

STANDARDISED EXPANDED NUTRITION SURVEY

(SENS)

Refugee camps in Liberia: Bahn, PTP, Solo and Little Wlebo

Survey conducted: November- December 2013

Report finalized: February 2014



UNHCR IN COLLABORATION WITH
WFP, AHA, IRC, MERLIN, DRC, CARE, and MOHSW/CHT



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ACRONYMS

AHA	African Humanitarian Action
BCG	Bacillus Calmette–Guérin
BO–M	Branch Office – Monrovia (UNHCR)
CDI	Cote d’Ivoire
CHT	Count Health Team
CI	Confidence Interval
CMAM	Community-based Management of Acute Malnutrition
CSB	Corn Soy Blend (renamed to SuperCerealSuper Cereal)
ENA	Emergency Nutrition Assessment
GAM	Global Acute Malnutrition
HAZ	Height for Age in Z-score
IMAM	Integrated Management of Acute Malnutrition
IP	Implementing Partner
IPT	Intermittent Preventive Treatment (for malaria)
IRC	International Rescue Committee
IYCF	Infant and Young Child Feeding Practices
JAM	Joint Assessment Mission
MAM	Moderate Acute Malnutrition
MNP	Micronutrient Powder
MOHSW	Ministry of Health and Social Welfare
NCHS	National Centre for Health Statistics
OP	Operational Partner
OTP	Outpatient Therapeutic Programme
PLW	Pregnant and Lactating Women
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
WFP	World Food Programme
WHO	World Health Organisation
WHZ	Weight for Height in Z-score

EXECUTIVE SUMMARY

Introduction

Nutrition survey was conducted in the four Ivorian refugee camps in Nimba, Grand Gedeh and Maryland Counties along the border with Cote d'Ivoire (CDI). UNHCR and WFP organised the survey in close collaboration with partners including AHA, IRC, Merlin, DRC, CARE, CHT, and MOHSW of the Government of the Republic of Liberia. The survey was conducted in Bahn, PTP, Solo, and Little Wlebo camps from 11th November to 13th December 2013. This was the second UNHCR SENS to be conducted in the camps since the Ivorian refugee emergency in 2010 in Liberia; the first was in 2012.

Unlike the 2012, this survey covered the six modules of the UNHCR SENS which includes; Anthropometry and health; anaemia among women and children; infant and young children feeding practices; food security; water, sanitation and hygiene; and mosquito net coverage.

Primary Objectives

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

Methodology

A representative sample was calculated for each camp using ENA for SMART software as per UNHCR SENS guidelines to obtain sampling unit which, in this survey was the household. Systematic random sampling without list was desired, taking into account of arrangements of households in the camps. Adjustment for small population was applied to all sample size calculated since the number of under-fives was below 10,000.

Individual and household level questionnaires were adapted from UNHCR SENS standard questionnaires, adjusted and uploaded in the mobile phones by the expert from CartONG organization in France.

Training of enumerators was conducted in two phases; the central training for supervisors, blood samplers, and mobile phone holders; and the camp level training for the measurers of anthropometries and translators. The former was for both international and national staff, while the latter was for nationals. Three participants from the central training from each camp were responsible to organize and lead teams during the training at camp level. A team of seventeen people including participants from central training together with supervisors and managers moved from one camp to another and conducted camp level training and data collection.

Sampling interval was calculated in each camp based on the population size. Data was collected by six teams of six members for three to four days depending on sample size required in each camp. Information on anthropometric measurements, morbidity and anaemia was collected among children aged 6 – 59 months; anaemia among non-pregnant women aged 15 – 49 years; antenatal care services in pregnant women; infant and young children feeding practice in 0 – 23 months; food security, water, sanitation and hygiene and mosquito net coverage were collected. Analysis of data was done using ENA for SMART (delta version, 16th November 2013) and EPI info (version 3.5.4, 30th July 2012) software.

Summary of key findings

	Camps				Classification of public health significance or target (where applicable)
	Bahn	PTP	Solo	Little Wlebo	
Survey Date	20th - 23rd Nov 2013	27th - 30th Nov 2013	4th - 6th Dec 2013	11th - 13th Dec 2013	
Sample size					
No of House Hold (HH) calculated	275	491	241	309	
No of HH surveyed	258	428	133	301	
% response rate	93.8%	87.2%	55.2%	97.4%	
CHILDREN 6-59 months: Acute Malnutrition (WHO 2006 Growth Standards): (n) % (95% CI)					
N	325	435	172	335	Critical if \geq 15%
Global Acute Malnutrition (GAM)	(8) 2.5% (1.3 - 4.8)	(14) 3.2% (1.9 - 5.3)	(3) 1.7% (0.6- 5.0)	(9) 2.7% (1.4- 5.0)	
Moderate Acute Malnutrition (MAM)	(8) 2.5% (1.3 - 4.8)	(14) 3.2% (1.9 - 5.3)	(3) 1.7% (0.6- 5.0)	(9) 2.7% (1.4- 5.0)	
Severe Acute Malnutrition (SAM)	(0) 0% (0.0 - 1.2)	(0) 0.0% (0.0 - 0.9)	(0) 0.0% (0.0 - 2.2)	(0) 0.0% (0.0- 1.1)	
Oedema	(0) 0.0%	(n=0) 0.0%	(n=0) 0.0%	(n=0) 0.0%	
Mid Upper Arm Circumference (MUAC): (n) % (95% CI)					
N	334	453	175	340	
MUAC <125mm and/or oedema	(3) 0.9% (0.3 - 2.6)	(24) 5.3% (3.6 - 7.8)	(7) 4.0% (2.0- 8.0)	(11) 3.2% (1.8- 5.7)	
MUAC 115-124 mm	(3) 0.9% (0.3 - 2.6)	(20) 4.4% (2.9 - 6.7)	(5) 2.9% (1.2 - 6.5)	(9) 2.6% (1.4-5.0)	

MUAC <115 mm and/or oedema	(0) 0.0% (0.0 - 1.1)	(4) 0.9% (0.3- 2.2)	(2) 1.1% (0.3 - 4.1)	(2) 0.6% (0.2- 2.1)	
Stunting (WHO 2006 Growth Standards): (n) % (95% CI)					
N	308	394	159	313	Critical if >40%
Total Stunting	(115) 37.3% (32.1-42.9)	(190) 48.2% (43.3-53.2)	(74) 46.5% (39.0-54.3)	(127) 40.6% (35.3-46.1)	
Severe Stunting	(41) 13.3% (10.0-17.6)	(91) 23.1% (19.2-27.5)	(24) 15.1% (10.4-21.5)	(47) 15.0% (11.5-19.4)	
Programme coverage: (n/N); % (95% CI)					
Measles vaccination with card or recall (9- 59 months)	(158/304); 52.0% (46.2-57.7)	(224/410); 54.6% (49.9-59.5)	(89/156); 56.0% (47.9-63.8)	182/318); 57.2% (51.6-62.7)	Target of ≥ 95%
Vitamin A supplementation within past 6 months with card or recall	(201/333); 60.4% (54.9-65.7)	(268/453); 59.2% (54.5-63.7)	(108/175); 61.7% (54.1-68.9)	(195/339); 57.5% (52.1-62.8)	Target of ≥ 90%
Diarrhoea: (n/N); % (95% CI)					
Diarrhoea in last 2 weeks	(64/310); 20.6% (16.4-25.7)	(84/419); 20.0% (16.4-24.3)	(21/170); 12.4% (7.8-18.3)	(80/318); 25.2% (20.6- 30.4)	
Anaemia: (n) % (95% CI)					
N	325	442	175	339	
Total Anaemia (Hb <11 g/dl)	(247) 76.0% (71.0 - 80.5)	(356) 80.5% (76.5 - 84.1)	(143) 81.7% (75.2-87.1)	(250)73.7% (68.7-78.4)	High if ≥ 40%
Mild (Hb 10- 10.9g/dl)	(98) 30.2% (25.3 - 35.5)	(122) 27.6% (23.5 - 32.1)	(46) 26.3% (19.9-33.5)	(100) 29.5% (24.8-34.7)	
Moderate (Hb 7- 9.9g/dl)	(135) 41.5 % (36.2% 47.1)	(222) 50.2% (45.5 - 55.0)	(85) 48.6% (41.0-56.2)	(142) 41.9% (36.6-47.4)	
Severe (Hb <7g/dl)	(14) 4.3 % (2.6 - 7.5)	(12) 2.7% (1.5 - 4.8)	(12) 6.9% (3.6-11.7)	(8)2.4% (1.1- 4.8)	
CHILDREN 0-23 months: IYCF indicators: (n/N); % (95% CI)					
Timely initiation	(108/159);	(108/188);	(42/68);	(95/184);	

of breastfeeding	67% (60.1-75.1)	57.4% (50.0-64.6)	61.8% (49.2-73.3)	51.6% (44.2- 59.0)	
Exclusive breastfeeding under 6 months	(62/76); 81.6% (71.0- 89.5)	(34/39); 87.2% (72.6-95.7)	(3/6); 50.0% (11.8-88.2)	(31/38); 81.6% (65.7- 92.3)	
Consumption of iron-rich or iron-fortified foods	(4/118); 3.4% (0.9-8.5)	(5/145); 3.4% (1.1- 7.9)	(1/57); 1.8% (0.0-9.4)	(15/142); 10.6% (6.0- 16.8)	
Bottle feeding	(6/158); 3.8% (1.4-8.1)	(5/187); 2.7% (0.9- 6.1)	(3/67); 4.5% (0.9-12.5)	(11/184); 6.0% (3.0-10.4)	
WOMEN 15-49 years: Anaemia (non-pregnant)					
Total Anaemia (Hb <12 g/dl)	(62/122); 50.8% (41.6-60.0)	(98/186); 52.7% (45.3-60.0)	(29/67); 43.3% (31.2-56.0)	(77/154); 50.0% (41.8- 58.2)	High if ≥ 40%
Mild (Hb 11-11.9g/dl)	(33/122); 27.0% (19.4-35.8)	(46/186); 24.7% (18.7-31.6)	(15/67); 22.4% (13.1-34.2)	(42/154); 27.3% (20.4- 35.0)	
Moderate (Hb 8-10.9g/dl)	(26/122); 21.3% (14.4-29.6)	(48/186); 25.8% (19.7-32.7)	(14/67); 20.9% (11.9-32.6)	(35/154); 22.7% (16.4- 30.2)	
Severe (Hb <8g/dl)	(3/122); 2.5% (0.5-7.0)	(4/186); 2.2% (0.6- 5.4)	(0/67); 0.0%	(0/154); 0.0%	
FOOD SECURITY					
Food distribution					
Proportion of households with a ration card	(141/141); 100.0% (100-100)	(233/235); 99.1% (97.0-99.9)	(72/72); 100.0% (100-100)	(156/159); 98.1% (94.6- 99.6)	
Average number of days general food ration lasts out of 30 days (mean ± SD)	20.5 ± 6.2	21.9 ± 5.2	20.8 ± 6.3	20.8 ± 5.9	

Negative household coping strategies					
Proportion of households reporting using none of the coping strategies over the past month	(123/137); 89.8% (83.4-94.3)	(177/226); 78.3% (72.4-83.5)	(54/71); 76.1% (64.5-85.4)	(138/154); 89.6% (83.7-93.9)	
Household dietary diversity					
Average HDDS (mean ± SD)	7.2 ± 2.3	6.3 ± 2.0	6.52 ± 2.25	6.4 ± 2.0	Max HDDS is 12
Water, Sanitation, and Hygiene Promotion (WASH)					
Water quality					
Proportion of households using improved drinking water source	(140/141); 99.3% (96.1-100.0)	(233/236); 98.7% (96.3-99.7)	(72/72); 100.0% (100-100)	(159/159); 100.0% (100-100)	
Water quantity					
Proportion of households that use:					
≥ 20 lpppd	(93/140); 66.4% (58.0-74.2)	(184/236); 78.0% (72.1-83.1)	(45/72); 62.5% (50.3-73.6)	(117/159); 73.6% (66.0-80.3)	Average quantity of water available per person / day ≥ 20 litres
15 - <20 lpppd	(27/140); 19.3% (13.1-26.8)	(29/236); 12.3% (8.4-17.2)	(13/72); 18.1% (10.0-28.9)	(23/159); 14.5% (9.4-20.9)	
<15 lpppd	(20/140); 14.3% (8.9-21.2)	(23/236); 9.7% (6.3-14.3)	(14/72); 19.4% (11.1-30.5)	(19/159);11.9% (7.4-18.0)	
Satisfaction with drinking water supply					

Proportion of households that say they are satisfied with drinking water supply	(131/141); 92.9% (87.3-96.5)	(194/236); 82.2% (76.7-86.9)	(67/72); 93.1% (84.5-97.7)	(152/158); 96.2% (91.9-98.6)	
Safe excreta disposal					
Proportion of households that use:					
An improved excreta disposal facility (improved toilet facility, 1 household)	(1/135); 0.7% (0.0-4.1)	(0/234); 0.0%	(0/72); 0.0%	(7/157); 4.5% (1.8-9.0)	
A shared family toilet (improved toilet facility, 2 households)	(1/135); 0.7% (0.0-4.1)	(2/234);0.9% (0.1-3.1)	(3/72);4.2% (0.9-11.7)	(12/157); 7.6% (4.0-13.0)	
A communal toilet (improved toilet facility, 3 households or more)	(99/135); 73.3% (65.0-80.6)	(177/234); 75.6% (69.6-81.0)	(56/72); 77.8% (66.4-86.7)	(109/157);69 .4% (61.6-76.5)	
An unimproved toilet (unimproved toilet facility or public toilet)	(34/135); 25.2% (18.1-33.4)	(55/234); 23.5% (18.2-29.5)	(13/72);18.1 % (10.0-28.9)	(29/157); 18.5% (12.7-25.4)	
MOSQUITO NET COVERAGE					
Mosquito net ownership					
Proportion of households owning at least one LLIN	(121/140); 86.4% (79.6-91.6)	(180/234); 76.9% (71.0-82.2)	(53/72); 73.6% (61.9-83.3)	(122/157); 77.7% (70.4-84.0)	Target of >80%

Average number of persons per LLIN (mean)	3.3	4.2	3.9	3.7	2 persons per LLIN
Mosquito net utilization					
Proportion of household members (all ages) who slept under an LLIN	(505/661); 76.4%	(620/1068); 58.1%	(231/365); 63.3%	(532/796); 66.8%	
Proportion of children 0-59 months who slept under an LLIN	(165/192); 85.9%	(167/250); 66.8%	(67/90); 74.4%	(137/193); 70.9%	
Proportion of pregnant women who slept under an LLIN	(15/17); 88.2%	(13/21); 61.9%	(5/7); 71.4%	(14/20); 70.0%	

Interpretation

Acute Malnutrition, stunting and anaemia

- Acute malnutrition rate was maintained within the recommended WHO Standards (<5%). There was no statistically significant difference between the level of acute malnutrition in 2012 and 2013 survey results ($p>0.05$). However, analysis by age group indicates poor nutritional status among under two years children (>5%). Stunting remained high.
- Coverage of measles and vitamin A supplementation were below standard despite established routine vaccinations in all camp clinics and the national campaigns conducted few months before the survey. This was mainly linked to MOHSW policy where immunization coverage is calculated for infants as opposed to UNHCR, which recommends all under five children; hence the calculation was based on UNHCR recommendations among under five; this also leads to receipt of less quantity of antigens than actually needed from the county health offices; and to poor documentation and recording of antigens in the child health book in some cases.
- The total anaemia (sum of mild, moderate and severe) was critical among under five children as compared to WHO public health classification of significance or targets

(<40%). In fact anaemia levels have slightly increased from 80% in 2012 to 88% in 2013 survey among children aged below two years. The HIS indicates malaria as leading cause of morbidity among under-five children. When compared to children, the total anaemia among women 15 – 49 age, though still high, was fairly low with statistically significant difference.

Infant and Young Children Feeding practices

- Consumption of iron-rich and fortified food was very low ranging from 1.8% (0.0-9.4) in Solo camp to 10.6% (6.0-16.8) in Little Wlebo camp. The critical level of anaemia and medium level of acute malnutrition among children under two years may be linked to poor infant feeding practice.

Food security

- Although close to 100% of respondents had ration cards, food ration received from general distribution could last for an average of 21 out of the 30 planned days. In such case, refugees might be obliged to engage in negative coping strategies. Dietary diversity at household level was low, counting to around half of the recommended twelve food groups, which may be linked to poor purchasing power and enslavement to general ration.

Water, Sanitation and Hygiene

- Generally water supply in refugee camps is very good; approximately 99% of households received water from improved sources, at least 63% of families consuming the UNHCR target of ≥ 20 litres per person per day and over 82% satisfied with water supply. This is a noble achievement to UNHCR and its partners as evidenced by absence of any outbreaks of water borne diseases.
- The overall proportion of households that use improved toilets was 78.1% while 21.9% uses unimproved toilets. This could potentially contribute to outbreak of potential waterborne diseases such as cholera in the camps which is endemic in Liberia.

Mosquito net coverage

- The overall proportion of households owning at least one LLIN was 79.1% which is close to the UNHCR recommended target of >80%. Average number of persons per LLIN was around 4 compared to 2 persons recommended by UNHCR. The latter may be linked to low utilization which ranged from 67% to 86%. A total of 10,346 LLINs were distributed in refugee camps in 2013.

Recommendations and priorities

Immediate term:

1. UNHCR and partners should investigate the main causes of anaemia, with technical support from HQs.

2. UNHCR to start blanket supplementation of nutributter and micronutrients to children aged between 6 – 23 and 24 – 59 months respectively to reduce the critical level of anaemia and stunting.
3. Avail sufficient resources to prevent and control micronutrient deficiencies. Outbreaks of thiamine deficiency and riboflavin deficiency, though at low levels, occurred in Liberia in 2012 and in 2013 respectively.
4. UNHCR should continue providing Ready-to-Use nutrition items for nutrition programmes in refugee camps while WFP and UNICEF provides the same items for refugee residing in the host communities as well as to the locals .
5. WFP to maintain the recommended level of kilocalories / food basket in the general food ration with constant supply.
6. WFP and UNHCR to continue with blanket supplementary feeding programme for pregnant and lactating women from second trimester until 6 months post-delivery. This would address the increased requirement of both macro and micronutrients needed due to physiological changes in this target group.
7. Health partners should provide continued and increased awareness on proper use of the supplementary foods including green leafy vegetables through household visits, education, and mother-to-mother support groups.
8. Improve documentation of Vitamin A supplementation and measles vaccinations in child health books.
9. Start calculation of vaccination among infants rather than among under-fives children. This is possible as the camps are in stable situation and should abide to MOHSW policy.
10. Continue and strengthen prevention and control activities as well as effective case management of malaria cases to contribute to the reduction the alarming level of anaemia among children. Ensure adequate amount of rapid diagnostic supplies for malaria and anaemia are provided partners in a timely manner.
11. WASH and health partners to continue sensitizing the communities on importance of mosquito nets to ensure high retention and proper utilization.
12. Continue strengthening antenatal and postnatal services at the clinics including enrolment and management of pregnant women and lactating mothers and provision of iron and folic acid supplements, intermittent presumptive treatment for malaria, and reproductive health education.

Medium term:

1. Health partners to plan and conduct KAP surveys on IYCF to assess complementary feeding practices among children aged 6-23 months, including local and traditional behaviours that may have negative impact on health and nutrition status.

2. UNHCR to procure and supply sufficient LLIN to cover the gap of about 21% deficit and reduce the current average of 4 persons sleeping under one LLIN to 2 persons.
3. UNHCR in collaboration with WASH partners to increase the number of household drinking water storage containers for refugees to ensure protection of water contamination at household level.
4. UNHCR and WASH partners to source adequate funds to improve coverage and maintenance of sanitation facilities through decommissioning of filled latrines and replace with new ones.
5. Livelihood partners in collaboration with health partners to be mandated for improvement of dietary diversity at household level, including continued scale-up of backyard home gardening, poultry and related projects, provision of seeds, training and technical support.
6. UNHCR and health partners to start implementing the onsite food basket monitoring during general ration distribution to ensure the actual ration delivered to beneficiaries.
7. Health partners should continue with the on-job training to relevant staffs on IMAM/CMAM, anaemia, IYCF skills, malaria etc., so as to improve knowledge among healthcare providers.

Long term:

1. UNHCR to continue pursuing the Government of Liberia for acquisition of land that will be used for cultivation for refugees. Food crops will be used to increase income and to complement general food ration.
2. UNHCR and partners to implement prevention and control of malaria through “epidemiologic triad” approach targeting host, agent and environment, which include; increased distribution of bed nets, indoor residual spraying (IRS), and timely diagnosis and treatment of cases. IRS has not been sufficiently carried out in refugee camps except in Bahn in 2011.
3. Conduct standardised nutrition surveys in refugee camps on annual intervals to ensure continued monitoring of trends and to plan interventions accordingly.

1. INTRODUCTION

1.1. Geographic description of survey area and population

Liberia is located in West Africa bordering Sierra Leone to its west, Guinea to its north, and Côte d'Ivoire (CDI) to its east. It covers an area of 111,369 square kilometres (43,000 sq. mi), and is home to about 3.7 million people.

Administratively, the country is divided into fifteen counties, which, in turn, are subdivided into districts and further subdivided into clans. Nimba, Grand Gedeh and Maryland are among the fifteen counties in eastern and south eastern parts, bordering CDI. The counties, including River Gee, host refugee from CDI who fled their country to seek refuge in Liberia as a results of civil war in 2010. In September 2011, refugee population in Liberia was counting at around 224,000 and later decreased drastically following the facilitated voluntary repatriation to CDI.

UNHCR has also been encouraging relocation of refugees from local community to refugee camps for better protection and assistance while in the country of asylum. In the beginning of November 2013, the registered refugee population in Liberia was 57,724 of whom 34,819 (60%) were living in the four refugee camps: 9,218 in Bahn, Nimba County; 12,205 in PTP and 3,459 in Solo in Grand Gedeh County; and 9,937 in Little Wlebo in Maryland County. During the survey the total estimated number of under-fives was 7,249 including 2,168 in Bahn, 2,255 in PTP, 652 in Solo and 2,174 in Little Wlebo camps.

Table 1: UNHCR IPs in 2013 (Health, Nutrition, HIV/AIDS, WASH, and SGBV)

No.	Organization	Type of services	Camp (s)
1.	Medical Emergency Relief International (Merlin)	Health, Nutrition, HIV/AIDS	Little Wlebo and Solo
2.	International Rescue Committee (IRC)	Health, Nutrition, HIV/AIDS	PTP
3.	African Humanitarian Action (AHA)	Health, Nutrition, HIV/AIDS	Bahn
4	IRC	SGBV	Bahn, Solo, and PTP
4.	CARE	WASH	Bahn, PTP and Solo
5.	Danish Refugee Council (DRC)	WASH and SGBV	Little Wlebo
6.	SEARCH	Health /HIV/AIDS	Urban Refugees

Table 2: Break down of refugee population by location as at 31 December 2013

County	Number of refugees at each location	
	Camp	Host community
Nimba County:	Bahn camp: 8,412	5,769
Grand Gedeh County	PTP: 12,734	9,150
	Solo: 2,989	
Maryland County	Little Wlebo camp: 10,009	1,817
River Gee	0	1,247
Montserrado	0	589 (urban)
Total	34,144 (65%)	17,983(35%), excluding urban

1.2. General Health situation

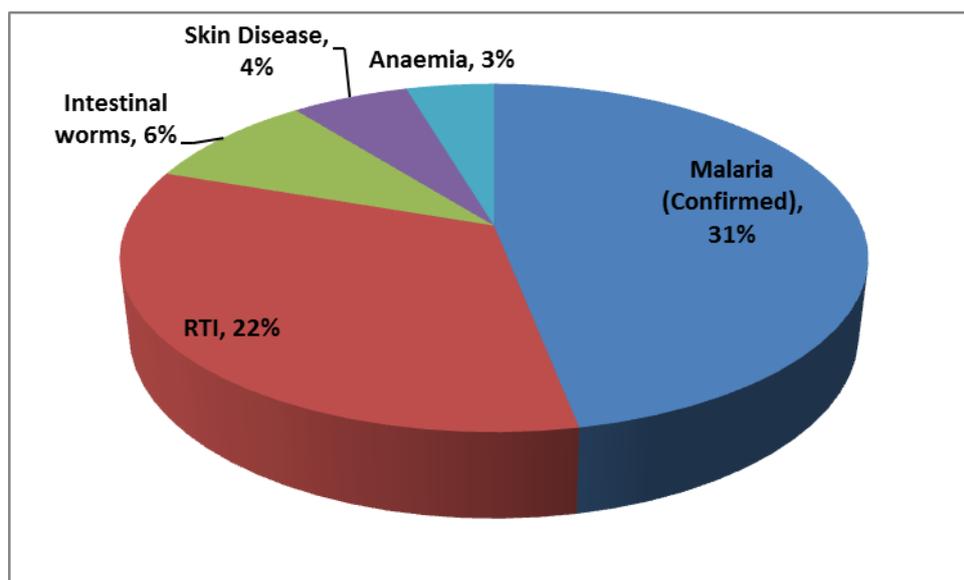
1.2.1. Health

In each camp there is a clinic which provides integrated health services, with an in-patient service in PTP camp that has a population of more than 10,000.

Refugees received integrated health services through four clinics operating in the four refugee camps (one in each camp) with funding and support from UNHCR, and through government referral facilities for secondary and tertiary care; those in urban areas through public and private health facilities. Conducted evaluation of the quality of health services using the UNHCR Balanced Score Card; the results were found excellent – among the best UNHCR has recorded globally. Water, sanitation and hygiene services were also provided in all camps.

