO recommendations (WHO 2007). Infant formula feeding was also assessed.

Referrals: Children aged 6-59 months were referred to the health post for treatment when MUAC was <125mm, when oedema was present or when haemoglobin was <7g/dL. Women of reproductive age (15 – 49 years) were referred to the hospital for treatment if haemoglobin was < 8 g/dL.

3.4 Case definitions and calculations

Malnutrition in children 6-59 months: Acute malnutrition was defined using weight-for-height index values or the presence of oedema and classified as show in the table below. Main results are reported after analysis using the WHO 2006 Growth Standards.

Results using the NCHS 1977 Growth Reference are reported in **Appendix 3**.

Table 3: Definitions of acute malnutrition using weight-for-height and/or oedema in children 6–59 months

Categories of acute malnutrition	Percentage of median (NCHS Growth	Z-scores (NCHS Growth Reference 1977 and WHO Growth Standards	Bilateral oedema

	Reference 1977 only)	2006)	
Global acute malnutrition	<80%	< -2 z-scores	Yes/No
Moderate acute malnutrition	<80% to ≥70%	< -2 z-scores and ≥ -3 z-scores	No
Severe acute malnutrition	>70%	> -3 z-scores	Yes
	<70%	< -3 z-scores	Yes/No

Stunting (chronic malnutrition) was defined using height-for-age index values and was classified as severe or moderate based on the cut-offs shown below. Main results are reported according to the WHO Growth Standards 2006. Results using the NCHS Growth Reference 1977 are reported in **Appendix 3.**

Table 4: Definitions of stunting using height-for-age in children 6–59 months

Categories of stunting	Z-scores (WHO Growth Standards 2006 and NCHS Growth Reference 1977)
Stunting	<-2 z-scores
Moderate stunting	<-2 z-score and >=-3 z-score
Severe stunting	<-3 z-scores

Underweight was defined using the weight-for-age index values and was classified as severe or moderate based on the following cut-offs. Main results are reported according to the WHO Growth Standards 2006. Results using the NCHS Growth Reference 1977 are reported in **Appendix 3.**

Table 5: Definitions of underweight using weight-for-age in children 6–59 months

Categories of underweight	Z-scores (WHO Growth Standards 2006 and NCHS Growth Reference 1977)
Underweight	<-2 z-scores
Moderate underweight	<-2 z-scores and >=-3 z-scores
Severe underweight	<-3 z-scores

Mid Upper Arm Circumference (MUAC) values were used to define malnutrition according to the following cut-offs in children 6-59 months:

Table 6: MUAC malnutrition cut-offs in children 6-59 months

Categories of MUAC values	
<125 mm	Moderate and severe wasting (GAM)
≥ 115 mm and <125 mm	Moderate wasting (MAM)
< 115 mm	Severe wasting (SAM)

Child enrolment in selective feeding programme for children 6-59 months: Feeding programme enrolment is estimated during the nutrition survey using the direct method as follows (reference: Emergency Nutrition Assessment: Guidelines for field workers. (Save the Children 2004):

Coverage of SFP programme (%) =

100 x

No. of surveyed children with MAM according to SFP admission criteria who reported being registered in SFP/

No. of surveyed children with MAM *according to SFP admission criteria*

Coverage of TFP programme (%) =

100 x

No. of surveyed children with SAM according to OTP admission criteria who reported being registered in OTP/

No. of surveyed children with SAM *according to OTP admission criteria*

Infant and young child feeding practices in children 0-23 months

Infant and young child feeding practices were assessed as follows based on the UNHCR SENS IYCF module ((Version 1.3 (March 2012)).

Timely initiation of breastfeeding in children aged 0-23 months:

Proportion of children 0-23 months who were put to the breast within one hour of birth=

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

Children 0-23 months of age

Exclusive breastfeeding under 6 months:

Proportion of infants 0–5 months of age who are fed exclusively with breast milk=
(including expressed breast milk or from a wet nurse, ORS, drops or syrups (vitamins,
breastfeeding minerals, medicines)

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:

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:

Proportion of infants 6–8 months of age who receive solid, semi-solid or soft foods=

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

Infants 6–8 months of age

Children ever breastfed:

Proportion of children born in the last 24 months who were ever breastfed=

Children born in the last 24 months who were ever breastfed

Children born in the last 24 months

Continued breastfeeding at 2 years:

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

Consumption of iron rich or iron fortified foods in children aged 6-23 months:

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

Bottle feeding:

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

Anaemia in children 6-59 months and women of reproductive age: Anaemia was classified according to the following cut-offs in children 6-59 months and non-pregnant women of reproductive age. Pregnant women were not included in this survey for the assessment of anaemia as UNHCR recommends not including them, usually due a small sample size obtained during the survey and difficulties in assessing gestational age[8].

Table 7: Definition of anaemia (WHO 2000)

Age/Sex groups	Categories of Anaemia (Hb g/dL)			
	Total	Mild	Moderate	Severe
Children 6 - 59 months	<11.0	10.9 - 10.0	9.9 - 7.0	< 7.0
Non-pregnant adult females 15-49 years	<12.0	11.9 - 11.0	10.9 - 8.0	< 8.0

Household food security

HDDS

A household dietary diversity score was calculated according to FANTA 2006 and FAO 2011 guidelines (adapted to refugee settings) 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 (below).

1. Cereals
2. White roots and tubers

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[8] UNHCR SENS Guidelines for refugee population, Module2 – Anaemia (2013)

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

12. Spices, condiments and beverages

WASH

The table below provides an overview of the definitions of drinking water and sanitation facilities used in the survey and available in the three Ivorian refugee camps in Liberia.

Table 8: Definition of WASH

Drinking Water	Improved source	Unimproved source
	Public tap	Small water vendor (cart with small tank or drum)
	Protected dug well with hand pump	Bottled water*
		Surface water (river, dam, lake, pond, stream, canal, irrigation channels). Rainwater collection from surface run-off.
*Bottled water is considered improved only when the household uses it by choice rather than because they are obliged to or when it can be guaranteed that this water is not contaminated.		
Sanitation facility definition		
	Improved category	**Unimproved category**
	Pit latrine with slab	Pit latrine without slab (slab with holes) /open pit
		No facilities or bush or field
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

*To maintain consistency with other survey instruments (e.g. the multiple indicator cluster survey), UNHCR SENS WASH module classifies an **"improved excreta disposal facility"** as a toilet in the above "improved" category **AND** one that is **not shared** with other families / households.

According to UNHCR WASH monitoring system, an **"improved excreta disposal facility" is defined differently than in other survey instruments and is defined as a toilet in the above "improved" category **AND** one that is shared by a *maximum* of 2 families / households or with no more than *12 individuals*. Therefore, the following two categories from the above SENS survey definitions are considered "improved excreta disposal facility" for UNHCR WASH monitoring system: "improved excreta disposal facility" and "shared family toilet".

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. It is also common for people to think that children's faeces are less harmful than adult faeces. "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.

Classification of public health problems and targets

Anthropometric data: The UNHCR target for the prevalence of global acute malnutrition (GAM) for children 6-59 months of age by camp, country and region should be < 10% and the target for the prevalence of severe acute malnutrition (SAM) should be <2%. However,

WHO recommends GAM of <5% according to classification of public health significance for children aged 6 – 59 months[9]. (See table below)

Table 9: Classification of public health significance for children under 5 years of age

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

Selective feeding programmes:

UNHCR Strategic Plan for Nutrition and Food Security 2008-2012 includes the targeted performance indicators for malnutrition treatment programmes as indicated in the table below.

Table 10: Performance indicators for selective feeding programmes (UNHCR Strategic Plan for Nutrition and Food Security 2008-2012)*

				Coverage		
	Recovery	**Case fatality**	**Defaulter rate**	**Rural areas**	**Urban areas**	**Camps**
SFP	>75%	<3%	<15%	>50%	>70%	>90%
TFP	>75%	<10%	<15%	>50%	>70%	>90%

* Also meet SPHERE standards for performance

Measles vaccination coverage: UNHCR recommends target coverage of 95% (same as Sphere Standards).

Vitamin A supplementation coverage: UNHCR Strategic Plan for Nutrition and Food Security (2008-2012) states that the target for vitamin A supplementation coverage for children aged 6-59 months by camp, country and region should be >90%.

Anaemia data*: UNHCR Strategic Plan for Nutrition and Food Security (2008-2010) states that the targets for the prevalence of anaemia in children 6-59 months of age and in women 15-49 years of age should be low i.e. <20%. The severity of the public health situation should be classified according to WHO criteria as shown in Table 13 below.

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[9] UNHCR SENS Guidelines for refugee population, Mondule2 – Anthropometry and Health (2013)

Table 11: Classification of public health significance (WHO 2000)

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

WASH: Diarrhoea caused by poor water, sanitation and hygiene accounts for the annual deaths of over two million children under five years old globally. Diarrhoea contributes to malnutrition, which subsequently leads to high infant and child morbidity and mortality. Refugee populations are often more vulnerable to public health risks and reduced funding can mean that long term refugee camps often struggle to ensure the provision of essential services, such as water, sanitation and hygiene. Hygienic conditions and adequate access to safe water and sanitation services is a matter of ensuring human dignity and is recognised as a fundamental human right. The following standards (amongst others) apply to UNHCR WASH programmes:

Table 12: UNHCR WASH Programme Standards

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

Mosquito nets: WHO defines a long-lasting insecticidal net as a factory-treated mosquito net made with netting material that has insecticide incorporated within or bound around the fibres. The net must retain its effective biological activity without re-treatment for at least 20 WHO standard washes under laboratory conditions and three years of recommended use.

Table 13: 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

3.5 Training, coordination and supervision

Training was compulsory to all survey participants even those who have participated in the last nutrition surveys. The training was done in two phases; 1) central training to

supervisors including blood sample takers for anaemia (haemoglobin test), and; 2) field training at camp level, particularly for measures of anthropometric information.

Central training was conducted to international and national staff members; two from AHA, CARE one and CHT one. The training was conducted for six days from 7th April 2015 in Harper City, Maryland County by Tiras Nkala, UNHCR Associate Nutrition officer assisted by Miata Johnson, UNHCR Health Associate and two health coordinators; Dr. Elias Mammo and Dr. Zelalem from AHA. This was a detailed training aiming at imparting knowledge to the survey supervisors on the six modules of UNHCR SENS guidelines. The training covered all important areas including; general survey objectives, overview of survey design, household selection procedures, anthropometric measurements, signs and symptoms of malnutrition, data collection using mobile phones (ODK collect for android)and interview skills.

At the end of the central training supervisors were divided into six teams of two each and joined measurers for field training and subsequent data collection in each camp. Under the supervision of survey coordinators, supervisors took the lead during field training. Standardisation test for anthropometry was conducted to six children, two times per child per team. Twenty four volunteers mainly from AHA and CARE (health information team and hygiene promoters) were organized, trained and divided into six teams of four each, and thus, six team members for data collection in each camp. Each team composed of one team leader, one blood taker, three measurers (one for MUAC and two for anthropometry) and one translator. Team leaders were accountable to survey coordinators who moved around to provide necessary support throughout data collection.

3.6 Data collection

Data collection was carried out for four days just after field training in each camp. Team leaders introduced their teams, explained the purpose of the survey and asked consent from respondents to participate in the survey. If consent was given, information required based on the guidance by the household control sheet was collected. Whenever no consent was given, team leader thanked that particular respondent and equally respected them as those participated in the survey.

Fourteen smartphones with android technology were procured from Lonestar Company, particularly for use during data collection. The devices were pre-installed with open data kit (ODK collect) apps and data collection forms were uploaded in the application. The UNHCR Associated Nutrition Officer requested CartONG to provide remote support by editing the pre-existing forms from the survey conducted in 2013 and send them for uploading in the mobile phones. The fourteen devices were distributed to six teams, (two each) and two devices were kept for back-up every day. Household forms in hard copies were also used to record anthropometry and haemoglobin information gathered from children and non-pregnant women.

Synchronisation of data from the mobile phones to the server and downloading to desk top was done every day in the evening. Plausibility check data quality control was performed daily and feedback was provided to team members every morning before they leave for newly data collection in the field. At the end of data collection, three folders corresponding to each camp were used to keep the downloaded information for analysis.

3.7 Data analysis

The whole process of data analysis was done by the UNHCR Associate Nutrition Officer based at sub office in Zwedru. The nutritional indices were cleaned based on flexible exclusion range criteria – exclusion of z-score from observed mean. A default values of +/- 3 SD as set in the ENA for SMART software was used to exclude the outliers. Cleaning of other indicators was done using a UNHCR SENS data cleaning PGM file in Epi info software. Anthropometry results were generated using ENA for SMART (delta version, 21st April 2015) software. Epi Info software (Centres for diseases control, version 3.5.4 of 30th July 2012) was used to analyze coverage of measles vaccination, Vitamin A supplementation, Feeding programme (OTP and SFP), indicators for anaemia, IYCF, Food security, WASH and Mosquito net coverage.

4. RESULTS

Table 14: Demographic characteristics of the study population

	CAMP		
	BAHN	**PTP**	**LITTLE WLEBO**
Total households surveyed	122	185	130
Total population surveyed	651	981	651
Total U5 surveyed	134	253	195
Average household size	5.3	5.3	5.0
% of U5	20.5%	25.7%	29.9%

The above information was derived from mosquito net coverage module in each camp. The above calculations were aimed to estimate average household size and percentage under-fives for planning in the future.

Children 6-59 months

Sample size

A total number of children aged 6 – 59 months are as indicated the table below. The survey included more children than targeted apparently due to inaccurate information extracted from the UNHCR ProGres database during sample estimation by camp.

Table 15: Target and actual number captured

	CAMP		
	BAHN	**PTP**	**LITTLE WLEBO**
Targeted 6 – 59 months	182	219	206
Surveyed 6 – 59 months	261	358	252
Percentage of the target	143%	163%	122%

4.1 RESULTS FOR BAHN CAMP

4.1.1 Children 6-59 months

Table 16: Age and sex distribution of sampled children: 6 – 59 months

AGE (mo)	Boys no.	%	Girls no.	%	Total no.	%	Ratio Boy:girl
6-23	35	42.7	47	57.3	82	31.4	0.7
24-29	15	39.5	23	60.5	38	14.6	0.7
30-41	37	55.2	30	44.8	67	25.7	1.2
42-53	34	57.6	25	42.4	59	22.6	1.4
54-59	8	53.3	7	46.7	15	5.7	1.1
Total	129	49.4	132	50.6	261	100.0	1.0

Percentage of children with no exact birthday was 7 %

Table 17: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex based on WHO Growth Standards 2006.

	All n = 261	Boys n = 129	Girls n = 132
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(5) 1.9 % (0.8 - 4.4 95% C.I.)	(3) 2.3 % (0.8 - 6.6 95% C.I.)	(2) 1.5 % (0.4 - 5.4 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(5) 1.9 % (0.8 - 4.4 95% C.I.)	(3) 2.3 % (0.8 - 6.6 95% C.I.)	(2) 1.5 % (0.4 - 5.4 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(0) 0.0 % (0.0 - 1.5 95% C.I.)	(0) 0.0 % (0.0 - 2.9 95% C.I.)	(0) 0.0 % (0.0 - 2.8 95% C.I.)

The prevalence of oedema was 0.0 %

Table 18: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema

Age (mo)	Total no.	Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-23	82	0	0.0	2	2.4	80	97.6	0	0.0
24-29	38	0	0.0	1	2.6	37	97.4	0	0.0
30-41	67	0	0.0	2	3.0	65	97.0	0	0.0
42-53	59	0	0.0	0	0.0	59	100.0	0	0.0
54-59	15	0	0.0	0	0.0	15	100.0	0	0.0
Total	261	0	0.0	5	1.9	256	98.1	0	0.0

Table 19: Distribution of acute malnutrition and oedema based on weight-for-height z-scores

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 0 (0.0 %)	Not severely malnourished No. 261 (100.0 %)

Figure 2: Distribution of weight-for-height z-scores
The reference population is shown in green and the surveyed population is shown in red
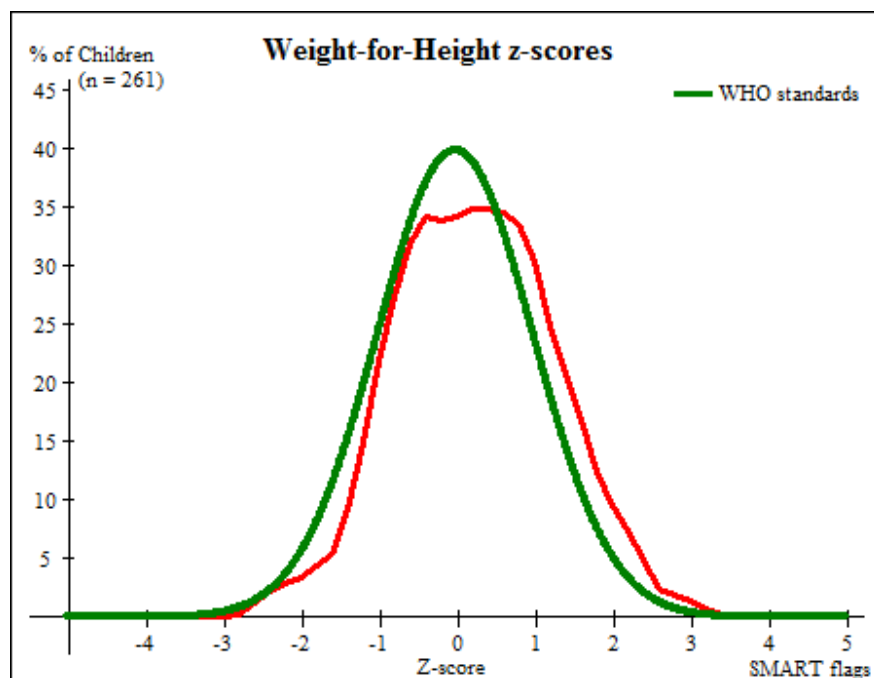
Table 20: Prevalence of malnutrition based on MUAC by sex

	All n = 261	Boys n = 129	Girls n = 132
Prevalence of MUAC < 125 mm and/or oedema	(2) 0.8 % (0.2 - 2.8 95% C.I.)	(1) 0.8 % (0.1 - 4.3 95% C.I.)	(1) 0.8 % (0.1 - 4.2 95% C.I.)
Prevalence of MUAC < 125 mm and >= 115 mm, no oedema	(2) 0.8 % (0.2 - 2.8 95% C.I.)	(1) 0.8 % (0.1 - 4.3 95% C.I.)	(1) 0.8 % (0.1 - 4.2 95% C.I.)
Prevalence MUAC < 115 mm and/or oedema	(0) 0.0 % (0.0 - 1.5 95% C.I.)	(0) 0.0 % (0.0 - 2.9 95% C.I.)	(0) 0.0 % (0.0 - 2.8 95% C.I.)

Table 21: Prevalence of acute malnutrition by age, based on MUAC cut-offs' and/or oedema

Age (mo)	Total no.	MUAC < 115 mm No.	MUAC < 115 mm %	MUAC >= 115 mm and < 125 mm No.	MUAC >= 115 mm and < 125 mm %	MUAC > = 125 mm No.	MUAC > = 125 mm %	Oedema No.	Oedema %
6-23	82	0	0.0	2	2.4	80	97.6	0	0.0
24-29	38	0	0.0	0	0.0	38	100.0	0	0.0
30-41	67	0	0.0	0	0.0	67	100.0	0	0.0
42-53	59	0	0.0	0	0.0	59	100.0	0	0.0
54-59	15	0	0.0	0	0.0	15	100.0	0	0.0
Total	261	0	0.0	2	0.8	259	99.2	0	0.0

Table 22: Prevalence of underweight based on weight-for-age z-scores by sex

	All n = 261	Boys n = 129	Girls n = 132
Prevalence of underweight (<-2 z-score)	(29) 11.1 % (7.8 - 15.5 95% C.I.)	(15) 11.6 % (7.2 - 18.3 95% C.I.)	(14) 10.6 % (6.4 - 17.0 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(25) 9.6 % (6.6 - 13.8 95% C.I.)	(13) 10.1 % (6.0 - 16.5 95% C.I.)	(12) 9.1 % (5.3 - 15.2 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(4) 1.5 % (0.6 - 3.9 95% C.I.)	(2) 1.6 % (0.4 - 5.5 95% C.I.)	(2) 1.5 % (0.4 - 5.4 95% C.I.)

Table 23: Prevalence of stunting based on height-for-age z-scores and by sex

	All n = 261	Boys n = 129	Girls n = 132
Prevalence of stunting (<-2 z-score)	(99) 37.9 % (32.3 - 44.0 95% C.I.)	(54) 41.9 % (33.7 - 50.5 95% C.I.)	(45) 34.1 % (26.6 - 42.5 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(60) 23.0 % (18.3 - 28.5 95% C.I.)	(31) 24.0 % (17.5 - 32.1 95% C.I.)	(29) 22.0 % (15.8 - 29.8 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(39) 14.9 % (11.1 - 19.8 95% C.I.)	(23) 17.8 % (12.2 - 25.3 95% C.I.)	(16) 12.1 % (7.6 - 18.8 95% C.I.)

Table 24: Prevalence of stunting by age based on height-for-age z-scores

Age (mo)	Total no.	Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
		No.	%	No.	%	No.	%
6-23	82	9	11.0	14	17.1	59	72.0
24-29	38	6	15.8	9	23.7	23	60.5
30-41	67	13	19.4	15	22.4	39	58.2
42-53	59	8	13.6	19	32.2	32	54.2
54-59	15	3	20.0	3	20.0	9	60.0
Total	261	39	14.9	60	23.0	162	62.1

Figure 3: Distribution of height-for-age z-scores
Reference population is shown in green and the surveyed population is shown in red.
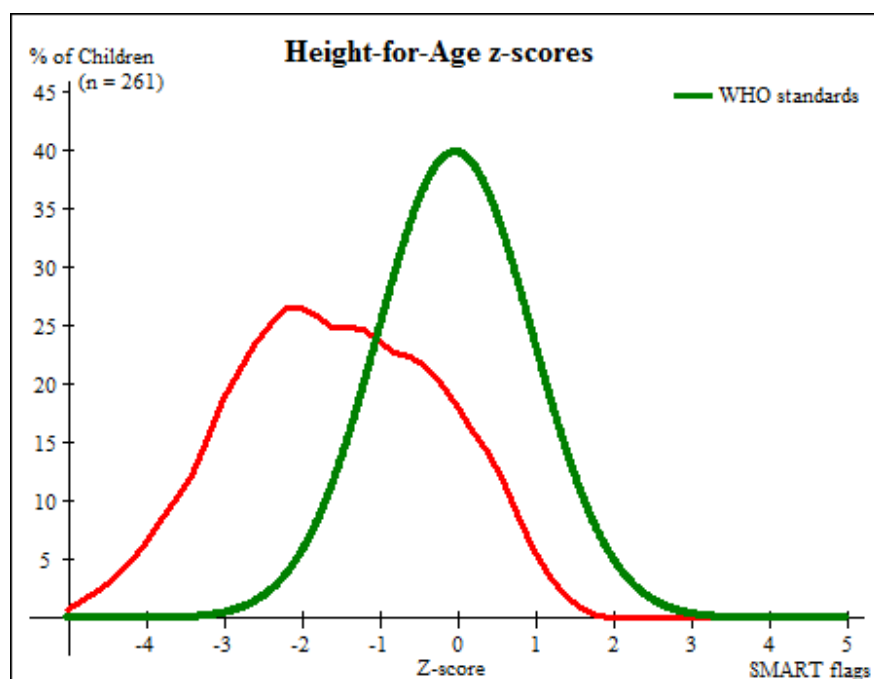
Table 25: Mean z-scores, design effects and excluded subjects

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	261	0.24±1.00	1.00	0	0
Weight-for-Age	261	-0.70±1.05	1.00	0	0
Height-for-Age	261	-1.55±1.29	1.00	0	0

* contains for WHZ and WAZ the children with oedema.