Overall, the health status of the refugee population in the camps improved to a large extent; crude mortality rate was 0.3/1000/month; under five mortality 0.8/1000/month; infant mortality rate 32.6/1000 live births/month; and neonatal mortality rate 12.6/100,000 live births / month. However, infant mortality rates were higher in Little Wlebo camp and in Bahn camp than in other camps.

No outbreaks except that of mouth sores largely attributed to riboflavin deficiency, which was effectively controlled. The top causes of morbidity in all age groups were malaria (confirmed), 23%); Acute Respiratory Tract Infections (ARTI), 16%); skin Diseases, 5.3%), Intestinal Parasites, 5.1%), and sexually transmitted infections (non-HIV/AIDS), 4.3%). In summary the top five leading causes of morbidity constituted 53.7% of the total consultations. If suspected malaria is considered, malaria would account for more than 35%.

Figure 1. Causes of morbidity among under five children

Malaria continues to be the major cause of morbidity and mortality. Crude incidence of malaria was 58.7/1000/month; malaria incidence rate was 105.3 cases /1000/month for confirmed cases among under five children. 10,346 long lasting impregnated bed nets (LLITNs) were distributed; the proportion of households owning at least one LLIN was 78.7%; on average 3.7 individuals owned one LLIN as compared to 2 persons targeted by UNHCR. Proportion of under-fives children who slept under an LLIN was 74.5%, and proportion of pregnant women slept under an LLIN was 73%.

Immunisation rates were; BCG – 65.9%; Polio – 103.8%; DPT – 105.7%; and Measles – 62.1%. Mass deworming and vitamin A supplementation campaigns among under-fives were carried out by the Government of Liberia every six months with the support of UNICEF and WHO; refugee population is also covered with support from UNHCR and health partners working in the camps. The last campaign took place one month before commencement of the survey. The general coverage was 92% and 64% for Vitamin A supplementation and deworming respectively.

Disease surveillance was put in place; so also epidemic preparedness and response plans in each camp for malaria, measles, and diarrheal diseases. MOHSW and CHTs also supported the refugees by ensuring free access to various programmes tuberculosis, leprosy, ART, vaccines, and immunization campaigns

Figure 2: Trend of crude and under five mortality rates for the four camps in 2013

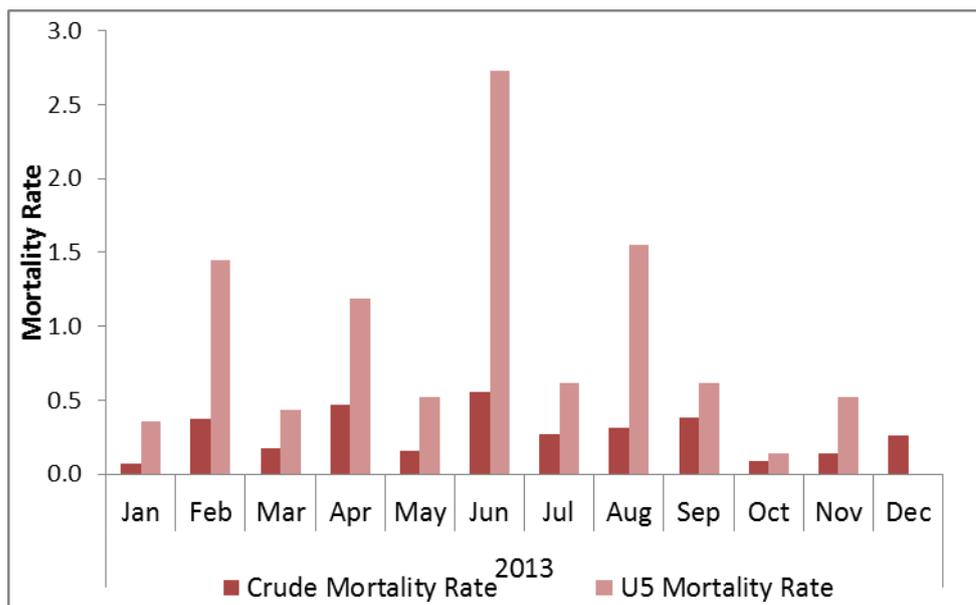


Figure 3: Top five causes of mortality among children under-five: 2013

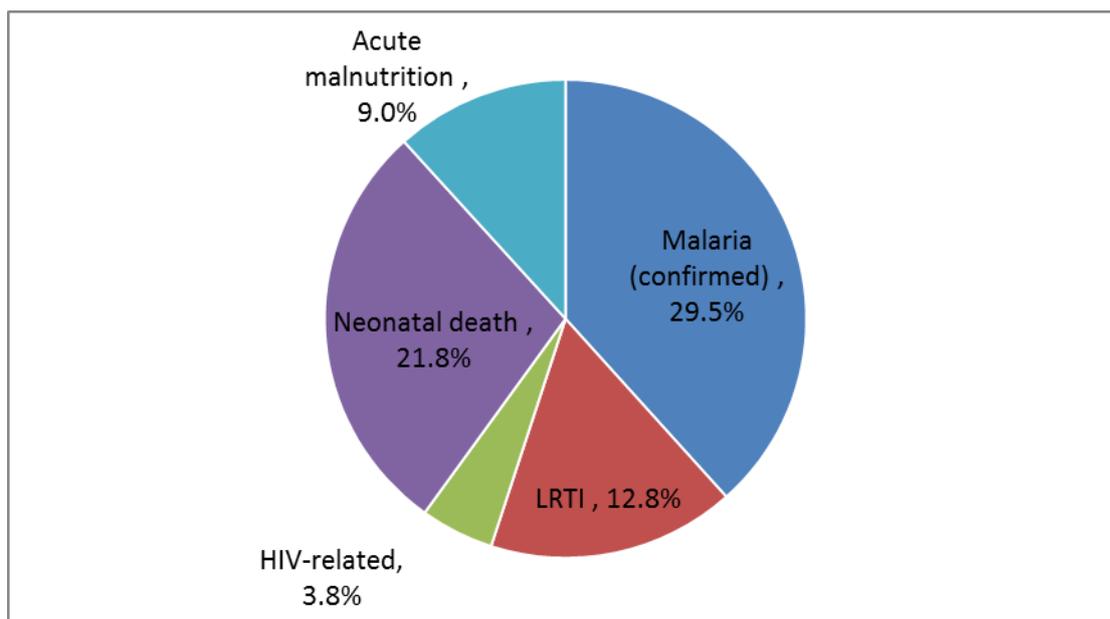
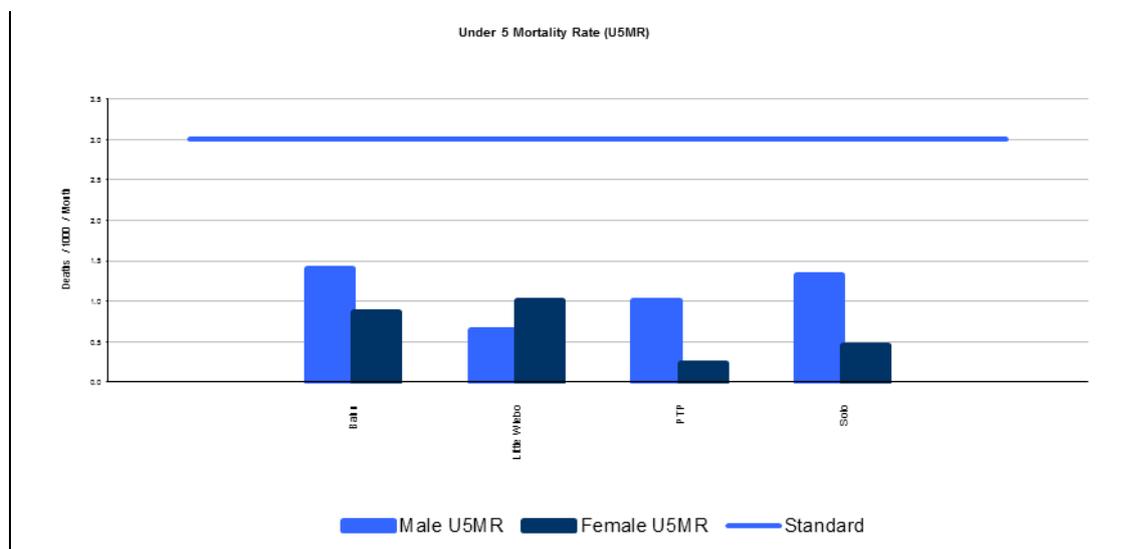


Figure 4 Infant mortality rate-2013: All camps

1.2.2. HIV/AIDS and Reproductive Health

Overall the performance and quality of services in HIV/AIDS and reproductive health are at acceptable level; however, there is still a need to strengthen the reproductive health component, specifically related to emergency obstetric care, neonatal care, family planning, and interventions to reduce teenage pregnancies. HIV/AIDS/RH services were also augmented with HIV/AIDS/Reproductive Health quick impact projects funded through the 2012-2013 UNAIDS UBRAF (Unified Budget, Result, and Accountability Framework) funding, which focused among others on interventions for teenage pregnancies; care and support for people living with HIV/AIDS; strengthening and scaling up family planning services; improving emergency management of obstetric and neonatal services; and provision of mama / baby kits; support infant feeding.

Complete ANC coverage was 91%; coverage of ANC tetanus immunization was 72%. Intermittent Preventive Therapy (IPT) for malaria for pregnant women has increased from 64% in 2012 to 91% in 2013; crude birth rate was 2.2 / 1000/month. 94% of the deliveries were conducted by Skill Birth Attendants (SBA), and 97% delivered at health facilities. Still birth rate for the reporting period was 21.5/ 1000 live births. According to the 2009 report¹, the Liberia still birth rate is 26.91/1000 births while that of Ivory Coats was 27.39/1000 births. Contraceptive prevalence rate has increased from <20% in 2012 to 25.6% in 2013. Conducted rapid assessments to know the magnitude of the problem of teenage pregnancies; designed and implement feasible interventions for each camp.

¹ <http://chartsbin.com/view/1445>

2,423 persons received HIV voluntary counselling and testing services; PMTCT coverage stood at 96%. By the end of December 2013, there were 243 people living with HIV/AIDS (PLWA) in refugee camps in Liberia; 153 (63%) of them were on antiretroviral therapy.

1.3. Water, Sanitation and Hygiene

There have been major constraints in WASH, specifically in the first half of the year due to funding constraints. However, by the end of 2013, overall the performance and quality of services in WASH have been at acceptable level. There were no outbreaks of water borne diseases. UNHCR and partners have managed upgrading sanitation facilities. Standards were met in all camps; average water consumption was 20.25 litres / person / day, ranging from 24 litre/per/person /day in Solo camp to 18 litres per /person /day in PTP. Three camps run parallel water system (motorized and hand pump) with motorize system accounting for > 50% of the water supply; Little Wlebo camp is running a single water system, hand pumps.

Water quality tests were done regularly. KAP surveys (PTP, Solo, and Bahn camps) by CARE indicated that 94% of women knew that uncovered water may cause health hazards and 97% knew that bad water would cause water borne diseases. About 67% of the respondents use buckets to store drinking water. KAP survey was also conducted in Little Wlebo camp by Danish Refugee Council.

The transformation of latrines from transitional to semi-permanent was one of the major achievements during this reporting period. 85% of the latrines in PTP, Bahn and Solo were transformed to semi-permanent while the remaining were transitional. 100% of latrines in Little Wlebo were transformed to semi-permanent. Standards were met with average of 17.8 persons / cubicle, while the UNHCR standard is 20 person / drop hole. This ranged from 19 persons / cubicle in Solo to 16 persons /cubicle in Little Wlebo. About 80% of the refugees have improved toilet facilities. Knowledge-Aptitude-Practice (KAP) survey conducted in PTP, Bahn, and Solo showed signs of improvements, especially in hygiene practice; 85% of the people in PTP camp wash their hands after using the latrine.

1.4. Food security situation

Liberia is richly endowed with water, mineral resources, forests and a climate favourable to agriculture, with agricultural product on making up 26% of direct and 27% of indirect gross GDP through other services (National Rice Development Strategy, 2011). Agricultural production is greatest in Nimba County, followed by Maryland, Grand Gedeh and River Gee. Production was marginally expanded as a result of the increased availability of skilled

agricultural labour with the refugee influx.² The host communities are mostly engaged in multiple livelihood strategies, such as agro forestry, hunting, fishing, petty trade and gold and diamond mining of which opportunities are profound in Grand Gedeh County, and to a lesser extent in River Gee County.³

The prevalence of food insecurity in Liberia is most severe in Bomi, River Cess and Grand Kru where 55%, 45% and 46% of households are food insecure respectively. The level has been slowly decreasing compared to last 2012 where the trend of insecurity was higher in River Gee (82.5%), Maryland (72.5%), Grand Gedeh (42.0%) and in Nimba (32.4%). According to the June 2013 survey the prevalence was 39%, 21% and 11% in Maryland, Grand Gedeh and Nimba counties respectively.⁴

Refugees hosted in the three counties are entirely depending on the relief food supplied by WFP through general ration. At the beginning of January 2013, the refugee food basket comprised of Rice, Corn Soy Blend (CSB), Pulses, Vegetable oil and salt. In April 2013 however, WFP declared the official removal of CSB from general rations following recommendations from the joint assessment mission (JAM) 2012. The recommendation was drawn due to the fact that refugees were not properly consuming the item and some were rather selling it resulting to wastage of resources. WFP instead, increased pulses in the refugee food basket by 100% to compensate amount of Kcal to consumers. In addition to the absence of fortified blended food, refugees were not receiving salt through general ration for almost six months, a situation which could add the precarious situation in acquiring some essential micronutrients.

The general food ration to refugees before and during the survey period, which is indicated in the table below, provided 100% of the required kcal per person per day.

Table 3: Food rations to refugees during the survey.

Food item	Ration	Energy	Iron	Iodine	Thiamine	Riboflavin	Vit. C
	g/p/day	Kcal	mg	µg	mg	mg	mg
Rice	420	1,512	7.1	0	0.42	0.13	0
Beans	100	335	8.2	0	0.5	0.22	0
Oil	30	266	0	0	0	0	0
Total ration	550	2,113	15.3	0	0.92	0.35	0

² 2009 and 2001, Crop Assessment; Production in Grand Gedeh, 12,980 MT (2009); 11,380 MT (2011); Maryland, 8,540 MT (2009); 8,740 MT (2011); Nimba, 60,570 MT (2009); 61,630 MT (2011); River Gee, 7,620 MT (2009); 8,410 MT (2011)

³ 2012, February, Cross Border Assessment Between Liberia and Côte d'Ivoire, January and February 2012: Security Stabilization and Food Security, UNDP

⁴ Liberia comprehensive Food Security and Nutrition survey 2013

Recommended allowance		2,100	22	150	0.9	1.4	28
% of supplied by ration		101%	70%	0%	102%	25%	0%

1.5. Nutrition situation

Management of acute malnutrition was done in an integrated approach in the camps where a range of services and activities are implemented both at the community and the clinic level. Active and passive screenings are conducted in the communities as well as in the camp clinics; treatments of both moderate and severe cases of malnutrition (MAM and SAM) are done in the health facilities.

The SAM cases with medical complications are referred to and admitted in the nearest special nutrition units (SNUs) in the government health facilities in the three Counties (Martha Tubman Memorial Hospital in Grand Gedeh, Bahn Health Centre in Nimba, and JJ Dossen Hospital in Mary Land). MAM and SAM cases without complications are enrolled and managed in SFP and OTP in the camps respectively.

The 2012 nutrition survey which was conducted in the same locations showed Global Acute Malnutrition (GAM) rate of 3.9% (2.7 - 5.7% CI), i.e., Moderate Acute Malnutrition (MAM) rate of 3.6% (2.4 - 5.4% CI) and Severe Acute Malnutrition (SAM) rate of 0.3% (0.1 - 1.1% CI), among children aged 6 – 59 months; this was within the acceptable range according to WHO cut-off point of 5%. Analysis by age groups revealed high prevalence of acute malnutrition (8.5%) among children aged 6-17months. This was far above the WHO recommendations, and thus, a demand for appropriate interventions. The survey was conducted in October to early November which is the peak rainy season in Liberia.

Stunting was 45.2% (41.2-49.1% CI), defined as critical according to WHO standards. Prevalence of stunting was higher among boys than for girls. Stunting rate showed a statistically significant difference between the two groups ($P=0.007$). There is no a clear reason behind this at the moment but this might be caused by a slight sex bias. The comprehensive food security and nutrition survey from 2010 estimated a stunting level of 41.8% among under five Liberian children in Liberia. The average stunting level in Côte d'Ivoire was 40.1% in 2006.

The overall anaemia level was 73.9% (69.0-78.5%) for children 6-59 months and 80.3% (72.0 – 87.1% CI) among 6 – 23 months. This is very high and is categorized as a severe public health concern according to the WHO standards. The prevalence of anaemia among

non-pregnant and non-lactating women between the ages of 15-49 years is estimated at 56.6% (50.6-62.3%); this is also considered to be a severe public health concern.

The 2013 survey was conducted in same locations and period in which the 2012 survey was conducted. This means that the survey could capture the nutritional situation in the most vulnerable period during the year.

2. OBJECTIVES

This nutrition survey was aimed to evaluate and provide reliable information reflecting interventions that were planned and implemented in the past 12 months, and thus, provide a roadmap on what should be done to improve the refugee health and nutrition in the coming at least one year.

2.1. Primary objectives: To:

1. Measure the prevalence of acute malnutrition among children aged 6-59 months;
2. Measure the prevalence of stunting among children aged 6-59 months;
3. Measure the prevalence of anaemia among children aged 6-59 months and among women of reproductive age between 15-49 years (non-pregnant);
4. Determine the coverage of measles vaccination among children aged 9-59 months;
5. Determine the coverage of vitamin A supplementation received during the last 6 months among children aged 6-59 months;
6. Assess the two-week prevalence of diarrhoea among children aged 6-59 months;
7. Investigate IYCF practices among children aged 0-23 months;
8. Determine the coverage of ration cards and the duration the general food ration lasts for recipient households;
9. Determine the extent to which negative coping strategies are used by households;
10. Assess household dietary diversity;
11. Collate available information on the performance of the food aid system;
12. Determine the population's access to, and use of, improved water, sanitation and hygiene facilities;
13. Determine the ownership of mosquito nets (all types and LLINs) in households;
14. 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 therapeutic feeding and targeted supplementary feeding programmes for children 6-59 months.
2. To determine enrolment into Antenatal Care Services and coverage of iron-folic acid supplementation in pregnant women.

3. METHODOLOGY

3.1. Sample size

The UNHCR SENS guidelines for refugee populations and the Standardized Monitoring and Assessment of Relief and Transitions (SMART) methodology version 2 were used to calculate the required sample size. Information on nutritional status obtained from the 2012 nutrition survey was used for sample size estimation. The systematic random sampling methodology without list was used during sample size estimation since in each block households are well arranged in rows and columns.

From the 2012 survey, the upper limit of the global acute malnutrition according to WHO 2006 growth standards was 5.4%, which for the purpose of the 2013 survey the figure was rounded to 6% and assumed as an expected prevalence of acute malnutrition. Precision of 3% was desired and 10% to take care of non-response and absentees. The non-response rate was taken across in all camps due to the fact that the mobility among refugees in the camps is very high. The under-five population was below 10,000 and thus the need for adjustment to small population.

Based on November 2013's ProGres data, the estimated sample size was automatically generated from emergency nutrition assessment (ENA) software as shown in the table below.

Table 4: Sample size by camp – ENA output

Parameters	Bahn	PTP	Solo	LWC	Total
Expected prevalence, %	6	6	6	6	6
Desired precision, +/-%	3.0	3.0	3.0	3.0	3.0
Total households	2,283	4,002	723	2,680	9,688
Total population (crude)	8,371	12,205	3,459	9,937	33,972
Total population (under 5)	2,207	2,255	652	2,174	7,288
Average household size	3.7	3.0	4.8	3.7	3.8
% population under five	26	18	19	22	21.4
% non-response households	10	10	10	10	10
Number of children to be sampled	214	215	171	215	815
Number of hh's to be visited	275	491	241	309	1,459

The UNHCR SENS guideline was used to calculate sample size for other indicators. Based on number of household to be visited for anthropometry and health, sample size for anaemia,

IYCF, food security, WASH and mosquito net coverage were obtained as shown in the table below.

Table 5: Calculated number of household by camp

Module	Description	Bahn	PTP	Solo	LWC	Total
Module 1	Anthropometry and Health	275	491	384	309	1459
Module 2	Anaemia (Children 6 - 59 m) - scenario 2	275	491	384	309	1,459
Module 2	Anaemia (Women 15 - 49 years)	138	246	192	155	730
Module 3	Infant and young children feeding (IYCF)	275	491	384	309	1,459
Module 4	Food Security	138	246	192	155	730
Module 5	WASH - systematic sampling	138	246	192	155	730
Module 6	Mosquito net coverage	138	246	192	155	730

3.2. Sampling procedure: selection of households and children

In reference to UNHCR SENS guidelines for refugee populations (v1.3) and the Standardized Monitoring and Assessment of Relief and Transitions (SMART) methodology (v1), a systematic random sampling technique without list was used for selection of eligible subjects. Households were systematically selected depending on the calculated sampling interval, from expected number of households to be visited.

The first household was randomly selected by the team with lottery method. The selected household was asked if there are children under-five or women aged 15-49 year in that particular household. Children and women who were eligible were all sampled. If no targeted children or women in the selected household were found, the household was included in the questionnaire and marked “no eligible sample” on the “data control sheet”.

Other parameters related to WASH, food security and mosquito nets were still assessed where applicable. If there were eligible women and/or children but not present at time of visit, the households were marked for revisit before the end of the day. If in that same day the eligible sample was not present, that household was later marked “absent” but still included in the questionnaire and not replaced.

3.3. Questionnaire and measurement methods

3.3.1. Questionnaire

UNHCR is increasingly recommending the use of mobile phones for survey implementation, and thus, this new technology is becoming familiar in the Liberia operation, this being the second nutrition survey using mobile data collection.

The questionnaires were created in the laptop and uploaded into smartphones; the Open Data Kit software installed in the phones was used to run the questionnaire. Data collection tools were configured in such a way that could read in both English and French depending to

the preferred language by the user. In this way there was no need of carrying a translated hard copy by the team for reference.

The questionnaires which were originally designed in English and French were further reviewed to include the local languages or dialect especially for some of food items obtained locally. The local names of food and WASH facilities which are commonly used in the community were also introduced in the questionnaire during central training in the presence and representation of people from all camps. The preferred language by the respondent during the interview was adhered to. Thus, translation from local language to either English or French where applicable was necessary for capturing of the information in the mobile phone.

Pretesting of the data collection tools was done in the field before the commencement of the survey. This helped to identify and correct ambiguous and difficult questions to both interviewers and respondents where applicable.

3.3.2. Measurement methods

Subjects for module 1, module 2 scenario two, and module 3 were sampled from all selected households while subjects for rest of the models were assessed in every other household. Data was directly entered in the mobile phones in which questionnaires were uploaded.

3.3.3. Anthropometry and Health:

All children between 6 and 59 months were assessed for anthropometric measurements, morbidity, vitamin A supplementation, feeding centre coverage and measles vaccination in children aged 9 to 59 months. Children in household where there were no mothers, caretakers or heads of households to provide the required information to complete the data were revisited before the end of the day. Digital weighing scale (Seca872), Infant height board (shorrboard) and MUAC tapes were used to collect anthropometric measurements.

3.3.4. Anaemia:

Children aged 6 – 59 months were sampled from all the selected households consisting of eligible samples while non-pregnant women aged 15 – 49 years were sampled from every other household. HemoCue® model Hb301 System was used to measure the haemoglobin. Safety lancet was used to prick the middle or ring finger and the third drop of blood was collected using HemoCue® Hb301 Microcuvette. The well filled microcuvette was inserted in the machine and reading was taken after the beep. Readings were in the mobile phone (in g/dl) corrected to one decimal place.

3.3.5. Infant and young children feeding:

Children between 0 and 23 months were assessed for IYCF practices. Subjects in this age were all surveyed in each of the selected household. The IYCF questionnaire, which was automatically selected from the child questionnaire in the mobile phone, based on the age, was administered to the mother or caretaker. If the mother or caretaker who could provide the information was not present, other information was taken and the particular household was revisited to complete the IYCF information before the end of the day.

3.3.6. Food security, Wash and Mosquito net coverage:

Information was collected in every other household according to UNHCR SENS guidelines. Available members of the household, preferably mothers, were asked to participate in and were interviewed in the guidance of the particular questionnaire. Only respondents aged at least 15 years were allowed to participate in the interview.

3.4. Case definitions, inclusion criteria and calculations

3.4.1. Indicators of nutritional status

The table below indicates definition and classification of the nutritional indicators used. Results are reported according to WHO Growth Standards 2006.

Table 6: Nutritional Status indicators and cut-offs

Indicator		Children 6-59 months
Acute Malnutrition ¹	Global acute malnutrition	WHZ <-2 and/or oedema
	Moderate acute malnutrition	WHZ <-2 and ≥-3
	Severe acute malnutrition	WHZ <-3 and/or oedema
Stunting ¹	Total stunting	HAZ <-2
	Moderate stunting	HAZ <-2 and ≥-3
	Severe stunting	HAZ <-3
Underweight ¹	Total underweight	WAZ <-2
	Moderate underweight	WAZ <-2 and ≥-3
	Severe underweight	WAZ <-3
Malnutrition (MUAC)	Global malnutrition	<12.5cm
	Moderate malnutrition	≥11.5cm and <12.5cm
	Severe malnutrition	<11.5cm and/or oedema

¹ Calculated using NCHS Growth Reference 1977 and WHO Growth Standards 2006

WHZ: weight-for-height z-score, **HAZ:** height-for-age z-score, **WAZ:** weight-for-age z-score

Table 7: Definition of anaemia based on the WHO cut off point (WHO, 2000)

Indicator	Children 6-59 months	Non-Pregnant Women 15-49 years
Total anaemia	Hb <11.0 g/dL	Hb <12.0 g/dL
Mild anaemia	Hb 10.0 - 10.9 g/dL	Hb 11.0 - 11.9 g/dL
Moderate anaemia	Hb 7.0 - 9.9 g/dL	Hb 8.0 - 10.9 g/dL
Severe anaemia	Hb <7.0 g/dL	Hb <8.0 g/dL

3.4.2. Selective Feeding Programme Coverage (children 6-59 months)

Selective feeding programme coverage was assessed using the direct method as follows:

3.4.2.1. Supplementary feeding programme

Coverage of SFP programme (%) = 100 x No. of surveyed children with MAM according to SFP admission criteria who reported being registered in SFP, divided by No. of surveyed children with MAM according to SFP admission criteria.

3.4.2.2. Therapeutic feeding programme

Coverage of OTP programme (%) = 100 x No. of surveyed children with SAM according to OTP admission criteria who reported being registered in OTP, divided by No. of surveyed children with SAM according to OTP admission criteria.

3.4.3. Infant and Young Child Feeding (IYCF) Indicators (0-23 months)

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

3.4.3.1. Timely initiation of breastfeeding: WHO core indicator 1

Proportion of children 0-23 months of age who were put to the breast within one hour of birth = Children 0-23 months of age who were put to the breast within one hour of birth, divided by Children 0-23 months of age.

3.4.3.2. Exclusive breastfeeding under 6 months: WHO core indicator 2

Proportion of infants 0–5 months of age who are fed exclusively with breast milk: (including milk expressed or from a wet nurse, ORS, drops or syrups (vitamins, minerals, medicines)) = Infants 0–5 months of age who received only breast milk during the previous day, divided by Infants 0–5 months of age.

3.4.3.3. Continued breastfeeding at 1 year: WHO core indicator 3

Proportion of children 12–15 months of age who are fed breast milk = Children 12–15 months of age who received breast milk during the previous day, divided by Children 12–15 months of age.

3.4.3.4. Introduction of solid, semi-solid or soft foods: WHO core indicator 4 Proportion of infants 6–8 months of age who receive solid, semi-solid or soft foods = Infants 6–8 months of age who received solid, semi-solid or soft foods during the previous day, divided by Infants 6–8 months of age.

3.4.3.5. Consumption of iron-rich or iron-fortified foods: WHO core indicator 8

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

3.4.3.6. Continued breastfeeding at 2 years: WHO optional indicator 10 - Proportion of children 20–23 months of age who are fed breast milk = Children 20–23 months of age who received breast milk during the previous day, divided by Children 20–23 months of age.

3.4.3.7. Bottle feeding: WHO optional indicator 14

Proportion of children 0–23 months of age who are fed with a bottle = Children 0–23 months of age who were fed with a bottle during the previous day, divided by Children 0–23 months of age.

3.4.4. Household food security indicators

Household dietary diversity score (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
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

3.4.5. WASH

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

	Improved source	Unimproved source
Drinking Water	Piped water into dwelling, plot or yard	Unprotected spring
	Public tap/standpipe	Unprotected dug well or protected dug well with bucket
	Tube well / borehole (and pump)	Small water vendor (cart with small tank or drum)
	Protected dug well with hand pump	Tanker truck

	Protected spring	Bottled water*
	Rainwater collection from roof	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. This will need to be assessed prior to the survey and categorised accordingly.		
Sanitation facility definition	Improved category	Unimproved category
	Flush / pour flush to Septic tank or pit latrine	Flush / pour flush to open drain
	VIP latrine, Pit latrine with slab, Composting toilet	Pit latrine without slab (slab with holes) /open pit, bucket, 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 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 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.

3.5. Classification of public health problem and targets

3.5.1. Anthropometric data:

According to UNHCR strategic plan 2008-2012 the target for the prevalence of global acute malnutrition (GAM) for children aged 6-59 months should be <5% and the target for the prevalence of severe acute malnutrition (SAM) should be <1%.

Table 8: Classification of malnutrition as a public health significance for children under 5 years of age⁵

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

3.5.2. Selective feeding programmes:

UNHCR Strategic Plan for Nutrition and Food Security 2008-2012 includes the following indicators:

⁵ WHO 1995, 2000

Table 9: Acceptable performance indicators for selective feeding programmes^{6*}

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

* Also meet sphere standards for performance

3.5.3. Measles vaccination and vitamin A supplementation in last 6 months coverage: UNHCR recommends the following target:

Table 10: Recommended targets for measles vaccination and vitamin A supplementation in last 6 months

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

3.5.4. Anaemia:

The UNHCR Strategic Plan for Nutrition and Food Security (2008-2012) 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 <20%. However, the severity of the public health situation for the prevalence of anaemia should be classified according to WHO criteria as shown in the Table below.

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

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

3.5.6. 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 also contributes to high infant and child morbidity and mortality by directly affecting children's nutritional status. 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 right⁷.

⁶ UNHCR Strategic Plan for Nutrition and Food Security 2008-2012

⁷ UNHCR SENS Wash module

Table 12: UNHCR WASH Programme Standards

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

3.5.7. 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

3.6. Training, Coordination and Supervision**3.6.1. Central training**

This was conducted for three selected international and national staff members each from IRC, AHA, CARE, and Merlin. Partners were advised to select, if possible, those who participated in the previous UNHCR SENS in Liberia or just nutrition survey elsewhere. The training, which took place for six days at AHA office in Saclepea City, Nimba County, targeted supervisors and was aimed at imparting sufficient knowledge on the six modules of the SENS guidelines. Training methodology included theory and practical, but more in a participatory way.

The training included objectives for nutrition survey, composition of survey teams, sampling procedure, rationale and importance of representativeness of the sample; so also questionnaires and sheets, measurement techniques for anthropometry and haemoglobin, interview techniques for each module and finally discussed on survey logistics.

A one day session was spent for training on data collection using mobile phone facilitated by an expert from CartONG. During the training participants were asked to provide local names of food and sanitation facilities as used by refugee community which were later coded and entered in the questionnaire. Practical sessions were conducted in groups to allow maximum participation among group members.

3.6.2. Data collector's training

This was done to enumerators at camp level, with a key focus on measurement and familiarization of data collectors on other information to be collected. 24 participants comprising of refugee volunteers and a few national staffs participated in this two days training, which was done prior to data collection in each camp. Participants of the central training facilitated the training (co-facilitation) while nutrition coordinators from UNHCR and WFP provided guidance. The training included measurements of weight, height, MUAC, interview techniques as well as observation for availability and utilisation of mosquito nets, and WASH facilities. Day one was spent for theory and day two for practical sessions including standardisation tests for anthropometric measurements and field test.

3.6.3. Coordination and supervision

UNHCR team comprised of the Associate Nutrition Officer, Associate Public Health Officer, Health Associate, and Senior field assistant for WASH, and WFP was represented by the Nutrition Officer (in Bahn, in Solo, and in PTP camps). The UNHCR Associate Nutrition Officer, in collaboration with the WFP Nutrition officer, played the main coordination and lead role.. They ensured that data collected are in good quality as per SMART recommendations. The mobile phone expert from CartONG was available to provide technical support on data management especially during first three days of data collection. Throughout the survey there was communication between teams, supervisors and coordinators through VHF handsets to make sure technical support and guidance is provided whenever needed.

The UNHCR Public Health Officer guided the overall survey and coordinated at the central level in collaboration with the Health Associate.

3.7. Data collection

Data collection started in Bahn camp on the 19th November and concluded in Little Wlebo camp on 13th December 2013. Two mobile phones were possessed by each team; one for individual level modules (1, 2 and 3), and the second one for household level modules (4, 5 and 6.

The exercise lasted for four days in each of Bahn and PTP camps, and three days in each of Solo and Little Wlebo camps. The teams started work at 08:00am at each block.

Team leaders introduced the members to block leaders and later they led their teams to at the corner of the block to start sampling of the first household by following the systematic sampling procedures. Team leaders asked the consent for participation from respondents and proceeded with interviews. Whenever consent was not given, the team did not gather any information but still the household was included in the survey and not replaced.

In the afternoon all team members were called to the assembling points for lunch and went

again to complete their respective blocks including revisiting of some households where applicable. Supervisors had to recheck the mobile phones, hardcopies of data control sheets, and household forms before submitting to the coordinators. The survey manager ensured that all national and international staffs leave the camp no later than 05:00pm every day.

On arrival to the base station the survey manager and coordinators had to go through all the mobile phones to make necessary corrections and finalize the data. Mobile phones, router and the laptop were set; data were uploaded from the mobile phones to the server and downloaded to the laptop. Plausibility check was done for anthropometric information using ENA for smart software. Important notes were made and feedback was provided to the survey teams the following morning before data collection starts.

3.8. Data analysis

Data cleaning was done using a UNHCR SENS data cleaning PGM file in Epi info software. Anthropometry results were generated using ENA for SMART (delta version, 16th November 2013) software and the Epi Info software (Centres for diseases control, version 3.5.4) for the coverage of measles vaccination, Vitamin A supplementation and Feeding programme (OTP and SFP). Epi info software was also used to analyse indicators for anaemia, IYCF, Food security, WASH and Mosquito net coverage.

4. RESULTS

Table 14: Demographic Characteristics of the study population

	CAMP			
	Bahn	PTP	Solo	Little Wlebo
Total households surveyed	258	428	133	301
Total population surveyed	2,016	2,196	678	1,817
Total U5 surveyed	373	495	185	382
Average household size	7.8	5.1	5.1	6.0
% of U5	19%	23%	27%	21%

4.1. Sample size

A total number of children aged 6 – 59 months are as indicated the table below. The survey included more children than targeted due to misinformation on the actual number of under-fives children in the camps, except in Solo where it is more or less similar.

Table 15: Target and actual number captured

	CAMP			
	Bahn	PTP	Solo	Little Wlebo
Targeted 6 – 59 months	214	215	171	215
Surveyed 6 – 59 months	334	453	175	340
Percentage of the target	156%	211%	102%	158%

4.2 RESULTS FOR BAHN CAMP

4.2.1. Children 6-59 months

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

AGE (mo)	Boys		Girls		Total		Ratio
	no.	%	no.	%	no.	%	Boy: girl
6-23	67	55.8	53	44.2	120	36.9	1.3
24-29	26	56.5	20	43.5	46	14.2	1.3
30-41	41	57.7	30	42.3	71	21.8	1.4
42-53	26	44.1	33	55.9	59	18.2	0.8
54-59	14	48.3	15	51.7	29	8.9	0.9
Total	174	53.5	151	46.5	325	100.0	1.2

The overall sex ratio (boy: girl) of 1.2 is in the recommended acceptable range of equal distribution among the two sex.

Table 17: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or Oedema) and by sex

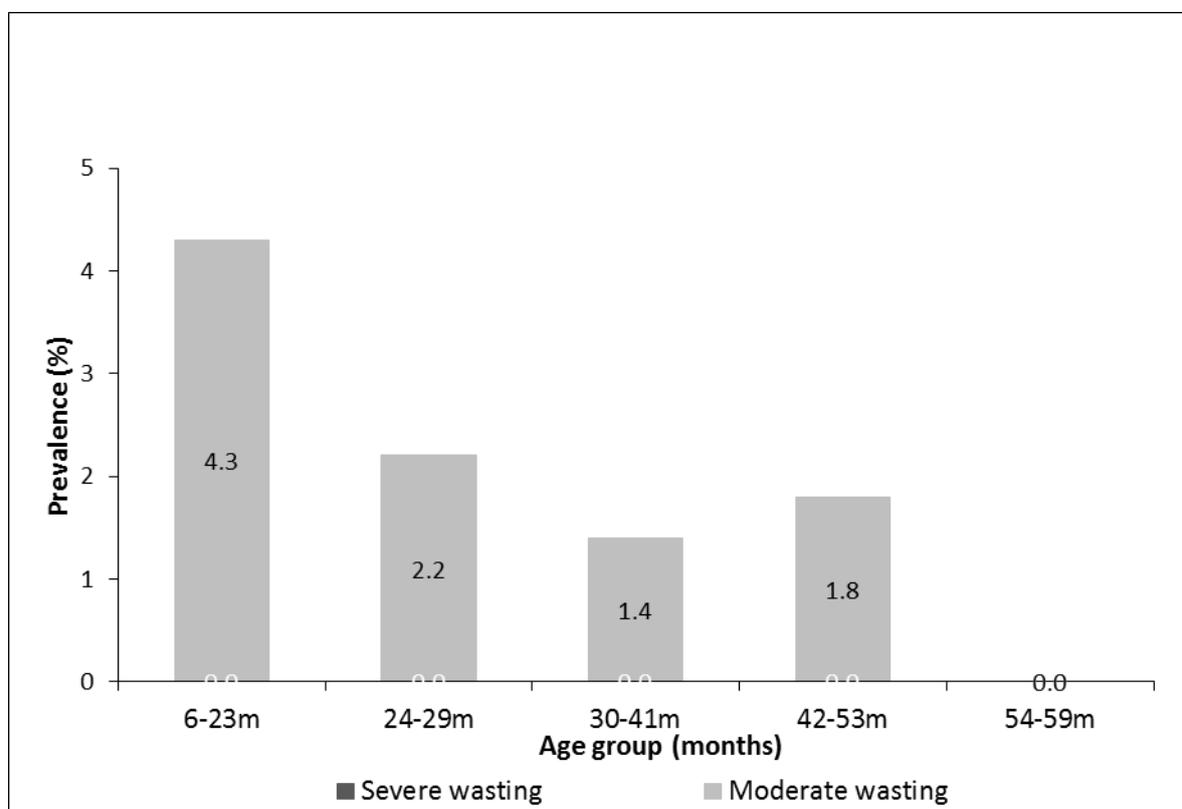
Malnutrition rates	All n = 325	Boys n = 173	Girls n = 152
Prevalence of global acute malnutrition: (<-2 z-score and/or oedema)	(8) 2.5 % (1.3 - 4.8 95% C.I.)	(4) 2.3 % (0.9 - 5.8 95% C.I.)	(4) 2.6 % (1.0 - 6.6 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(8) 2.5 % (1.3 - 4.8 95% C.I.)	(4) 2.3 % (0.9 - 5.8 95% C.I.)	(4) 2.6 % (1.0 - 6.6 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(0) 0.0 % (0.0 - 1.2 95% C.I.)	(0) 0.0 % (0.0 - 2.2 95% C.I.)	(0) 0.0 % (0.0 - 2.5 95% C.I.)

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

Age (months)	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	116	0	0.0	5	4.3	111	95.7	0	0.0
24-29	45	0	0.0	1	2.2	44	97.8	0	0.0
30-41	70	0	0.0	1	1.4	69	98.6	0	0.0
42-53	57	0	0.0	1	1.8	56	98.2	0	0.0
54-59	28	0	0.0	0	0.0	28	100.0	0	0.0
Total	316	0	0.0	8	2.5	308	97.5	0	0.0

The most affected age group seemed to be younger children (6-23) which counted 5 out of 8 cases of MAM

Figure 5: Trend of wasting prevalence by age in children 6-59 months



Younger children (<2yrs) were the most victims of severe acute malnutrition as seen in the figure above.

Table 19: Distribution of severe 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. 4 (1.2 %)	Not severely malnourished: No. 329; (98.8 %)

Figure 6: Distribution of weight-for-height z-scores

The reference population is shown in green and the surveyed population is shown in red

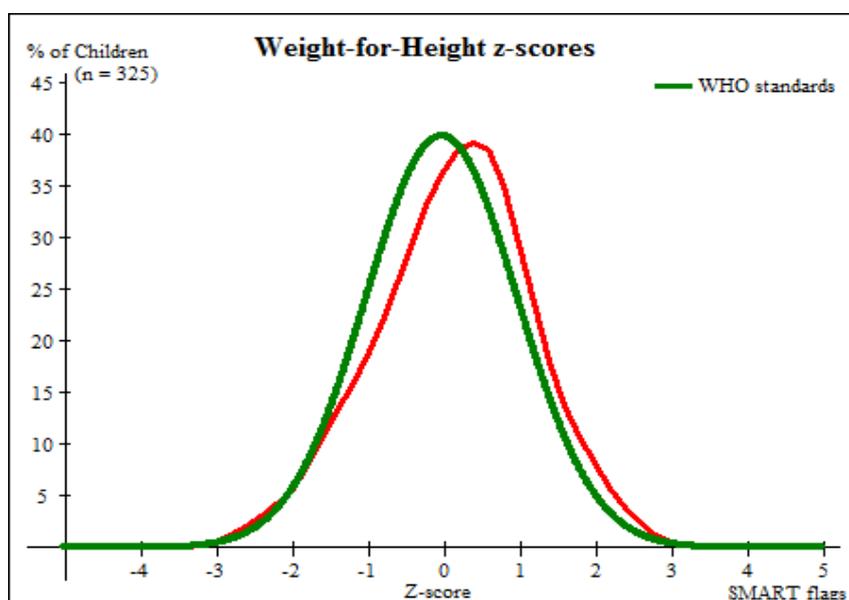


Table 20: Prevalence of malnutrition based on MUAC by sex

	All n = 334	Boys n = 177	Girls n = 157
Prevalence of global acute malnutrition (< 125 mm and/or oedema)	(3) 0.9 % (0.3 - 2.6 95% C.I.)	(2) 1.1 % (0.3 - 4.0 95% C.I.)	(1) 0.6 % (0.1 - 3.5 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(3) 0.9 % (0.3 - 2.6 95% C.I.)	(2) 1.1 % (0.3 - 4.0 95% C.I.)	(1) 0.6 % (0.1 - 3.5 95% C.I.)

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

Age (mo)	Total no.	Severe wasting (< 115 mm)		Moderate wasting (>= 115 mm and < 125 mm)		Normal (> = 125 mm)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-23	120	0	0.0	3	2.5	117	97.5	0	0.0
24-29	46	0	0.0	0	0.0	46	100.0	0	0.0
30-41	71	0	0.0	0	0.0	71	100.0	0	0.0
42-53	59	0	0.0	0	0.0	59	100.0	0	0.0
54-59	29	0	0.0	0	0.0	29	100.0	0	0.0
Total	325	0	0.0	3	0.9	322	99.1	0	0.0

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

	All n = 321	Boys n = 171	Girls n = 150
Prevalence of underweight (<-2 z-score)	(42) 13.1 % (9.8 - 17.2 95% C.I.)	(24) 14.0 % (9.6 - 20.0 95% C.I.)	(18) 12.0 % (7.7 - 18.2 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(36) 11.2 % (8.2 - 15.1 95% C.I.)	(20) 11.7 % (7.7 - 17.4 95% C.I.)	(16) 10.7 % (6.7 - 16.6 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(6) 1.9 % (0.9 - 4.0 95% C.I.)	(4) 2.3 % (0.9 - 5.9 95% C.I.)	(2) 1.3 % (0.4 - 4.7 95% C.I.)

Table 23: Prevalence of underweight by age, based on weight-for-age z-scores

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

(mo)	no.								
6-23	117	3	2.6	13	11.1	101	86.3	0	0.0
24-29	46	0	0.0	6	13.0	40	87.0	0	0.0
30-41	71	1	1.4	5	7.0	65	91.5	0	0.0
42-53	58	0	0.0	8	13.8	50	86.2	0	0.0
54-59	29	2	6.9	4	13.8	23	79.3	0	0.0
Total	321	6	1.9	36	11.2	279	86.9	0	0.0

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

	All n = 308	Boys n = 165	Girls n = 143
Prevalence of stunting (<-2 z-score)	(115) 37.3 % (32.1 - 42.9 95% C.I.)	(65) 39.4 % (32.3 - 47.0 95% C.I.)	(50) 35.0 % (27.6 - 43.1 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(74) 24.0 % (19.6 - 29.1 95% C.I.)	(41) 24.8 % (18.9 - 32.0 95% C.I.)	(33) 23.1 % (16.9 - 30.6 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(41) 13.3 % (10.0 - 17.6 95% C.I.)	(24) 14.5 % (10.0 - 20.7 95% C.I.)	(17) 11.9 % (7.6 - 18.2 95% C.I.)

Table 25: 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	112	11	9.8	25	22.3	76	67.9
24-29	44	3	6.8	9	20.5	32	72.7
30-41	69	11	15.9	11	15.9	47	68.1
42-53	56	10	17.9	15	26.8	31	55.4
54-59	27	6	22.2	14	51.9	7	25.9
Total	308	41	13.3	74	24.0	193	62.7

Figure 7: Trend in the prevalence of stunting by age in children 6-59 months

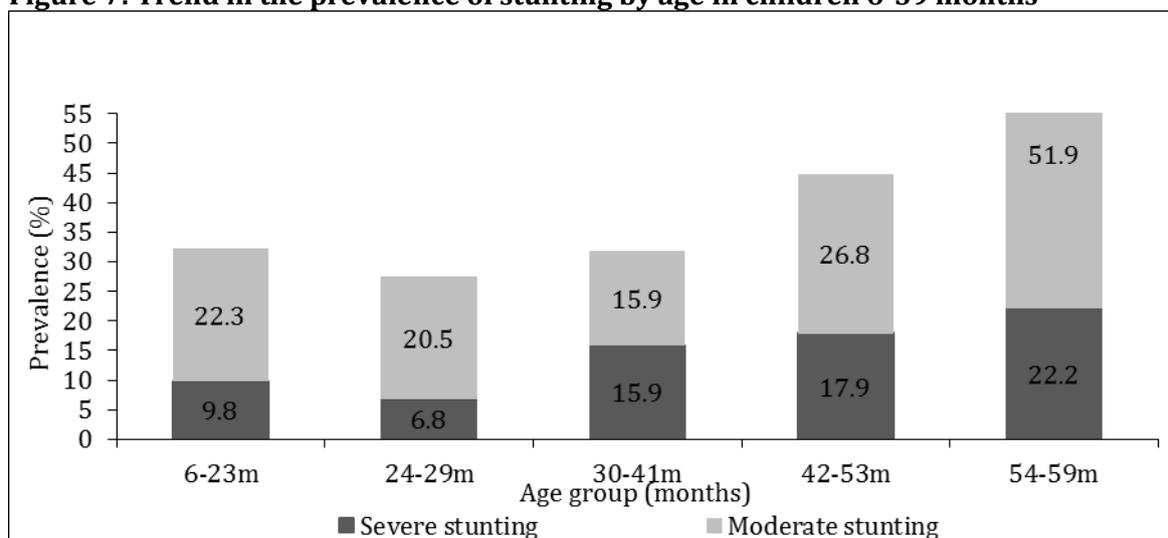


Figure 8: Distribution of height-for-age z-scores

Reference population is shown in green and the surveyed population is shown in red.

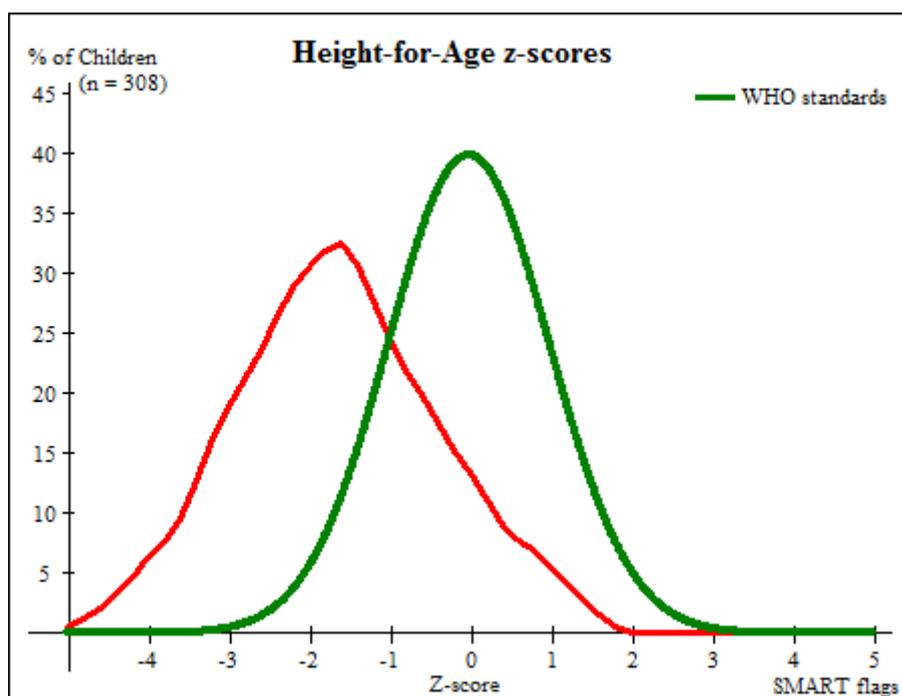


Table 26: Mean z-scores, design effects and excluded subjects

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	325	0.15±1.02	1.00	1	8
Weight-for-Age	321	-0.80±1.07	1.00	9	4
Height-for-Age	308	-1.64±1.24	1.00	10	16

* contains for WHZ and WAZ the children with oedema.