Feeding programme enrolment results

Table 26: Programme enrolment for acutely malnourished children

	Number/total	% (95% CI)
Supplementary feeding programme enrolment	0/2	0%(0.0 - 0.0)
Therapeutic feeding programme enrolment	N/A*	N/A*

*There was no case of severe malnutrition found during the survey

Measles vaccination coverage results

Table 27: Measles vaccination coverage for children aged 9-59 months (n=267)

	Measles (with card) n=156	Measles (with card or confirmation from mother) n=239
YES	58.4% (52.3 - 64.4; 95% CI)	89.5% (85.2 – 92.9; 95% CI)

Vitamin A supplementation coverage results

Table 28: Vitamin A supplementation; 6-59 months within past 6 months (n=281)

	Vitamin A capsule (with card) n=88	Vitamin A capsule (with card or confirmation from mother) n=266
YES	31.3% (25.9 - 37.1; 95% CI)	94.7% (91.3 – 97.0; 95% CI)

Diarrhoea results

Table 29: Period prevalence of diarrhoea

	Number/total	% (95% CI)
Diarrhoea in the last two weeks	29/273	10.6% (7.2 – 14.9)

Anaemia results

Table 30: Prevalence of total anaemia, anaemia categories, and mean haemoglobin concentration in children 6-59 months of age and by age group

	6-59 months n = 281	6-23 months n=87	24-59 months n=194
Total Anaemia (Hb<11.0 g/dL)	(138) 49.1% (43.1 - 55.1; 95% CI)	(44) 50.6% (39.6 - 61.5; 95% CI)	(94) 48.5% 41.2 - 55.7; 95% CI)
Mild Anaemia (Hb 10.0-10.9 g/dL)	(66) 23.5% (18.7 - 28.9)	(19) 21.8 (13.7 - 32.0; 95% CI)	(47) 24.2% (18.4 - 30.9; 95% CI)
Moderate Anaemia (7.0-9.9 g/dL)	(71) 25.3% (20.3 - 30.8; 95% CI)	(25) 28.7% (19.5 - 39.4; 95% CI)	(46) 23.7% (17.9 - 30.3; 95% CI)
Severe Anaemia (<7.0 g/dL)	(1)0.4% (0.0 - 2.0; 95% CI)	(0) 0.0% (0.0 - 4.2; 95% CI)	(1) 0.5% (0.0 - 2.8; 95% CI)
Mean Hb (g/dL) (SD) [range]	10.8g/dL (±1.4 SD) [6.6min, 14.4max]	10.8g/dL (±1.4SD) [7.4min, 13.5max]	10.8g/dL (±1.4SD) [6.6min, 14.4max]

Table 31: Prevalence of moderate and severe anaemia in children 6-59 months of age and by age group

	6-59 months n =281	6-23 months n=87	24-59 months n=194
Moderate and Severe Anaemia (Hb<10.0g/dL)	(72) 25.6% (20.6 - 31.1; 95% CI)	(25) 28.7% (19.5 - 39.4; 95% CI)	(47) 24.2% (18.4 - 30.9; 95% CI)

4.1.2 Children 0-23 months

Table 32: Infant and young child feeding practices indicators

Indicator	Age range	Number/ total	Prevalence (%)	95% CI
Timely initiation of breastfeeding	0-23 months	88/107	82.2%	(73.7 - 89.0)
Exclusive breastfeeding under 6 months	0-5 months	17/20	85.0%	(62.1 - 96.8)
Continued breastfeeding at 1 year	12-15 months	22/23	95.7%	(78.1 - 99.9)
Continued breastfeeding at 2 years	20-23 months	10/16	62.5%	(35.4 - 84.8)
Introduction of solid, semi-solid or soft foods	6-8 months	6/14	42.9%	(17.7 - 71.1)
Consumption of iron-rich or iron-fortified foods	6-23 months	73/81	90.1%	(81.5 - 95.6)
Bottle feeding	0-23 months	13/106	12.3%	(6.7 - 20.1)

Prevalence of intake

Infant formula

Table 33: Infant formula intake in children aged 0-23 months

	Number/total	% (95% CI)
Proportion of children aged 0-23 months who receive infant formula (fortified or non-fortified)	3/106	2.8 (0.6 - 8.0)

Fortified blended foods

Table 34: FBF intake in children aged 6-23 months

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive FBF	37/85	43.5(32.8 - 54.7)

Special nutritional products

Table 35: LNS intake in children aged 6-23 months (Nutributter® or Plumpy' Doz®)

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive LNS	63/87	72.4 (61.8 - 81.5)

Table 36: MNP intake in children aged 6-23 months

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive MNP	6/86	7.0 (2.6 - 14.6)

4.1.3 Women 15-49 years

Table 37: Women physiological status and age

Physiological status	Number/total	% of sample
Non-pregnant	114/129	88.4
Pregnant	15/129	11.6
Mean age (range)	29.7 Years (15 – 48)	

Table 38: Prevalence of anaemia and haemoglobin concentration in non-pregnant women of reproductive age (15-49 years)

Anaemia in non-pregnant women of reproductive age (15-49 years)	All n =114
Total Anaemia (<12.0 g/dL)	(48) 42.1% (32.9 - 51.7)
Mild Anaemia (11.0-11.9 g/dL)	(25) 21.9% (14.7 - 30.6)
Moderate Anaemia (8.0-10.9 g/dL)	(23) 20.2% (13.2 - 28.7)
Severe Anaemia (<8.0 g/dL)	(0) 0.0%
Mean Hb (g/dL) (SD) [range]	12.0g/dL (±1.4SD) [8.2min, 15.6max]

Table 39: ANC enrolment and iron-folic acid pills coverage among pregnant women (15-49 years)

	Number /total	% (95% CI)
Currently enrolled in ANC programme	13/15	86.7 (59.5 - 98.3)
Currently receiving iron-folic acid pills	13/15	86.7(59.5 - 98.3)

4.1.4 Food security

Table 40: Food security sampling information

Household data	Planned	Actual	% of target
Total households surveyed for Food Security	206	123	59.7

Access to food assistance results
Table 41: Ration card coverage

	Number/total	% (95% CI)
Proportion of households with a ration card	(123/123)	100% (100 - 100)

Table 42: Reported duration of general food ration 1

Average number of days the food ration lasts (Standard deviation or 95% CI)	Average duration (%) in relation to the theoretical duration of the ration
17.8 (13.1 – 22.5) days out of 30	59.3%

Table 43: Reported duration of general food ration 2

	Number/total	% (95% CI)
Proportion of households reporting that the food ration lasts the entire duration of the cycle	0/123	0(0 – 0)
Proportion of households reporting that the food ration lasted:		
≤75% of the 30 days cycle	115/123	93.5 (87.6 - 97.2)
>75% of the 30 days cycle	8/123	6.5 (2.8 - 12.4)

Negative coping strategies results

Table 44: Coping strategies used by the surveyed population over the past month

	Number/total	% (95% CI)
Proportion of households reporting using the following coping strategies over the past month*:		
Borrowed cash, food or other items *with or without interest*	116/123	94.3 (88.6 - 97.7)
Sold any assets that would not have normally sold (furniture, seed stocks, tools, other NFI, livestock etc.)	105/123	85.4 (77.9 - 91.1)
Requested increased remittances or gifts as compared to normal	99/122	81.1 (73.1 - 87.7)
Reduced the quantity and/or frequency of meals	96/123	78.0 (69.7 - 85.0)
Begged	105/123	85.4 (77.9 - 91.1)
Engaged in potentially risky or harmful activities	28/123	22.8 (15.7 - 31.2)
Proportion of households reporting using none of the coping strategies over the past month	3/122	2.5 (0.5 - 7.0)

* The total is over 100% as households may use several negative coping strategies.

Table 45: Average HDDS

	Mean (SD)
Average HDDS	9.2 (± 2.2)

* Maximum HDDS is 12.

Figure 4: Proportion of households consuming different food groups within last 24 hours
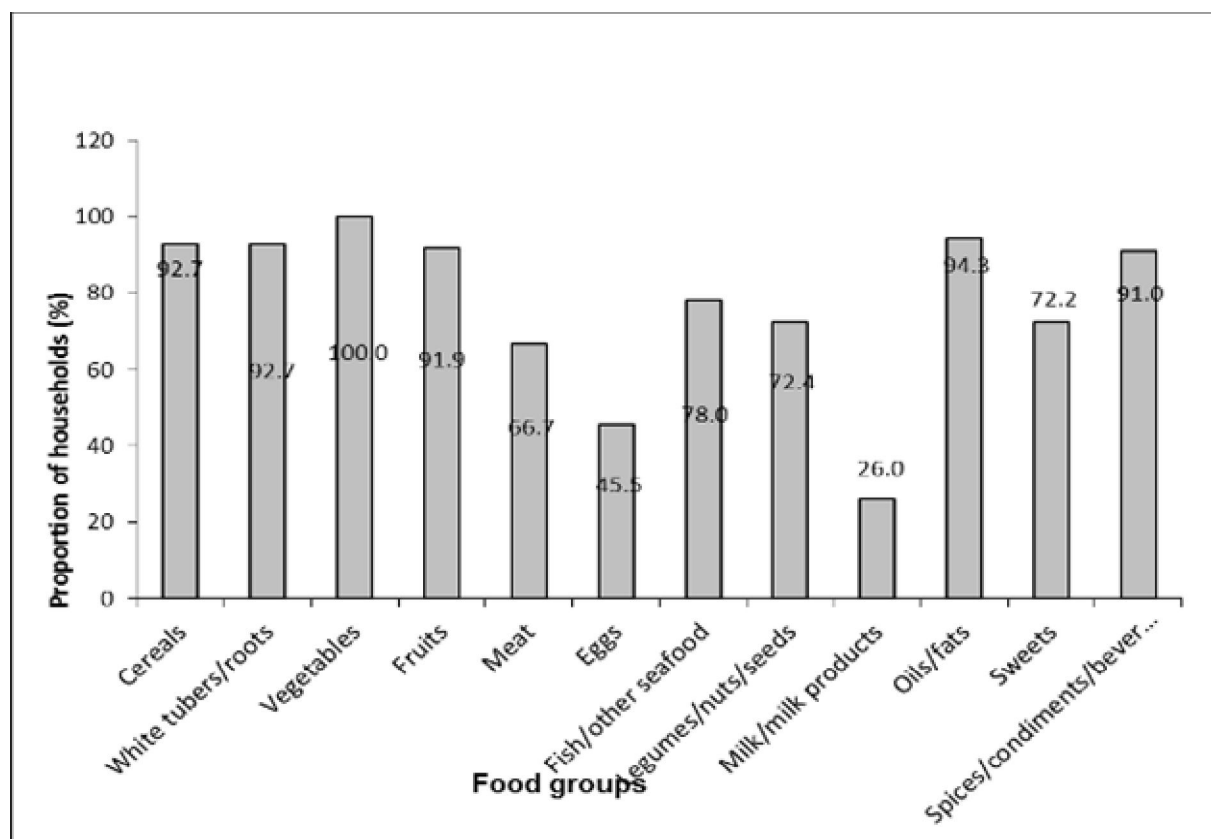
Table 46: Consumption of micronutrient rich foods by households

	Number /total	% (95% CI)
Proportion of households *not consuming any* vegetables, fruits, meat, eggs, fish/seafood, and milk/milk products	0/123	0 (0.0-0.0)
Proportion of households consuming either a plant or animal source of vitamin A	121/121	100 (100-100)
Proportion of households consuming organ meat/flesh meat, or fish/seafood (food sources of haem iron)	109/123	88.6 (81.6 - 93.6)

4.1.5 WASH

Table 47: Wash sampling information

Household data	Planned	Actual	% of target
Total households surveyed for WASH	206	122	59.2

Table 48: Water quality

	Number/total	% (95% CI)
Proportion of households using an improved drinking water source	159/159	100.0 (100.0-100.0)
Proportion of households that use a covered or narrow necked container for storing their drinking water	58/122	47.5 (38.4 - 56.8)

Table 49: Water quantity: amount of litres of water used per person per day

Proportion of households that use:	Number/total	% (95% CI)
≥ 20 lpppd	54/122	44.3% (35.3 - 53.5)
15 – <20 lpppd	22/122	18.0% (11.7 - 26.0)
<15 lpppd	46/122	37.7% (29.1 - 46.9)

The average water consumption was 20.8 liters per person per day

Table 50: Satisfaction with water supply

	Number/total	% (95% CI)
Proportion of households that say they are satisfied with the drinking water supply	(117/122)	95.9 (90.7 - 98.7)

Figure 5: Proportion of households that say they are satisfied with the water supply
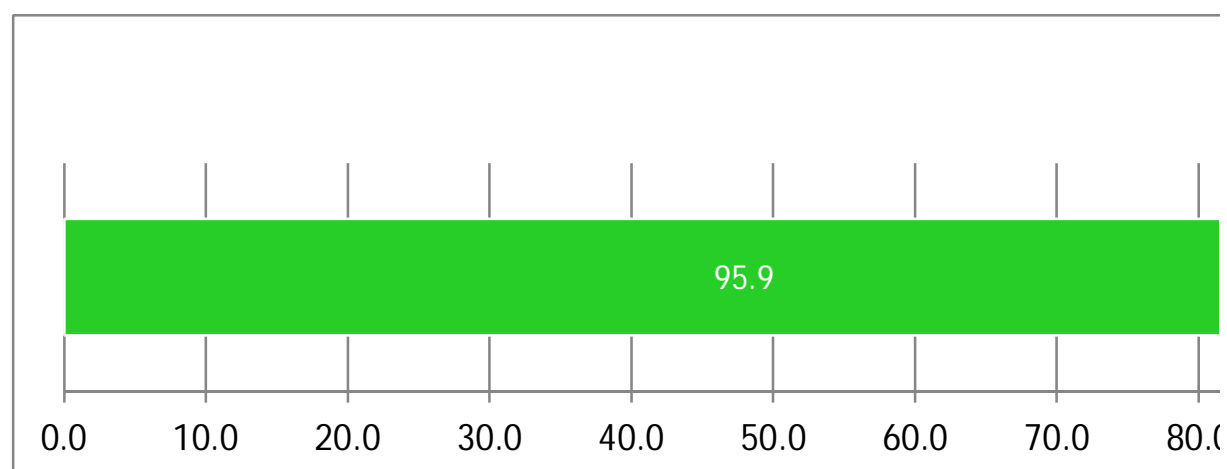
Figure 6: Main reason for dissatisfaction among households not satisfied with water supply.
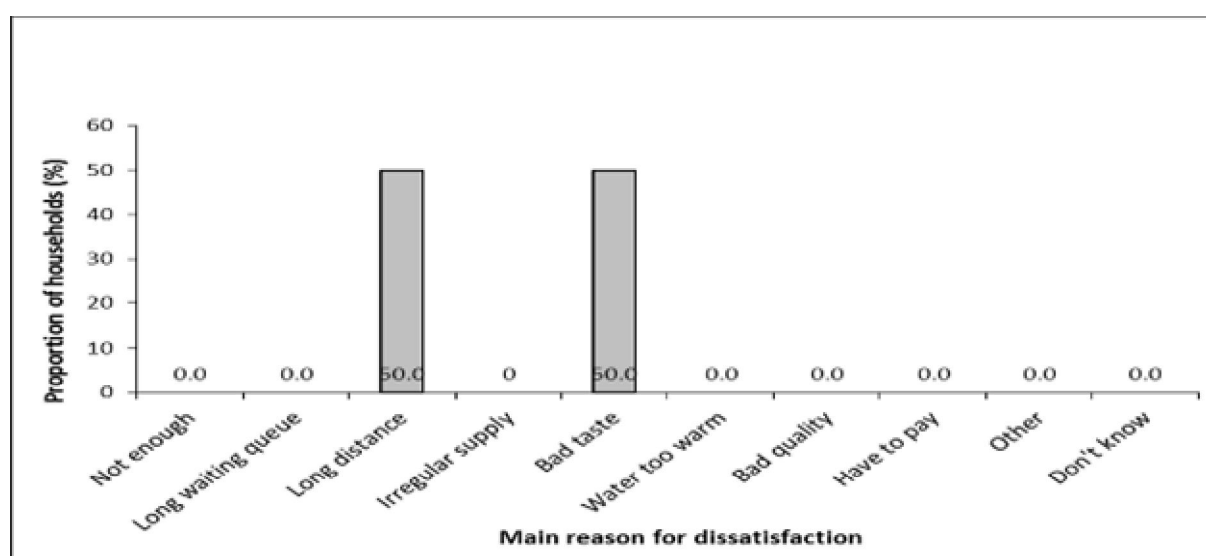
Table 51: Safe excreta disposal

	Number /total	% (95% CI)
Proportion of households that use:		
An improved excreta disposal facility (improved toilet facility, 1 household)	4/109	3.7 (1.0 - 9.1)
A shared family toilet (improved toilet facility, 2 households)	2/109	1.8 (0.2 - 6.5)
A communal toilet (improved toilet facility, 3 households or more)	73/109	67.0 (57.3 - 75.7)
An unimproved toilet (unimproved toilet facility or public toilet)	30/109	27.5 (19.4 - 36.9)
Proportion of households with children under three years old that dispose of faeces safely	80/87	92.0 (84.1 - 96.7)

Figure 7: Proportion of households with children under the age of 3 years whose (last) stools were disposed of safely
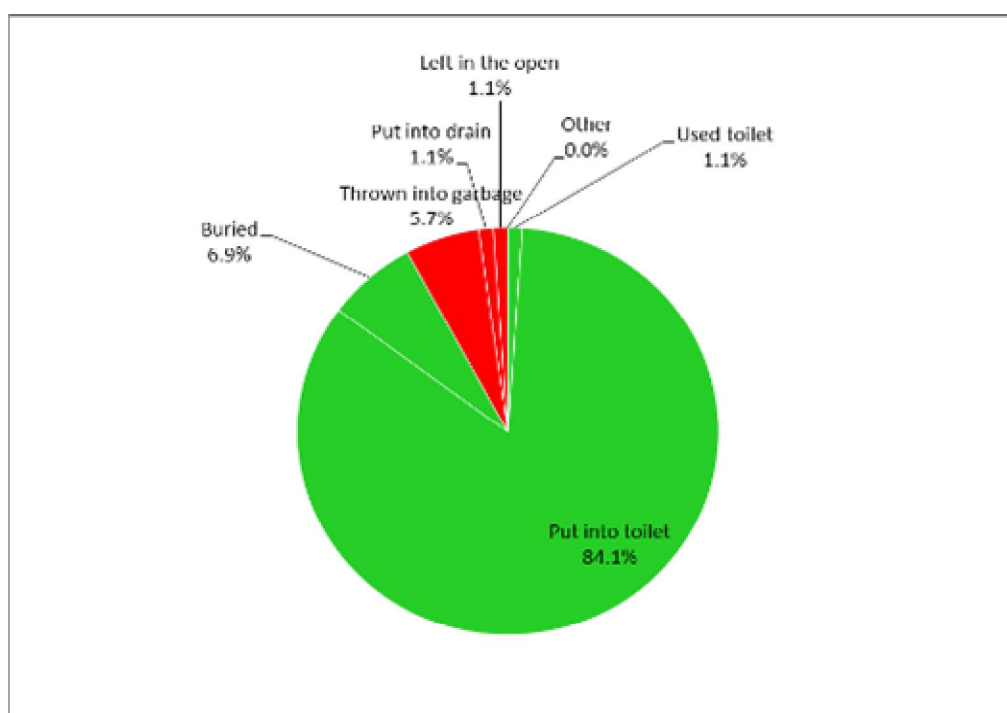
4.1.6 Mosquito Net Coverage

Table 52: Mosquito net coverage sampling information

Household data	Planned	Actual	% of target
Total households surveyed for mosquito net coverage	206	120	58.2

Table 53: Household mosquito net ownership

	Number/total	% (95% CI)
Proportion of total households owning at least one mosquito net of any type	70/120	58.3 (49.0 - 67.3)
Proportion of total households owning at least one LLIN	70/120	58.3 (49.0 - 67.3)

Figure 8: Household ownership of at least one mosquito net (any type)

Households with no mosquito net 41.7%

Households with at least one mosquito net 58.3%
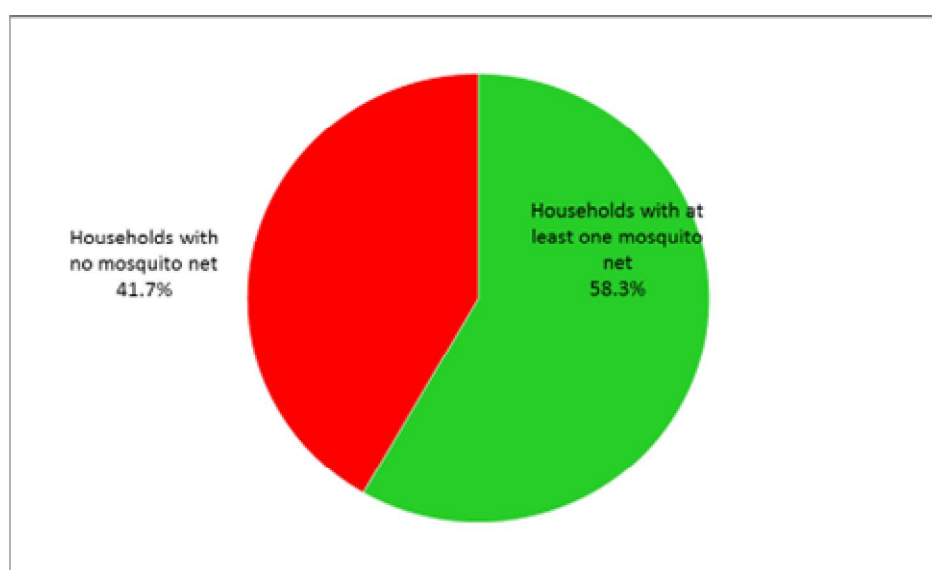
Figure 9: Household ownership of at least one LLIN
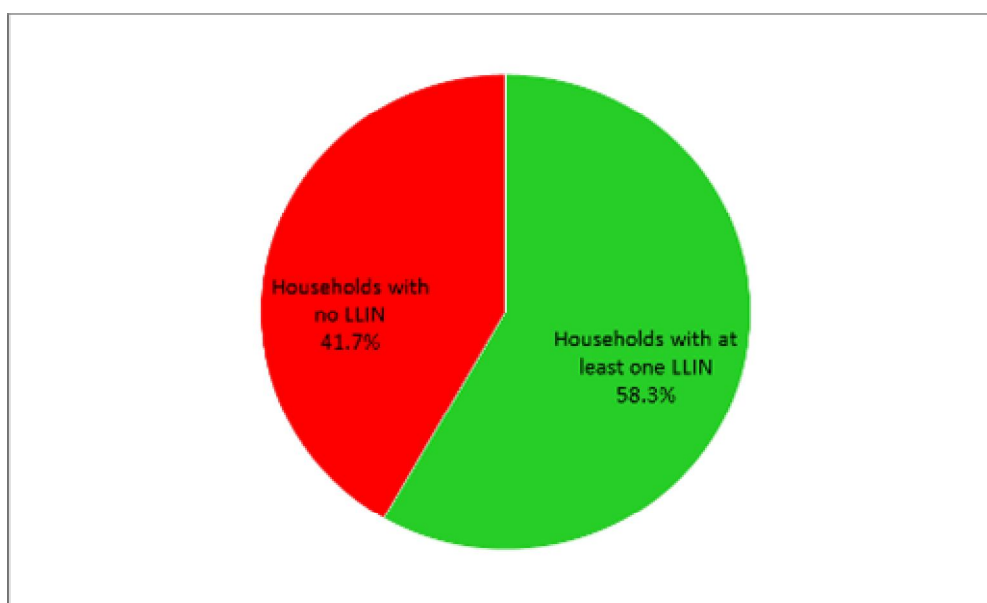
Table 54: Number of Nets