Table 27: Programme coverage for acutely malnourished children (all criteria)

	Number/total	% (95% CI)
SFP coverage	2/8	25%(3.2-65.1)
OTP coverage	0	0

Table 28: Programme coverage for acutely malnourished children (MUAC or oedema)

	Number/total	% (95% CI)
Supplementary feeding programme coverage	2/3	66.7; (9.4 - 99.2)
Therapeutic feeding programme coverage	0	0

Table 29: Measles vaccination coverage for children aged 9-59 months (n=304)

	Measles (with card) n=89	Measles (with card <u>or</u> confirmation from mother) n=158
YES	29.3% (24.3% 34.8; 95% CI)	52.0% (46.2-57.7%; 95% CI)

Table 30: Vitamin A supplementation; 6-59 months within past 6 months (n=333)

	Vitamin A capsule (with card) n=94	Vitamin A capsule: (w card <u>or</u> confirmation from mother);n=201
Yes	28.2%: (23.5 - 33.4%; 95% CI)	60.4%: (54.9-65.7; 95% CI)

Table 31: Period prevalence of diarrhea

	Number/total	% (95% CI)
Diarrhoea in the last two weeks	64/334	19.2%; (15.2% 23.9)

Table 32 Prevalence of anaemia, and mean haemoglobin concentration in children 6-59 months of age and by age group

	6-59 months n = 325	6-23 months n=120	24-59 months n=205
Total Anaemia (Hb<11.0 g/dL)	(247) 76.0% (71.0 - 80.5)	(94) 78.3% (69.9 - 85.3)	(153) 74.6% (68.1% 80.4)

Mild Anaemia (Hb 10.0-10.9 g/dL)	(98) 30.2% (25.3 - 35.5%)	(37) 30.8% (22.7 - 39.9)	(61) 29.8% (23.6 - 36.5)
Moderate Anaemia (7.0-9.9 g/dL)	(135) 41.5 % (36.2% 47.1)	(52) 43.3% (34.3 - 52.7)	(83) 40.5% (33.7 - 47.5)
Severe Anaemia (<7.0 g/dL)	(14) 4.3 % (2.6 - 7.5)	(5) 4.2% (1.4 - 9.5)	(9) 4.4% (2.0 - 8.2)
Mean Hb (g/dL) (SD / 95% CI) [range]	9.8g/dL (+1.5) [5.8, 13.6]	9.8g/dL (±1.5) [5.8, 13.0]	9.9g/dL (± 1.5) [5.9, 13.6]

4.2.2. Children 0-23 months

Table 33: Prevalence of Infant and Young Child Feeding Practices Indicators

Indicator	Age range (months)	Number/total	Prevalence (%)	95% CI
Timely initiation of breastfeeding	0-23	108/159	67	60.1-75.1
Exclusive breastfeeding under 6 months	0-5	62/76	81.6	71.0-89.5
Continued breastfeeding at 1 year	12-15	15/15	100	100-100
Continued breastfeeding at 2 years	20-23	9/23	39.1	19.7-61.5
Introduction of solid, semi-solid or soft foods	6-8	67	54.0	44.9 - 63.0
Consumption of iron-rich or iron-fortified foods	6-23	4/118	3.4	0.9-8.5
Bottle feeding	0-23	6/158	3.8	1.4-8.1

Table 334: 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)	28/161	1.2(0.2 4.4)

Table 35: Super Cereal Plus, Fortified blended foods (FBF) intake in children aged 6-23 months

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive Super Cereal Plus	4/122	3.3 (0.9 - 8.2)

Super Cereal Plus was not part of the refugee food basket during the nutrition survey

4.2.3. Women 15-49 years

Table 36: Women physiological status and age

Physiological status	Number/total	% of sample
Non-pregnant	122/140	87.1
Pregnant	18/140	12.9
Mean age (range)	28.7 years [15.0 Min, 49.0 Max]	

Table 37: 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=122
Total Anaemia (<12.0 g/dL)	(62); 50.8% (41.6-60.0)
Mild Anaemia (11.0-11.9 g/dL)	(33); 27.0% (19.4-35.8)
Moderate Anaemia (8.0-10.9 g/dL)	(26); 21.3% (14.4-29.6)
Severe Anaemia (<8.0 g/dL)	(3); 2.5% (0.5-7.0)
Mean Hb (g/dL)	11.70g/dL (±1.5 SD) [4.8 min, 15.6max]

Table 38: Antenatal Care enrolment and iron-folic acid pills coverage among pregnant women (15-49 years)

	Number /total	% (95% CI)
Currently enrolled in ANC programme	18/18	100; (100-100)
Currently receiving iron-folic acid pills	17/18	94.4; (72.7 - 99.9)

4.2.4. Food security

Table 39: Food security sampling information

Household data	Planned	Actual	% of target
Total households surveyed for Food Security	138	141	102%

4.2.4.1. Access to food assistance

Table 40: Ration card coverage

	Number/total	% (95% CI)
Proportion of households with a ration card	141/141	100.0% (100-100)

Table 41: 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*
20.5 ± 6.2	68.3%

Intended duration from food distribution was 30 days

Table 42: 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	18/140	12.9 (7.8 - 19.6)
Proportion of households reporting that the food ration lasted:		
≤75% of the cycle 30 days	100/140	71.4(63.2-78.7)
>75% of the cycle 30 days	40/140	28.6(21.3-36.8)

4.2.4.2. Negative coping strategies results

Table 43: 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 <i>with or without interest</i>	116/141	82.3 (74.9 - 88.2)

Sold any assets that would not have normally sold (furniture, seed stocks, tools, other NFI, livestock etc.)	94/141	66.7 (58.2-74.4)
Requested increased remittances or gifts as compared to normal	68/137	49.6 (41.0 - 58.3)
Reduced the quantity and/or frequency of meals	69/141	48.9 (40.4 - 57.5)
Begged	100/138	72.5 (64.2 - 79.7)
Engaged in potentially risky or harmful activities	8/140	5.7 (2.5 - 10.9)
Proportion of households reporting using none of the coping strategies over the past month	123/137	89.8 (83.4-94.3)

4.2.4.3. Household dietary diversity results

The last general food distribution ended 6 days prior to the start of the survey data collection.

Table 44 : Average HDDS

	Mean (Standard deviation or 95% CI)
Average HDDS	7.2 ± 2.3

* Maximum HDDS is 12.

Figure 9. Proportion of households consuming different food groups

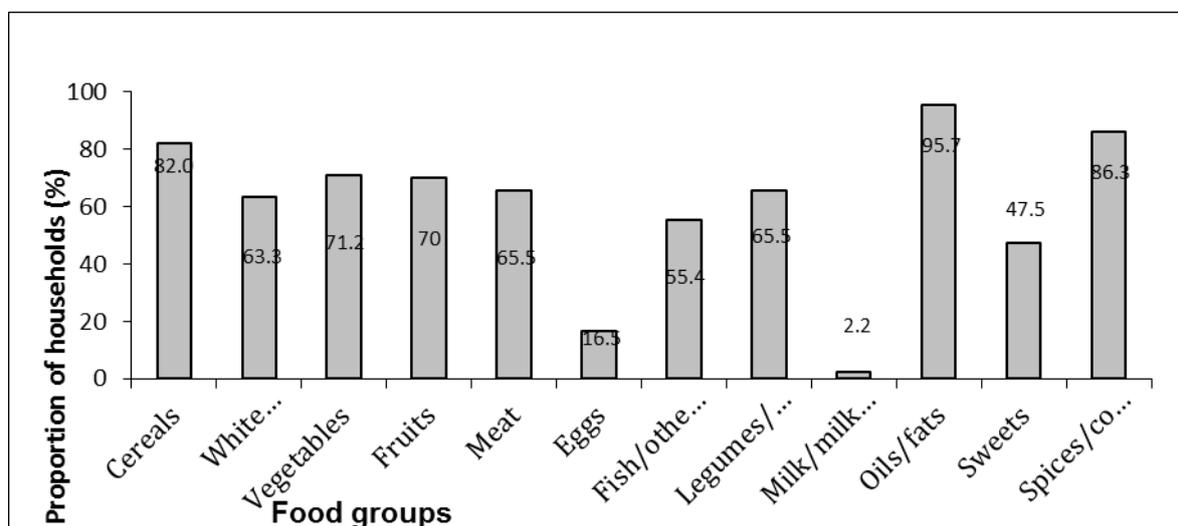


Table 45: Consumption of micronutrient rich foods by households

	Number/total	% (95% CI)
Proportion of households <i>not consuming any</i> vegetables, fruits, meat, eggs, fish/seafood, and milk/milk products	2/137	1.5 (0.2 - 5.2)
Proportion of households consuming either a plant or animal source of vitamin A	121/137	88.3 (81.7 - 93.2)
Proportion of households consuming organ meat/flesh meat, or fish/seafood (food sources of haem-iron)	116/139	83.5(76.2 - 89.2)

4.2.5. WASH**Table 46. WASH sampling information**

Household data	Planned	Actual	% of target
Total households surveyed for WASH	138	141	102%

Table 47. Water Quality

	Number/total	% (95% CI)
Proportion of households using an improved drinking water source	140/141	99.3% (96.1-100.0)
Proportion of households that use a covered or narrow necked container for storing their drinking water	73/141	51.8 (43.2 - 60.3)

Table 48. Water Quantity: Amount of litres of water used per person per day

Proportion of households that use:	Number/total	% (95% CI)
≥ 20 lpppd	93/140	66.4 (58.0-74.2)
15 - <20 lpppd	27/140	19.3 (13.1-26.8)
<15 lpppd	20/140	14.3 (8.9-21.2)

Table 49. Satisfaction with water supply

	Number/total	% (95% CI)
Proportion of households that say they are satisfied with the drinking water supply	131/141	92.9 (87.3-96.5)

Figure 10. Proportion of households that say they are satisfied with the water supply



Figure 11. Main reason for dissatisfaction among households not satisfied with water supply

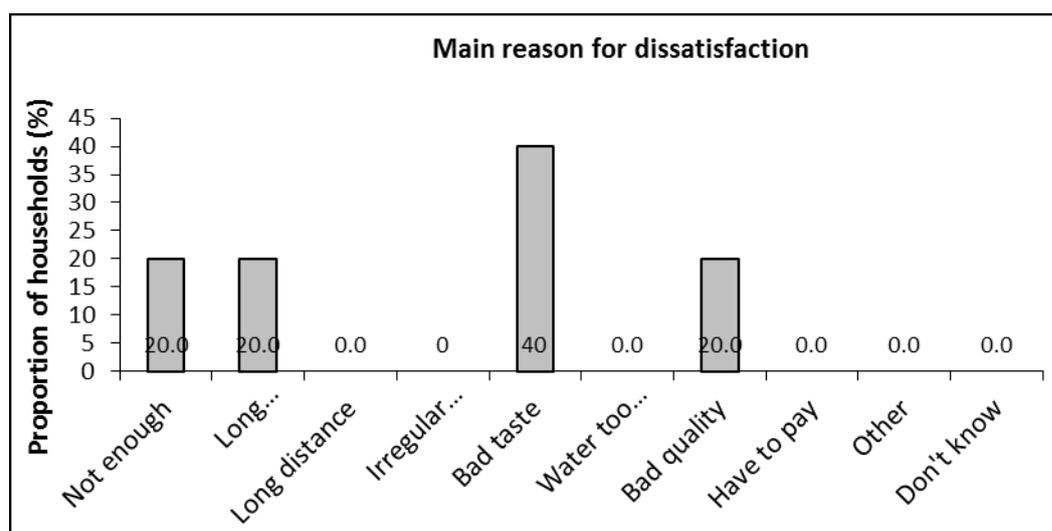
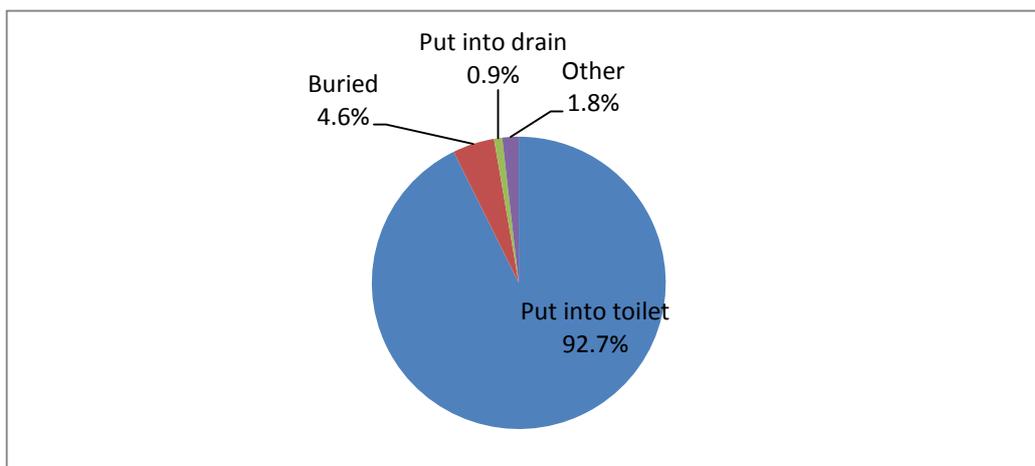


Table 50. Safe Excreta disposal

	Number/total	% (95% CI)
Proportion of households that use:		
An improved excreta disposal facility (improved toilet facility, 1 household)	1/135	0.7(0.0-4.1)
A shared family toilet (improved toilet facility, 2 households)	1/135	0.7 (0.0-4.1)
A communal toilet (improved toilet facility, 3 households or more)	99/135	73.3 (65.0-80.6)
An unimproved toilet (unimproved toilet facility or public toilet)	34/135	25.2 (18.1-33.4)
Proportion of households with children under three years old that dispose of faeces safely	106/109	97.2(92.2 - 99.4)

Figure 12: 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 51. Mosquito net coverage sampling information

Household data	Planned	Actual	% of target
Total households surveyed for mosquito net coverage	138	140	101%

Table 52 : Household Mosquito net ownership

	Number/total	% (95% CI)
Proportion of total households owning at least one mosquito net of any type	121/140	86.4 (79.6 - 91.6)
Proportion of total households owning at least one LLIN	121/140	86.4% (79.6-91.6)

Figure 13 : Household ownership of at least one mosquito net (any type)

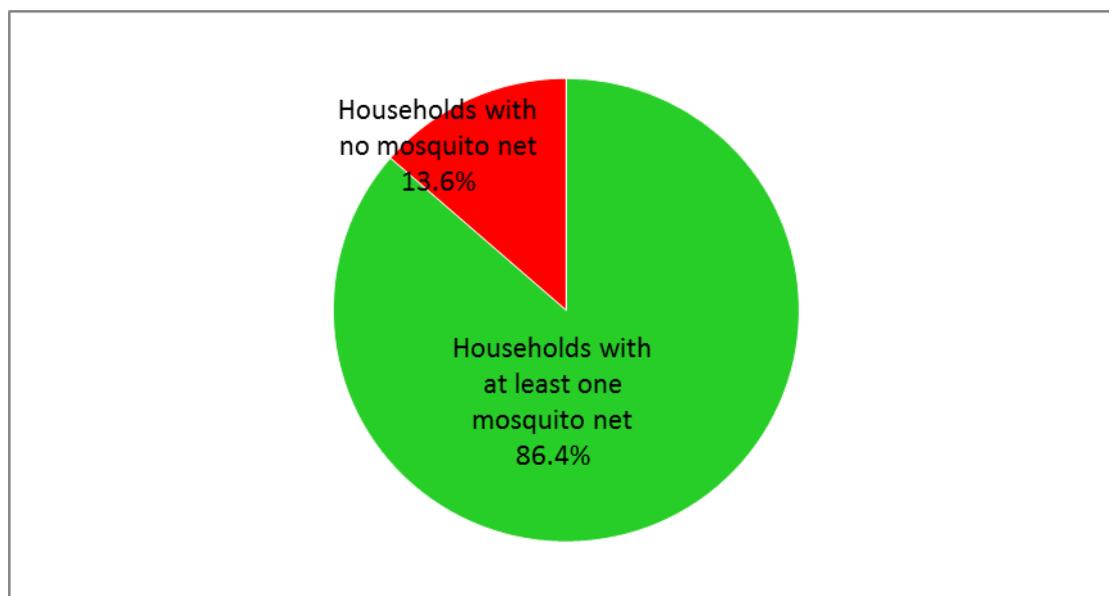


Figure 14 : Household ownership of at least one LLIN

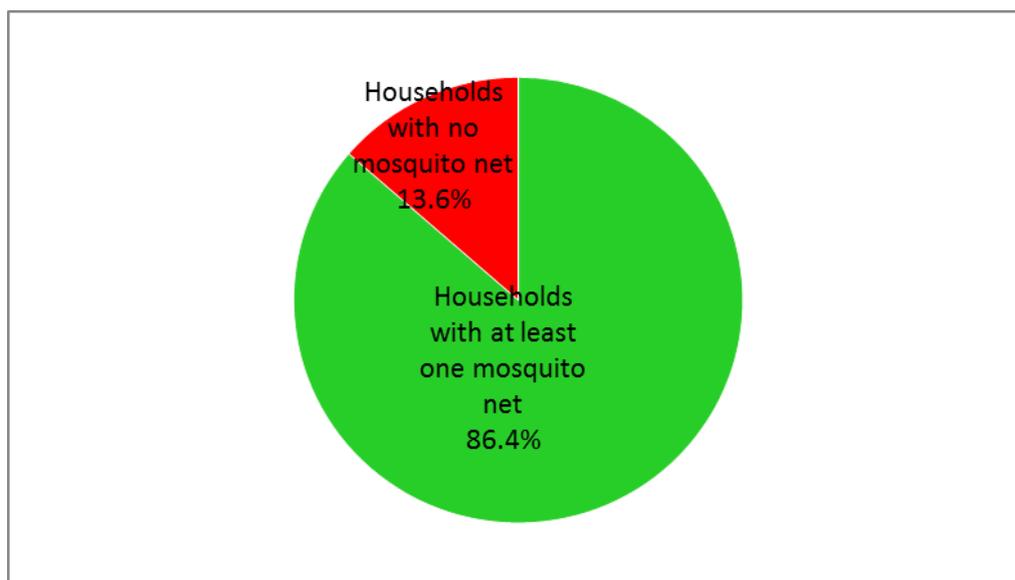


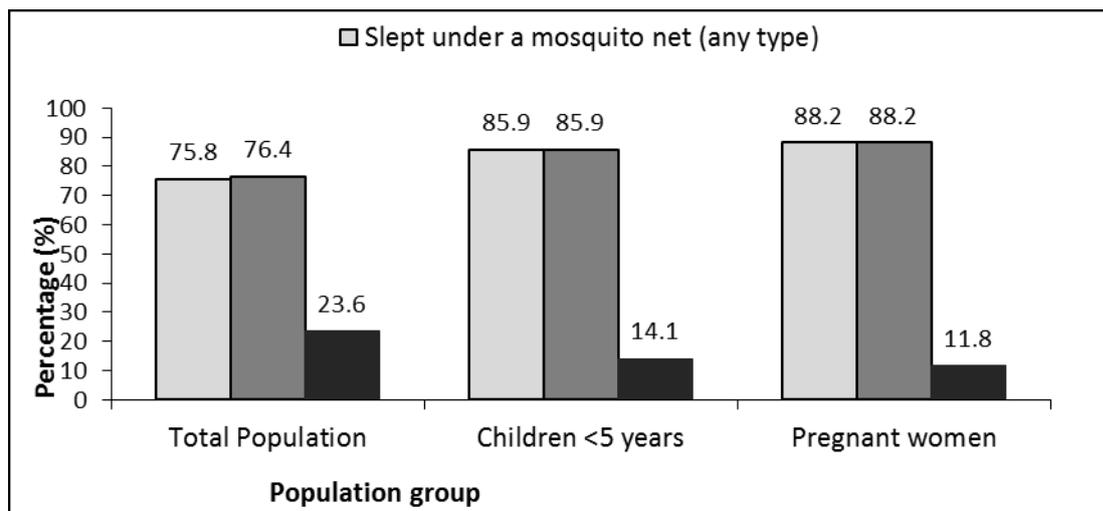
Table53: Number of nets

Average number of LLINs per household	Average number of persons per LLIN
1.6	3.3

Table54 : Mosquito net utilization

	Proportion of total population (all ages)		Proportion of 0-59 months		Proportion of pregnant women	
	Total No = 661	%	Total No = 192	%	Total = 17	%
Slept under net of any type	501	75.8	165	85.9	15	88.2
Slept under LLIN	505	76.4	165	85.9	15	88.2

Figure 15: Mosquito Net Utilization by sub-group



4.3 RESULTS FOR PTP CAMP

4.3.1. Children 6-59 months

Table 55: Distribution of age and sex of sample

AGE (mo)	Boys		Girls		Total		Ratio
	no.	%	no.	%	no.	%	Boy: girl
6-23	74	50.0	74	50.0	148	33.5	1.0
24-29	26	46.4	30	53.6	56	12.7	0.9
30-41	54	54.5	45	45.5	99	22.4	1.2
42-53	50	50.0	50	50.0	100	22.6	1.0
54-59	19	48.7	20	51.3	39	8.8	0.9
Total	223	50.5	219	49.5	442	100.0	1.0

Table 56: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex

	All n = 435	Boys n = 216	Girls n = 219
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(14) 3.2 % (1.9 - 5.3; 95% C.I.)	(11) 5.1 % (2.9 - 8.9; 95% C.I.)	(3) 1.4 % (0.5 - 3.9; 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(14) 3.2 % (1.9 - 5.3; 95% C.I.)	(11) 5.1 % (2.9 - 8.9 ; 95% C.I.)	(3) 1.4 % (0.5 - 3.9; 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(0) 0.0 % (0.0 - 0.9; 95% C.I.)	(0) 0.0 % (0.0 - 1.7; 95% C.I.)	(0) 0.0 % (0.0 - 1.7; 95% C.I.)

Prevalence of oedema was 0.0 %

Table57: 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	141	0	0.0	10	7.1	131	92.9	0	0.0
24-29	52	0	0.0	0	0.0	52	100.0	0	0.0
30-41	96	0	0.0	3	3.1	93	96.9	0	0.0
42-53	97	0	0.0	1	1.0	96	99.0	0	0.0
54-59	38	0	0.0	0	0.0	38	100.0	0	0.0
Total	424	0	0.0	14	3.3	410	96.7	0	0.0

Figure 16: Trends in prevalence of moderate and severe wasting by age in children 6-59 months

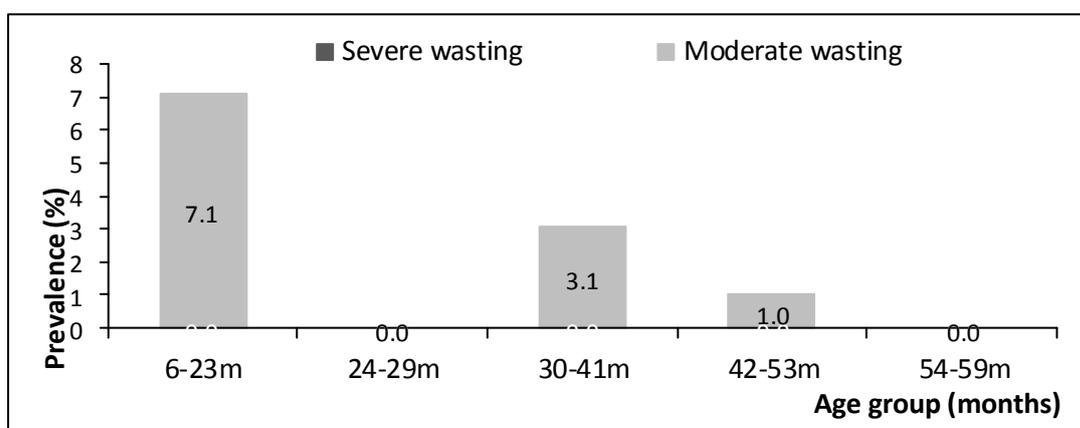
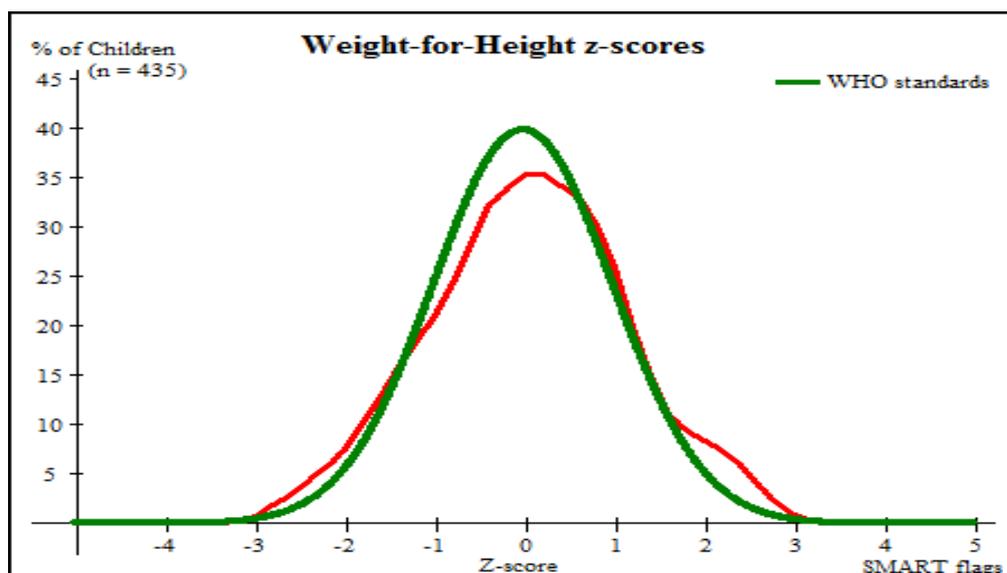


Table58: Distribution of acute malnutrition and oedema based on weight-for-height z-scores

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor: No. 0 (0.0 %)	Kwashiorkor: No. 0 (0.0 %)
Oedema absent	Marasmic: No. 6 (1.3 %)	Not severely malnourished No. 445 (98.7 %)

Figure 17: Distribution of weight-for-height z-scores



A comparison of reference (green) and surveyed population (red) based on WHO 2006 Growth Standards

Table59: Prevalence of acute malnutrition, MUAC by sex

	All n = 453	Boys n = 225	Girls n = 228
Prevalence of global malnutrition (< 125 mm and/or oedema)	(24) 5.3 % (3.6 - 7.8; 95% C.I.)	(11) 4.9 % (2.8 - 8.5; 95% C.I.)	(13) 5.7 % (3.4 - 9.5; 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(20) 4.4 % (2.9 - 6.7; 95% C.I.)	(7) 3.1 % (1.5 - 6.3; 95% C.I.)	(13) 5.7 % (3.4 - 9.5; 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(4) 0.9 % (0.3 - 2.2; 95% C.I.)	(4) 1.8 % (0.7 - 4.5; 95% C.I.)	(0) 0.0 % (0.0 - 1.7; 95% C.I.)

Table60: Prevalence of acute malnutrition by age, based on MUAC cut off and/or oedema

Age (mo)	Total no.	Severe wasting (< 115 mm)		Moderate wasting (>= 115 mm and < 125 mm)		Normal (> = 125 mm)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-23	148	3	2.0	16	10.8	129	87.2	0	0.0
24-29	56	0	0.0	2	3.6	54	96.4	0	0.0
30-41	99	1	1.0	2	2.0	96	97.0	0	0.0
42-53	100	0	0.0	0	0.0	100	100.0	0	0.0
54-59	39	0	0.0	0	0.0	39	100.0	0	0.0
Total	442	4	0.9	20	4.5	418	94.6	0	0.0

Table61: Prevalence of underweight based on weight-for-age z-scores by sex

	All n = 426	Boys n = 215	Girls n = 211
Prevalence of underweight (<-2 z-score)	(73) 17.1 % (13.9 - 21.0; 95% C.I.)	(40) 18.6 % (14.0 - 24.3; 95% C.I.)	(33) 15.6 % (11.4 - 21.2; 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(48) 11.3 % (8.6 - 14.6; 95% C.I.)	(25) 11.6 % (8.0 - 16.6; 95% C.I.)	(23) 10.9 % (7.4 - 15.8; 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(25) 5.9 % (4.0 - 8.5 95% C.I.)	(15) 7.0 % (4.3 - 11.2; 95% C.I.)	(10) 4.7 % (2.6 - 8.5; 95% C.I.)

Table62: Prevalence of underweight by age, based on weight-for-age z-scores

Age (mo)	Total no.	Severe underweight (<-3 z-score)		Moderate underweight (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-23	143	10	7.0	16	11.2	117	81.8	0	0.0
24-29	52	3	5.8	7	13.5	42	80.8	0	0.0
30-41	96	5	5.2	12	12.5	79	82.3	0	0.0
42-53	96	4	4.2	8	8.3	84	87.5	0	0.0
54-59	39	3	7.7	5	12.8	31	79.5	0	0.0
Total	426	25	5.9	48	11.3	353	82.9	0	0.0

Table63: Prevalence of stunting based on height-for-age z-scores and by sex

	All n = 394	Boys n = 198	Girls n = 196
Prevalence of stunting (<-2 z-score)	(190) 48.2 % (43.3 - 53.2; 95% C.I.)	(88) 44.4 % (37.7 - 51.4; 95% C.I.)	(102) 52.0 % (45.1 - 58.9; 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(99) 25.1 % (21.1 - 29.6; 95% C.I.)	(49) 24.7 % (19.3 - 31.2; 95% C.I.)	(50) 25.5 % (19.9 - 32.0; 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(91) 23.1 % (19.2 - 27.5; 95% C.I.)	(39) 19.7 % (14.8 - 25.8; 95% C.I.)	(52) 26.5 % (20.8 - 33.1; 95% C.I.)

Table64: 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	132	16	12.1	32	24.2	84	63.6
24-29	47	10	21.3	10	21.3	27	57.4

30-41	85	23	27.1	23	27.1	39	45.9
42-53	92	28	30.4	23	25.0	41	44.6
54-59	38	14	36.8	11	28.9	13	34.2
Total	394	91	23.1	99	25.1	204	51.8

Figure 18: Trends in the prevalence of stunting by age in children 6-59 months

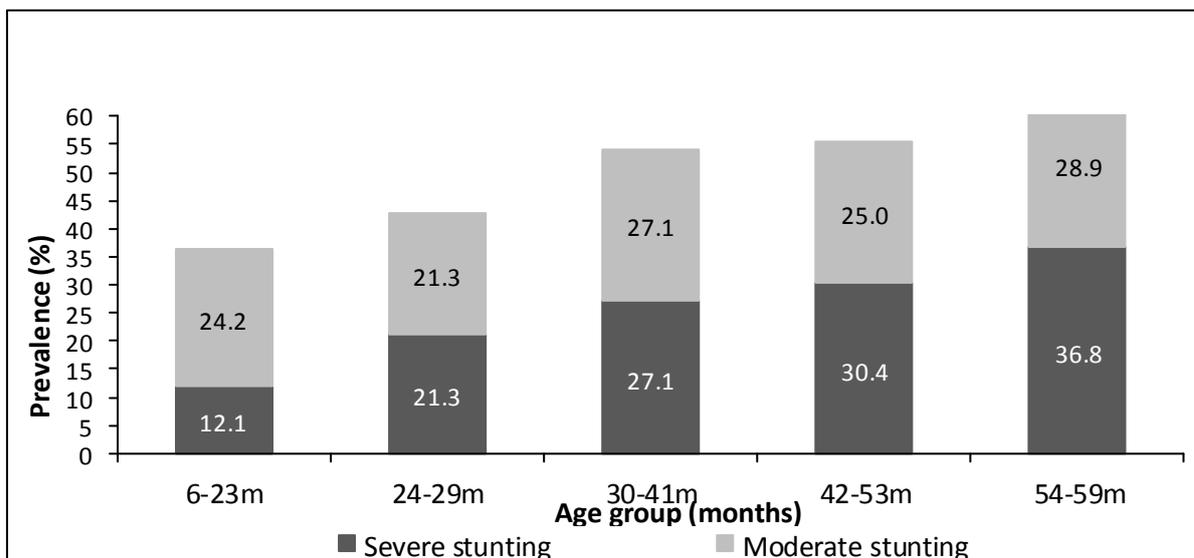
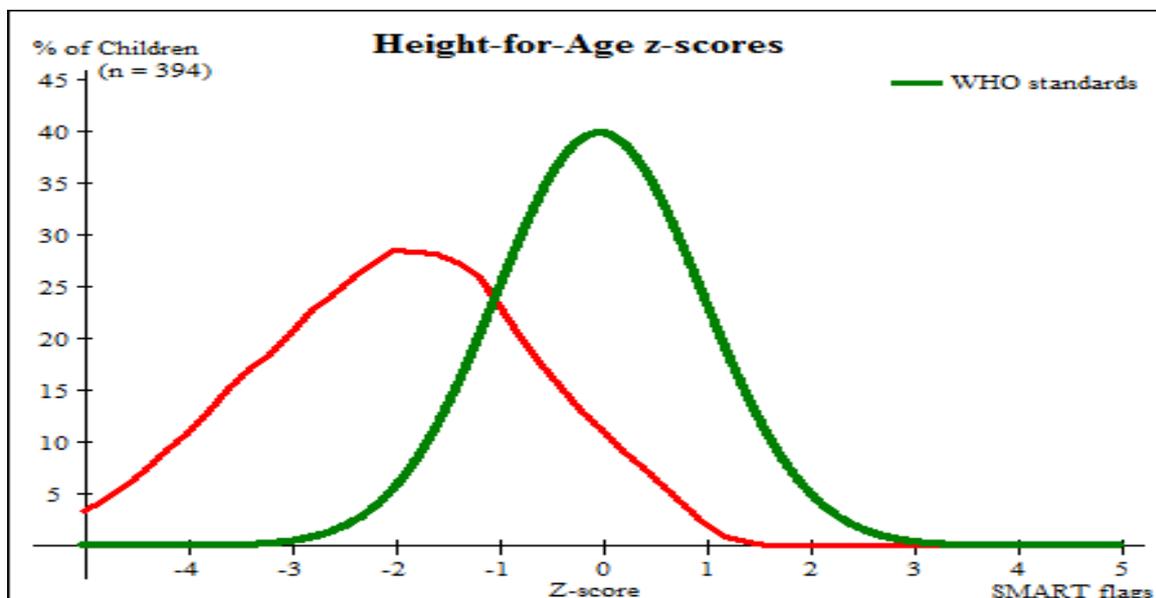


Figure 19: Distribution of height-for-age z-scores



A comparison of reference (green) and surveyed population (red) based on WHO 2006 Growth Standards

Table65: 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	435	0.04±1.10	1.00	2	16
Weight-for-Age	426	-1.02±1.11	1.00	11	16
Height-for-Age	394	-2.00±1.30	1.00	12	47

* contains for WHZ and WAZ the children with oedema.

Feeding programme coverage**Table66: Programme coverage for acutely malnourished children (all criteria)**

	Number/total	% (95% CI)
SFP coverage	4/29	13.8(3.9 - 31.7)
OTP coverage	1/3	33.3(0.8 - 90.6)

Table67: Programme coverage for acutely malnourished children (MUAC)

	Number/total	% (95% CI)
Supplementary feeding programme coverage	6/20	30.0(11.9 - 54.3)
Therapeutic feeding programme coverage	1/4	25.0(0.6 - 80.6)

Measles vaccination coverage**Table68: Measles vaccination coverage for children aged 9-59 months (n=410)**

	Measles; (with card):n= 97	Measles; (with card <u>or</u> confirmation from mother) n= 224
YES	23.7%; (19.7 - 28.1; 95% CI)	54.6%; (49.7 - 59.5; 95% CI)

Vitamin A supplementation coverage results**Table69: Vitamin A supplementation for children aged 6-59 months within past 6 months (n=453)**

	Vitamin A capsule, (with card); n=112	Vitamin A capsule; (with card <u>or</u> confirmation from mother) n=268
YES	24.7 % (20.9 - 29.0; 95% CI)	59.2 %; (54.5 - 63.7; 95% CI)

Diarrhoea**Table70: Period prevalence of diarrhoea**

	Number/total	% (95% CI)
Diarrhoea in the last two weeks	84/419	20.0(16.4 - 24.3)

Anaemia**Table71: Prevalence of anaemia, and mean haemoglobin concentration in children 6-59 months of age and by age group**

	6-59 months n = 442	6-23 months n=148	24-59 months n=294
Total Anaemia (Hb<11.0 g/dL)	(356) 80.5% (76.5 - 84.1)	(127) 85.8% (79.1 - 91.0)	(229) 77.9% (72.7 - 82.5)
Mild Anaemia (Hb 10.0-10.9 g/dL)	(122) 27.6% (23.5 - 32.1)	(52) 35.1% (27.5 - 43.4)	(70) 23.8% (19.1 - 29.1)
Moderate Anaemia (7.0-9.9 g/dL)	(222) 50.2% (45.5 - 55.0)	(71) 48.0% (39.7 - 56.3)	(151) 51.4% (45.5 - 57.2)
Severe Anaemia (<7.0 g/dL)	(12) 2.7% (1.5 - 4.8)	(4) 2.7% (0.7 - 6.8)	(8) 2.7% (1.2 - 5.3)
Mean Hb (g/dL) (SD) [range]	9.8g/dL (±1.4) [5.1, 14.2]	9.8g/dL (±1.3) [6.1, 13.8]	9.8g/dL (±1.5) [5.1, 14.2]

4.3.2. Children 0-23 months**Table72: Prevalence of Infant and Young Child Feeding Practices Indicators**

Indicator	Age range (months)	Number /total	Prevalence (%)	95% CI
Timely initiation of breastfeeding	0-23	108/188	57.4	50.0-64.6
Exclusive breastfeeding under 6 months	0-5	34/39	87.2	72.6-95.7
Continued breastfeeding at 1 year	12-15	31/36	86.1	70.5 - 95.3
Continued breastfeeding at 2 years	20-23	10/21	47.6	25.7 - 70.2
Introduction of solid, semi-solid or soft foods	6-8	10/32	31.3	16.1 - 50.0
Consumption of iron-rich or iron-fortified foods	6-23	5/145	3.4	1.1-7.9
Bottle feeding	0-23	5/187	2.7	0.9-6.1

Table 343: 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)	3/188	1.6 (0.3 - 4.6)

Table74: Super Cereal Plus intake in children aged 6-23 months

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive Super Cereal Plus	5/145	3.4 (1.1-7.9)

Super Cereal Plus was not part of the refugee food basket in the general ration during the nutrition survey

4.3.3. Women 15-49 years

Table75: 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 = 186
Total Anaemia (<12.0 g/dL)	(98); 52.7% (45.3-60.0)
Mild Anaemia (11.0-11.9 g/dL)	(46); 24.7% (18.7-31.6)
Moderate Anaemia (8.0-10.9 g/dL)	(48); 25.8% (19.7-32.7)
Severe Anaemia (<8.0 g/dL)	(4); 2.2% (0.6-5.4)
Mean Hb (g/dL) (SD / 95% CI)[range]	11.7g/dL (± 1.5) ;[4.5, 15.2]

Table76: Women physiological status and age

Physiological status	Number/total	% of sample
Non-pregnant	188/209	90.0 (85.1 - 93.7)
Pregnant	21/209	10.0 (6.3 - 14.9)
Mean age (range)	29.1 years [15.0, 48.0]	

Table77: ANC enrolment and iron-folic acid pills coverage among pregnant women in PTP camp (15-49 years)

	Number /total	% (95% CI)
Currently enrolled in ANC programme	17/21	81.0 (58.1 - 94.6)
Currently receiving iron-folic acid pills	16/21	76.2(52.8 - 91.8)

4.3.4. Food security

Table78: Food security sampling information

Household data	Planned	Actual	% of target
Total households surveyed for Food Security	246	235	95.5

Access to food assistance results

Table79: Ration card coverage

	Number/total	% (95% CI)
Proportion of households with a ration card	233/235	99.1 (97.0-99.9)

Table80: 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*
21.9 ± 5.2 days	73%

Table81: 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	26 /233	11.2 (7.4 - 15.9)
Proportion of households reporting that the food ration lasted:		
≤75% of the 30 days cycle	144/233	61.8 (55.2 - 68.1)
>75% of the 30 days cycle	89/233	38.2 (31.9-44.8)

Negative coping strategies results

Table82 : 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 <i>with or without interest</i>	148/234	63.2(56.7 - 69.4)
Sold any assets that would not have normally sold (furniture, seed stocks, tools, other NFI, livestock etc.)	103/234	44.0 (37.6 - 50.6)
Requested increased remittances or gifts as compared	72/233	30.9 (25.0 - 37.3)

to normal		
Reduced the quantity and/or frequency of meals	92/234	39.3(33.0 - 45.9)
Begged	114/231	49.4(42.7 - 56.0)
Engaged in potentially risky or harmful activities	55/228	24.1(18.7 - 30.2)
Proportion of households reporting using none of the coping strategies over the past month	177/226	78.3 (72.4-83.5)

Household dietary diversity results

The last general food distribution ended 5 days prior to the start of the survey data collection.

Table 83 : Average HDDS

	Mean (Standard deviation or 95% CI)
Average HDDS	6.3 ± 2.0

* Maximum HDDS is 12.

Figure 20 : Proportion of households consuming different food groups within last 24 hours

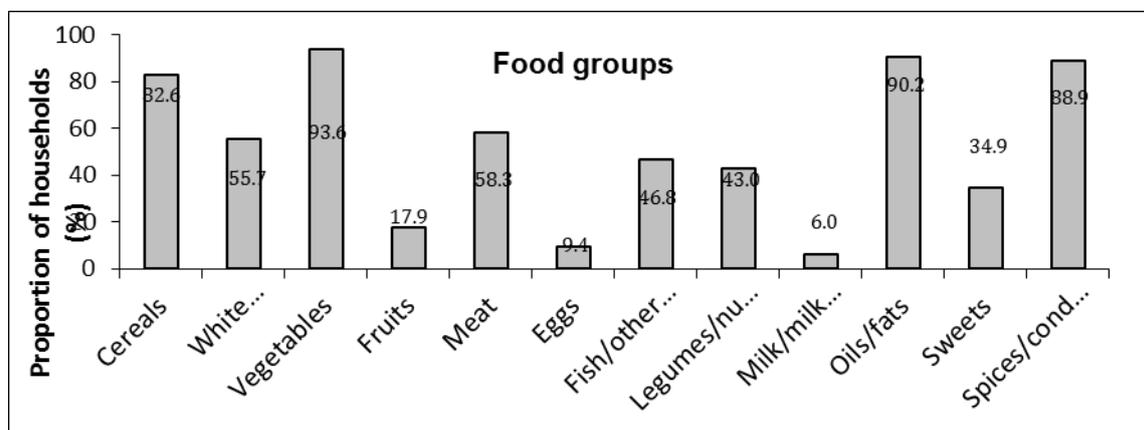


Table84: Consumption of micronutrient rich foods by households

	Number/total	% (95% CI)
Proportion of households <i>not consuming any</i> vegetables, fruits, meat, eggs, fish/seafood, and milk/milk products	5/235	2.1(0.7 - 4.9)
Proportion of households consuming either a plant or	202/235	86.0(80.8 - 90.1)

animal source of vitamin A		
Proportion of households consuming organ meat/flesh meat, or fish/seafood (food sources of haem iron)	179/235	76.2(70.2 - 81.5)

4.3.5. WASH

Table85: Sampling information

Household data	Planned	Actual	% of target
Total households surveyed for WASH	246	236	95.9

Table86: Water Quality

	Number/total	% (95% CI)
Proportion of households using an improved drinking water source	233/236	98.7 (96.3-99.7)
Proportion of households that use a covered or narrow necked container for storing their drinking water	74/236	31.4(25.5 - 37.7)

Table87: Water Quantity: Amount of litres of water used per person per day

Proportion of households that use:	Number/total	% (95% CI)
≥ 20 lpppd	184/236	78.0 (72.1-83.1)
15 - <20 lpppd	29/236	12.3 (8.4-17.2)
<15 lpppd	23/236	9.7 (6.3-14.3)

Table 89. Satisfaction with water supply

	Number/total	% (95% CI)
Proportion of households that say they are satisfied with the drinking water supply	194/236	82.2 (76.7-86.9)

Figure 21: Proportion of households that say they are satisfied with the water supply

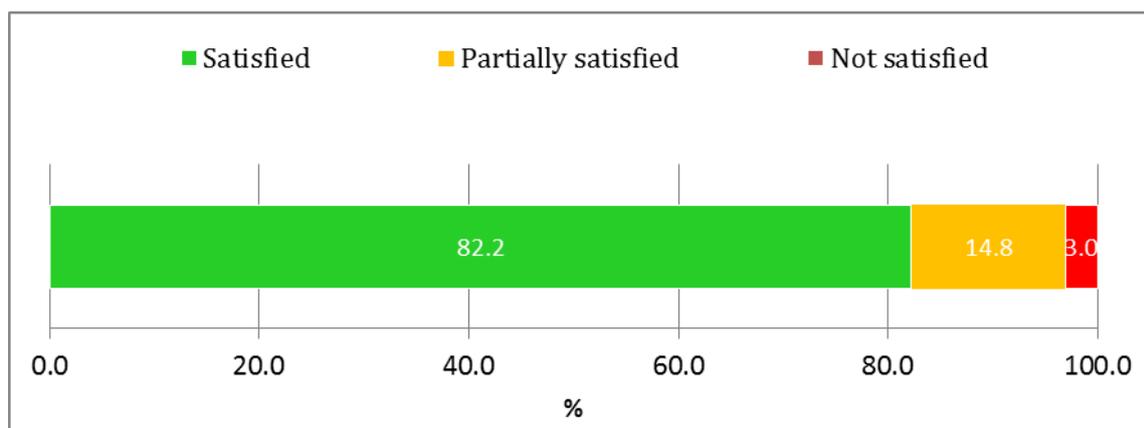


Figure 22: Main reason for dissatisfaction among households not satisfied with water supply.

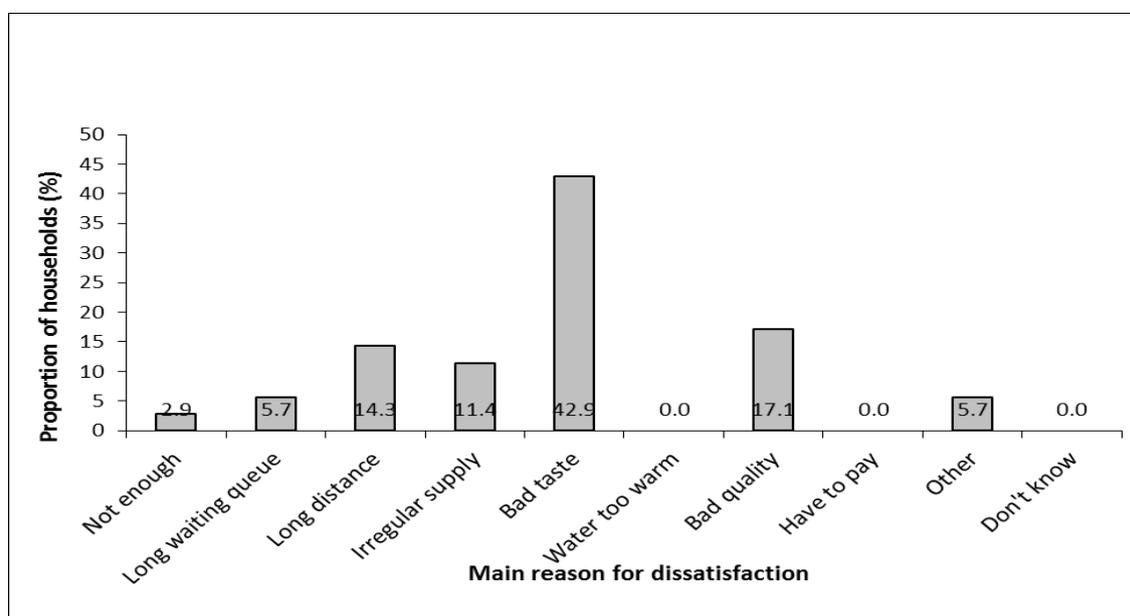
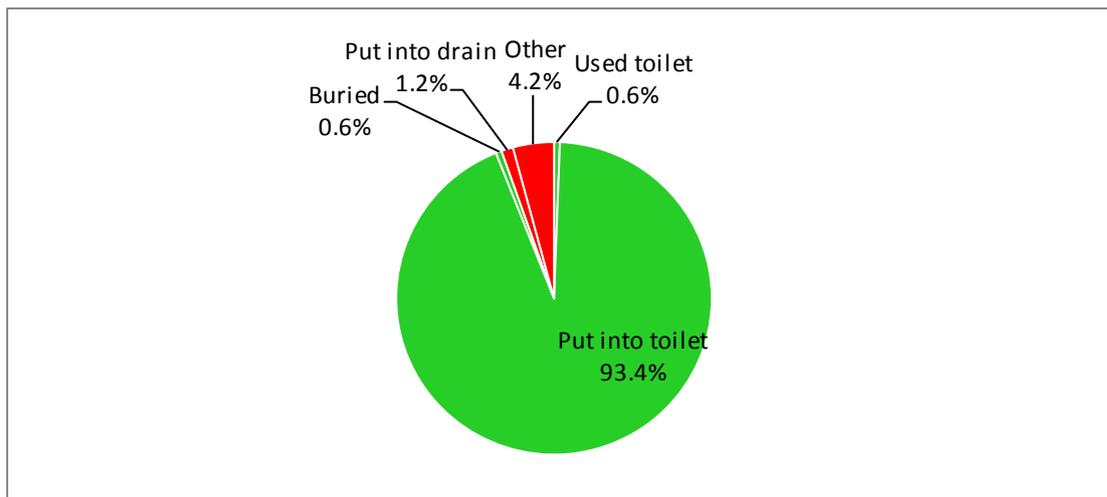


Table90: Safe Excreta disposal

	Number/total	% (95% CI)
Proportion of households that use:		
An improved excreta disposal facility (improved toilet facility, 1 household)	0/234	0.0%
A shared family toilet (improved toilet facility, 2 households)	2/234	0.9% (0.1-3.1)
A communal toilet (improved toilet facility, 3 households or more)	177/234	75.6% (69.6-81.0)

An unimproved toilet (unimproved toilet facility or public toilet)	55/234	23.5% (18.2-29.5)
Proportion of households with children under three years old that dispose of faeces safely	157/166	94.6(90.0 - 97.5)

Figure 23: Proportion of households with children under the age of 3 years whose (last) stools were disposed of safely



4.3.6. Mosquito Net Coverage

Table91: Mosquito net coverage sampling information

Household data	Planned	Actual	% of target
Total households surveyed for mosquito net coverage	246	234	95.1

Table92: Household Mosquito net ownership

	Number/total	% (95% CI)
Proportion of total households owning at least one mosquito net of any type	180/234	76.9%(71.0-82.2)
Proportion of total households owning at least one LLIN	180/234	76.9%(71.0-82.2)

Figure 24: Household ownership of at least one mosquito net (any type)