Average number of LLINs per household	Average number of persons per LLIN
1.6	6.0

Table 55: Mosquito net utilisation

	Proportion of total population (all ages)		Proportion of 0-59 months		Proportion of pregnant women	
	Total No=651	%	Total No=143	%	Total No=18	%
Slept under net of any type	289	44.4	70	52.2	6	33.3
Slept under LLIN	289	44.4	70	52.2	6	33.3

Figure 10: Mosquito net utilisation by sub-group
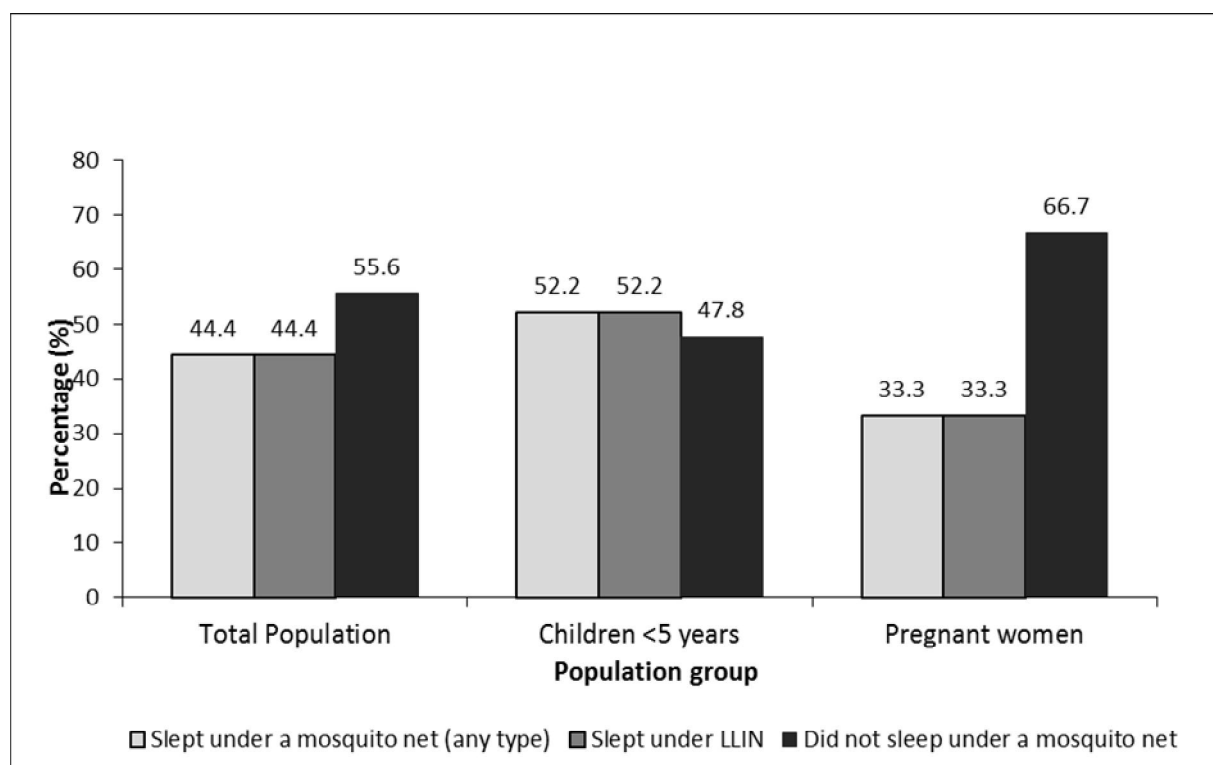
4.2 RESULTS FOR PTP CAMP

4.2.1 Children 6-59 months

Table 56: Age and sex distribution of sampled children: 6 – 59 months

	Boys		Girls		Total		Ratio
AGE (mo)	no.	%	no.	%	no.	%	Boy:girl
6-23	76	54.7	63	45.3	139	38.8	1.2
24-29	27	51.9	25	48.1	52	14.5	1.1
30-41	49	54.4	41	45.6	90	25.1	1.2
42-53	32	46.4	37	53.6	69	19.3	0.9
54-59	5	62.5	3	37.5	8	2.2	1.7
Total	189	52.8	169	47.2	358	100.0	1.1

Proportion of children with no exact birthdate was 5%

Table 57: Prevalence of acute malnutrition based on WHO Growth Standards 2006, weight-for-height z-scores (and/or oedema) and by sex

	All n = 358	Boys n = 189	Girls n = 169
Prevalence of global malnutrition **(<-2 z-score and/or oedema)**	(15) 4.2 % (2.6 - 6.8 95% C.I.)	(10) 5.3 % (2.9 - 9.5 95% C.I.)	(5) 3.0 % (1.3 - 6.7 95% C.I.)
Prevalence of moderate malnutrition **(<-2 z-score and >=-3 z-score, no oedema)**	(15) 4.2 % (2.6 - 6.8 95% C.I.)	(10) 5.3 % (2.9 - 9.5 95% C.I.)	(5) 3.0 % (1.3 - 6.7 95% C.I.)
Prevalence of severe malnutrition **(<-3 z-score and/or oedema)**	(0) 0.0 % (0.0 - 1.1 95% C.I.)	(0) 0.0 % (0.0 - 2.0 95% C.I.)	(0) 0.0 % (0.0 - 2.2 95% C.I.)

The prevalence of oedema was 0.0 %

Table 58: Prevalence of acute malnutrition by age, based on WHO Growth Standards 2006, weight-for-height z-scores and/or oedema

Age (mo)	Total no.	Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-23	139	0	0.0	11	7.9	128	92.1	0	0.0
24-29	52	0	0.0	3	5.8	49	94.2	0	0.0
30-41	90	0	0.0	0	0.0	90	100.0	0	0.0
42-53	69	0	0.0	1	1.4	68	98.6	0	0.0
54-59	8	0	0.0	0	0.0	8	100.0	0	0.0
Total	358	0	0.0	15	4.2	343	95.8	0	0.0

Table 59: Distribution of acute malnutrition and oedema based on WHO Growth Standards 2006, weight-for-height z-scores

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 0 (0.0 %)	Not severely malnourished No. 358 (100.0 %)

Figure 11: Distribution of weight-for-height z-scores
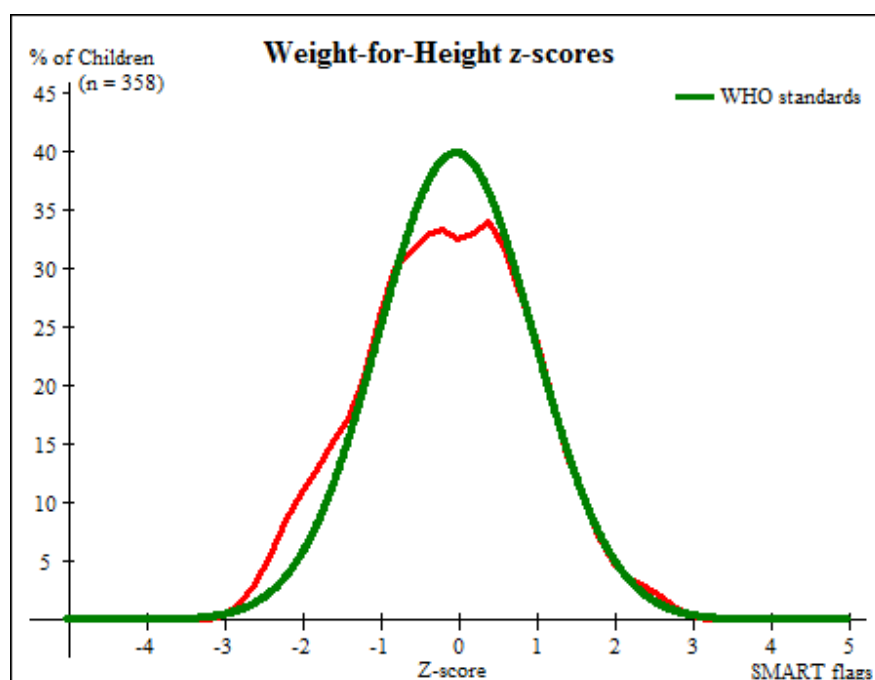
Table 60: Prevalence of MUAC malnutrition

	All n = 358	**Boys** n = 189	**Girls** n = 169
Prevalence of MUAC < 125 mm and/or oedema	(16) 4.5 % (2.8 - 7.1 95% C.I.)	(5) 2.6 % (1.1 - 6.0 95% C.I.)	(11) 6.5 % (3.7 - 11.3 95% C.I.)
Prevalence of MUAC < 125 mm and >= 115 mm, no oedema	(16) 4.5 % (2.8 - 7.1 95% C.I.)	(5) 2.6 % (1.1 - 6.0 95% C.I.)	(11) 6.5 % (3.7 - 11.3 95% C.I.)
Prevalence MUAC < 115 mm and/or oedema	(0) 0.0 % (0.0 - 1.1 95% C.I.)	(0) 0.0 % (0.0 - 2.0 95% C.I.)	(0) 0.0 % (0.0 - 2.2 95% C.I.)

Table 61: Prevalence of MUAC malnutrition by age, based on MUAC cut-off's and/or oedema

Age (mo)	Total no.	MUAC < 115 mm		MUAC >= 115 mm and < 125 mm		MUAC > = 125 mm		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-23	139	0	0.0	15	10.8	124	89.2	0	0.0
24-29	52	0	0.0	1	1.9	51	98.1	0	0.0
30-41	90	0	0.0	0	0.0	90	100.0	0	0.0
42-53	69	0	0.0	0	0.0	69	100.0	0	0.0
54-59	8	0	0.0	0	0.0	8	100.0	0	0.0
Total	358	0	0.0	16	4.5	342	95.5	0	0.0

Table 62: Prevalence of underweight based on weight-for-age z-scores by sex

	All n = 358	Boys n = 189	Girls n = 169
Prevalence of underweight (<-2 z-score)	(88) 24.6 % (20.4 - 29.3 95% C.I.)	(57) 30.2 % (24.1 - 37.0 95% C.I.)	(31) 18.3 % (13.2 - 24.9 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(69) 19.3 % (15.5 - 23.7 95% C.I.)	(46) 24.3 % (18.8 - 30.9 95% C.I.)	(23) 13.6 % (9.2 - 19.6 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(19) 5.3 % (3.4 - 8.1 95% C.I.)	(11) 5.8 % (3.3 - 10.1 95% C.I.)	(8) 4.7 % (2.4 - 9.1 95% C.I.)

Table 63: Prevalence of stunting based on height-for-age z-scores and by sex

	All n = 358	Boys n = 189	Girls n = 169
Prevalence of stunting (<-2 z-score)	(193) 53.9 % (48.7 - 59.0 95% C.I.)	(110) 58.2 % (51.1 - 65.0 95% C.I.)	(83) 49.1 % (41.7 - 56.6 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(117) 32.7 % (28.0 - 37.7 95% C.I.)	(66) 34.9 % (28.5 - 42.0 95% C.I.)	(51) 30.2 % (23.8 - 37.5 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(76) 21.2 % (17.3 - 25.8 95% C.I.)	(44) 23.3 % (17.8 - 29.8 95% C.I.)	(32) 18.9 % (13.7 - 25.5 95% C.I.)

Table 64: Prevalence of stunting by age based on height-for-age z-scores

Age (mo)	Total no.	Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
		No.	%	No.	%	No.	%
6-23	139	20	14.4	44	31.7	75	54.0
24-29	52	18	34.6	15	28.8	19	36.5
30-41	90	24	26.7	30	33.3	36	40.0
42-53	69	11	15.9	26	37.7	32	46.4
54-59	8	3	37.5	2	25.0	3	37.5
Total	358	76	21.2	117	32.7	165	46.1

Figure 12: Distribution of height-for-age z-scores
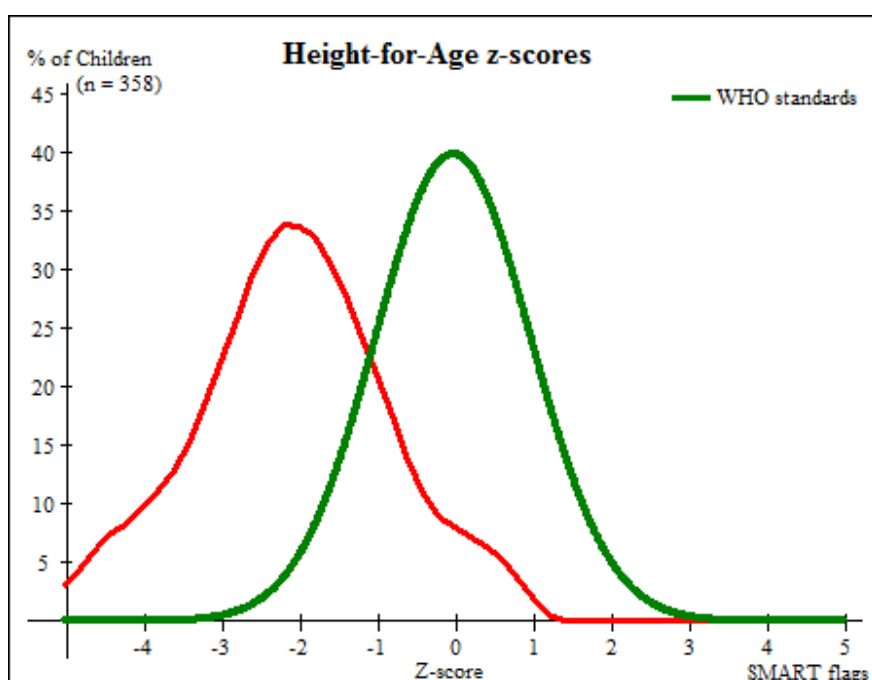
Table 65: Mean z-scores, design effects and excluded subjects

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	358	-0.12±1.06	1.00	0	0
Weight-for-Age	358	-1.25±1.06	1.00	0	0
Height-for-Age	358	-2.08±1.22	1.00	0	0

* contains for WHZ and WAZ the children with oedema.

Feeding programme enrolment results

Table 66: Programme enrolment for acutely malnourished children

	Number/total	% (95% CI)
Supplementary feeding programme enrolment	7/16	43.8% (19.8 - 70.1)
Therapeutic feeding programme enrolment	N/A*	N/A*

*There was no severe malnutrition case found during the survey

Measles vaccination coverage results

Table 67: Measles vaccination coverage for children aged 9-59 months: (N= 429)

	Measles (with card) n=240	Measles (with card or confirmation from mother) n=413
YES	55.9% (51.1 - 60.7; 95% CI)	96.3% (93.9 - 97.8; 95% CI)

Vitamin A supplementation coverage results

Table 68: Vitamin A supplementation for children aged 6-59 months within past 6 months: (N= 465)

	Vitamin A capsule (with card) n=139	Vitamin A capsule (with card or confirmation from mother) n=441
YES	29.9% (25.8 - 34.3; 95% CI)	94.8% (92.3-96.6; 95% CI)

Diarrhoea results

Table 69: Period prevalence of diarrhoea

	Number/total	% (95% CI)
Diarrhoea in the last two weeks	(78/453)	17.2% (13.9 - 21.1)

Anaemia results

Table 70: Prevalence of total anaemia, anaemia categories, and mean haemoglobin concentration in children 6-59 months of age and by age group

	6-59 months n = 465	6-23 months n=158	24-59 months n=307
Total Anaemia (Hb<11.0 g/dL)	(364) 78.3% (74.2 - 81.9)	(112) 70.9% (63.1 - 77.8)	(252) 82.1% 77.3 - 86.2)
Mild Anaemia (Hb 10.0-10.9 g/dL)	(144) 31.0% (26.8 - 35.4)	(42) 26.6% (19.9 - 34.2)	(102) 33.2% (28.0 - 38.8)
Moderate Anaemia (7.0-9.9 g/dL)	(213) 45.8% (41.2 - 50.5)	(69) 43.7% (35.8 - 51.8)	(144) 46.9% (41.2 - 52.7)
Severe Anaemia (<7.0 g/dL)	(7) 1.5% (0.7 - 3.2)	(1) 0.6% (0.0 - 3.5)	(6) 2.0% (0.8 - 4.4)
Mean Hb (g/dL) (SD) [range]	9.9g/dL (±1.4SD) [5.7min, 14.0max]	10.0g/dL (±1.3SD) [6.6min, 13.2max]	9.8g/dL (±1.4SD) [5.7min, 14.0max]

Table 71: Prevalence of moderate and severe anaemia in children 6-59 months of age and by age group

	6-59 months n =465	6-23 months n=158	24-59 months n=307
Moderate and Severe Anaemia (Hb<10.0 g/dL)	(220) 47.3% (42.7 - 52.0; 95%CI)	(70) 44.3% (36.4 - 52.4; 95%CI)	(150) 48.9% (43.1 - 54.6; 95%CI)

4.2.2 Children 0-23 months

Table 72: Infant and young child feeding practices indicators

Indicator	Age range	Number/ total	Prevalence (%)	95% CI
Timely initiation of breastfeeding	0-23 months	111/183	60.7	53.2 - 67.8
Exclusive breastfeeding under 6 months	0-5 months	16/20	80.0	56.3 - 94.3
Continued breastfeeding at 1 year	12-15 months	31/35	88.6	73.3 - 96.8
Continued breastfeeding at 2 years	20-23 months	23/39	59.0	42.1 - 74.4
Introduction of solid, semi-solid or soft foods	6-8 months	20/35	57.1	39.4 - 73.7
Consumption of iron-rich or iron-fortified foods	6-23 months	138/149	92.6	87.2 - 96.3
Bottle feeding	0-23 months	35/180	19.4	19.9 - 26.0

Prevalence of intake

Infant formula

Table 73: Infant formula intake in children aged 0-23 months

	Number/total	% (95% CI)
Proportion of children aged 0-23 months who receive infant formula (fortified or non-fortified)	13/180	7.2% (3.9 - 12.0)

Fortified blended foods

Table 74: FBF intake in children aged 6-23 months

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive FBF	61/154	39.6 (31.8 - 47.8)

Special nutritional products

Table 75: LNS intake in children aged 6-23 months (Nutributter® or Plumpy'Doz®)

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive LNS	111/155	71.6 (63.8 - 78.6)

Table 76: MNP intake in children aged 6-23 months

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive MNP	24/156	15.4 (10.1 - 22.0)

4.2.3 Women 15-49 years

Table 77: Women physiological status and age

Physiological status	Number/total	% of sample
Non-pregnant	167/183	91.3%
Pregnant	16/183	8.7%
Mean age (range)	28.7 years [15 Min; 47 Max]	

Table 78: Prevalence of anaemia and haemoglobin concentration in non-pregnant women of reproductive age (15-49 years)

Anaemia in non-pregnant women of reproductive age (15-49 years)	All n = 167
Total Anaemia (<12.0 g/dL)	(117) 70.1% (62.5 - 76.9)
Mild Anaemia (11.0-11.9 g/dL)	(50) 29.9% (23.1 - 37.5)
Moderate Anaemia (8.0-10.9 g/dL)	(65) 38.9% (31.5 - 46.8)
Severe Anaemia (<8.0 g/dL)	(2) 1.2% (0.1 - 4.3)
Mean Hb (g/dL) (SD) [range]	11.3g/dL (±1.4SD) [6.5 min, 14.7max]

Table 79: ANC enrolment and iron-folic acid pills coverage among pregnant women (15-49 years)

	Number /total	% (95% CI)
Currently enrolled in ANC programme	14/16	87.5% (61.7 - 98.4)
Currently receiving iron-folic acid pills	12/16	75.0% (47.6 - 92.7)

4.2.4 Food security

Table 80: Food security sampling information

Household data	Planned	Actual	% of target
Total households surveyed for Food Security	249	186	74.7

Access to food assistance results
Table 81: Ration card coverage

	Number/total	% (95% CI)
Proportion of households with a ration card	185/186	99.5 (97.0 - 100)

Of the 186 families, one household had no ration card because it was lost.

Table 82: Reported duration of general food ration 1

Average number of days the food ration lasts (Standard deviation)	Average duration (%) in relation to the theoretical duration of the ration*
18.8 (13.4 – 24.2) days out of 30	62.7%

Table 83: Reported duration of general food ration 2

	Number/total	% (95% CI)
Proportion of households reporting that the food ration lasts the entire duration of the cycle	1/185	0.5 (0.0 - 3.0)
Proportion of households reporting that the food ration lasted:		
≤75% of the cycle 30 days	152/185	82.2 (75.9 - 87.4)
>75% of the cycle 30 days	33/185	17.8 (12.6 - 24.1)

Negative coping strategies results

Table 84: Coping strategies used by the surveyed population over the past month

	Number/ total	% (95% CI)
Proportion of households reporting using the following coping strategies over the past month*:		
Borrowed cash, food or other items *with or without interest*	147/186	79.0 (72.5 - 84.6)
Sold any assets that would not have normally sold (furniture, seed stocks, tools, other NFI, livestock etc.)	122/186	65.6 (58.3 - 72.4)
Requested increased remittances or gifts as compared to normal	125/185	67.6 (60.3 - 74.3)
Reduced the quantity and/or frequency of meals	111/186	59.7 (52.3 - 66.8)
Begged	146/186	78.5 (71.9 - 84.2)
Engaged in potentially risky or harmful activities [LIST ACTIVITIES]	33/185	17.8 (12.6 - 24.1)
Proportion of households reporting using none of the coping strategies over the past month	29/184	15.8 (10.8 - 21.8)

* The total is over 100% as households may use several negative coping strategies.

Table 85: Average HDDS

	Mean (Standard deviation)
Average HDDS	9.1 (6.9 – 11.3)

* Maximum HDDS is 12.

Figure 13: Proportion of households consuming different food groups within last 24 hours
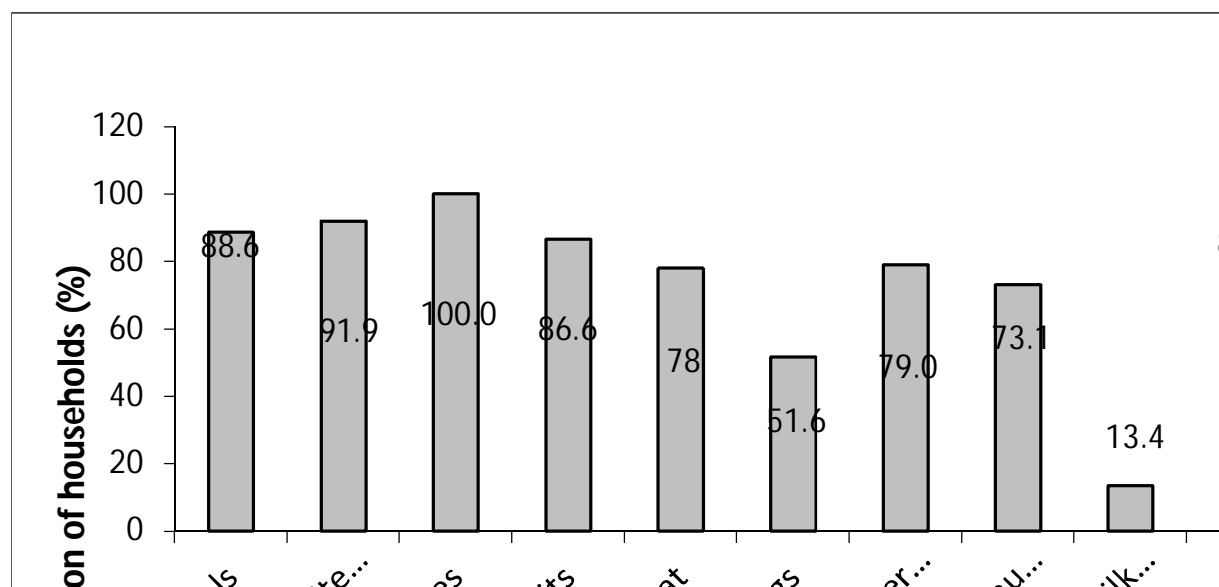
Table 86: Consumption of micronutrient rich foods by households

	Number/total	% (95% CI)
Proportion of households *not consuming any* vegetables, fruits, meat, eggs, fish/seafood, and milk/milk products	0/186	0 (0.0 – 0.0)
Proportion of households consuming either a plant or animal source of vitamin A	180/181	99.4 (97.0 - 100.0)
Proportion of households consuming organ meat/flesh meat, or fish/seafood (food sources of haem iron)	162/186	87.1 (81.4 - 91.6)

4.2.5 WASH

Table 87: WASH sampling information

Household data	Planned	Actual	% of target
Total households surveyed for WASH	249	185	73.2

Table 88: Water quality

	Number /total	% (95% CI)
Proportion of households using an improved drinking water source	185/185	100% (100.0 - 100.0)
Proportion of households that use a covered or narrow necked container for storing their drinking water	81/185	43.8 (36.5 - 51.3)

Table 89: Water quantity: amount of litres of water used per person per day

Proportion of households that use:	Number/total	% (95% CI)
≥ 20 lpppd	64/185	34.6% (27,8 - 41.9)
15 – <20 lpppd	37/185	20.0% (14.5 - 26.5)
<15 lpppd	84/185	45.4% (38.1 - 52.9)

Average water usage was 18.5 lppd

Table 90: Satisfaction with water supply

	Number/total	% (95% CI)
Proportion of households that say they are satisfied with the drinking water supply	177/185	95.7 (91.7 - 98.1)

Figure 14 : Percentage proportion of households that say they are satisfied with the water supply
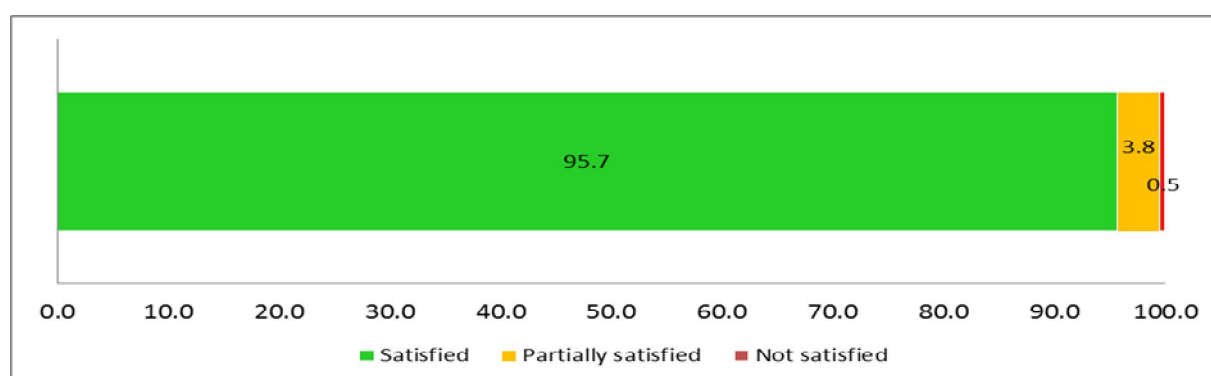
Figure 15: Main reason for dissatisfaction among households not satisfied with water supply
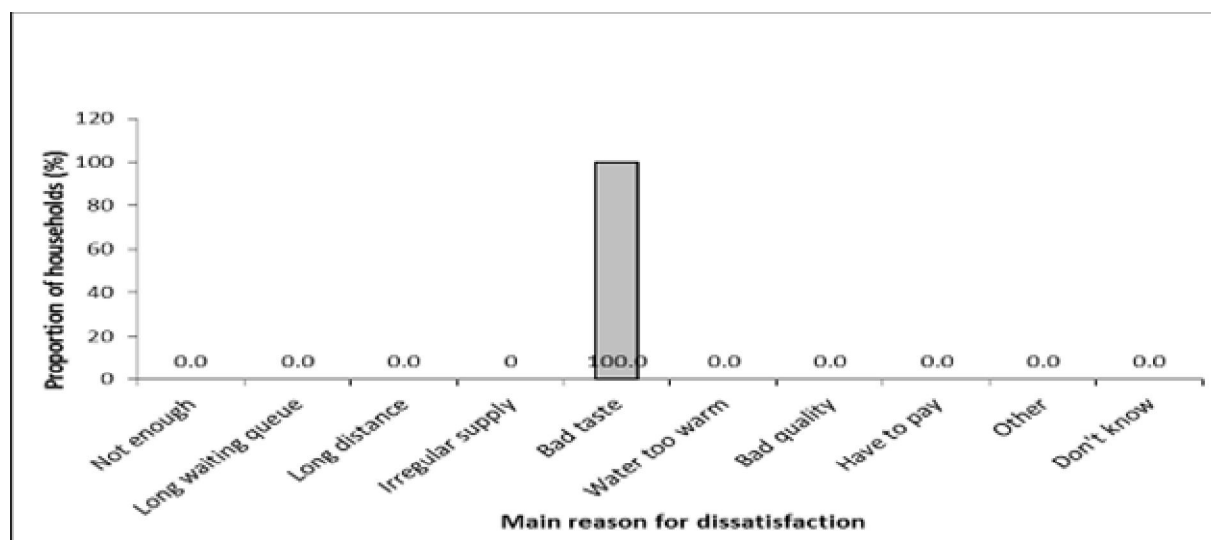
Table 91: Safe excreta disposal

	Number /total	% (95% CI)
Proportion of households that use:		
An improved excreta disposal facility (improved toilet facility, 1 household)	2/179	1.1 (0.1 - 4.0)
A shared family toilet (improved toilet facility, 2 households)	1/179	0.6 (0.0 - 3.1)
A communal toilet (improved toilet facility, 3 households or more)	114/179	63.7 (56.2 - 70.7)
An unimproved toilet (unimproved toilet facility or public toilet)	62/179	34.6 (27.7 - 42.1)
Proportion of households with children under three years old that dispose of faeces safely	133/158	84.2 (77.5 - 89.5)

Figure 16: Proportion of households with children under the age of 3 years whose (last) stools were disposed of safely
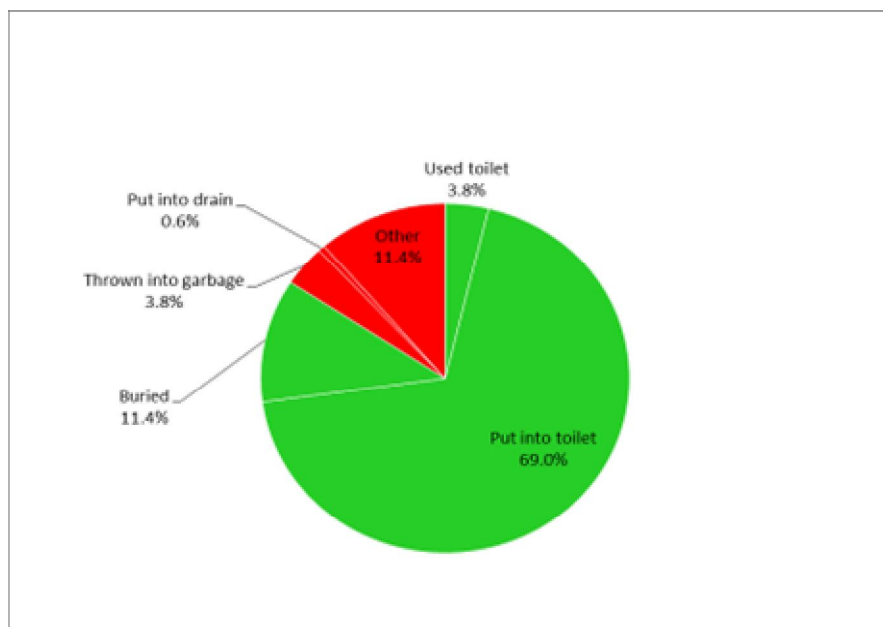
4.2.6 Mosquito Net Coverage

Table 92: Mosquito net coverage sampling information

Household data	Planned	Actual	% of target
Total households surveyed for mosquito net coverage	249	187	*75.1%*

Table 93: Household mosquito net ownership

	Number/total	% (95% CI)
Proportion of total households owning at least one mosquito net of any type	102/187	54.5 (47.1 - 61.8)
Proportion of total households owning at least one LLIN	102/187	54.5 (47.1 - 61.8)

Figure 17: Household ownership of at least one mosquito net (any type)
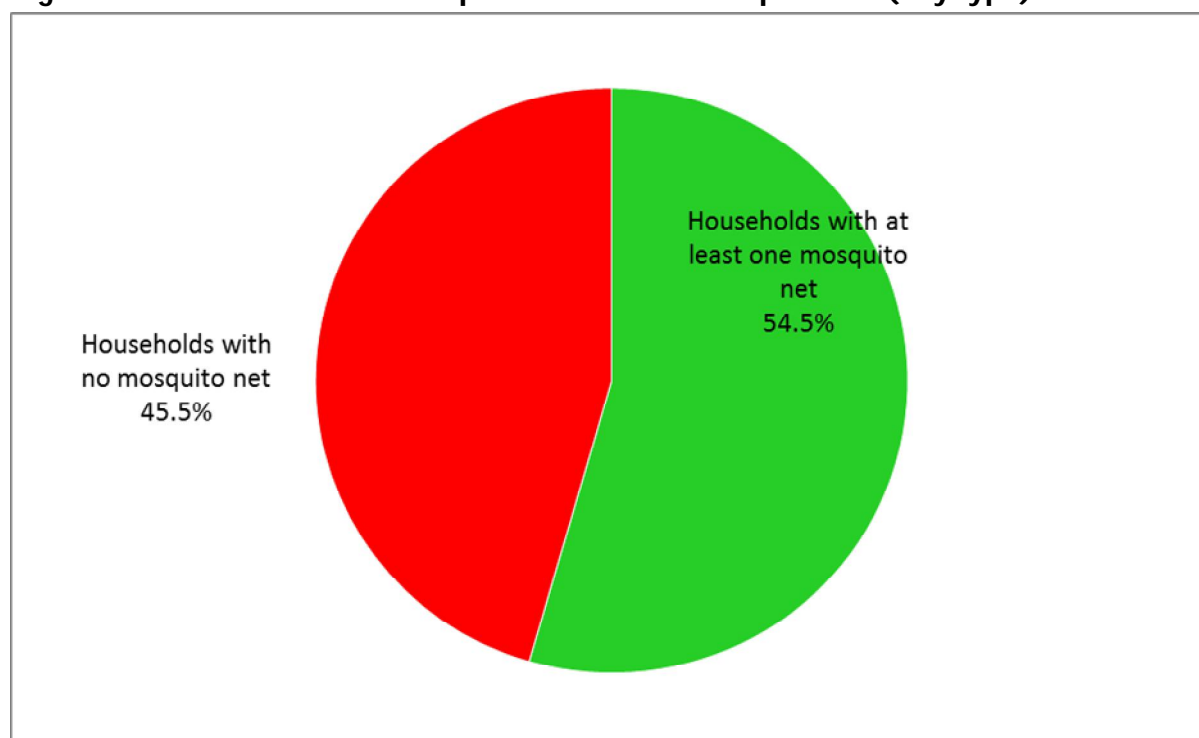
Figure 18: Household ownership of at least one LLIN
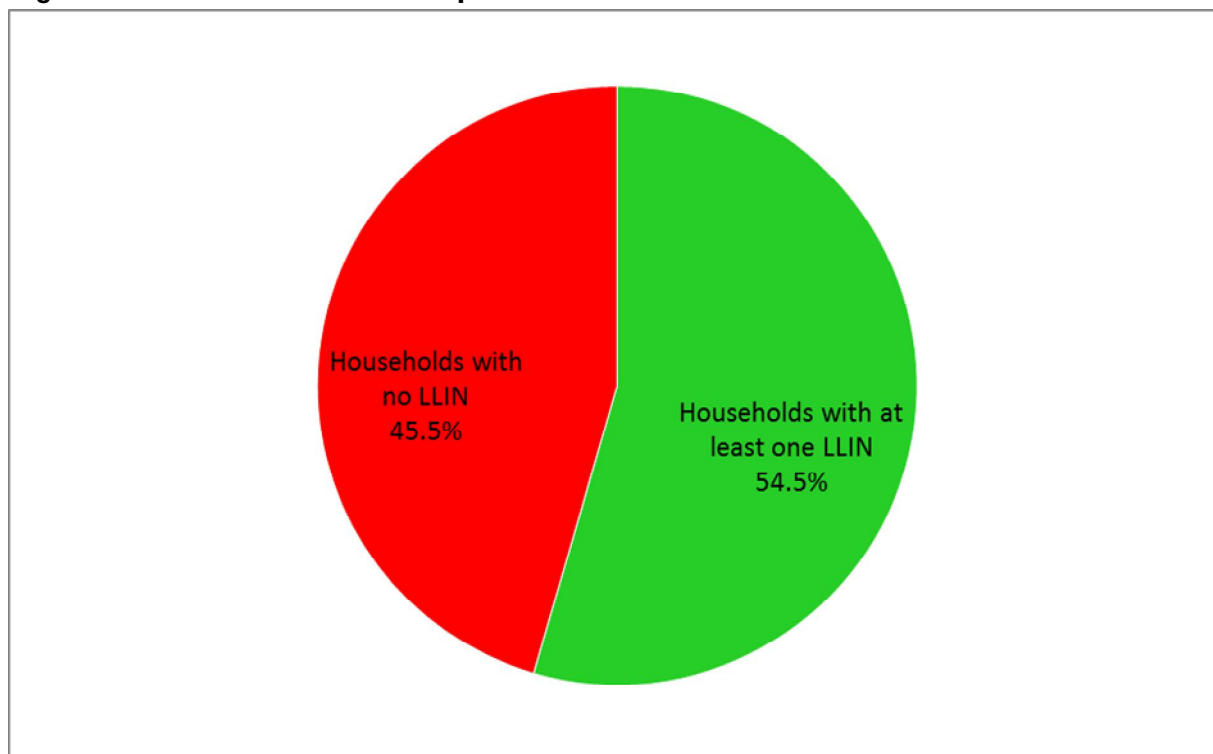
Table 94: Number of nets

Average number of LLINs per household	Average number of persons per LLIN
1.4	6.9

Table 95: Mosquito net utilisation

	Proportion of total population (all ages)		Proportion of 0-59 months		Proportion of pregnant women	
	Total No=981	%	Total No=253	%	Total No=28	%
Slept under net of any type	405	41.3	111	43.9	12	42.9
Slept under LLIN	405	41.3	111	43.9	12	42.9

Figure 19: Mosquito net utilisation by sub-group
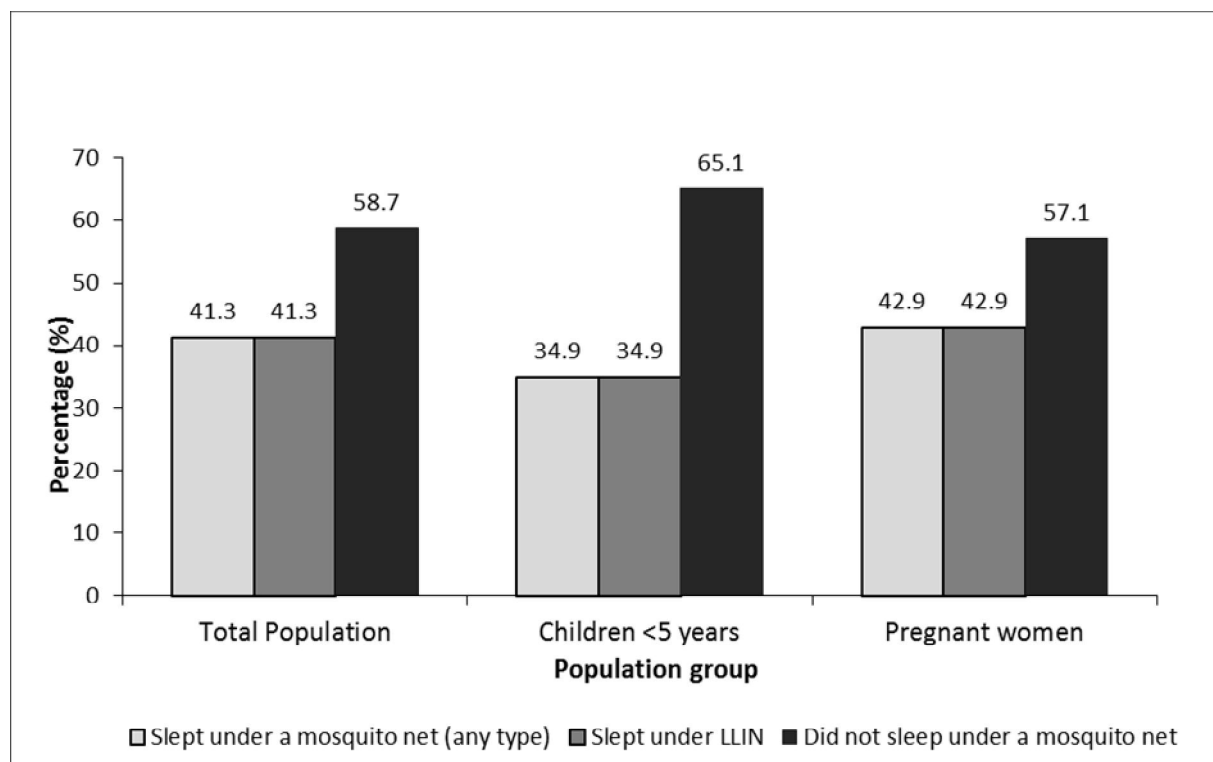
4.3 RESULTS FOR LITTLE WLEBO CAMP

4.3.1 Children 6-59 months

Table 96: Age and sex distribution of sampled children: 6 – 59 months

AGE (mo)	Boys no.	%	Girls no.	%	Total no.	%	Ratio Boy:girl
6-23	46	44.7	57	55.3	103	40.9	0.8
24-29	18	48.6	19	51.4	37	14.7	0.9
30-41	29	58.0	21	42.0	50	19.8	1.4
42-53	18	36.7	31	63.3	49	19.4	0.6
54-59	6	46.2	7	53.8	13	5.2	0.9
Total	117	46.4	135	53.6	252	100.0	0.9

Proportion of children with no exact birthdate was 3%

Table 97: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex.

	All n = 252	Boys n = 117	Girls n = 135
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(9) 3.6 % (1.9 - 6.6 95% C.I.)	(4) 3.4 % (1.3 - 8.5 95% C.I.)	(5) 3.7 % (1.6 - 8.4 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(9) 3.6 % (1.9 - 6.6 95% C.I.)	(4) 3.4 % (1.3 - 8.5 95% C.I.)	(5) 3.7 % (1.6 - 8.4 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(0) 0.0 % (0.0 - 1.5 95% C.I.)	(0) 0.0 % (0.0 - 3.2 95% C.I.)	(0) 0.0 % (0.0 - 2.8 95% C.I.)

The prevalence of oedema was 0%

Table 98: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema

Age (mo)	Total no.	Severe wasting (<-3 z-score) No.	%	Moderate wasting (>= -3 and <-2 z-score) No.	%	Normal (> = -2 z score) No.	%	Oedema No.	%

6-23	103	0	0.0	7	6.8	96	93.2	0	0.0
24-29	37	0	0.0	1	2.7	36	97.3	0	0.0
30-41	50	0	0.0	0	0.0	50	100.0	0	0.0
42-53	49	0	0.0	0	0.0	49	100.0	0	0.0
54-59	13	0	0.0	1	7.7	12	92.3	0	0.0
Total	252	0	0.0	9	3.6	243	96.4	0	0.0

Table 99: Distribution of acute malnutrition and oedema based on weight-for-height z-scores

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 0 (0.0 %)	Not severely malnourished No. 252 (100.0 %)

Figure 20: Distribution of weight-for-height z-scores
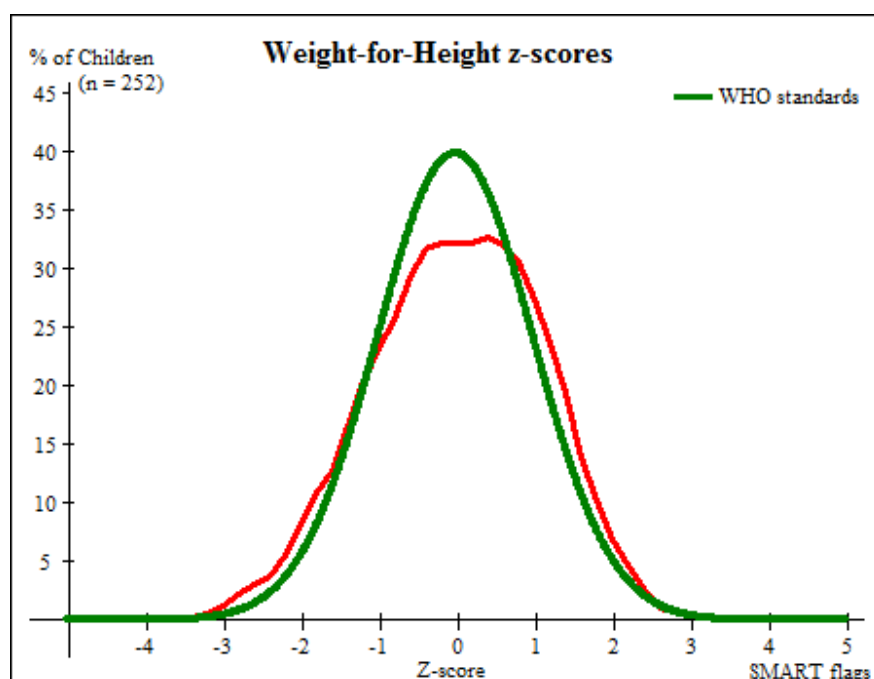
Table 100: Prevalence of acute malnutrition based on MUAC

	All n = 252	Boys n = 117	Girls n = 135
Prevalence of MUAC < 125 mm and/or oedema	(5) 2.0 % (0.9 - 4.6 95% C.I.)	(2) 1.7 % (0.5 - 6.0 95% C.I.)	(3) 2.2 % (0.8 - 6.3 95% C.I.)
Prevalence of MUAC < 125 mm and >= 115 mm, no oedema	(5) 2.0 % (0.9 - 4.6 95% C.I.)	(2) 1.7 % (0.5 - 6.0 95% C.I.)	(3) 2.2 % (0.8 - 6.3 95% C.I.)
Prevalence MUAC < 115 mm and/or oedema	(0) 0.0 % (0.0 - 1.5 95% C.I.)	(0) 0.0 % (0.0 - 3.2 95% C.I.)	(0) 0.0 % (0.0 - 2.8 95% C.I.)