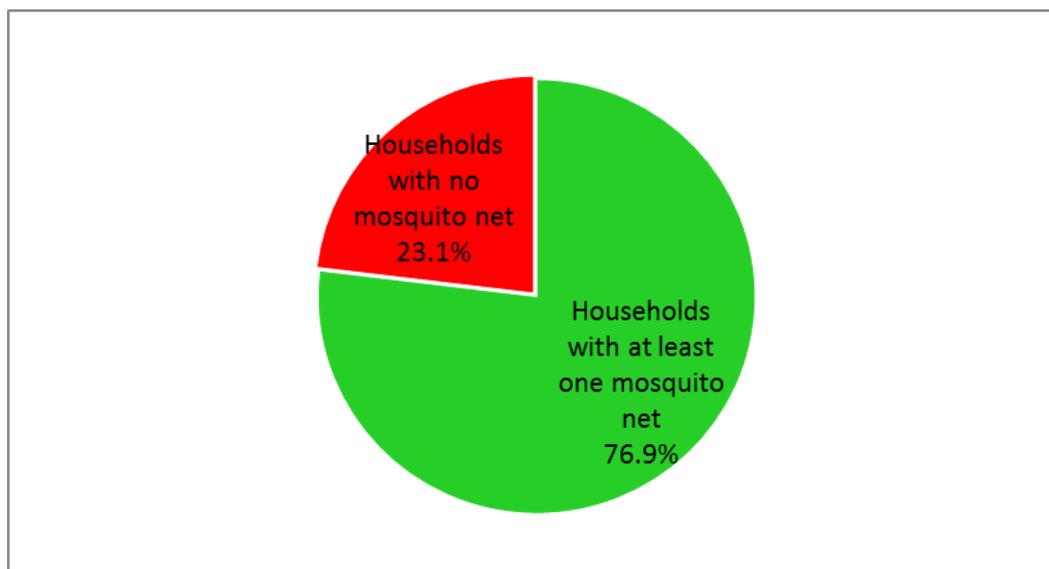


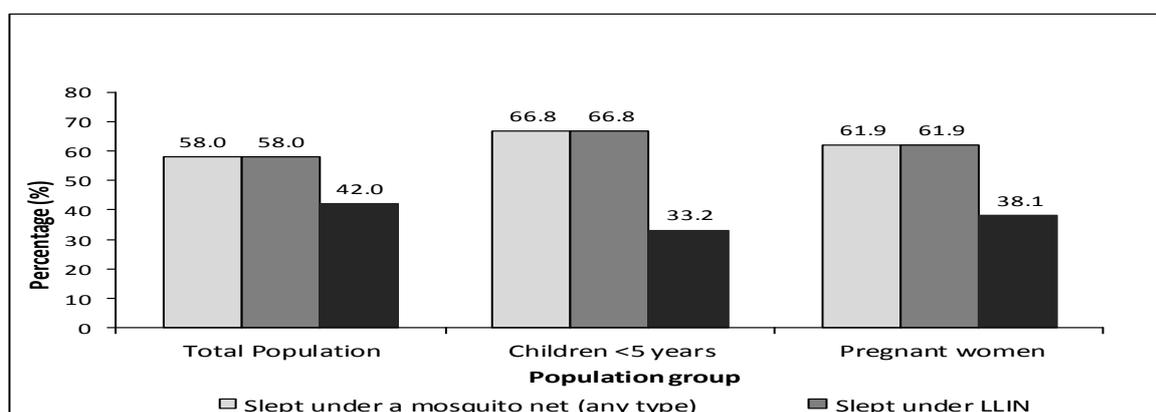
Table93: Number of nets

Average number of LLINs per household	Average number of persons per LLIN
1.4	4.2

Table94: Mosquito net Utilisation

	Proportion of total population (all ages)		Proportion of 0-59 months		Proportion of pregnant women	
	Total No=1068	%	Total No=250	%	Total No=21	%
Slept under net of any type	620	58%	167	66.8%	13	61.9%
Slept under LLIN	620	58%	167	66.8%	13	61.9%

Figure 25: Mosquito Net Utilization by sub-group



4.4. RESULTS FOR SOLO CAMP

4.4.1. Children 6-59 months

Table 95: Age and sex distribution

AGE (mo)	Boys		Girls		Total		Ratio
	no.	%	no.	%	no.	%	Boy: girl
6-23	35	60.3	23	39.7	58	33.1	1.5
24-29	13	65.0	7	35.0	20	11.4	1.9
30-41	36	67.9	17	32.1	53	30.3	2.1
42-53	14	46.7	16	53.3	30	17.1	0.9
54-59	8	57.1	6	42.9	14	8.0	1.3
Total	106	60.6	69	39.4	175	100.0	1.5

Table 96: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) by sex

	All n = 172	Boys n = 104	Girls n = 68
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(3) 1.7 % (0.6 - 5.0 95% C.I.)	(2) 1.9 % (0.5 - 6.7 95% C.I.)	(1) 1.5 % (0.3 - 7.9 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(3) 1.7 % (0.6 - 5.0 95% C.I.)	(2) 1.9 % (0.5 - 6.7 95% C.I.)	(1) 1.5 % (0.3 - 7.9 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(0) 0.0 % (0.0 - 2.2 95% C.I.)	(0) 0.0 % (0.0 - 3.6 95% C.I.)	(0) 0.0 % (0.0 - 5.3 95% C.I.)

The prevalence of oedema is 0.0 %

Table 97: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema

Age (months)	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	57	0	0.0	2	3.5	55	96.5	0	0.0
24-29	20	0	0.0	0	0.0	20	100.0	0	0.0
30-41	53	0	0.0	1	1.9	52	98.1	0	0.0
42-53	29	0	0.0	0	0.0	29	100.0	0	0.0
54-59	13	0	0.0	0	0.0	13	100.0	0	0.0
Total	172	0	0.0	3	1.7	169	98.3	0	0.0

Figure 26: Trends in prevalence of moderate and severe wasting by age in children 6-59 months

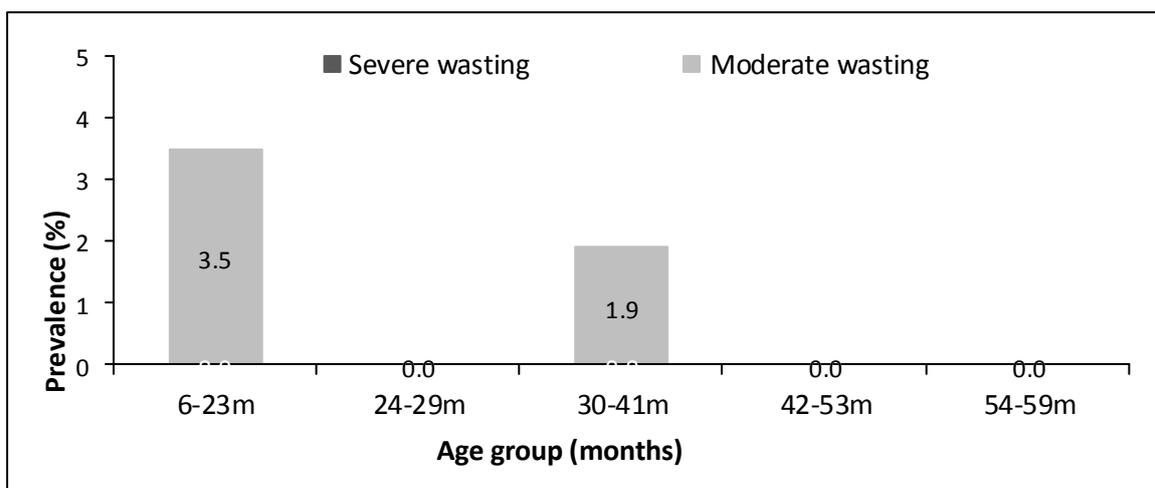
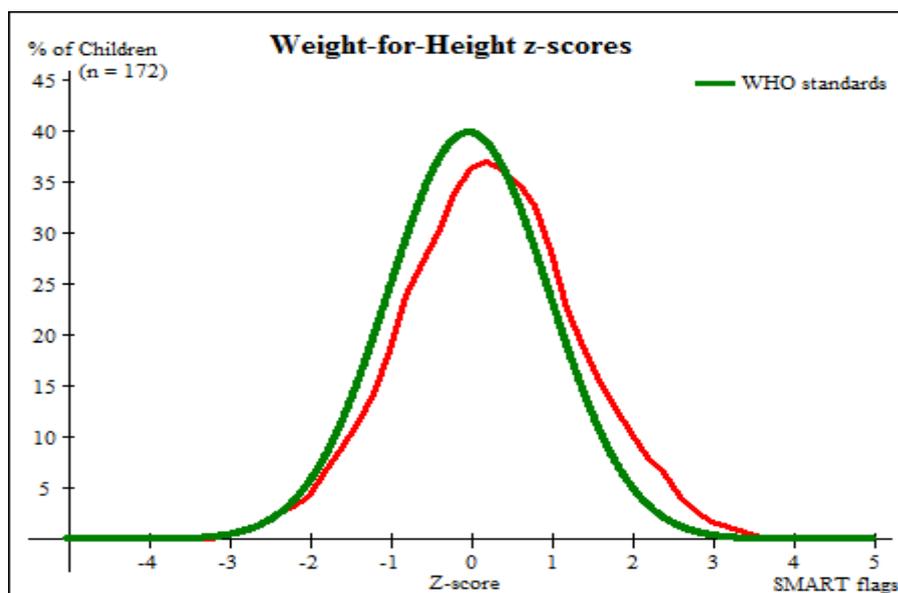


Table 98: Distribution of acute malnutrition and oedema based on weight-for-height z-scores

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor: No. 0; (0.0%)	Kwashiorkor: No. 0; (0.0 %)
Oedema absent	Marasmus: No. 1; (0.6 %)	Not severely malnourished: No. 174; (99.4 %)

Figure 27 Distribution of weight-for-height z-scores



Comparison: Reference (green) and surveyed population (red) based on WHO 2006 Growth standards

Table 99: Prevalence of acute malnutrition: MUAC cut offs (and/or oedema) and by sex

	All n = 175	Boys n = 106	Girls n = 69
Prevalence of global malnutrition (< 125 mm and/or oedema)	(7) 4.0 % (2.0 - 8.0 95% C.I.)	(4) 3.8 % (1.5 - 9.3 95% C.I.)	(3) 4.3 % (1.5 - 12.0 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(5) 2.9 % (1.2 - 6.5 95% C.I.)	(2) 1.9 % (0.5 - 6.6 95% C.I.)	(3) 4.3 % (1.5 - 12.0 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(2) 1.1 % (0.3 - 4.1 95% C.I.)	(2) 1.9 % (0.5 - 6.6 95% C.I.)	(0) 0.0 % (0.0 - 5.3 95% C.I.)

Table100: Prevalence of acute malnutrition by age, based on MUAC cut offs and/or oedema

Age (months)	Total no.	Severe wasting (< 115 mm)		Moderate wasting (>= 115 mm and < 125 mm)		Normal (> = 125 mm)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-23	58	1	1.7	3	5.2	54	93.1	0	0.0
24-29	20	1	5.0	1	5.0	18	90.0	0	0.0
30-41	53	0	0.0	1	1.9	52	98.1	0	0.0
42-53	30	0	0.0	0	0.0	30	100.0	0	0.0
54-59	14	0	0.0	0	0.0	14	100.0	0	0.0
Total	175	2	1.1	5	2.9	168	96.0	0	0.0

Table 101: Prevalence of underweight based on weight-for-age z-scores by sex

	All n = 172	Boys n = 103	Girls n = 69
Prevalence of underweight (<-2 z-score)	(23) 13.4 % (9.1 - 19.3 95% C.I.)	(18) 17.5 % (11.3 - 25.9 95% C.I.)	(5) 7.2 % (3.1 - 15.9 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(20) 11.6 % (7.7 - 17.3 95% C.I.)	(15) 14.6 % (9.0 - 22.6 95% C.I.)	(5) 7.2 % (3.1 - 15.9 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(3) 1.7 % (0.6 - 5.0 95% C.I.)	(3) 2.9 % (1.0 - 8.2 95% C.I.)	(0) 0.0 % (0.0 - 5.3 95% C.I.)

Table102: Prevalence of underweight by age, based on weight-for-age z-scores

Age (months)	Total no.	Severe underweight (<-3 z-score)		Moderate underweight (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-23	57	0	0.0	7	12.3	50	87.7	0	0.0
24-29	19	2	10.5	0	0.0	17	89.5	0	0.0
30-41	52	1	1.9	7	13.5	44	84.6	0	0.0
42-53	30	0	0.0	3	10.0	27	90.0	0	0.0
54-59	14	0	0.0	3	21.4	11	78.6	0	0.0
Total	172	3	1.7	20	11.6	149	86.6	0	0.0

Table103: Prevalence of stunting based on height-for-age z-scores and by sex

	All n = 159	Boys n = 94	Girls n = 65
Prevalence of stunting (<-2 z-score)	(74) 46.5 % (39.0 - 54.3 95% C.I.)	(44) 46.8 % (37.0 - 56.8 95% C.I.)	(30) 46.2 % (34.6 - 58.1 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(50) 31.4 % (24.7 - 39.0 95% C.I.)	(25) 26.6 % (18.7 - 36.3 95% C.I.)	(25) 38.5 % (27.6 - 50.6 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(24) 15.1 % (10.4 - 21.5 95% C.I.)	(19) 20.2 % (13.3 - 29.4 95% C.I.)	(5) 7.7 % (3.3 - 16.8 95% C.I.)

Table104: Prevalence of stunting by age based on height-for-age z-scores

Age (months)	Total no.	Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
		No.	%	No.	%	No.	%
6-23	54	2	3.7	15	27.8	37	68.5
24-29	15	2	13.3	7	46.7	6	40.0

30-41	49	11	22.4	19	38.8	19	38.8
42-53	28	7	25.0	5	17.9	16	57.1
54-59	13	2	15.4	4	30.8	7	53.8
Total	159	24	15.1	50	31.4	85	53.5

Figure 28: Trends in the prevalence of stunting by age in children 6-59 months

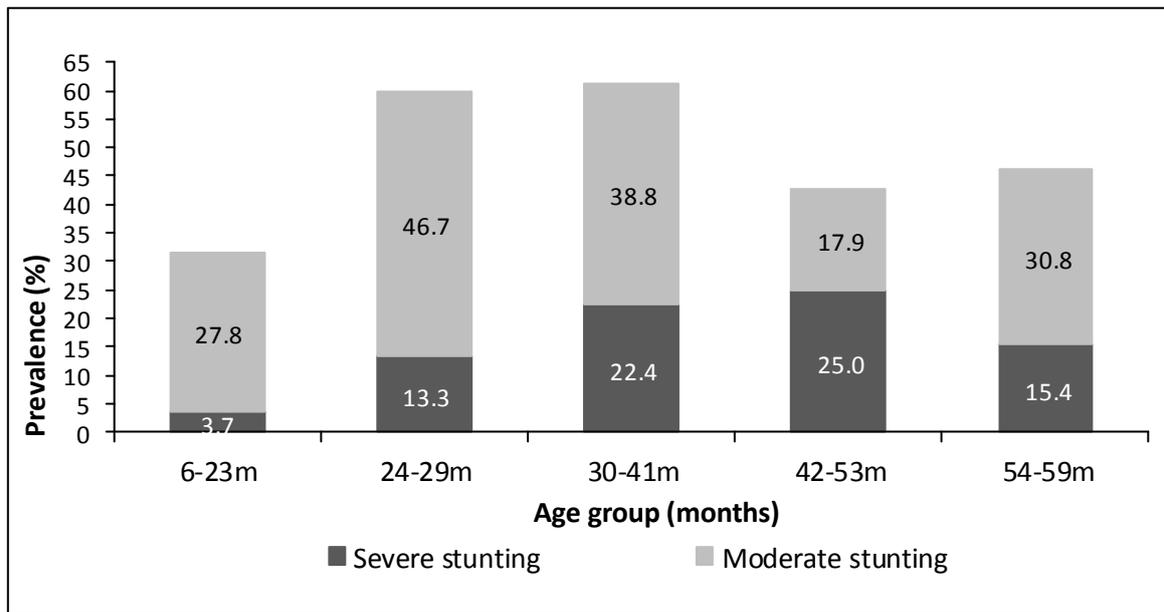
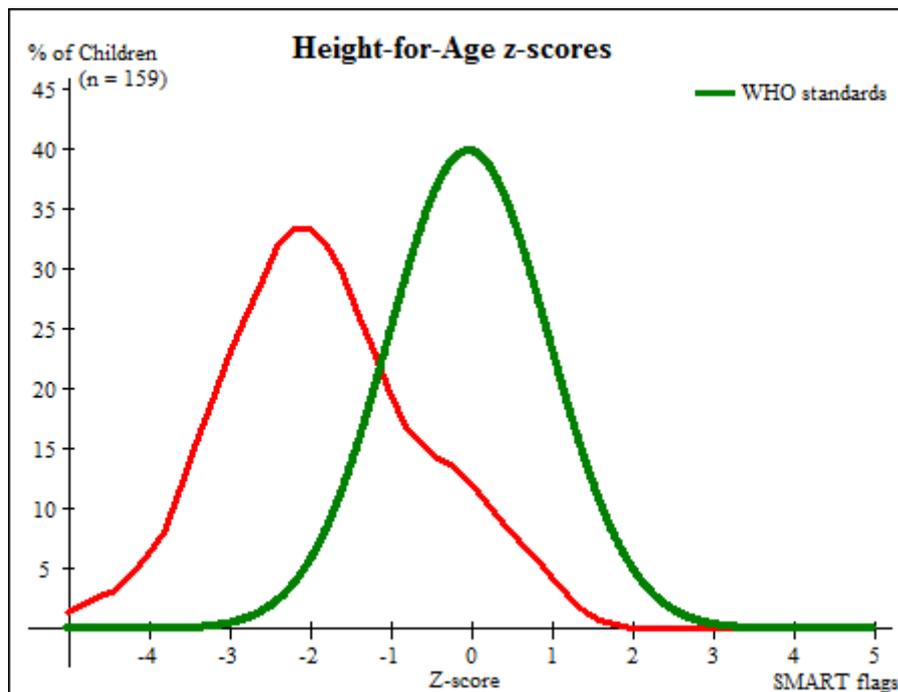


Figure 29: Distribution of height-for-age z-scores



A comparison of reference (green) and surveyed population (red) based on WHO 2006 Growth Standards

Table105: Mean z-scores, Design Effects and excluded subjects

Indicator	n	Mean z-scores \pm SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	172	0.24 \pm 1.05	1.00	0	3
Weight-for-Age	172	-0.84 \pm 1.07	1.00	0	3
Height-for-Age	159	-1.82 \pm 1.22	1.00	0	16

* contains for WHZ and WAZ the children with oedema.

Feeding programme coverage results

Table106: Programme coverage for acutely malnourished children (all criteria)

	Number/total	% (95% CI)
Supplementary feeding programme coverage	0	0
Therapeutic feeding programme coverage	1/1	100.0 (100 - 100)

Table107: Programme coverage for acutely malnourished children (MUAC)

	Number/total	% (95% CI)
Supplementary feeding programme coverage	0	0
Outpatient therapeutic program	2/2	100(100 - 100)

Measles vaccination coverage results

Table108: Measles vaccination coverage for children aged 9-59 months (n=159)

	Measles (with card): n=42	Measles (with card <u>or</u> confirmation from mother) n=89
Yes	26.4%: (19.7 - 34.0)	56.0%: (47.9 - 63.8)

Vitamin A supplementation coverage results

Table109: Vitamin A supplementation for children aged 6-59 months within past 6 months (n=175)

	Vitamin A capsule (with card) n=38	Vitamin A capsule (with card <u>or</u> confirmation from mother) n=108
Yes	21.7% (15.8 - 28.6)	61.7% (54.1 - 68.9)

Diarrhoea

Table 110: Period prevalence of diarrhea

	Number/total	% (95% CI)
Diarrhoea in the last two weeks	21/170	12.4%(7.8 - 18.3)

Anaemia

Table 111: Prevalence of anaemia, and mean haemoglobin concentration in children 6-59 months of age and by age group

	6-59 months n = 175	6-23 months n=58	24-59 months n=117
Total Anaemia (Hb<11.0 g/dL)	(143) 81.7% (75.2-87.1)	(51) 87.9% (76.7 - 95.0)	(92) 78.6% (70.1 - 85.7)
Mild Anaemia (Hb 10.0-10.9 g/dL)	(46) 26.3% (19.9-33.5)	(17) 29.3% (18.1 - 42.7)	(n) % (95% CI)
Moderate Anaemia (7.0-9.9 g/dL)	(85) 48.6% (41.0-56.2)	(29) 50.0% (36.6 - 63.4)	(n) % (95% CI)
Severe Anaemia (<7.0 g/dL)	(12) 6.9% (3.6-11.7)	(5) 8.6% (2.9 - 19.0)	(n) % (95% CI)
Mean Hb (g/dL)	9.6g/dL	9.2g/dL	9.7g/dL
(SD / 95% CI)	(±1.6)	(±1.5)	(±1.6)
[range]	[5.7,14.6]	[5.7, 12.2]	[6.5, 14.6]

4.4.2. Children 0-23 months

Table 35: Prevalence of Infant and Young Child Feeding Practices Indicators in Solo camp

Indicator	Age range	Number/total	Prevalence (%)	95% CI
Timely initiation of breastfeeding	0-23 months	42/68	61.8	49.2-73.3
Exclusive breastfeeding under 6 months	0-5 months	3/6	50.0	11.8-88.2
Continued breastfeeding at 1 year	12-15 months	12/13	92.3	64.0 - 99.8
Continued breastfeeding at 2 years	20-23 months	1/6	16.7	0.4 - 64.1
Introduction of solid, semi-solid or soft foods	6-8 months	6/16	37.5	15.2 - 64.6
Consumption of iron-rich or iron-fortified foods	6-23 months	1/57	1.8	0.0-9.4
Bottle feeding	0-23 months	3/67	4.5	0.9-12.5

Prevalence of intake**Infant formula****Table 36: 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)	1/58	1.7(0.0 - 9.2)

Fortified blended foods (FBF)**Table 37: Super Cereal Plus intake in children aged 6-23 months**

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive Super Cereal Plus	1/57	1.8(0.0-9.4)

Super Cereal Plus was not part of the refugee food basket in the general ration during the nutrition survey

4.4.3. Women 15-49 years**Table 38: Women physiological status and age**

Physiological status	Number/total	% of sample
Non-pregnant	67/73	91.8(83.0 - 96.9)
Pregnant	6/73	8.2(3.1 - 17.0)
Mean age (range)	28 years [15.0, 48.0]	

Table 39: 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=67
Total Anaemia (<12.0 g/dL)	(29/67); 43.3% (31.2-56.0)
Mild Anaemia (11.0-11.9 g/dL)	(15/67); 22.4% (13.1-34.2)
Moderate Anaemia (8.0-10.9 g/dL)	(14/67); 20.9% (11.9-32.6)
Severe Anaemia (<8.0 g/dL)	(0/67); 0.0%
Mean Hb (g/dL)	12.1g/dL (±1.4) [8.8, 15.1]

Table 40: ANC enrolment and iron-folic acid pills coverage among pregnant women (15-49 years)

	Number /total	% (95% CI)
Currently enrolled in ANC programme	6/6	100; (100-100)
Currently receiving iron-folic acid pills	6/6	100; (100-100)

4.4.4. Food security

Table 41: Food security sampling information

Household data	Planned	Actual	% of target
Total households surveyed for Food Security	192	72*	37.5

*There was an on-going relocation of refugees from Solo to PTP since the planning to the time when survey was conducted including one day among the three days of data collection in Solo camp.

Access to food assistance

Table 42 Ration card coverage

	Number/total	% (95% CI)
Proportion of households with a ration card	72/72	100(100-100)

Table 43 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
20.8 ± 6.3 days	69.3%

Table 44 : 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	15/72	20.8(12.2 - 32.0)
Proportion of households reporting that the food ration lasted:		
≤75% of the 30 days cycle	48/72	66.7 (54.6 - 77)
>75% of the 30 days cycle	24/72	33.3 (22.7 - 45.4)

Negative coping strategies

Table 45 : 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 <i>with or without interest</i>	42/72	58.3 (46.1 - 69.8)
Sold any assets that would not have normally sold (furniture, seed stocks, tools, other NFI, livestock etc.)	31/71	43.7(31.9 - 56.0)
Requested increased remittances or gifts as compared to normal	25/72	34.7 (23.9 - 46.9)
Reduced the quantity and/or frequency of meals	29/72	40.3 (28.9 - 52.5)
Begged	41/72	56.9 (44.7 - 68.6)
Engaged in potentially risky or harmful activities	15/72	20.8(12.2 - 32.0)
Proportion of households reporting using none of the coping strategies over the past month	54/71	76.1% (64.5-85.4)

Household dietary diversity results

The last general food distribution ended 15 days prior to the start of the survey data collection.

Table 46 : Average HDDS

	Mean ± SD
Average HDDS	6.52 ± 2.25

* Maximum HDDS is 12.