Table 101: Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema

Age (mo)	Total no.	MUAC < 115 mm		MUAC >= 115 mm and < 125 mm		MUAC > = 125 mm		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-23	103	0	0.0	5	4.9	98	95.1	0	0.0
24-29	37	0	0.0	0	0.0	37	100.0	0	0.0
30-41	50	0	0.0	0	0.0	50	100.0	0	0.0
42-53	49	0	0.0	0	0.0	49	100.0	0	0.0
54-59	13	0	0.0	0	0.0	13	100.0	0	0.0
Total	252	0	0.0	5	2.0	247	98.0	0	0.0

Table 102: Prevalence of underweight based on weight-for-age z-scores by sex

	All n = 252	Boys n = 117	Girls n = 135
Prevalence of underweight (<-2 z-score)	(34) 13.5 % (9.8 - 18.3 95% C.I.)	(21) 17.9 % (12.0 - 25.9 95% C.I.)	(13) 9.6 % (5.7 - 15.8 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(28) 11.1 % (7.8 - 15.6 95% C.I.)	(18) 15.4 % (10.0 - 23.0 95% C.I.)	(10) 7.4 % (4.1 - 13.1 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(6) 2.4 % (1.1 - 5.1 95% C.I.)	(3) 2.6 % (0.9 - 7.3 95% C.I.)	(3) 2.2 % (0.8 - 6.3 95% C.I.)

Table 103: Prevalence of stunting based on height-for-age z-scores and by sex

	All n = 252	Boys n = 117	Girls n = 135
Prevalence of stunting **(<-2 z-score)**	(81) 32.1 % (26.7 - 38.1 95% C.I.)	(45) 38.5 % (30.1 - 47.5 95% C.I.)	(36) 26.7 % (19.9 - 34.7 95% C.I.)
Prevalence of moderate **stunting** **(<-2 z-score and >=-3 z-score)**	(53) 21.0 % (16.5 - 26.5 95% C.I.)	(26) 22.2 % (15.6 - 30.6 95% C.I.)	(27) 20.0 % (14.1 - 27.5 95% C.I.)
Prevalence of severe stunting **(<-3 z-score)**	(28) 11.1 % (7.8 - 15.6 95% C.I.)	(19) 16.2 % (10.6 - 24.0 95% C.I.)	(9) 6.7 % (3.5 - 12.2 95% C.I.)

Table 104: Prevalence of stunting by age based on height-for-age z-scores

Age (mo)	Total no.	Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
		No.	%	No.	%	No.	%
6-23	103	8	7.8	16	15.5	79	76.7
24-29	37	5	13.5	5	13.5	27	73.0
30-41	50	7	14.0	13	26.0	30	60.0
42-53	49	6	12.2	13	26.5	30	61.2
54-59	13	2	15.4	6	46.2	5	38.5
Total	252	28	11.1	53	21.0	171	67.9

Figure 21: Distribution of height-for-age z-scores
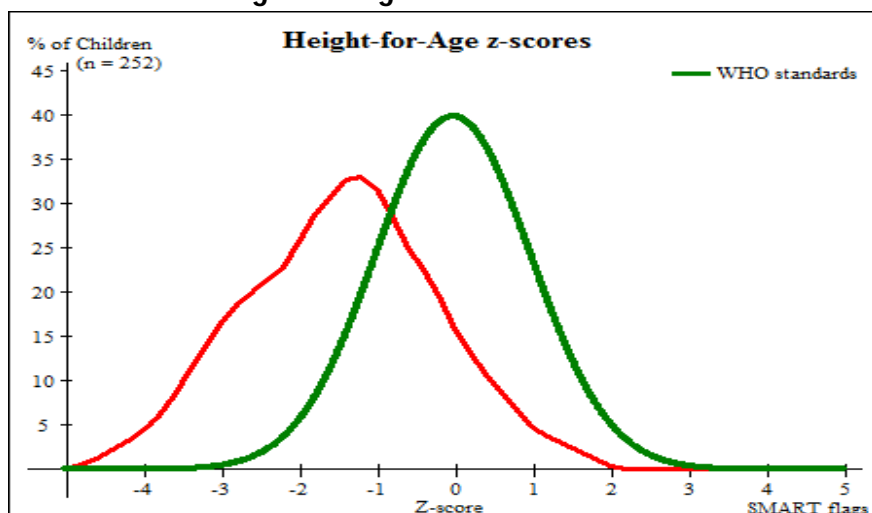
Table 105: Mean z-scores, design effects and excluded subjects

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	252	0.00±1.07	1.00	0	0
Weight-for-Age	252	-0.81±1.04	1.00	0	0
Height-for-Age	252	-1.45±1.20	1.00	0	0

* contains for WHZ and WAZ the children with oedema.

Feeding programme enrolment results

Table 106: Programme enrolment for acutely malnourished children

	Number/total	% (95% CI)
Supplementary feeding programme enrolment	3/5	60.0% (14.7 - 94.7)
Therapeutic feeding programme enrolment	N/A*	N/A*

*There was no case of severe malnutrition found during the survey

Measles vaccination coverage results

Table 107: Measles vaccination coverage for children aged 9-59 months (n= 249)

	Measles (with card) n=108	Measles (with card or confirmation from mother) n=202
YES	43.4% (37.1 - 49.8; 95% CI)	81.1% (75.7 - 85.8; 95% CI)

Vitamin A supplementation coverage results

Table 108: Vitamin A supplementation for children aged 6-59 months within past 6 months (n= 273)

	Vitamin A capsule (with card) n=61	Vitamin A capsule (with card or confirmation from mother) n=202
YES	22.3% (17.5 - 27.8; 95% CI)	74.0% (68.4-79.10; 95% CI)

Diarrhoea results

Table 109: Period prevalence of diarrhoea

	Number/total	% (95% CI)

| Diarrhoea in the last two weeks | 17/243 | 7.0 (4.1-11.0) |

Anaemia results

Table 110: Prevalence of total anaemia, anaemia categories, and mean haemoglobin concentration in children 6-59 months of age and by age group

	6-59 months n = 272	6-23 months n= 110	24-59 months n= 162
Total Anaemia (Hb<11.0 g/dL)	(157) 57.7% (51.6 - 63.7)	(68) 61.8% (52.1 - 70.9)	(89) 54.9% (46.9 - 62.8)
Mild Anaemia (Hb 10.0-10.9 g/dL)	(84) 30.9% (25.4-36.7)	(34) 30.9% (22.4 - 40.4)	(50) 30.9% (23.9 - 38.6)
Moderate Anaemia (7.0-9.9 g/dL)	(71) 26.1% (21.0 - 31.7)	(34) 30.9% (22.4 - 40.4)	(37) 22.8% (16.6 - 30.1)
Severe Anaemia (<7.0 g/dL)	(2) 0.7% (0.1 - 2.6)	(0) 0.0% (0.0 - 0.0)	(2) 1.2% (0.1 - 4.4)
Mean Hb (g/dL) (SD / 95% CI) [range]	10.6g/dL (±1.3SD) [6.0min, 13.6max]	10.5g/dL ((±1.2SD) [7.5min, 13.0max]	10.6g/dL ((±1.3SD) [6.0min, 13.6max]

Table 111: Prevalence of moderate and severe anaemia in children 6-59 months of age and by age group

	6-59 months n = 272	6-23 months n=110	24-59 months n=162
Moderate and Severe Anaemia (Hb<10.0 g/dL)	(73) 26.8% (21.7 - 32.5; 95% CI)	(34) 30.9% (22.4 - 40.4; 95% CI)	(39) 24.1% (17.7 - 31.4; 95% CI)

4.3.2 Children 0-23 months

Table 112: Infant and young child feeding practices indicators

Indicator	Age range	Number /total	Prevalence (%)	95% CI
Timely initiation of breastfeeding	0-23 months	85/143	59.4	50.9 - 67.6
Exclusive breastfeeding under 6 months	0-5 months	22/31	71.0	52.0 - 85.8
Continued breastfeeding at 1 year	12-15 months	23/27	85.2	66.3 - 95.8
Continued breastfeeding at 2 years	20-23 months	6/26	23.1	9.0 - 43.6
Introduction of solid, semi-solid or soft foods	6-8 months	15/23	65.2	42.7 - 83.6
Consumption of iron-rich or iron-fortified foods	6-23 months	74/111	89.2	80.4 - 94.9
Bottle feeding	0-23 months	24/139	17.3	11.4 - 24.6

Prevalence of intake
Infant formula
Table 113 : Infant formula intake in children aged 0-23 months

	Number/total	% (95% CI)
Proportion of children aged 0-23 months who receive infant formula (fortified or non-fortified)	12/125	9.6 (5.1 - 16.2)

Fortified blended foods
Table 114: FBF intake in children aged 6-23 months

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive FBF	31/94	33.0 (23.6 - 43.4)

Special nutritional products

Table 115 : LNS intake in children aged 6-23 months (Nutributter® or Plumpy'Doz®)

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive LNS	57/93	61.3 (50.6 - 71.2)

Table 116: MNP intake in children aged 6-23 months

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive MNP	13/93	14.0 (7.7 - 22.7)

4.3.3 Women 15-49 years

Table 117: Women physiological status and age

Physiological status	Number/total	% of sample
Non-pregnant	134/146	91.8%
Pregnant	12/146	8.2%
Mean age (range)	29.4 years [15min; 49max]	

Table 118: Prevalence of anaemia and haemoglobin concentration in non-pregnant women of reproductive age (15-49 years)

Anaemia in non-pregnant women of reproductive age (15-49 years)	All n = 134
Total Anaemia (<12.0 g/dL)	(80) 59.7% (50.9 - 68.1)
Mild Anaemia (11.0-11.9 g/dL)	(54) 40.3% (31.9 - 49.1)
Moderate Anaemia (8.0-10.9 g/dL)	(24) 17.9% (11.8 - 25.5)
Severe Anaemia (<8.0 g/dL)	(2) 1.5% (0.2 - 5.3)
Mean Hb (g/dL) (SD) [range]	11.8g/dL (±1.2SD) [7.5min, 14.4max]

Table 119: ANC enrolment and iron-folic acid pills coverage among pregnant women (15-49 years)

	Number /total	% (95% CI)
Currently enrolled in ANC programme	12/12	100.0 (100.0 – 100.0)
Currently receiving iron-folic acid pills	12/12	100.0 (100.0 – 100.0)

4.3.4 Food security

Table 120: Food security sampling information

Household data	Planned	Actual	% of target
Total households surveyed for Food Security	176	136	77.3%

Access to food assistance results

Table 121: Ration card coverage

	Number/total	% (95% CI)
Proportion of households with a ration card	132/136	97.1% (92.6 - 99.2)

Out of the four households reporting not to having ration cards, 1 (25%) said it got lost, 1 (25%) said it was because they were not included in the targeting criteria; and 2 (50%) gave other reasons.

Table 122: Reported duration of general food ration 1

Average number of days the food ration lasts (Standard deviation or 95% CI)	Average duration (%) in relation to the theoretical duration of the ration
19.7 (10.8 – 28.6)days out of 30	65.7%

Table 123: Reported duration of general food ration 2

	Number/total	% (95% CI)
Proportion of households reporting that the food ration lasts the entire duration of the cycle	6/130	4.6% (1.7 - 9.8)
Proportion of households reporting that the food ration lasted:		
≤75% of the 30 days cycle	106/130	81.5% (73.8 - 87.8)
>75% of the 30 days cycle	24/130	18.5% (12.2 - 26.2)

Negative coping strategies results

Table 124: Coping strategies used by the surveyed population over the past month

	Number/ total	% (95% CI)
Proportion of households reporting using the following coping strategies over the past month*:		
Borrowed cash, food or other items *with or without interest*	124/135	91.9% (85.9 - 95.9)
Sold any assets that would not have normally sold (furniture, seed stocks, tools, other NFI, livestock etc.)	108/134	80.6% (72.9 - 86.9)
Requested increased remittances or gifts as compared to normal	99/135	73.3% (65.0 - 80.6)
Reduced the quantity and/or frequency of meals	99/136	72.8% (64.5 - 80.1)
Begged	99/136	72.8% (64.5 - 80.1)
Engaged in potentially risky or harmful activities	29/133	21.8% (15.1 - 29.8)
Proportion of households reporting using none of the coping strategies over the past month	3/130	2.3% (0.5 - 6.6)

* The total is over 100% as households may use several negative coping strategies.

Table 125: Average HDDS

	Mean (Standard deviation)
Average HDDS	8.4 (5.5 – 11.3)

* Maximum HDDS is 12.

Figure 22: Proportion of households consuming different food groups within last 24 hours
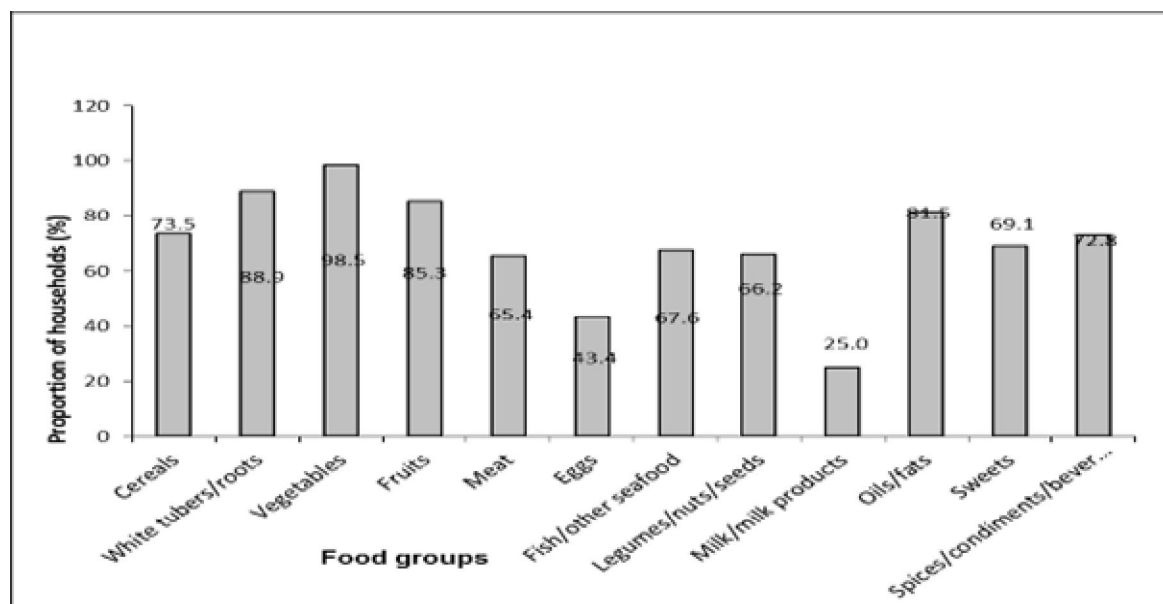
Table 126: Consumption of micronutrient rich foods by households

	Number/total	% (95% CI)
Proportion of households *not consuming any* vegetables, fruits, meat, eggs, fish/seafood, and milk/milk products	1/136	0.7 (0.0 - 4.0)
Proportion of households consuming either a plant or animal source of vitamin A	128/134	95.5 (90.5 - 98.3)
Proportion of households consuming organ meat/flesh meat, or fish/seafood (food sources of haem iron)	105/136	77.2 (69.2 - 84.0)

4.3.5 WASH

Table 127: WASH sampling information

Household data	Planned	Actual	% of target
Total households surveyed for WASH	176	130	73.9%

Table 128: Water quality

	Number/total	% (95% CI)
Proportion of households using an improved drinking water source	130/130	100 (100.0 - 100.0)
Proportion of households that use a covered or narrow necked container for storing their drinking water	80/130	61.5 (52.6 - 69.9)

Table 129: Water quantity: amount of litres of water used per person per day

Proportion of households that use:	Number/total	% (95% CI)
≥ 20 lpppd	62/130	47.7% (38.9 - 56.6)
15 – <20 lpppd	27/130	20.8% (14.2 - 28.8)
<15 lpppd	41/130	31.5% (23.7 - 40.3)

Average water usage was 21.4 lpppd

Table 130: Satisfaction with water supply

	Number/total	% (95% CI)
Proportion of households that say they are satisfied with the drinking water supply	129/130	99.2% (95.8 - 100.0)

Figure 23: Proportion of households that say they are satisfied with the water supply
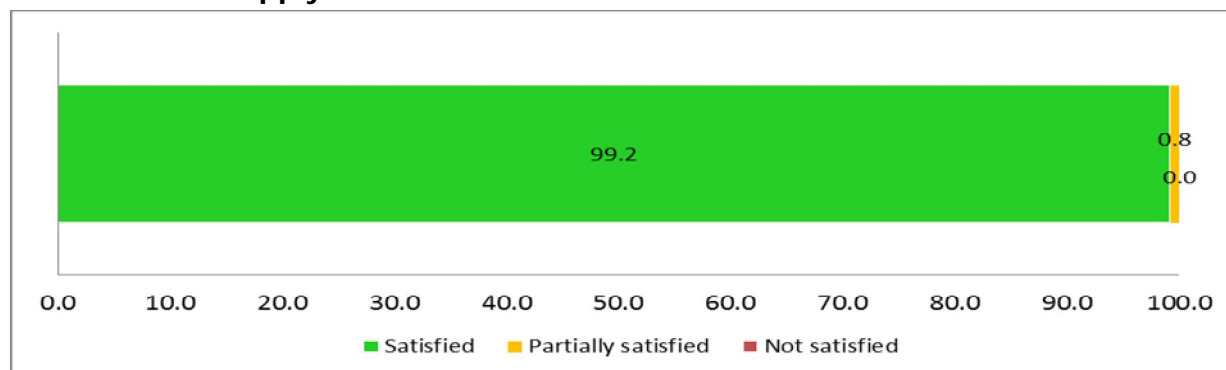
Table 131: Safe excreta disposal

	Number/total	% (95% CI)
Proportion of households that use:		
An improved excreta disposal facility (improved toilet facility, 1 household)	7/127	5.5 (2.2 - 11.0)
A shared family toilet (improved toilet facility, 2 households)	23/127	18.1 (11.8 - 25.9)
A communal toilet (improved toilet facility, 3 households or more)	66/127	52.0 (42.9 - 60.9)
An unimproved toilet (unimproved toilet facility or public toilet)	31/127	24.4 (17.2 - 32.8)
Proportion of households with children under three years old that dispose of faeces safely	89/94	94.7 (88.0 - 98.3)

Figure 24: Proportion of households with children under the age of 3 years whose (last) stools were disposed of safely
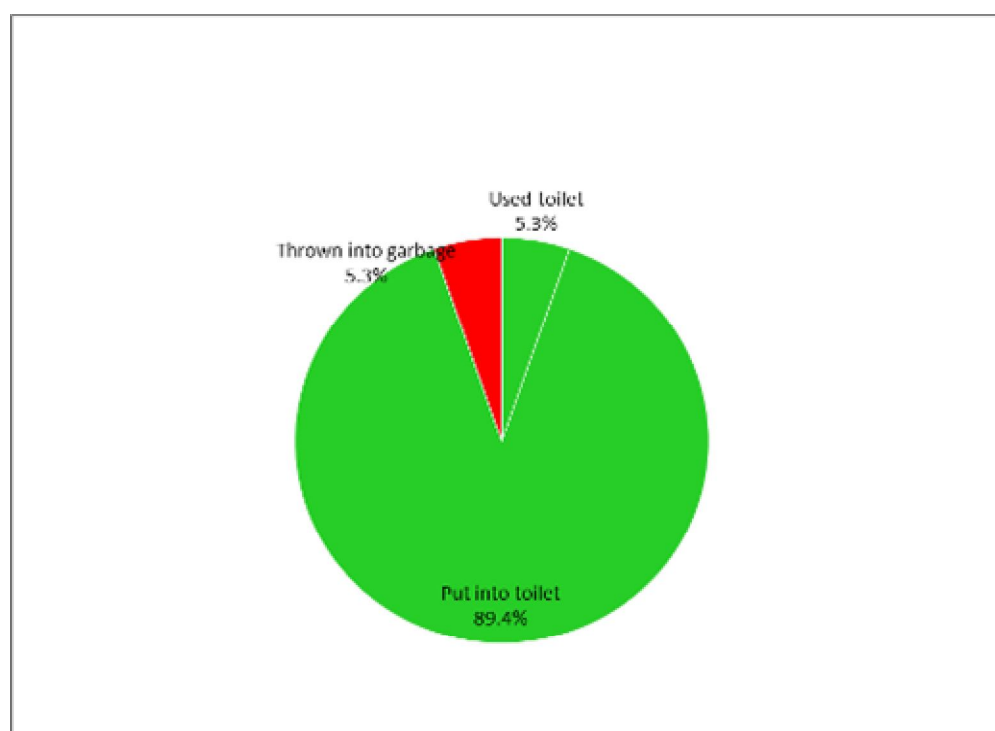
4.3.6 Mosquito Net Coverage

Table 132: Mosquito net coverage sampling information

Household data	Planned	Actual	% of target
Total households surveyed for mosquito net coverage	176	135	76.7%

Table 133: Household mosquito net ownership

	Number /total	% (95% CI)
Proportion of total households owning at least one mosquito net of any type	65/135	48.1% (39.5 - 56.9)
Proportion of total households owning at least one LLIN	65/135	48.1% (39.5 - 56.9)

Figure 25: Household ownership of at least one mosquito net (any type)
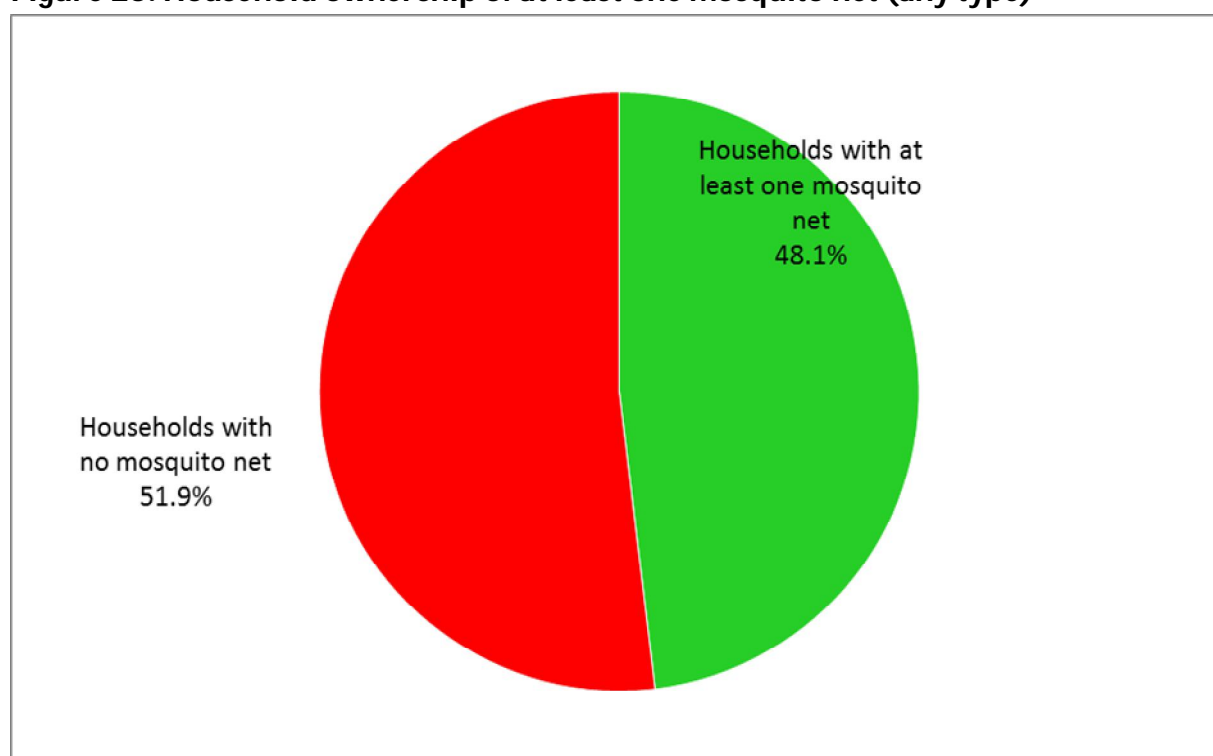
Figure 26: Household ownership of at least one LLIN

Households with no LLIN
51.9%

Households with at least one LLIN
48.1%
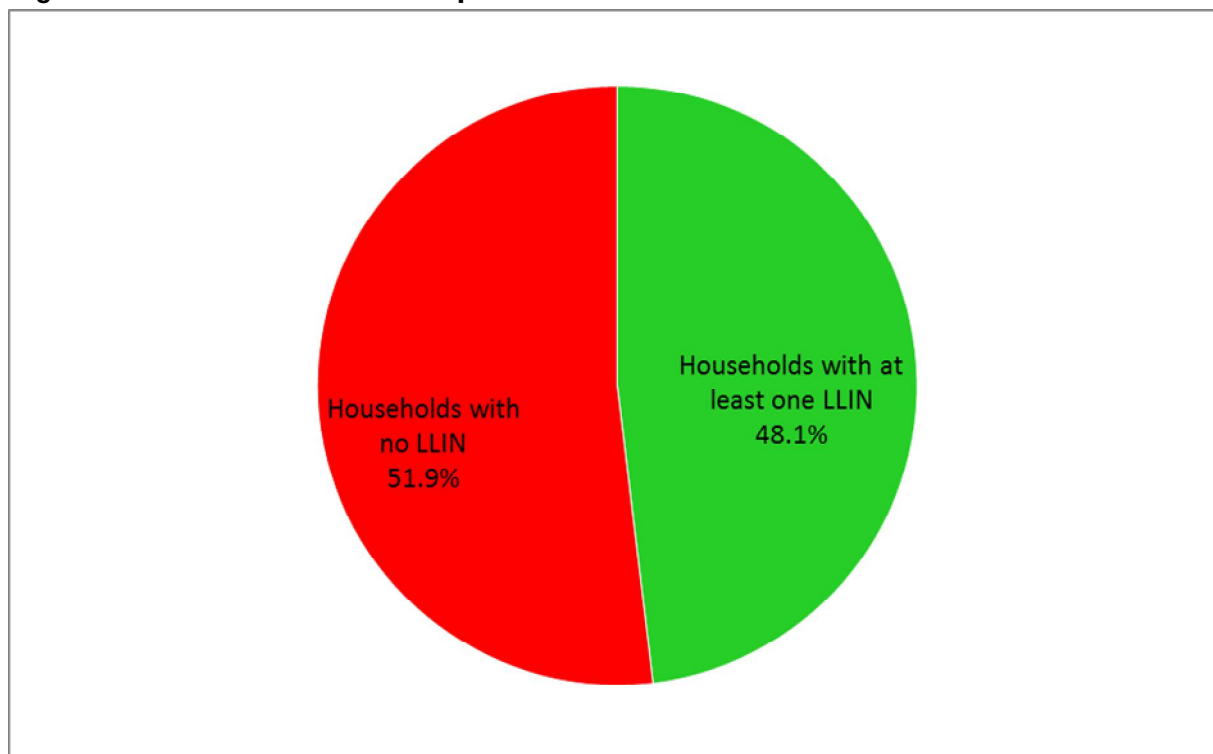
Table 134: Number of nets

Average number of LLINs per household	Average number of persons per LLIN
1.5	6.8

Table 135: Mosquito net utilisation

	Proportion of total population (all ages)		Proportion of 0-59 months		Proportion of pregnant women	
	Total No=651	%	Total No=135	%	Total No=17	%
Slept under net of any type	257	39.5	87	64.4	6	35.3
Slept under LLIN	257	39.5	87	64.4	6	35.3

Figure 27: Mosquito net utilisation by sub-group
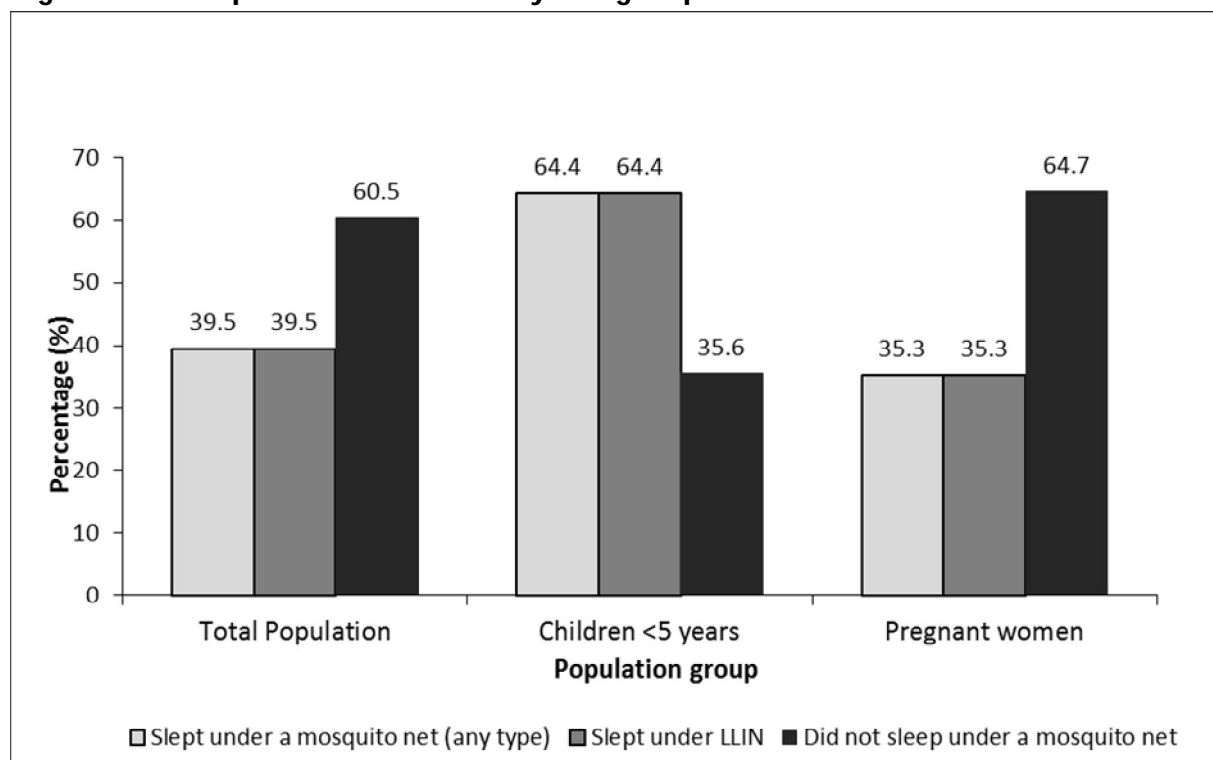
5. LIMITATIONS

- **Timing of the survey:** Comparison between the 2015 and 2013 nutrition survey should be done with caution bearing in mind of the annual seasons. The 2013 was done in November and December while the 2015 was conducted in April and May. In other words the two surveys were conducted in two different annual season, 2013 at the end of rainy season where harvests is at the peak and morbidity is high and vice-versa for the 2015. This might have an impact on the data collected and mislead interpretation of the information gathered especially on food security and morbidities.

- **Ebola virus disease (EVD):** The survey was conducted during the EVD, where a considerable number of respondents were not ready to participate in fear of contamination and acquiring the virus. Response rate was thus, inadequate across the three camps and might have affected the sample representation especially for household level questionnaires of Food security, WASH and Mosquito net.

- **Poor quality of age data:** Despite improvement of age documentation still some of the surveyed children did not have official documents leading to estimation. It was noted during the survey that documentation of age was not optimal. Birth certificates or any other reliable documents that could be used for reference were very few. In some cases use of local event calendar was not possible as parents or caretakers could not recall the period, and thus, difficult to determine age among a few sampled children. In such case where selection of age was a criterion for analysis, the subject was automatically excluded. The ration card which usually has the names and year of births for family members were used to determine ages where applicable. Unfortunately, most of the UNHCR registration cards had rounded age with birthdates. This also may have affected stunting and underweight results due to inaccurate recorded age.

- **Language barrier:** Training of surveyors was done in English with translation to French by a few participants. During data collection most of refugees were not able to speak either of the two, instead interview were conducted in local dialects. It is possible that in the course of translations some messages were incorrectly passed and thus mislead the respondent.

- **Use of smart phones:** Data collection using mobile technology was new to some of the survey team members, and might have also introduced some errors.

- **Use of standard MUAC tape:** In two of the three camps, standard MUAC tapes calibrated in millimeters were used. The readings in the used tapes are all even numbers (e.g. 110, 112, 114...etc). The measurements were therefore penalized in the plausibility check report for not having odd numbers recorded during data collection. This should be interpreted with caution especially for PTP camp where score was 10 just for this particular measurement.

- **Analysis of mosquito net ownership and utilization in pregnant women:** Number of pregnant women reported in the anaemia module may differ from the one reported for mosquito net. The difference may be due to allowable entry of pregnant women into electronic mosquito net questionnaire in the mobile phone regardless of the age limit, henceforth should be interpreted with care.

6. DISCUSSION

6.1 Nutritional status of children under-fives

Representation of sex was overall equal in number considering all the boys and girls surveyed across the three camps (sex ratio 1.0 boys to girls). Sex ratio was 1.0 in Bahn camp, 1.1 in PTP and 0.9 in Little Wlebo. Sex ratio is acceptable when lies between 0.8 and 1.2 boys to girls, and thus, both sexes were equally represented.

Prevalence of GAM in children aged 6 – 59 months (based on WHO 2006 Growth Standards) across the three camps remained within the WHO and UNHCR recommended standards of below 5% and below 10% respectively. The highest observed GAM was 4.2% (2.6 – 6.8; 95%CI) in PTP while the lowest was 1.9% (0.8 – 4.4; 95% CI) in Bahn camp. The difference was not statistically significant (p>0.05). The weighted prevalence of the three camps was 3.6% indicating an increase when compared 2.7% in 2013. Liberia is among the West African countries which were highly affected by EVD including the counties where refugee camps are located. Imposed restrictions on movements within and outside the camps for petty trading and other positive coping strategies might have affected the level of household food security bearing in mind that food aid provided by WFP was below the recommended minimum ration.

Prevalence of GAM (based on MUAC) ranged from 0.8% (0.2 – 2.8; 95%CI) in Bahn and 4.5% (2.8 – 7.1; 95%CI) in PTP indicating a statistically significant difference between the two camps (p<0.05). There was no severe wasting or bilateral pitting oedema found during the survey across all the camps.

Prevalence of chronic malnutrition as indicated by stunting in children aged 6 – 59 months was 37.9% (32.3-44.0; 95%CI) in Bahn, 53.9% (48.7-59.0; 95%CI) in PTP camp and 32.1% (26.7-38.1; 95%CI) for Little Wlebo. The weighed prevalence for the three camps was 45% compared to 43% in the 2013 nutrition survey. Disaggregation by age indicates higher prevalence of stunting in children aged above two years. The weighted prevalence in the latter group was 50% as opposed to 36% in children aged 6 – 23 months. The level of stunting has thus, remained almost unchanged over the last one year, classified at "critical level" (>40%) according to classification of public health significance or targets.

The situation is however similar to that of host community which according to the survey conducted in June 2013 by the MOHSW prevalence of stunting among children aged 6 – 59 was 49% in Grand Gedeh, 45% in Nimba and 40% in Maryland counties. The national prevalence was 36%, improved from 42% in 2009.

Despite efforts to curb the higher prevalence of stunting through targeted feeding to children aged below 2 years in the camps, an insignificant improvement has been noticed. UNHCR started BSFP to children aged 6 – 23 months by providing Nutributter® since July 2014, but it is believed that the EVD which hit Liberia from third quarter of the same year decelerated the efforts and might have greatly impaired performance of the program. Lack of funds to procure more LNS remains a serious challenge for the Liberia operation.

6.2 Programme coverage / enrolment

6.2.1 Measles

The measles vaccination coverage was 89.5% (85.2-92.9; 95CI) for Bahn, 96.3% (93.9 - 97.8; 95%CI) for PTP, 81.1% (75.7 - 85.8; 95%CI) for Little Wlebo camp and the weighed figure was 91%. In the survey conducted in 2013, weighted prevalence was 55% indicating low coverage mainly due to poor documentation of the antigen in the child vaccination card. The regular national immunization campaigns and improved documentation of antigens has significantly improved the overall coverage of measles vaccination when compared to 2013. The coverage was however still below the recommended UNHCR and WHO target of >95%. HIS reports indicated measles vaccination coverage of >95%. Liberia national EPI programme targets only infants for measles vaccination while UNHCR and WHO calculates the coverage based on the denominator of number of children aged between 9 – 59 months.

6.2.2 Vitamin A

The coverage of vitamin A supplementation in children aged 6 – 59 months was 94.7% (91.3-97.0; 95%CI) in Bahn, 94.8% (92.3-96.6; 95%CI) in PTP, in Little Wlebo 74.0% (68.4-79.10; 95%CI) and 88.7% overall coverage. Overall coverage has significantly improved when compared to the 2013 nutrition survey that revealed 59.3%, although the coverage was still below the UNHCR standard that recommends ≥90% in emergency in refugee

camps[10]. Regular national immunization campaigns have been carried out and included supplementation of vitamin A, polio and measles vaccination where possible. Improved documentation/record system of the supplement has contributed to increased vitamin A coverage when compared to the past years. If more efforts are to be invested there is no doubt that the UNHCR standard of >90% will be met.

6.2.3 Feeding program enrolment

The program coverage was calculated only for SFP as there was no SAM case found during the survey across the three camps. In Bahn camp there were two cases of MAM both not registered in the feeding programme, and thus zero percentage coverage. In Little Wlebo and PTP, cases were found but in small number leading to low coverage (60% and 44%) but wider range confidence interval (CI). The reported annual coverage was however within the observed CI during the survey[11]. There may be several reasons connected to the difference including the denominator used for calculation of routine coverage which always refers to nutritional status according the past nutrition survey. The figure might not reflect the reality where there is a significant change in nutritional status among children.

6.2.4 Prevalence of diarrhoea

Percentage of children aged between 6 – 59 months who reported to have had episodes of diarrhoea in the last two weeks was 11% in Bahn camp, 17% in PTP and 7% in Little Wlebo. The weighted percentage of the three camps was 13.0% reduced from 21% in the 2013 nutrition survey. Reports for WASH indicate that more efforts were invested including increased water supply, hygiene promotion and health education especially during the peak of EVD in 2014. Diarrheal diseases have always been low among the major causes of outpatient morbidity in camp clinics contributing to below 10% of under-five morbidity.

6.2.5 ANC and iron-folic acid supplementation

The coverage of pregnant women enrolled at antenatal clinic was 86.7% (59.5 - 98.3; 95%CI) in Bahn, 87.5% (61.7% 98.4%) in PTP and 100.0% (100.0 – 100.0) in Little Wlebo.

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[10] Global Strategy for Public Health (UNHCR, 2014)
[11] Year End Nutrition Report (UNHCR Zwedru, 2014)

All pregnant women enrolled in ANC in Bahn and Little Wlebo camp were receiving iron and folic acid supplements. In PTP camp, 14.3% of enrolled pregnant women in the ANC were not receiving the supplements. Coverage of ANC and micronutrients supplementation has maintained almost at the same level when the two surveys are compared.

6.3 Anaemia in young children and women

The prevalence of anaemia among children aged 6 – 59 months was 49.1% (43.1 - 55.1; 95%CI) in Bahn, 78.3% (74.2 - 81.9; 95%CI) in PTP and 57.7% (51.6 - 63.7; 95%CI) in Little Wlebo camp. When compared to the results of the 2013 survey, 76.0% (71.0 - 80.5; 95%CI) in Bahn, 80.5% (76.5 - 84.1; 95%CI) in PTP and 73.7% (68.7-78.4; 95%CI), prevalence of anemia decreased by 26.9% for Bahn, 2.2% for PTP and 16.0% in Little Wlebo, showing significant difference particularly in Bahn and Little Wlebo camps. The overall prevalence was 67%, decreased by 11% when compared to 2013 nutrition survey.

In children aged between 6 – 23 months, prevalence of anaemia decreased from 78% to 50.6% in Bahn, 86% to 70.9% in PTP and 78% to 61.8% in Little Wlebo camp. The overall prevalence of anaemia decreased from 82% in 2013 to 64.6% in 2015.

Several interventions were implemented based on recommendations of the 2013 nutrition survey targeting health and nutrition. Introduction of BSFP to children aged 6 – 23 months, intensifying infant and young children feeding practices, distribution of mosquito net to reduce incidences of malaria, livelihood activities including home backyard gardening and animal husbandry, health education and promotion in pregnant women and lactating mothers were the most prioritized interventions. The planned project of blanket supplementation of micronutrient powder in children aged 24 – 59 months could not happen due to funding limitations. As the results, the level of anaemia in this above mentioned age group remained almost unchanged.

Despite reduced prevalence in both targeted age, the situation remained in a "public health emergency" category according to classification of public health significance. A lot of efforts are still needed to address anaemia in the three camps but more in PTP where according to

2014 weekly monitoring reports, an average of three children were referred to government health facility for blood transfusion in each week[12].

The prevalence of anaemia in non-pregnant women aged 15-49 years was 42.1% (32.9 - 51.7; 95%CI) in Bahn, 70.1% (62.5 - 76.9; 95%CI) in PTP and 59.7% (50.9 - 68.1; 95%CI) in Little Wlebo camp leading to an overall of 62.0%. When compared to the overall figure of 50% in 2013, prevalence of anaemia in this target group had increased by 12%. The increase is highest in PTP with 17.4%. This increase may be linked to food insecurity which was exacerbated by the hit of EVD in 2014, inadequate intake of iron caused by insufficient micronutrients in the refugee food basket and poor eating habits of green leafy vegetables connected to cultural practices. The BSFP which was initially planned and implemented in pregnant and lactating women run only for a short period of time before it was halted due to inadequate resources. Health education and promotion of consumption of iron-rich food has been going across the three camps, but change of behavior is still inadequate.

6.4 IYCF indicators

The proportion of women who breastfed their babies within the first one hour after delivery ranged from 59.4% (50.9 - 67.6; 95%CI) in Little Wlebo to 82.2% (73.7 - 89.0; 95%CI) in Bahn camp and weighted figure was 64.2%. In the 2013 nutrition survey the overall proportion was 58.5% and thus an insignificant increase when compared to the 2015 survey. There was no clear explanation as to why this indicator has remained low despite higher delivery rate at the health facilities. In 2013, it was thought to be difficult for the mothers to recall the time of initiation. In the 2015 nutrition survey, clarification on the question was made to surveyors and how they could triangulate it to make sure respondents provides credible results, but still the proportion remained relatively low. Women who delivered at health facilities would be expected to start breastfeeding their babies within recommended duration of one hour of delivery. According to HIS, deliveries at health facilities from January to December 2014 accounts for 98% of all deliveries conducted in the camps. This indicator may need further attention to ensure whether it reflects the reality or the question needs to be rephrased. If the indicator reflects the reality, there is a need to investigate capacities of health staffs particularly the certified

[12] Weekly Monitoring Reports for PTP (AHA, 2014)

midwives and related care workers at camp clinics. It could be imperative to also investigate possible cultural and traditional barriers/practices that might hinder initiation of breastfeeding amongst mothers.

Prevalence of exclusive breastfeeding was 71.0% (52.0 - 85.8; 95%CI) in Little Wlebo, 80.0% (56.3 - 94.3; 95%CI) in PTP, 85.0% (62.1 - 96.8; 95%CI) in Bahn camp and weighted figure of 78.3%. There was a slight change for this indicator when compared 80.4% overall proportion in 2013.

Consumption of iron-rich or iron-fortified foods in children aged 6 – 23 months ranged from 89.2% (80.4 - 94.9; 95%CI) in Little Wlebo camp to 92.6% (87.2 - 96.3; 95%CI) in PTP and 91.2% overall. There was a huge difference noted when the above proportion is compared to 5.3% recorded in 2013, the major reason being blanket supplementary feeding of LNS, which started in July 2014 to the above mentioned age group. During the survey fortified blended food was neither part of general food ration nor targeted supplementary feeding program in any of three refugee camps. However, distribution of the items aimed for treatment of MAM in children and supplementation to chronically ill patients was ongoing in the host communities under the support of WFP through CHTs. UNICEF through CHT was also piloting MNP in some counties these were possible to reach a few refugees due to existing interactions between the two communities. Bottle feeding showed a significant increase from 4.1% in 2013 to 17.5% observed in the 2015 survey.

6.5 Food security

Results revealed that 99% of refugee families had ration cards. In PTP only one household had no card for the reason that it got lost and four households in Little Wlebo camps had different reasons including lost cards, not in the criteria and others. Food aid from the general ration lasted for an average of 19 days out of 30 planned. The proportion of families that said ration can last for entire duration 30 planned days was 1.7%. More than 82% of respondents claimed that the rations do not even reach three quarters of the targeted 30 days.