Figure 30 : Proportion of households consuming different food groups within last 24

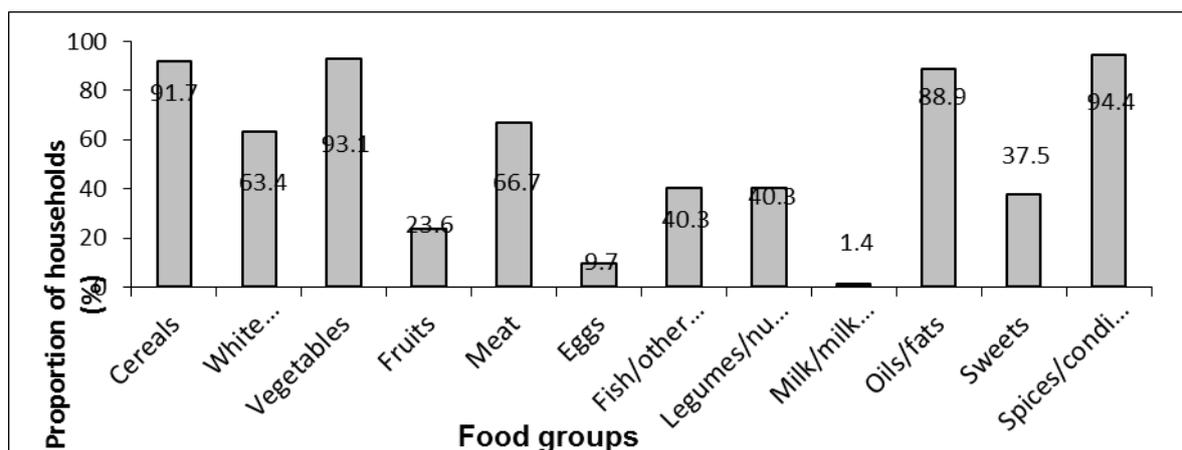


Table 47 : Consumption of micronutrient rich foods by households

	Number/total	% (95% CI)
Proportion of households <i>not consuming any</i> vegetables, fruits, meat, eggs, fish/seafood, and milk/milk products	3/72	4.2(0.9 - 11.7)
Proportion of households consuming either a plant or animal source of vitamin A	60/72	83.3(72.7 - 91.1)
Proportion of households consuming organ meat/flesh meat, or fish/seafood (food sources of haem iron)	55/72	76.4(64.9 - 85.6)

4.4.5. WASH

Table 48 : WASH sampling information

Household data	Planned	Actual	% of target
Total households surveyed for WASH	192	72*	37.5

*Relocation affected actual vs. number of household initially planned to be visited

Table 49: Water Quality

	Number/total	% (95% CI)
Proportion of households using an improved drinking water source	72/72	100.0(100-100)
Proportion of households that use a covered or narrow necked container for storing their drinking water	15/72	20.8(12.2 - 32.0)

Table 50 : Water Quantity: Amount of litres of water used per person per day

Proportion of households that use:	Number/total	% (95% CI)
≥ 20 lpppd	45/72	62.5(50.3 - 73.6)
15 - <20 lpppd	13/72	18.1(10.0 - 28.9)
<15 lpppd	14/72	19.4(11.1 - 30.5)

Mean = 23±12.3

Table 51 : Satisfaction with water supply

	Number/total	% (95% CI)
Proportion of households that say they are satisfied with the drinking water supply	67/72	93.1 (84.5-97.7)

Figure 31 : Proportion of households that say they are satisfied with the water supply

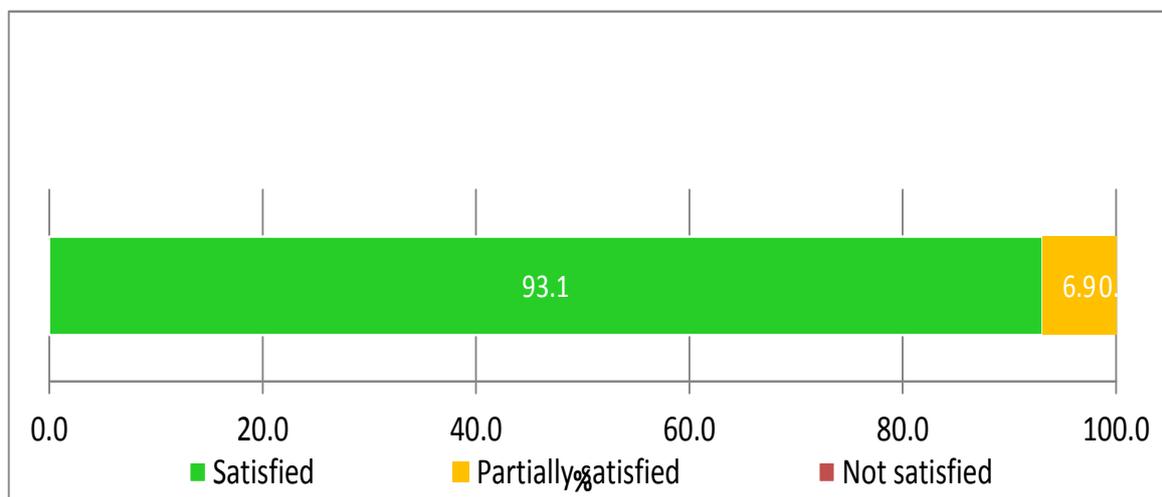


Figure 32 : Main reason for dissatisfaction among households not satisfied with water supply

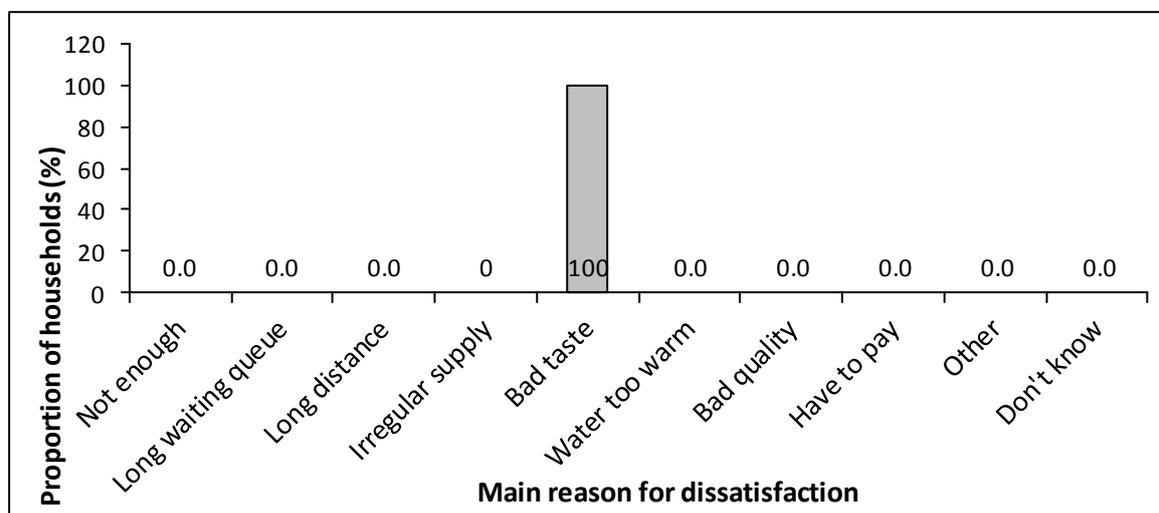
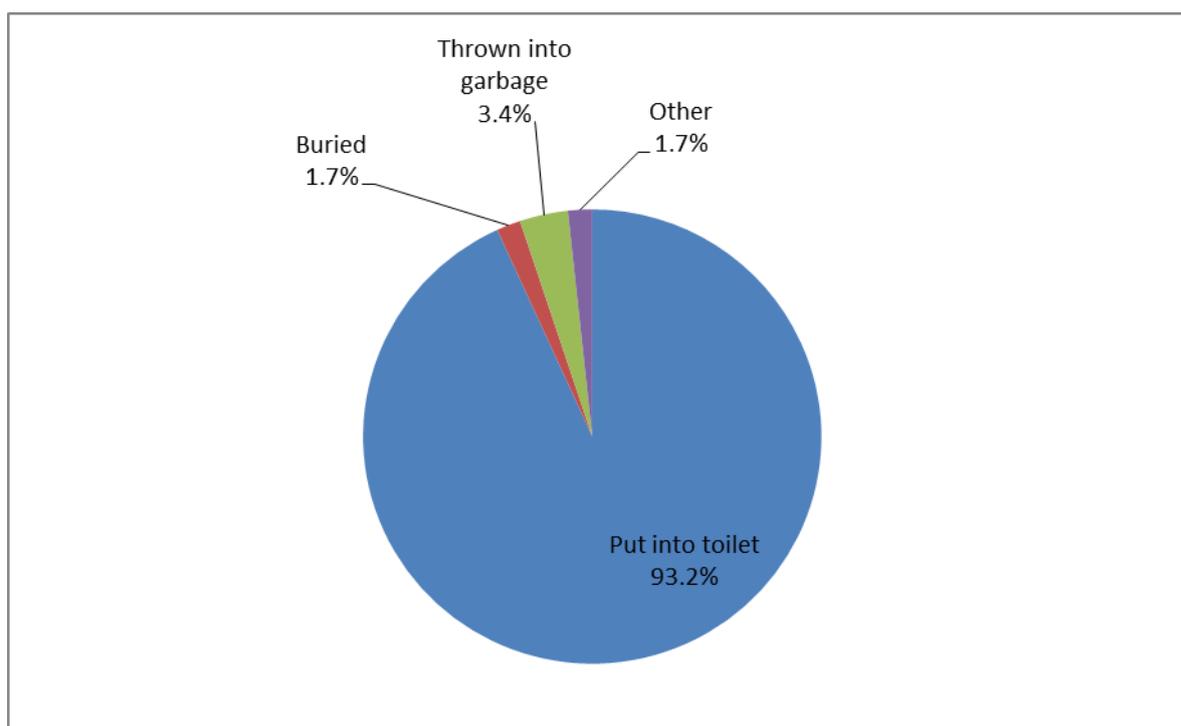


Table 52 : Safe Excreta disposal

	Number/total	% (95% CI)
Proportion of households that use:		
An improved excreta disposal facility (improved toilet facility, 1 household)*,**	0/72	0.0
A shared family toilet (improved toilet facility, 2 households)**	3/72	4.2 (0.9-11.7)
A communal toilet (improved toilet facility, 3 households or more)	56/72	77.8(66.4-86.7)
An unimproved toilet (unimproved toilet facility or public toilet)	13/72	18.1(10.0-28.9)
Proportion of households with children under three years old that dispose of faeces safely	55/58	94.8(85.6 - 98.9)

Figure 33 : Proportion of households with children under the age of 3 years whose (last) stools were disposed of safely



4.4.6. Mosquito Net Coverage

Table 53 : Mosquito net coverage sampling information

Household data	Planned	Actual	% of target
Total households surveyed for mosquito net coverage	192	72	37.5

Table 54 : Household Mosquito net ownership

	Number/total	% (95% CI)
Proportion of total households owning at least one mosquito net of any type	53/72	73.6 (61.9-83.3)
Proportion of total households owning at least one LLIN	53/72	73.6 (61.9-83.3)

Figure 34 : Household ownership of at least one mosquito net (any type)

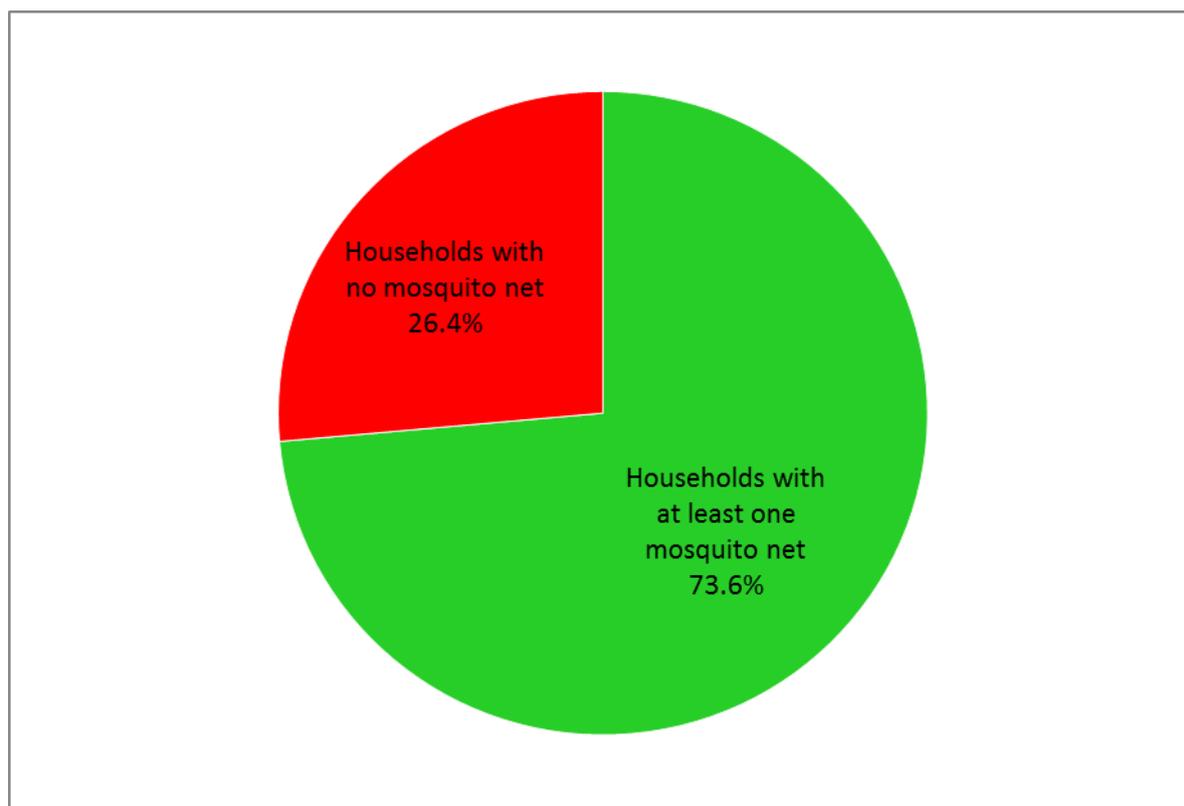
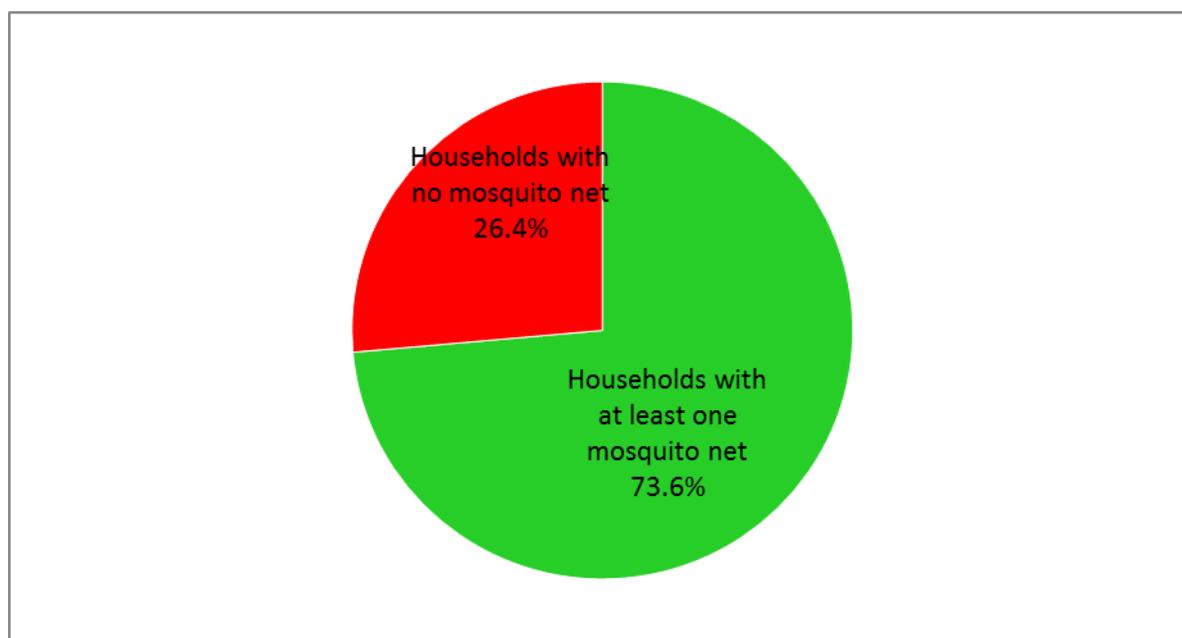


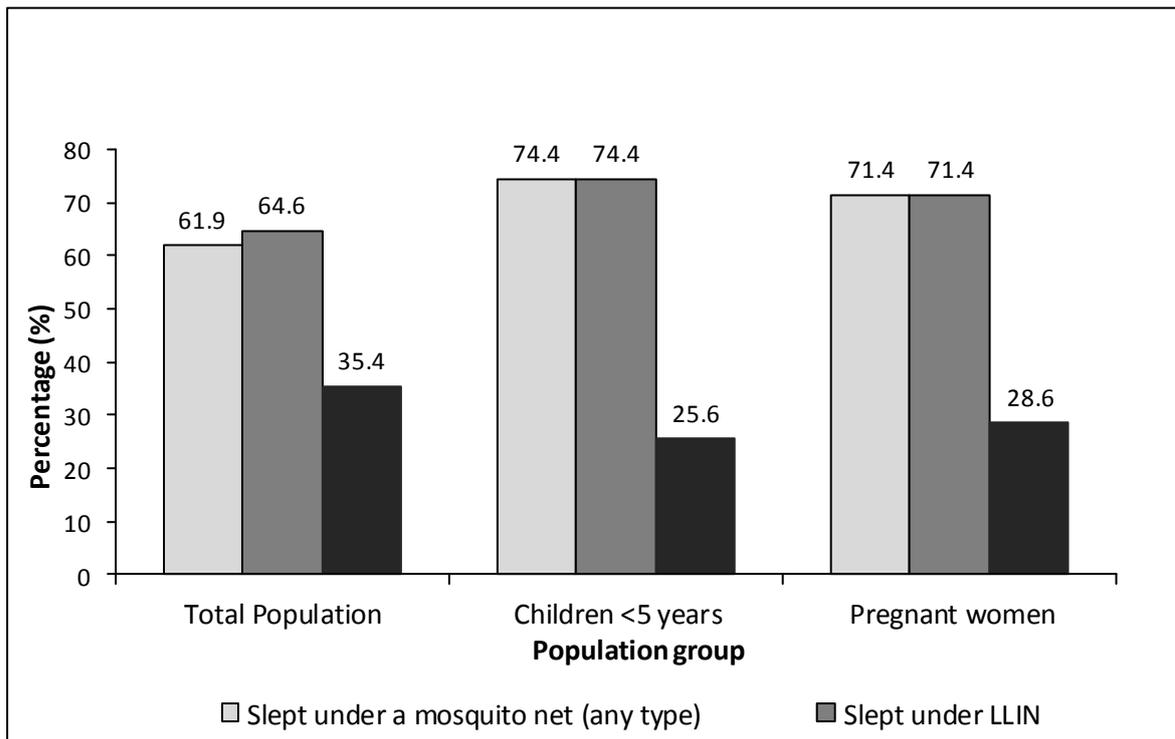
Figure 35 : Household ownership of at least one LLIN**Table 55 : Number of nets**

Average number of LLINs per household	Average number of persons per LLIN
1.8	3.9

Table 56 : Mosquito net Utilisation.

	Proportion of total population (all ages)		Proportion of 0-59 months		Proportion of pregnant women	
	Total No=365	%	Total No=90	%	Total No=7	%
Slept under net of any type	226	61.9%	67	74.4%	5	71.4%
Slept under LLIN	236	64.6%	67	74.4%	5	71.4%

Figure 36 : Mosquito Net Utilization by sub-group



4.5. RESULTS FOR LITTLE WLEBO CAMP

4.5.1. Children 6-59 months

Table 57: Distribution of age and sex of sample

AGE (mo)	Boys		Girls		Total		Ratio
	no.	%	no.	%	no.	%	Boy:Girl
6-23	72	50.3	71	49.7	143	42.1	1.0
24-29	18	50.0	18	50.0	36	10.6	1.0
30-41	36	50.7	35	49.3	71	20.9	1.0
42-53	41	57.7	30	42.3	71	20.9	1.4
54-59	10	52.6	9	47.4	19	5.6	1.1
Total	177	52.1	163	47.9	340	100.0	1.1

Table 58: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex

	All n = 335	Boys n = 175	Girls n = 160
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(9) 2.7 % (1.4 - 5.0 95% C.I.)	(4) 2.3 % (0.9 - 5.7 95% C.I.)	(5) 3.1 % (1.3 - 7.1 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(9) 2.7 % (1.4 - 5.0 95% C.I.)	(4) 2.3 % (0.9 - 5.7 95% C.I.)	(5) 3.1 % (1.3 - 7.1 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 - 2.1 95% C.I.)	(0) 0.0 % (0.0 - 2.3 95% C.I.)

The prevalence of oedema is 0.0 %

Table 59: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema

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

hs)									
6-23	141	0	0.0	7	5.0	134	95.0	0	0.0
24-29	36	0	0.0	1	2.8	35	97.2	0	0.0
30-41	70	0	0.0	0	0.0	70	100.0	0	0.0
42-53	71	0	0.0	1	1.4	70	98.6	0	0.0
54-59	17	0	0.0	0	0.0	17	100.0	0	0.0
Total	335	0	0.0	9	2.7	326	97.3	0	0.0

Figure: 37. Trends in prevalence of moderate and severe wasting by age in children 6-59 months

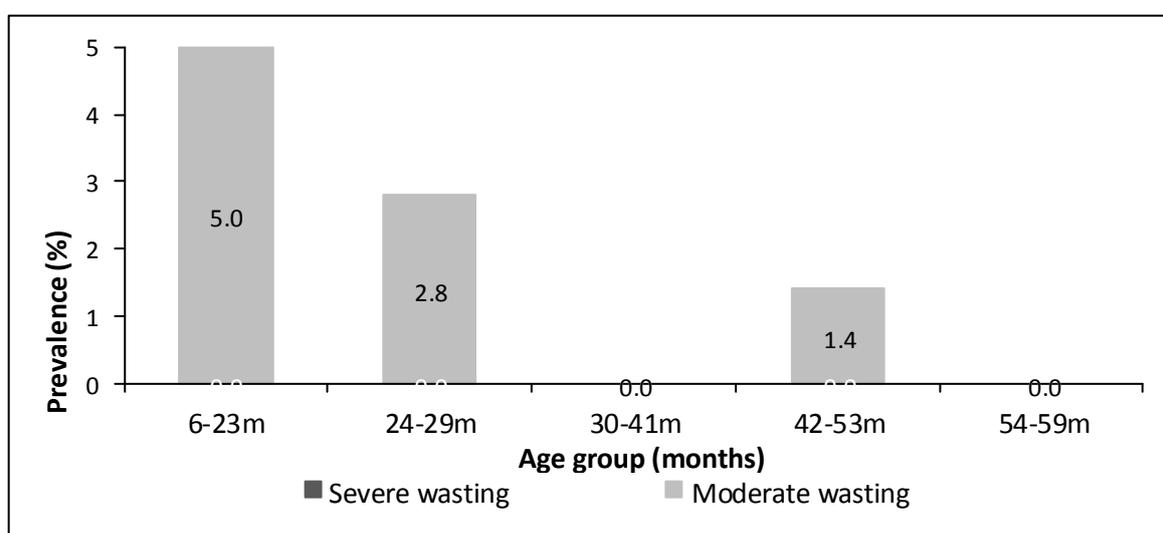
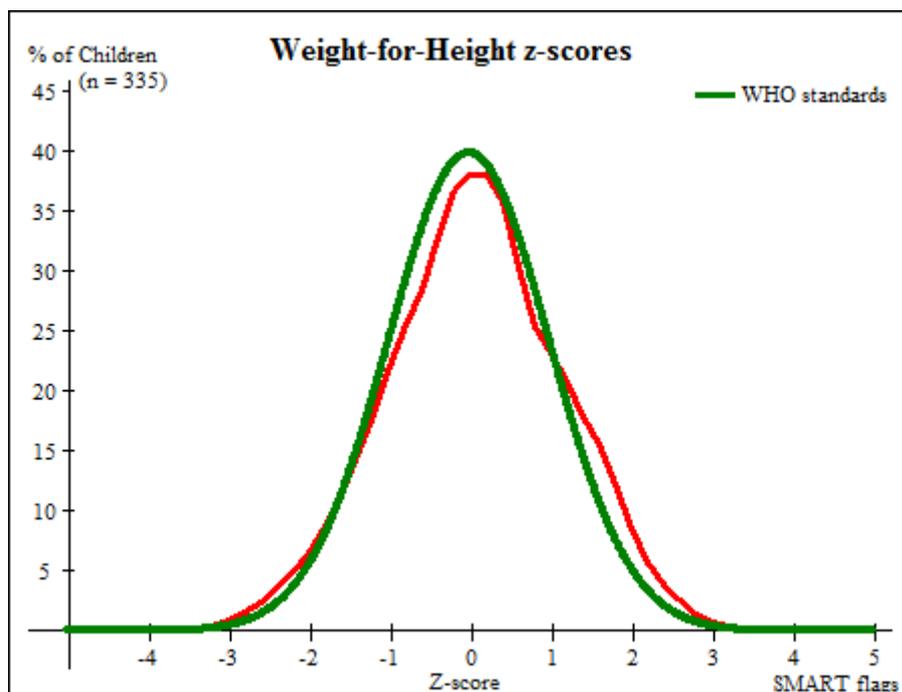


Table 60: Distribution of acute malnutrition and oedema based on weight-for-height z-scores

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 2 (0.6 %)	Not severely malnourished No. 338 (99.4 %)

Figure 38: Distribution of weight-for-height z-scores



A comparison of reference (green) and surveyed population (red) based on WHO 2006 Growth Standards

Table 61: Prevalence of acute malnutrition based on MUAC cut offs (and/or oedema) and by sex

	All n = 340	Boys n = 177	Girls n = 163
Prevalence of global malnutrition (< 125 mm and/or oedema)	(11) 3.2 % (1.8 - 5.7 95% C.I.)	(3) 1.7 % (0.6 - 4.9 95% C.I.)	(8) 4.9 % (2.5 - 9.4 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(9) 2.6 % (1.4 - 5.0 95% C.I.)	(3) 1.7 % (0.6 - 4.9 95% C.I.)	(6) 3.7 % (1.7 - 7.8 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(2) 0.6 % (0.2 - 2.1 95% C.I.)	(0) 0.0 % (0.0 - 2.1 95% C.I.)	(2) 1.2 % (0.3 - 4.4 95% C.I.)