The proportion of households reporting using none of the negative coping strategies based on the past 30 days recall was 2.5% (0.5 - 7.0; 95%CI) in Bahn, 15.8% (10.8 - 21.8; 95%CI)

in PTP and 2.3% (0.5 - 6.6; 95%CI) in Little Wlebo making and overall of 9.4% for entire operation. Over 90% of household were engaged in negative coping strategies. Borrowing of food with expectation of reimbursement in the next food distribution was the most preferred mechanism while engaging in harmful and risk practices was the least. Other negative coping strategies (selling of items, increased request of remittance or gifts, reduced frequency of meal preparation from normal and begging) were all practiced in at least 60% of the surveyed households in each camp, indicating a serious household food insecurity.

Dietary diversity score at household level ranged from 9.2 in Bahn, 9.1 in PTP and 8.4 in Little Wlebo making an average 8.9 out of the total 12 scores recommended by UNHCR. Accessibility of the 12 food groups could not be possible because of several reasons including but not limited to inadequate purchasing power, limited farming and engagement to other livelihood activities.

6.6 Water, Sanitation and Hygiene

All the surveyed households in all the camps were collecting water from improved sources including deep wells piped to water collection points or protected dug wells with hand pumps, indicating that refugees have access to potable water. The average water consumption per person per day was 20.8 liters in Bahn, 18.5 liters in PTP and 21.8 liters in Little Wlebo camp. The UNHCR standard is to provide least 20 liters per person per day. This standard describes the overall quantity of water distributed to refugees and not the quantity of water consumed by the household, which may be less than the quantity that has been distributed due to several reasons.[13] Results indicate that at least 60% of surveyed households were receiving water as per SPHERE standards of above 15 liters and above 40% were receiving at least 20 liters per person per day recommended by UNHCR.

The proportion of households reporting to be satisfied with water supply was 95.9% (90.7 - 98.7) in Bahn, 95.7% (91.7 - 98.1) in PTP, 99.2% (95.8 - 100.0) in Little Wlebo and 96.8% overall. A very small proportion of the surveyed was however, not satisfied with drinking water supply because of "bad taste" in Bahn and PTP and long distance in Bahn camp. One

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[13] Global Strategy for Public Health (UNHCR, 2014)

household in 0.8% was partially satisfied and thus no reason was required from the respondent. These results show how most of the refugees were enjoying potable drinking water collected from improved sources. Community members preferred water collected from protected dug well hand pumps than tap stand gravitated from water reservoir tanks, as this is usually warm, and thus, chorine can be easily tasted than in relatively cold water. A number of hand pumps were installed on the dug protected wells and pumping hours were increased in the period of 2014 due to the EVD. Water supply has not been a problem in the three refugee camps over the past three years.

Safe excreta disposal showed an overall proportion of 2.9% using improved excreta disposal facilities (improved toilet facility, 1 household), 5.9% shared family toilet (improved toilet facility, 2 households), 60.9% communal toilet (improved toilet facility, 3 households or more), 30.3% unimproved toilet (unimproved toilet facility or public toilet). The percentage of households using unimproved toilets has increased from 22% in 2013 to 30% in 2015.

There have been some constraints in sanitation activities, mainly due to resource shortage. Despite efforts that UNHCR and partners have invested to fully engage the refugees to participate in improvement of sanitation facilities, especially during the EVD, latrine coverage remained an area for improvement. In Little Wlebo camp for example, until the end of 2014, about 100 latrines with damaged doors were in need of repair while 120 latrines were awaiting for decommission and replacement[14]. In the first quarter of 2015, refugee participation in digging of pit hole for latrines construction through empowering them with working tools and assortments in PTP has significantly improved latrine coverage and should be encouraged in this era of serious funding limitations.

6.7 Mosquito nets coverage

The proportion of households owning at least one LLIN was 58.3% (49.0 - 67.3) in Bahn, 54.5% (47.1 - 61.8) in PTP and 48.1% (39.5 - 56.9) in Little Wlebo making an overall of 53.3% across the three camps. When compared to UNHCR target of ≥80% the coverage across the operation was very low. The average number of persons per LLIN was 5.9 in

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[14] CARE and DRC Wash Reports, 2014

Bahn, 6.9 in PTP, 6.8 in Little Wlebo and weighted average of 6.7 compared to 2 person recommended by the UNHCR. In 2013 survey, the overall ownership of any type of mosquito net was 79.1% thus a decrease by 25.8% is observed when compared to 2015 results. Despite distribution of about 13,000 mosquito nets[15] in 2014 alone, retention remained a major challenge among refugee communities. Poor retention was associated with food insecurity as reflected by the proportion of households selling NFIs as one of negative coping strategies which ranged from 66% in PTP to 85% in Bahn camp. Refugees themselves admitted selling the item especially during the peak of EVD when movements out and in the camps was imposed by the government to avoid possible transmission of the infection.

Overall utilization of LLIN was as low as 41.3% in all age groups, 51.4% among under-fives and 38.9% in pregnant women. The proportion has decreased when compared to the 2013 survey where percentage utilization was 65.7% in all age groups, 73.5% in children aged 0-59months and 71.7% in pregnant women.

Bearing in mind of malaria endemic area where prevalence is always high, efforts have to be invested to ensure retention and utilization is raised. In PTP for example, while prevalence of anaemia was as high as 78% in children aged 6 – 59 months, LLIN ownership and utilization was as low as 55% and 44% respectively. In such circumstances, the achievement for reduction of such alarming level of anaemia will be at a very slow pace.

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[15] NFI distribution report (UNHCR, 2014)

7. CONCLUSIONS

Prevalence of global acute malnutrition remained within UNHCR and WHO standards despite the hit of Ebola Virus Disease in Liberia. However, the maximum confidence limits of GAM in the two camps of PTP and Little Wlebo were above of the WHO recommended of <5% indicating a possibility of poor nutritional status. In 2014, EVD caused high tension among refugee community leading into reduced movements within and outside the camps thus, hampering positive coping strategies that refugee could embark to cover the gap of food aid received from general ration. There was no significant change in prevalence of stunting in children aged 6 – 59 months. The level remained >40%, categorised as "very high" prevalence by WHO.

Despite the decrease of anaemia in children aged 6 – 59 months, prevalence in both groups (children and women) remained at "critical" level of >60%, classified as "Public Health Emergency" according to WHO. Older children aged above two years were the most affected group compared to younger children aged 6 – 23 months who are registered in the blanket supplementary feeding program. Older children were not part of the project thus, depending on general interventions planned for the whole refugee population.

Households were facing serious food insecurity that forced refugees to embark in negative coping strategies including selling of non-food items and harmful activities. Only 9% of the surveyed household did not use any of the negative coping strategies.

There was an increase of proportion of household using unimproved latrines in camp due to insufficient of sanitation facilities. The use of unimproved latrines, which include open defecation and utilizing nearby bushes may cause a serous outbreaks leading to loss of refugee lives.

Ownership and utilization of mosquito net was far below the UNHCR standards and may highly contribute to contracting malaria among the refugee community, and hence, hampering efforts to contain the critical levels of anaemia.

8. RECOMMENDATIONS AND PRIORITIES

8.1 Immediate term

1. UNHCR in collaboration with WFP and UNICEF to continue providing nutrient supplements to children aged between 6 – 23 months, as it has already shown a significant decrease of prevalence of anaemia in Bahn and Little Wlebo camps mainly due to provision of Nutributter®. Where possible children aged between 24 – 59 months should be included.

2. Medical supplies including micro-cuvettes, safety lancets, etc. to be availed all the time at camp clinics for identification and monitoring of anaemia cases.

3. WFP to appeal to donors to maintain full ration of at least 2100kcal per person per day with recommended level of micronutrients especially iron, vit A, B1, B2 & C in the general food ration and ensure constant supply.

4. On-site food basket and post food distribution monitoring mechanisms to be strengthened and regularly conducted to refugees in all the three camps.

5. WFP and UNHCR to resume blanket supplementary feeding to pregnant and lactating women from the second trimester until 6 months post-delivery.

6. Livelihood and health partners to continue providing awareness to refugee community on proper use of the supplementary foods including consumption of green leafy vegetables.

7. UNHCR to allocate budget, procure and supply sufficient LLIN to cover the gap of about 47% deficit and reduce the current average of 6.7 persons sleeping under one LLIN to 2 persons in refugee communities.

8. WASH and health partners to continue sensitizing the communities on importance of LLIN to ensure high retention and proper utilization.

9. UNHCR, WASH partner and LRRRC to continue promoting refugee community to engage and participate in construction of sanitation facilities. This would increase coverage and reduce the proportion of refugees that use unimproved latrines including open defecation and bushes around them.

8.2 Medium term

1. UNHCR in collaboration with WFP and UNICEF to continue supplying Ready-to-Use nutrition items for nutrition programmes in refugee camps.

2. Health partner with the support from UNHCR and UNICEF to continue promoting IYCF practices in children aged 0 – 23 months on optimal feeding including early initiation of newborns to breast milk, exclusive breastfeeding until 6 months, continued breastfeeding together with age appropriate complementary food until two years.

3. UNHCR to allocate funds for improvement of sanitation facilities coverage and maintenance including decommissioning of filled latrines and replacement with new ones.

4. Food security at household level to be improved through livelihood activities including small scale farming, vocational skills, empowering petty traders and women groups for income-generating activities. This would improve not only the household dietary diversity at household level but also nutritional status of women and children as well as retention and utilisation of mosquito nets thereby reducing the burden of malaria and anaemia.

5. Health partners in collaboration with UNHCR to continue imparting knowledge to healthcare providers through formal and informal trainings on anaemia, IYCF, malaria etc.

6. UNHCR and health partner in collaboration with CHT to investigate possible barriers of early initiation to breastfeeding among women upon delivery.

8.3 Long term

1. UNHCR to consider the next SENS in 2016 for continued monitoring of trends and planning of interventions in the refugee camps accordingly.

9. ACKNOWLEDGEMENTS

List of key stakeholders

1. United Nations High Commissioner for Refugees (UNHCR) – HQ Geneva, RO Dakar and BO Monrovia

2. Ministry of Health and Social Welfare (MoHSW), Liberia

3. United Nations Children Funds (UNICEF), Liberia

4. World Food Program (WFP), Liberia

5. African Humanitarian Action (AHA), Liberia

6. CARE International, Liberia

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15.	Stephen T. Kerper	Bahn camp
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18.	Olee Mandein	Bahn camp
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23.	Doua K. Ebenezer	Bahn camp
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26.	Sonde Sonde	Little Wlebo
27.	Guehi Bah Anicet	Little Wlebo
28.	Douai Poliyou Marie	Little Wlebo
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30.	Camara Fatoumata	Little Wlebo
31.	Banhan Mankoula	Little Wlebo
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38.	Massa Serge	Little Wlebo
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45.	Tchape Brice Toussaint	Little Wlebo
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63.	Blei Zionkola Marceline	PTP camp
64.	Guei Dji Margueritte	PTP camp
65.	Doueze Lydie	PTP camp
66.	Sehi Esther	PTP camp
67.	Pehe Solange	PTP camp
68.	Guei Thomas	PTP camp
69.	Gnanole Koulate Mathurin	PTP camp
70.	Pouho Sandrine	PTP camp
71.	Kouide O. Hnorine	PTP camp
72.	Klao Constant	PTP camp
73.	Princess Geor	PTP camp
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Data analysis and report compilation

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APPENDIX 1: PLAUSIBILITY CHECK
Bahn Camp: z-score based on WHO standards 2006

Overall data quality

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Criteria                  Flags* Unit  Excel. Good    Accept Problematic  Score

Flagged data              Incl   %     0-2.5 >2.5-5.0 >5.0-7.5  >7.5
(% of out of range subjects)             0     5        10        20       0 (0.0 %)

Overall Sex ratio         Incl   p     >0.1  >0.05    >0.001   <=0.001
(Significant chi square)                 0     2         4        10       0 (p=0.853)

Age ratio(6-29 vs 30-59) Incl   p     >0.1  >0.05    >0.001   <=0.001
(Significant chi square)                 0     2         4        10       0 (p=0.992)

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       2 (12)

Dig pref score - MUAC     Incl   #     0-7   8-12     13-20    > 20
                                         0     2         4        10       0 (6)

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 (1.00)

Skewness   WHZ            Excl   #     <±0.2 <±0.4    <±0.6    >=±0.6
                                         0     1         3         5       0 (0.05)

Kurtosis   WHZ            Excl   #     <±0.2 <±0.4    <±0.6    >=±0.6
                                         0     1         3         5       1 (-0.20)

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         3 %
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The overall score of this survey is 3 %, this is excellent.

PTP Camp: z-score based on WHO standards 2006

Overall data quality

```
Criteria                Flags* Unit  Excel. Good    Accept  Problematic  Score

Flagged data            Incl   %     0-2.5 >2.5-5.0 >5.0-7.5   >7.5
(% of out of range subjects)          0     5         10        20       0 (0.0 %)

Overall Sex ratio       Incl   p     >0.1  >0.05    >0.001   <=0.001
(Significant chi square)              0     2         4         10       0 (p=0.290)

Age ratio(6-29 vs 30-59) Incl  p     >0.1  >0.05    >0.001   <=0.001
(Significant chi square)              0     2         4         10       4 (p=0.005)

Dig pref score - weight  Incl   #    0-7   8-12     13-20     > 20
                                      0     2         4         10       0 (7)

Dig pref score - height  Incl   #    0-7   8-12     13-20     > 20
                                      0     2         4         10       4 (14)

Dig pref score - MUAC    Incl   #    0-7   8-12     13-20     > 20
                                      0     2         4         10       10 (29)

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 (1.06)

Skewness   WHZ           Excl   #    <±0.2 <±0.4    <±0.6    >=±0.6
                                      0     1         3         5        0 (-0.02)

Kurtosis   WHZ           Excl   #    <±0.2 <±0.4    <±0.6    >=±0.6
                                      0     1         3         5        3 (-0.42)

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        21 %
```

The overall score of this survey is 21 %, this is acceptable.

Little Wlebo Camp: z-score based on WHO standards 2006

Overall data quality

```
Criteria              Flags* Unit  Excel. Good    Accept  Problematic  Score

Flagged data           Incl   %    0-2.5 >2.5-5.0 >5.0-7.5   >7.5
(% of out of range subjects)        0     5        10        20        0 (0.0 %)

Overall Sex ratio      Incl   p    >0.1  >0.05    >0.001    <=0.001
(Significant chi square)            0     2        4         10        0 (p=0.257)

Age ratio(6-29 vs 30-59) Incl p    >0.1  >0.05    >0.001    <=0.001
(Significant chi square)            0     2        4         10        4 (p=0.002)

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        2 (12)

Dig pref score - MUAC   Incl   #    0-7   8-12     13-20     > 20
                                    0     2        4         10        10 (32)

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 (1.07)

Skewness   WHZ          Excl   #    <±0.2 <±0.4    <±0.6     >=±0.6
                                    0     1        3         5         0 (-0.18)

Kurtosis   WHZ          Excl   #    <±0.2 <±0.4    <±0.6     >=±0.6
                                    0     1        3         5         1 (-0.35)

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       17 %
```

The overall score of this survey is 17 %, this is acceptable.

APPENDIX 2: SAMPLING SIZE CALCULATION AND SAMPLING

Description	Bahn	PTP	LWC	Total
Expected prevalence, %	6	6	6	6
Desired precision, +/-%	3.0	3.0	3.0	3.0
Total households (ProGres)	1,523	4,943	1,577	8,043
Total population	5,288	15,300	8,495	29,083
Total population under 5	826	2,676	1,568	5,070
Average household size	3.5	3.1	5.4	4.0
% population under five	15.6	17.5	18.5	17.2
% non-response households	10	10	10	10
Number of children to be included per camp	**182**	**219**	**206**	**607**
Number of hh to be included per camp	**411**	**498**	**269**	**1,178**

Distribution of teams and number of household to be surveyed

Description	Bahn	PTP	LWC	Total
Number of hh to be sampled per camp	411	498	352	1,261
Number of survey teams	6	6	6	6
Number of members per team	6	6	6	6
Average hh to be surveyed per team	69	83	59	210
Number of hh to be visited per day	17	21	15	18

Survey participants and team arrangement

Description	Bahn	PTP	LWC	Total
Participants for central training from each camp	4	4	4	12
Enumerators to be trained at camp level	24	24	24	72
Team size and composition (1 T/L, 1 bld taker, 1 translator, 3 measurers x 6 teams)	36	36	36	108

Desired number of households to be visited by camp

Module	Description	LWC	PTP	Bahn	Total
Module 1	Anthropometry and Health	352	498	411	1,261
Module 2	Anaemia (6 - 59 m) - senario 2	352	498	411	1,261
Module 2	Anaemia (Women 15 - 49 yrs)	176	249	206	631
Module 3	IYCF	352	498	411	1,261
Module 4	Food Security	176	249	206	631
Module 5	WASH - systematic sampling	176	249	206	631
Module 6	Mosquito net coverage	176	249	206	631

APPENDIX 3: NCHS GROWTH REFERENCE 1977

Prevalence of acute malnutrition based on Weight-for- height z-scores and by sex

		Bahn	PTP	Little Wlebo
All	**N**	**261**	**357**	**252**
Prevalence of global acute malnutrition	(n) %	(3) 1.1 %	(12) 3.4 %	(8) 3.2 %
(<-2 z-scores and/or oedema)	(95% CI)	(0.4 - 3.3 95% C.I.)	(1.9 - 5.8 95% C.I.)	(1.6 - 6.1 95% C.I.)
Prevalence of moderate acute malnutrition	(n) %	(3) 1.1 %	(12) 3.4 %	(8) 3.2 %
(<-2 and -3 z-scores, no oedema)	(95% CI)	(0.4 - 3.3 95% C.I.)	(1.9 - 5.8 95% C.I.)	(1.6 - 6.1 95% C.I.)
Prevalence of severe acute malnutrition	(n) %	(0) 0.0 %	(0) 0.0 %	(0) 0.0 %
(<-3 z-score and/or oedema	(95% CI)	(0.0 - 1.5 95% C.I.)	(0.0 - 1.1 95% C.I.)	(0.0 - 1.5 95% C.I.)
Oedema prevalence	n	0.0(0.0)	0.0(0.0)	0.0(0.0)
Boys	**N**	**129**	**189**	**117**
Prevalence of global acute malnutrition	(n) %	(1) 0.8 %	(10) 5.3 %	(4) 3.4 %
(<-2 z-scores and/or oedema)	(95% CI)	(0.1 - 4.3 95% C.I.)	(2.9 - 9.5 95% C.I.)	(1.3 - 8.5 95% C.I.)
Prevalence of moderate acute malnutrition	(n) %	(1) 0.8 %	(10) 5.3 %	(4) 3.4 %
(<-2 and -3 z-scores, no oedema)	(95% CI)	(0.1 - 4.3 95% C.I.)	(2.9 - 9.5 95% C.I.)	(1.3 - 8.5 95% C.I.)
Prevalence of severe acute malnutrition	n) %	(0) 0.0 %	(0) 0.0 %	(0) 0.0 %
(<-3 z-score and/or oedema	(95% CI)	(0.0 - 2.9 95% C.I.)	(0.0 - 2.0 95% C.I.)	(0.0 - 3.2 95% C.I.)
Girls	**N**	**132**	**168**	**135**
Prevalence of global acute malnutrition	(n) %	(2) 1.5 %	(2) 1.2 %	(4) 3.0 %
(<-2 z-scores and/or oedema)	(95% CI)	(0.4 - 5.4 95% C.I.)	(0.3 - 4.2 95% C.I.)	(1.2 - 7.4 95% C.I.)
Prevalence of moderate acute malnutrition	(n) %	(2) 1.5 %	(2) 1.2 %	(4) 3.0 %
(<-2 and -3 z-scores, no oedema)	(95% CI)	(0.4 - 5.4 95% C.I.)	(0.3 - 4.2 95% C.I.)	(1.2 - 7.4 95% C.I.)
Prevalence of severe acute malnutrition	(n) %	(0) 0.0 %	(0) 0.0 %	(0) 0.0 %
(<-3 z-score and/or oedema	(95% CI)	(0.0 - 2.8 95% C.I.)	(0.0 - 2.2 95% C.I.)	(0.0 - 2.8 95% C.I.)

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

All		Bahn	PTP	Little Wlebo
	N	260	357	252
Prevalence of stunting	(n) %	(86) 33.1 %	(156) 43.7 %	(69) 27.4 %
(<-2 z-scores)	(95% CI)	(27.6 - 39.0 95% C.I.)	(38.6 - 48.9 95% C.I.)	(22.2 - 33.2 95% C.I.)
Prevalence of moderate stunting	(n) %	(62) 23.8 %	(100) 28.0 %	(51) 20.2 %
(<-2 and -3 z-scores)	(95% CI)	(19.1 - 29.4 95% C.I.)	(23.6 - 32.9 95% C.I.)	(15.7 - 25.6 95% C.I.)
Prevalence of severe stunting	(n) %	(24) 9.2 %	(56) 15.7 %	(18) 7.1 %
(<-3 z-score)	(95% CI)	(6.3 - 13.4 95% C.I.)	(12.3 - 19.8 95% C.I.)	(4.6 - 11.0 95% C.I.)
Boys	N	129	189	117
Prevalence of stunting	(n) %	(47) 36.4 %	(86) 45.5 %	(38) 32.5 %
(<-2 z-scores)	(95% CI)	(28.6 - 45.0 95% C.I.)	(38.6 - 52.6 95% C.I.)	(24.7 - 41.4 95% C.I.)
Prevalence of moderate stunting	(n) %	(34) 26.4 %	(53) 28.0 %	(28) 23.9 %
(<-2 and-3 z-scores)	(95% CI)	(19.5 - 34.6 95% C.I.)	(22.1 - 34.8 95% C.I.)	(17.1 - 32.4 95% C.I.)
Prevalence of severe stunting	(n) %	(13) 10.1 %	(33) 17.5 %	(10) 8.5 %
(<-3 z-score)	(95% CI)	(6.0 - 16.5 95% C.I.)	(12.7 - 23.5 95% C.I.)	(4.7 - 15.0 95% C.I.)
Girls	N	131	168	135
Prevalence of stunting	(n) %	(39) 29.8 %	(70) 41.7 %	(31) 23.0 %
(<-2 z-scores)	(95% CI)	(22.6 - 38.1 95% C.I.)	(34.5 - 49.2 95% C.I.)	(16.7 - 30.7 95% C.I.)
Prevalence of moderate stunting	(n) %	(28) 21.4 %	(47) 28.0 %	(23) 17.0 %
(<-2 and-3 z-scores)	(95% CI)	(15.2 - 29.2 95% C.I.)	(21.7 - 35.2 95% C.I.)	(11.6 - 24.3 95% C.I.)
Prevalence of severe stunting	(n) %	(11) 8.4 %	(23) 13.7 %	(8) 5.9 %
(<-3 z-score)	(95% CI)	(4.8 - 14.4 95% C.I.)	(9.3 - 19.7 95% C.I.)	(3.0 - 11.3 95% C.I.)

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

		Bahn	PTP	Little Wlebo
All	N	259	357	252
Prevalence of underweight	(n) %	(38) 14.7 %	(109) 30.5 %	(44) 17.5 %
(<-2 z-scores)	(95% CI)	(10.9 - 19.5 95% C.I.)	(26.0 - 35.5 95% C.I.)	(13.3 - 22.6 95% C.I.)
Prevalence of moderate underweight	(n) %	(35) 13.5 %	(90) 25.2 %	(37) 14.7 %
(<-2 and ^{3}-3 z-scores)	(95% CI)	(9.9 - 18.2 95% C.I.)	(21.0 - 30.0 95% C.I.)	(10.8 - 19.6 95% C.I.)
Prevalence of severe underweight	(n) %	(3) 1.2 %	(19) 5.3 %	(7) 2.8 %
(<-3 z-score)	(95% CI)	(0.4 - 3.3 95% C.I.)	(3.4 - 8.2 95% C.I.)	(1.4 - 5.6 95% C.I.)
Boys	N	127	189	117
Prevalence of underweight	(n) %	(18) 14.2 %	(63) 33.3 %	(26) 22.2 %
(<-2 z-scores)	(95% CI)	(9.2 - 21.3 95% C.I.)	(27.0 - 40.3 95% C.I.)	(15.6 - 30.6 95% C.I.)
Prevalence of moderate underweight	(n) %	(17) 13.4 %	(51) 27.0 %	(22) 18.8 %
(<-2 and ^{3}-3 z-scores)	(95% CI)	(8.5 - 20.4 95% C.I.)	(21.2 - 33.7 95% C.I.)	(12.8 - 26.8 95% C.I.)
Prevalence of severe underweight	(n) %	(1) 0.8 %	(12) 6.3 %	(4) 3.4 %
(<-3 z-score)	(95% CI)	(0.1 - 4.3 95% C.I.)	(3.7 - 10.8 95% C.I.)	(1.3 - 8.5 95% C.I.)
Girls	N	132	168	135
Prevalence of underweight	(n) %	20) 15.2 %	(46) 27.4 %	(18) 13.3 %
(<-2 z-scores)	(95% CI)	(10.0 - 22.2 95% C.I.)	(21.2 - 34.6 95% C.I.)	(8.6 - 20.1 95% C.I.)
Prevalence of moderate underweight	(n) %	(18) 13.6 %	(39) 23.2 %	(15) 11.1 %
(<-2 and ^{3}-3 z-scores)	(95% CI)	(8.8 - 20.5 95% C.I.)	(17.5 - 30.2 95% C.I.)	(6.8 - 17.5 95% C.I.)
Prevalence of severe underweight	(n) %	(2) 1.5 %	(7) 4.2 %	(3) 2.2 %
(<-3 z-score)	(95% CI)	(0.4 - 5.4 95% C.I.)	(2.0 - 8.3 95% C.I.)	(0.8 - 6.3 95% C.I.)

Mean z-score values (NCHS Reference 1977) in children aged 6-59 months, design effects and included and excluded subjects

Indicator	Camp	Total	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*
Weight-for-Height	Bahn	261	-0.08±0.88	1	0
	PTP	357	-0.41±0.91	1	0
	Little Wlebo	252	-0.30±0.96	1	0
Height-for-Age	Bahn	260	-1.34±1.24	1	0
	PTP	357	-1.86±1.14	1	0
	Little Wlebo	252	-1.28±1.15	1	0
Weight-for-Age	Bahn	259	-0.94±1.01	1	0
	PTP	357	-1.47±1.00	1	0
	Little Wlebo	252	-1.04±1.05	1	0

APPENDIX 4: UNHCR SENS QUESTIONNAIRES

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 *[organisation/institution]*. 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.
- 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 / zones / sections *(THIS QUESTIONNAIRE IS TO BE ADMINISTERED TO ALL CHILDREN BETWEEN 6 AND 59 MONTHS OF AGE)*

Block code / Letter and number: _____Plot code/Letter and number _____

Date of interview (dd/mm/yyyy):		Cluster Number (*in cluster survey only*)			Team numbe
|__|__|/|__|__|/|__|__||__|__|		|__|__|			|__|

CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8	CH9	CH10	CH11	CH12	CH13	CH14	CH1
D	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=OTP 3=None	Measles 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/L
1				/ /										
2				/ /										
3				/ /										
4				/ /										
5				/ /										
6				/ /										
7				/ /										
8				/ /										
9				/ /										
				/ /										

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.**
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.

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)

Section code / number:_____Block code / number: _____

Date of interview (dd/mm/yyyy):				Cluster Number (*in cluster survey only*)		Team number
|__|__|/|__|__|/|__|__||__|__| |||| |__|__| || |__|
WM1	**WM2**	**WM3**	**WM4**	**WM5**	**WM6**	**WM7**	**WM8**
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 <u>enrolled</u> in the ANC programme? 1=Yes 2=No 8=Don't know	Are you currently <u>receiving</u> iron-folate pills (*SHOW PILL*)? 1=Yes (STOP NOW) 2=No (STOP NOW) 8=Don't know (STOP NOW)	Hb (g/L)
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)

Section code / number:_____**Block code / number**: _____**Consent** : yes / no / absent

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

No	QUESTION	ANSWER CODES	
SECTION IF1			
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 ANSWER 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. REPLACE AND ADAPT THE TEXT HIGHLIGHTED IN GREY TO THE CONTEXT. THE TEXT IN *ITALICS* NEEDS TO BE DELETED FROM THE FINAL SURVEY QUESTIONNAIRE – THE LIST THAT IS PROVIDED BELOW IS AN EXAMPLE.	
		Yes No DK
	7A. Plain water	7A...........................1 2 8
	7B. Infant formula, for example SMA, Guigoz, Lactogen,]	7B...........................1 2 8
	7C. Milk such as tinned, powdered, or fresh animal milk, for example [Nido, Me and My, Carnation, Peak milk, Jargo, Say milk, condensed milk]	7C...........................1 2 8
	7D. Juice or juice drinks, for example Fruit juice, Powdered juice, Foster Clark, Icemax]	7D..........................1 2 8
	7E. Clear broth	7E...........................1 2 8
	7F. Sour milk or yogurt, for example [INSERT LOCAL NAMES]	7F...........................1 2 8
	7G. Thin porridge, for example [Cocodolo, calama, soft rice Baca]	7G..........................1 2 8
	7H. Tea or coffee with milk	7H...........................1 2 8
	7I. Any other water-based liquids, for example [INSERT OTHER WATER-BASED LIQUIDS AVAILABLE IN THE LOCAL SETTING AND USE LOCAL NAMES] (e.g. *sodas, other sweet drinks, herbal infusion, gripe water, clear tea with no milk, black coffee, ritual fluids, potato greens water*)	7I.............................1 2 8
IF8	Yesterday, during the day or at night, did [NAME] eat solid or semi-solid (soft, mushy) food?	Yes......................1 No.......................2 Don't know........8 |__|

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	|__|
SECTION IF4			
IF10	IS CHILD AGED 6-23 MONTHS? REFER TO IF2 / IF3	Yes......................1 No....................…2	|__| **IF ANSWER IS 2 STOP NOW**
IF11	Now I would like to ask you about some particular foods [NAME] may eat. 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. REPLACE AND ADAPT THE TEXT HIGHLIGHTED IN GREY TO THE CONTEXT. THE TEXT IN *ITALICS* NEEDS TO BE DELETED FROM THE FINAL SURVEY QUESTIONNAIRE – THE LIST THAT IS PROVIDED BELOW IS AN EXAMPLE. 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. [INSERT COMMON MEAT, FISH, POULTRY AND LIVER/ORGAN FLESH FOODS USED THE LOCAL SETTING] *(e.g. beef, goat, lamb, mutton, pork, rabbit, chicken, duck, liver, kidney, heart, snail, chicken fee, kiss meat, pig tail or feet, crab, thiamide (buckle bud), bush meat, cray fish, cat fish, bonie))*	11A..1 2 8	
	11B. [INSERT FBF AVAILABLE IN THE LOCAL SETTING AND USE LOCAL NAMES] (e.g. CSB+, super gari)	11B..1 2 8	
	11D. [INSERT RUTF PRODUCTS AVAILABLE IN THE LOCAL SETTING AND USE LOCAL NAMES] *(e.g. Plumpy'Nut®,* (SHOW SACHET)	11D.......................................1 2 8	
	11E. [INSERT RUSF PRODUCTS AVAILABLE IN THE LOCAL SETTING AND USE LOCAL NAMES] *(e.g. Plumpy'Sup®,)* (SHOW SACHET)	11E..1 2 8	
	11F. [INSERT LNS PRODUCTS AVAILABLE IN THE LOCAL SETTING AND USE LOCAL NAMES] *(e.g. Nutributter® ®, Plumpy'doz®)* (SHOW SACHET / POT)	11F..1 2 8	

	11G. [INSERT LOCALLY AVAILABLE BRAND NAMES OF *IRON FORTIFIED* INFANT FORMULA *ONLY*] *(e.g. Nan, S26 infant formula)*	11G…..……………………….1 2 8	
	11H. [INSERTST ANY *IRON FORTIFIED* SOLID, SEMI-SOLID OR SOFT FOODS DESIGNED SPECIFICALLY FOR INFANTS AND YOUNG CHILDREN AVAILABLE IN THE LOCAL SETTING THAT ARE DIFFERENT THAN DISTRIBUTED COMMODITIES AND USE LOCALLY AVAILABLE BRAND NAMES] *(e.g. Cerelac, Weetabix, Nutrilon, corn cereal, rice cereal)*	11H…..…………………….....1 2 8	
IF12	**In a setting where micronutrient powders are used:** Yesterday, during the day or at night, did [NAME] consume any food to which you added a [INSERT LOCAL NAME FOR MICRONUTRIENT POWDER OR SPRINKLES] like this? (SHOW MICRONUTRIENT POWDER SACHET)	Yes………………………....... 1 No……………………………. 2 Don't know………………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)

Section code / number:_____**Block code / number**: _____**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			
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? ADAPT LIST TO LOCAL SETTING BEFORE SURVEY. WHEN ADAPTING THE LIST, KEEP THE ORIGINAL ANSWER CODES AND DO NOT CHANGE. DO NOT READ THE ANSWERS SELECT ONE ONLY	Piped water......................................01 Public tap/standpipe ....02 Tubewell/borehole (& pump)...............03 Protected dug well ....04 Protected spring.............................05 Rain water collection....................06 Unprotected spring........................08 Unprotected dug well ....09 Bottled water ....12 Surface water (e.g. river, pond) ....13 Other......................................96 Don't know......................................98	|__|__|
WS3	Are you satisfied with the water supply? THIS RELATES TO THE DRINKING WATER SUPPLY	Yes..1 No..2 Partially...3 Don't know 8	|__| **IF ANSWER IS 1, 3 OR 8 GO TO WS5**
WS4	What is the *main* reason you are not satisfied with the water supply?	Not enough...01 Long waiting queue 02	

	ADAPT LIST TO LOCAL SETTING BEFORE SURVEY. DO NOT READ THE ANSWERS SELECT ONE ONLY	Long distance..03 Irregular supply...04 Bad taste...05 Water too warm ....06 Bad quality ....07 Have to pay...08 Other...96 Don't know...98	|__|__|
WS5	What kind of toilet facility does this household use? ADAPT LIST TO LOCAL SETTING BEFORE SURVEY. WHEN ADAPTING THE LIST, KEEP THE ORIGINAL ANSWER CODES AND DO NOT CHANGE. DO NOT READ THE ANSWERS SELECT ONE ONLY	Flush to septic system....................................02 Pour-flush to pit..03 VIP/simple pit latrine with floor/slab.04 Composting/dry latrine..............................05 Flush or pour-flush elsewhere................06 Pit latrine without floor/slab ....07 Service or bucket latrine ....08 No facility, field, bush, plastic bag..........10	|__|__| **IF ANSWER IS 10 GO TO WS7**
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)	|__|__| Households
		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	|__| **IF ANSWER IS 2 GO TO WS9**
WS8	The last time [NAME OF YOUNGEST CHILD] passed stools, what was done to dispose of the stools? DO NOT READ THE ANSWERS SELECT ONE ONLY	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 Left in the open...06 Other...96 Don't know 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**			
WS9	CALCULATE THE TOTAL AMOUNT OF WATER USED BY THE HOUSEHOLD PER DAY THIS RELATES TO ALL SOURCES OF WATER (DRINKING WATER AND NON-DRINKING WATER SOURCES)	Please show me the containers you used yesterday for collecting water ASSIGN A NUMBER TO EACH CONTAINER	Capacity in litres	Number of journeys made with each container	Total litres **SUPERVISOR TO COMPLETE HAND CALCULATION**	
		1 E.g. jerry can	25 L	1 x	25	
		2 E.g. jerry can	10 L	2 x	20	
		3 E.g. jerry can	5 L	2 x	10	
		4 E.g. jerry can	5 L	1 x	5	
		5 E.g. bucket	50 L	1 x	50	
		6				
		7				
		8				
		9				
		10				
		Total litres used by household			110	
WS10	Please show me where you store your drinking water. ARE THE DRINKING WATER CONTAINERS COVERED OR NARROW NECKED?	All are...1 Some are..2 None are 3				|__|

FOOD SECURITY: 1 questionnaire per household *(THIS QUESTIONNAIRE IS TO BE ADMINISTERED TO THE MAIN CARETAKER WHO IS RESPONSIBLE FOR COOKING THE MEALS)*

Section code / number:_____**Block code / number**: _____**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			
FS1	Does your household have a ration card?	Yes ....1 No..2	|__| **IF ANSWER IS 1 GO TO FS3**
FS2	Why do you not have a ration card?	Not given one at registration......................1 Lost card..2 Traded/sold card..3 Not registered but eligible ....4 Not eligible (not in targeting criteria) ....5 Other..6	|__| **GO TO FS5**
FS3	Does your household receive full or reduced ration? (OPTIONAL)	Full...1 Half...2 Other...6	|__| **IF ANSWER IS 2 OR 6 GO TO FS5**
FS4	How many days did the food from the general food aid ration for February/March last?	RECORD THE NUMBER OF DAYS IF KNOWN (RECORD 98 IF UNKNOWN)	|__|__|
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 NFI, 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: [Stealing, commercial sex, hunting in restricted bushes] 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 *ONE* IN THE BOX IF ANYONE IN THE HOUSEHOLD ATE THE FOOD IN QUESTION, PLACE A *ZERO* IN THE BOX IF NO ONE IN THE HOUSEHOLD ATE THE FOOD. REPLACE AND ADAPT THE TEXT HIGHLIGHTED IN GREY TO THE CONTEXT. THE TEXT IN *ITALICS* NEEDS TO BE DELETED FROM THE FINAL SURVEY QUESTIONNAIRE – THE LIST THAT IS PROVIDED BELOW IS AN EXAMPLE.	
	1. Any [INSERT CEREALS LOCALLY AVAILABLE] (*e.g. wheat, corn/maize, corn soy blend, cocodolobuckwheat, oats, rice, , *) or any foods made from these such as [INSERT LOCAL FOODS] (*e.g. bread, porridge, noodles, paste, kabato,moninggbayee, moningcalama, deker*)	1...................................|__|
	2. Any [INSERT WHITE ROOTS AND TUBERS LOCALLY AVAILABLE] (*e.g. green bananas, lotus root, taro, plantains, white potatoes, white yam, white cassava, white sweet potato, eddoes, plakalee, futubana, bitter root*) or any foods made from roots such as [INSERT LOCAL FOODS]*gaygbar/GB, acheke, Gari*	2...................................|__|
	3A. Any [INSERT VITAMIN A RICH VEGETABLES AND TUBERS LOCALLY AVAILABLE] (*e.g. carrot, pumpkin, squash, or sweet potato that are orange inside, red sweet pepper*)	3A...............................|__|
	3B. Any [INSERT DARK GREEN LEAFY VEGETABLES LOCALLY AVAILABLE INLCUDING WILD FORMS AND VITAMIN A RICH LEAVES] (*e.g. cassava leaves, , spinach, eddoe leaves, potato greens, callor greens, pumpkin leaves, palava sauce, okray, eggplant leaves*)	3B...............................|__|

	3C. Any [INSERT ANY OTHER VEGETABLES LOCALLY AVAILABLE] *(e.g. cabbage, green pepper, tomato, onion, eggplant, bitterball, union leaves, union leaves)*	3C..............................|__|
	4A. Any [INSERT VITAMIN A RICH FRUITS LOCALLY AVAILABLE], and 100% fruit juice made from these *(e.g. mango (ripe, fresh and dried), water melon (ripe), grape, guava, sausau, cumcum, ripe papaya, passion fruit (ripe), dried peach (juice - pineapple, mango, lime, tropical, orange)*	4A..............................|__|
	4B. Any [INSERT ANY OTHER FRUITS LOCALLY AVAILABLE INCLUDING WILD FRUITS], and 100% fruit juice made from these *(e.g. apple, avocados, banana, coconut flesh, lemon, orange)*	4B..............................|__|
	5A. Any [INSERT ORGAN MEAT OR BLOOD-BASED FOODS LOCALLY AVAILABLE] *(e.g. liver, kidney, heart)*	5A..............................|__|
	5B. Any [INSERT FLESH MEAT LOCALLY AVAILABLE] *(e.g. beef, goat, lamb, mutton, pork, rabbit, chicken, duck, cane rat, guinea pig, rat, agouti frogs, snakes, insects, bush meat)*	5B..............................|__|
	6. Any eggs from [INSERT EGGS LOCALLY AVAILABLE] *(e.g. eggs from chicken, duck, guinea fowl, snake, bird, turtle)*	6................................|__|
	7. Any [INSERT FRESH, DRIED OR CANNED FISH OR SHELLFISH LOCALLY AVAILABLE] *(e.g. anchovies, tuna, sardines, shark, whale, roe/fish eggs, clam, crab, lobster, crayfish, mussels, shrimp, octopus, squid, sea snails, dorbor)*	7................................|__|
	8. Any [INSERT LEGUMES, NUTS AND SEEDS LOCALLY AVAILABLE] *(e.g. dried peas, dried beans, lentils, nuts, seeds)* or any foods made from these such as [INSERT LOCAL FOODS] *(e.g. hummus, peanut butter, benny seed)*	8................................|__|
	9. Any [INSERT MILK AND MILK PRODUCTS LOCALLY AVAILABLE] *(e.g. milk, infant formula, cheese, kiefer, yogurt)*	9................................|__|
	10. Any [INSERT OILS AND FATS LOCALLY AVAILABLE] added to food or used for cooking *(e.g. vegetable oil, ghee or butter, palm kennel oil, coconut oil, palm nuts)*	10..............................|__|
	11. Any [INSERT SWEETS, SWEETENED SODA OR JUICE DRINKS AND SUGARY FOODS LOCALLY AVAILABLE] *(e.g. sugar, honey, soda drinks, chocolates, candies, cookies, sweet biscuits and cakes)*	11..............................|__|
	12. Any [INSERT SPICES, CONDIMENTS AND BEVERAGES LOCALLY AVAILABLE] *(e.g. black pepper, salt, chillies, soy sauce, hot sauce, fish powder, fish sauce, ginger, herbs, magi cubes, ketchup, mustard, 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).

Section code / number:_____**Block code / number**: _____**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 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						
Lin e no	**Household members**	**Sex**	**Age**	**Pregnancy status**	**Slept under net**	**Which net**	**Type of net**
#	COL1	COL2	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 NET BRANDNAME 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
09		m f	<5 ≥5	1 0 99	1 0	|__|	1 2
10		m f	<5 ≥5	1 0 99	1 0	|__|	1 2
11		m f	<5 ≥5	1 0 99	1 0	|__|	1 2
12		m f	<5 ≥5	1 0 99	1 0	|__|	1 2
13		m f	<5 ≥5	1 0 99	1 0	|__|	1 2
14		m f	<5 ≥5	1 0 99	1 0	|__|	1 2
15		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	**TN15** |—|—|
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	**TN16** |—|—|

APPENDIX 5: LOCAL EVENT CALENDAR USED TO ESTIMATE AGE OF CHILDREN

Seasons	Religious Holidays	Other events	Months / Years	Age (M)
Start of rainy season	Easter		Apr-15	0
		Women's international day 8	Mar-15	1
			Feb-15	2
		New year's day 1	Jan-15	3
End of rainy season	Christmas	World Aids day 1	Dec-13	4
		Human rights day 10		
			Nov-14	5
Rainy season			Oct-14	6
			Sep-14	7
			Aug-14	8
		African Women day 31	Jul-14	9
Peak rainy season		International Child day 1	Jun-14	10
		Day of the African Child 16		
		World Refugee Day 20		
		Labour day 1	May-14	11
Start of rainy season	Easter		Apr-14	12
		Women's international day 8	Mar-14	13
			Feb-14	14
		New year's day 1	Jan-14	15

		World Aids day 1	Dec-13	16
End of rainy season	Christmas	Human rights day 10		
			Nov-13	17
Rainy season			Oct-13	18
			Sep-13	19
			Aug-13	20
		African Women day 31	Jul-13	21
		International Child day 1		
Peak rainy season		Day of the African Child 16	Jun-13	22
		World Refugee Day 20		
		Labour day 1	May-13	23
Start of rainy season	Easter		Apr-13	24
		Women's international day 8	Mar-13	25
			Feb-13	26
		New year's day 1	Jan-13	27
		World Aids day 1	Dec-12	28
End of rainy season	Christmas	Human rights day 10		
			Nov-12	29
Rainy season			Oct-12	30
			Sep-12	31
			Aug-12	32
		African Women day 31	Jul-12	33

Peak rainy season		International Child day 1	Jun-12	34
		Day of the African Child 16		
		World Refugee Day 20		
		Labour day 1	May-12	35
Start of rainy season	Easter		Apr-12	36
		Women's international day 8	Mar-12	37
			Feb-12	38
		New year's day 1	Jan-12	39
End of rainy season	Christmas	World Aids day 1	Dec-11	40
		Human rights day 10		
			Nov-11	41
Rainy season			Oct-11	42
			Sep-11	43
			Aug-11	44
		African Women day 31	Jul-11	45
Peak rainy season		International Child day 1	Jun-11	46
		Day of the African Child 16		
		World Refugee Day 20		
		Labour day 1	May-11	47
Start of rainy season	Easter		Apr-11	48
		Women's international day 8	Mar-11	49
			Feb-11	50

		New year's day 1	Jan-11	51
End of rainy season	Christmas	World Aids day 1	Dec-10	52
		Human rights day 10		
			Nov-10	53
Rainy season			Oct-10	54
			Sep-10	55
			Aug-10	56
		African Women day 31	Jul-10	57
Peak rainy season		International Child day 1	Jun-10	58
		Day of the African Child 16		
		World Refugee Day 20		
		Labour day 1	May-10	59
			Apr-10	60

APPENDIX 6: NUTRITION SURVEY TIMELINE

Date	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
05/04 – 11/04	Arrival of Survey Participants	Central training at UNHCR Harper – Anthropometry, Anaemia, IYCF, Food security, Wash and Mosquito net modules (Theory, practical, blood sampling, standardization test and use of mobile phone for data collection)					
12/04 – 18/04	Preparations for field training and data collection - LWC	Training of enumerators in LWC camp		Data collection in LWC (estimated time to complete 15 hh per team per day: 10hrs)			
19/04 – 25/04	Travel to Zwedru and preparations for PTP camp	Training of enumerators in PTP camp		Data collection in PTP camp (estimated time to complete 21 hh per team per day: 14hrs)			
26/04 – 02/05	Travel to Saclepea and preparations for Bahn camp	Training of enumerators in Bahn camp		Data collection in Bahn camp (estimated time to complete 17 hh per team per day: 11hrs, 20min)			
03/05 – 09/05	Travel back to duty station	Data analysis			Preliminary report		