Table 62: Prevalence of acute malnutrition by age, based on MUAC cut offs and/or oedema

Age (months)	Total no.	Severe wasting (< 115 mm)		Moderate wasting (>= 115 mm and < 125 mm)		Normal (>= 125 mm)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-23	143	2	1.4	8	5.6	133	93.0	0	0.0
24-29	36	0	0.0	1	2.8	35	97.2	0	0.0
30-41	71	0	0.0	0	0.0	71	100.0	0	0.0
42-53	71	0	0.0	0	0.0	71	100.0	0	0.0
54-59	19	0	0.0	0	0.0	19	100.0	0	0.0
Total	340	2	0.6	9	2.6	329	96.8	0	0.0

Table 63: Prevalence of underweight based on weight-for-age z-scores by sex

	All n = 333	Boys n = 173	Girls n = 160
Prevalence of underweight (<-2 z-score)	(55) 16.5 % (12.9 - 20.9 95% C.I.)	(31) 17.9 % (12.9 - 24.3 95% C.I.)	(24) 15.0 % (10.3 - 21.3 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(45) 13.5 % (10.3 - 17.6 95% C.I.)	(27) 15.6 % (11.0 - 21.8 95% C.I.)	(18) 11.3 % (7.2 - 17.1 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(10) 3.0 % (1.6 - 5.4 95% C.I.)	(4) 2.3 % (0.9 - 5.8 95% C.I.)	(6) 3.8 % (1.7 - 7.9 95% C.I.)

Table 64: Prevalence of underweight by age, based on weight-for-age z-scores

Age (months)	Total no.	Severe underweight (<-3 z-score)		Moderate underweight (>= -3 and <-2 z-score)		Normal (>= -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-23	140	3	2.1	19	13.6	118	84.3	0	0.0
24-29	34	2	5.9	3	8.8	29	85.3	0	0.0
30-41	70	3	4.3	10	14.3	57	81.4	0	0.0
42-53	70	1	1.4	11	15.7	58	82.9	0	0.0
54-59	19	1	5.3	2	10.5	16	84.2	0	0.0
Total	333	10	3.0	45	13.5	278	83.5	0	0.0

Table 65: Prevalence of stunting based on height-for-age z-scores and by sex

	All n = 313	Boys n = 164	Girls n = 149
Prevalence of stunting (<-2 z-score)	(127) 40.6 % (35.3 - 46.1 95% C.I.)	(69) 42.1 % (34.8 - 49.7 95% C.I.)	(58) 38.9 % (31.5 - 46.9 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(80) 25.6 % (21.0 - 30.7 95% C.I.)	(41) 25.0 % (19.0 - 32.1 95% C.I.)	(39) 26.2 % (19.8 - 33.8 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(47) 15.0 % (11.5 - 19.4 95% C.I.)	(28) 17.1 % (12.1 - 23.6 95% C.I.)	(19) 12.8 % (8.3 - 19.1 95% C.I.)

Table 66: Prevalence of stunting by age based on height-for-age z-scores

Age (months)	Total no.	Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
		No.	%	No.	%	No.	%
6-23	136	10	7.4	37	27.2	89	65.4
24-29	31	5	16.1	10	32.3	16	51.6
30-41	63	14	22.2	15	23.8	34	54.0
42-53	68	16	23.5	14	20.6	38	55.9
54-59	15	2	13.3	4	26.7	9	60.0
Total	313	47	15.0	80	25.6	186	59.4

Figure39: Trends in the prevalence of stunting by age in children 6-59 months

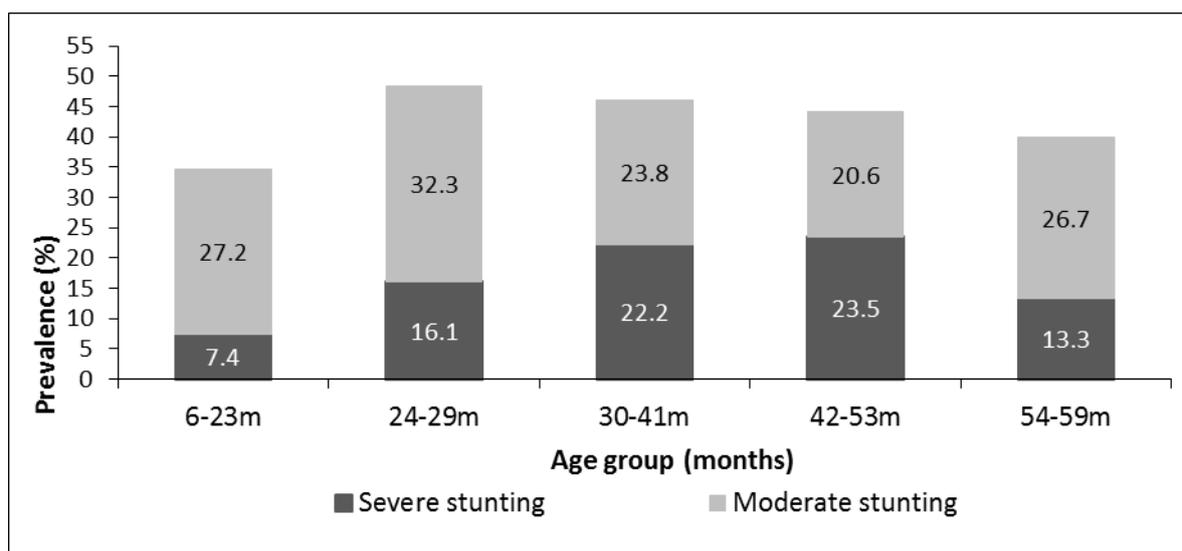


Figure 40: Distribution of height-for-age z-scores

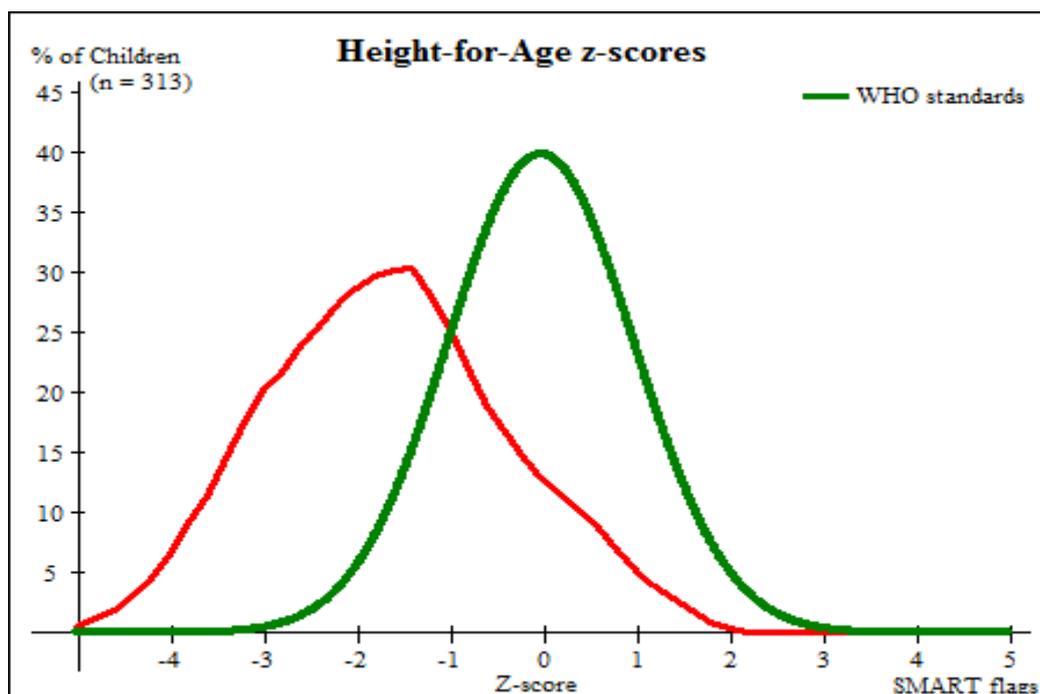


Table 67: Mean z-scores, Design Effects and excluded subjects

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	335	0.06±1.06	1.00	0	5
Weight-for-Age	333	-0.86±1.13	1.00	0	7
Height-for-Age	313	-1.65±1.26	1.00	0	27

* contains for WHZ and WAZ the children with oedema.

Feeding programme coverage results

Table 68: Programme coverage for acutely malnourished children (all criteria)

	Number/total	% (95% CI)
Supplementary feeding programme coverage	2/14	14.3(1.8 – 42.8)
Therapeutic feeding programme coverage	0	0

Table 69: Programme coverage for acutely malnourished children (MUAC or Oedema)

	Number/total	% (95% CI)
Supplementary feeding programme coverage	2/9	22.2(2.8 – 60.0)
Therapeutic feeding programme coverage	0	0

Measles vaccination

Table 70: Measles vaccination coverage: for children aged 9-59 months (N=318)

	Measles: (with card): n=92	Measles: (with card <u>or</u> confirmation from mother): n=182
YES	28.9%: (24.1 - 34.3)	57.2%: (51.6-62.7)

Vitamin A supplementation**Table 71: Vitamin A supplementation for children aged 6-59 months within past 6 months (n=339)**

	Vitamin A capsule (with card) n=88	Vitamin A capsule (with card <u>or</u> confirmation from mother): n=195
YES	26.0% : (21.4 - 31.0)	57.5%: (52.1-62.8)

Diarrhoea**Table 72: Period prevalence of diarrhea**

	Number/total	% (95% CI)
Diarrhoea in the last two weeks	80/318	25.2% (20.6-30.4)

Anaemia**Table 73 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 = 339	6-23 months n=143	24-59 months n=196
Total Anaemia (Hb<11.0 g/dL)	(250) 73.7% (68.7-78.4)	(112) 78.3% (70.7 - 84.8)	(138) 70.4% (63.5 - 76.7)
Mild Anaemia (Hb 10.0-10.9 g/dL)	(100) 29.5% (24.8-34.7)	(42) 29.4% (22.1 - 37.6)	(58) 29.6% (23.3 - 36.5)
Moderate Anaemia (7.0-9.9 g/dL)	(142) 41.9% (36.6-47.4)	(68) 47.6% (39.1 - 56.1)	(74) 37.8% (30.9 - 44.9)
Severe Anaemia (Hb <7.0 g/dL)	(8) 2.4% (1.1- 4.8)	(2) 1.4% (0.2 - 5.0)	(6) 3.1% (1.1 - 6.5)
Mean Hb (g/dL) (SD / 95% CI) [range]	(10.1g/dL (±1.4) [6.3, 13.2]	9.9g/dL (±1.4) [6.3, 13.2]	10.2g/dL (+1.5) [5.5, 13.7]

Table 74 Prevalence of moderate and severe anaemia in children 6-59 months of age

and by age group

	6-59 months n = 339	6-23 months n=143	24-59 months n=196
Moderate and Severe Anaemia (Hb<10.0 g/dL)	(150) 44.2% (38.9 - 49.7)	(70) 49.0% (40.5 - 57.4)	(80) 40.8% (33.9 - 48.0)

4.5.2. Children 0-23 months

Table 75: Prevalence of Infant and Young Child Feeding Practices Indicators

Indicator	Age range (months)	Number/total	Prevalence (%)	95% CI
Timely initiation of breastfeeding	0-23	95/184	51.6	44.2-59.0
Exclusive breastfeeding under 6 months	0-5	31/38	81.6	65.7-92.3
Continued breastfeeding at 1 year	12-15	30/39	76.9	60.7 - 88.9
Continued breastfeeding at 2 years	20-23	7/27	25.9	11.1 - 46.3
Introduction of solid, semi-solid or soft foods	6-8	3/22	13.6	2.9 - 34.9
Consumption of iron-rich or iron-fortified foods	6-23	15/142	10.6	6.0-16.8
Bottle feeding	0-23	11/184	6.0	3.0-10.4

Prevalence of intake

Infant formula

Table 76: 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)	4/140	2.9(0.8 - 7.2)

Fortified blended foods (FBF)

Table 77: Super Cereal Plus intake in children aged 6-23 months

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive Super Cereal Plus	15/142	10.6(6.0 - 16.8)

Super Cereal Plus was not part of the refugee food basket in the general ration during the nutrition survey

4.5.3. Women 15-49 years

Table 78: Women physiological status and age

Physiological status	Number/total	% of sample
Non-pregnant	153/171	89.5
Pregnant	18/171	10.5
Mean age (range)	29.3 years [15.0, 48.0]	

Table 79: 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=154
Total Anaemia (<12.0 g/dL)	(77); 50.0% (41.8-58.2)
Mild Anaemia (11.0-11.9 g/dL)	(42); 27.3% (20.4-35.0)
Moderate Anaemia (8.0-10.9 g/dL)	(35); 22.7% (16.4-30.2)
Severe Anaemia (<8.0 g/dL)	(0); 0.0%
Mean Hb (g/dL)	11.90g/dL
(SD / 95% CI)	(±1.4)
[range]	[9.0, 16.4]

Table 80: ANC enrolment and iron-folic acid pills coverage among pregnant women (15-49 years)

	Number /total	% (95% CI)
Currently enrolled in ANC programme	18/18	100 (100 - 100)
Currently receiving iron-folic acid pills	18/18	100(100 - 100)

4.5.4. Food security results

Table 81 Food security sampling information

Household data	Planned	Actual	% of target
Total households surveyed for Food Security	155	159	102%

Access to food assistance

Table 82 Ration card coverage

	Number/total	% (95% CI)
Proportion of households with a ration card	156/159	98.1% (94.6-99.6)

1.3% said it was because they were new arrivals who were eligible but were not yet registered and 0.6% said it was because they were not included in the targeting criteria

Table 83 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
20.8 ± 5.9 days	69.3%

Table 84 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	16/156	10.3%(6.0 - 16.1)
Proportion of households reporting that the food ration lasted:		
≤75% of the 30 days cycle	104/156	66.7(58.7 - 74.0)
>75% of the 30 days cycle	52 /156	33.3 (26.0 - 41.3)

Negative coping strategies

Table 85 : 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 <i>with or without interest</i>	118/158	74.7(67.2 - 81.3)
Sold any assets that would not have normally sold (furniture, seed stocks, tools, other NFI, livestock etc.)	86/157	54.8(46.6 - 62.7)
Requested increased remittances or gifts as compared to normal	54/158	34.2 (26.8 - 42.1)
Reduced the quantity and/or frequency of meals	78/156	50.0(41.9 - 58.1)

Begged	98/156	62.8(54.7 - 70.4)
Engaged in potentially risky or harmful activities	46/158	29.1(22.2 - 36.9)
Proportion of households reporting using none of the coping strategies over the past month	138/154	89.6(83.7 - 93.9)

Household dietary diversity results

The last general food distribution ended 0 days prior to the start of the survey data collection. In other words, nutrition survey started the last day of food distribution.

Table 86 Average HDDS

	Mean (Standard deviation or 95% CI)
Average HDDS	6.4± 2.0

* Maximum HDDS is 12.

Figure: 41: Proportion of households consuming different food groups within last 24 hours

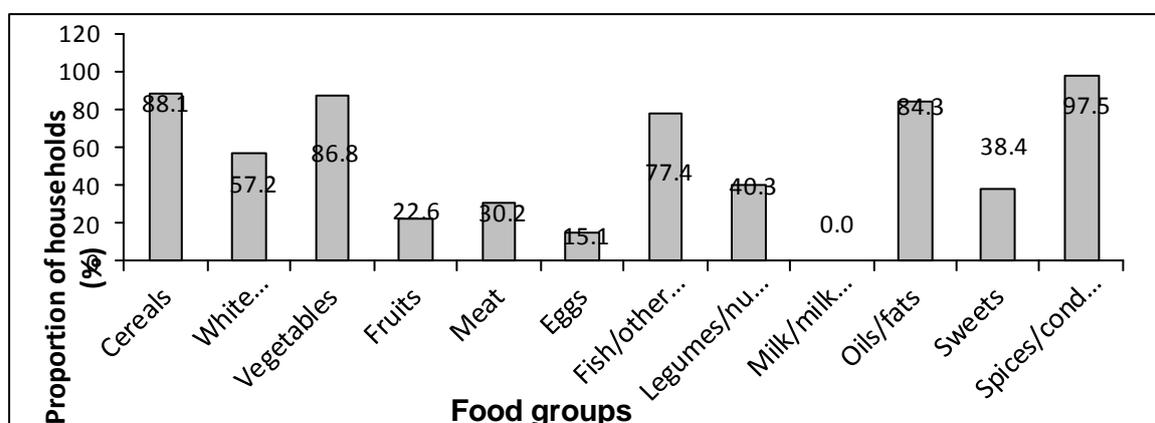


Table 87 Consumption of micronutrient rich foods by households

	Number/total	% (95% CI)
Proportion of households <i>not consuming any</i> vegetables, fruits, meat, eggs, fish/seafood, and milk/milk products	8/159	5.0(2.2 - 9.7)
Proportion of households consuming either a plant or animal source of vitamin A	133/159	83.6(77.0 - 89.0)
Proportion of households consuming organ meat/flesh meat, or fish/seafood (food sources of haem iron)	128/159	80.5(73.5 - 86.4)

4.5.5. WASH

Table 88 : Sampling information

Household data	Planned	Actual	% of target
Total households surveyed for WASH	155	159	102%

Table 89 : Water Quality

	Number/total	% (95% CI)
Proportion of households using an improved drinking water source	159/159	100.0(100 - 100)
Proportion of households that use a covered or narrow necked container for storing their drinking water	47/159	29.6(22.6 - 37.3)

Table 90 : Water Quantity: Amount of litres of water used per person per day

Proportion of households that use:	Number/total	% (95% CI)
≥ 20 lpppd	117/159	73.6 (66.0 - 80.3)
15 - <20 lpppd	23/159	14.5 (9.4% 20.9)
<15 lpppd	19/159	11.9 (7.4 - 18)

Mean = 25.4±12.4

Table 91 Satisfaction with water supply

	Number/total	% (95% CI)
Proportion of households that say they are satisfied with the drinking water supply	152/158	96.2(91.9 - 98.6)

Figure 42 Proportion of households that say they are satisfied with the water supply

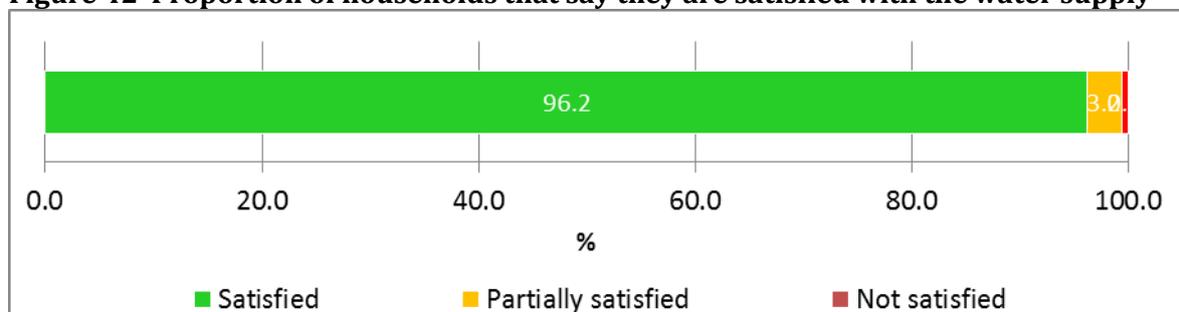


Figure 43 Main reason for dissatisfaction among households not satisfied with water supply

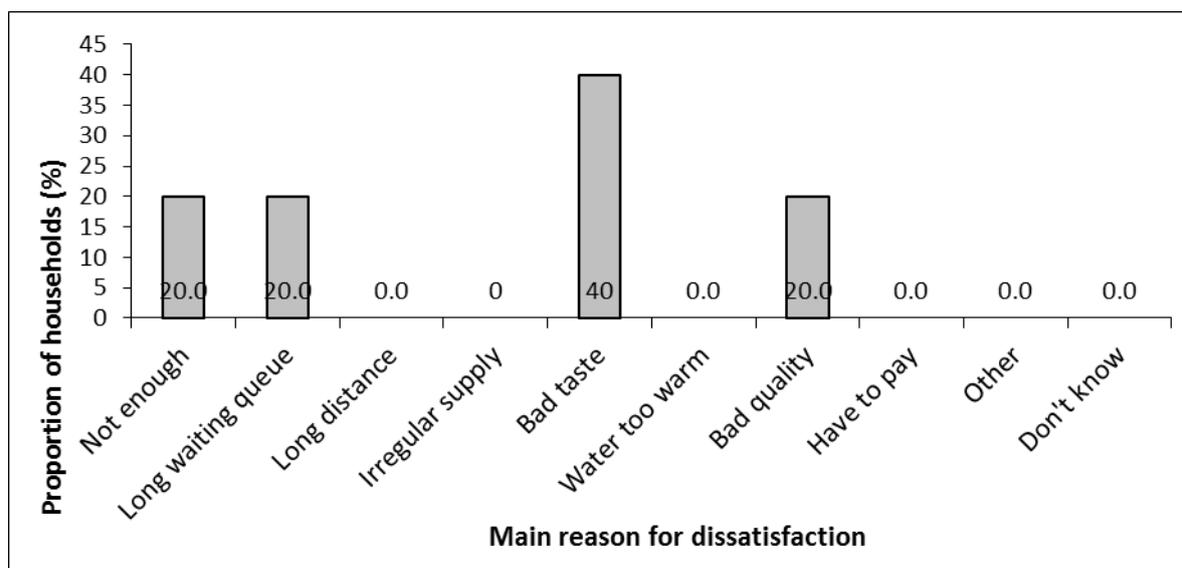
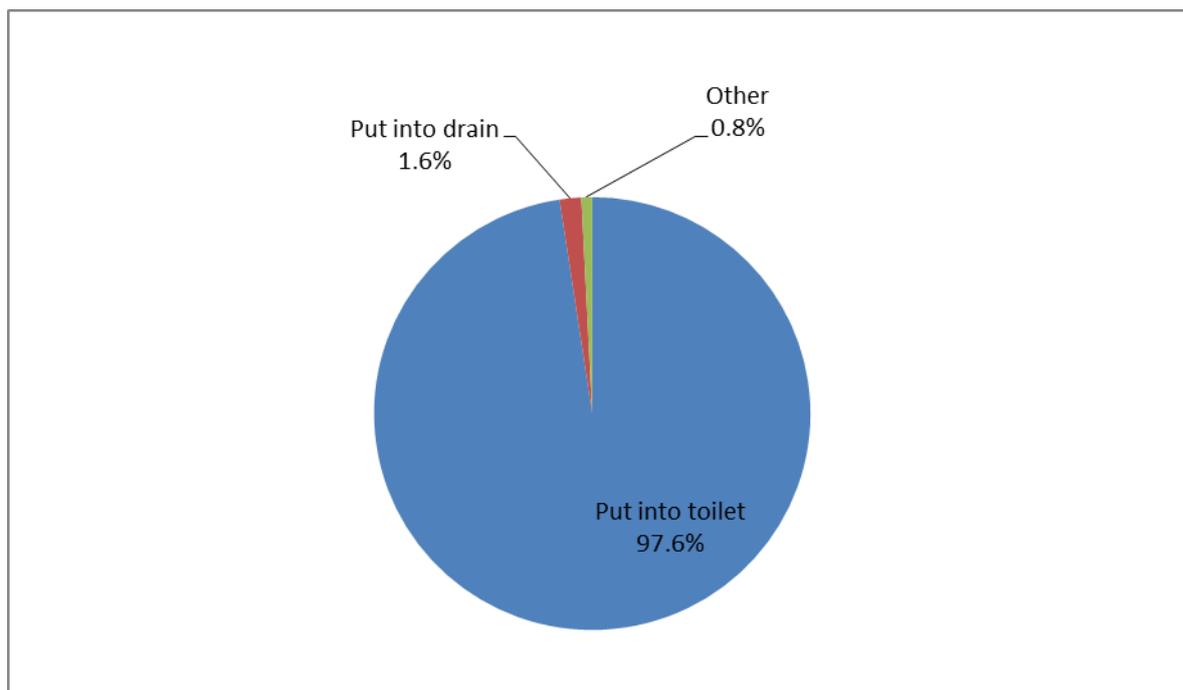


Table 92 : Safe Excreta disposal

	Number/total	% (95% CI)
Proportion of households that use:		
An improved excreta disposal facility (improved toilet facility, 1 household)	7/157	4.5 (1.8 - 9.0)
A shared family toilet (improved toilet facility, 2 households)	12/157	7.6 (4.0 - 13.0)
A communal toilet (improved toilet facility, 3 households or more)	109/157	69.4 (61.6 - 76.5)
An unimproved toilet (unimproved toilet facility or public toilet)	29/157	18.5 (12.7-25.4)
Proportion of households with children under three years old that dispose of faeces safely	121/124	97.6(93.1 - 99.5)

Figure 44: Proportion of households with children under the age of 3 years whose (last) stools were disposed of safely



4.5.6. Mosquito Net Coverage

Table 93 : Mosquito net coverage sampling information

Household data	Planned	Actual	% of target
Total households surveyed for mosquito net coverage	155	157	101%

Table 94 : Household Mosquito net ownership

	Number/total	% (95% CI)
Proportion of total households owning at least one mosquito net of any type	122/157	77.7% (70.4 - 84.0)
Proportion of total households owning at least one LLIN	122/157	77.7% (70.4 - 84.0)

Figure 45: Household ownership of at least one mosquito net (any type)

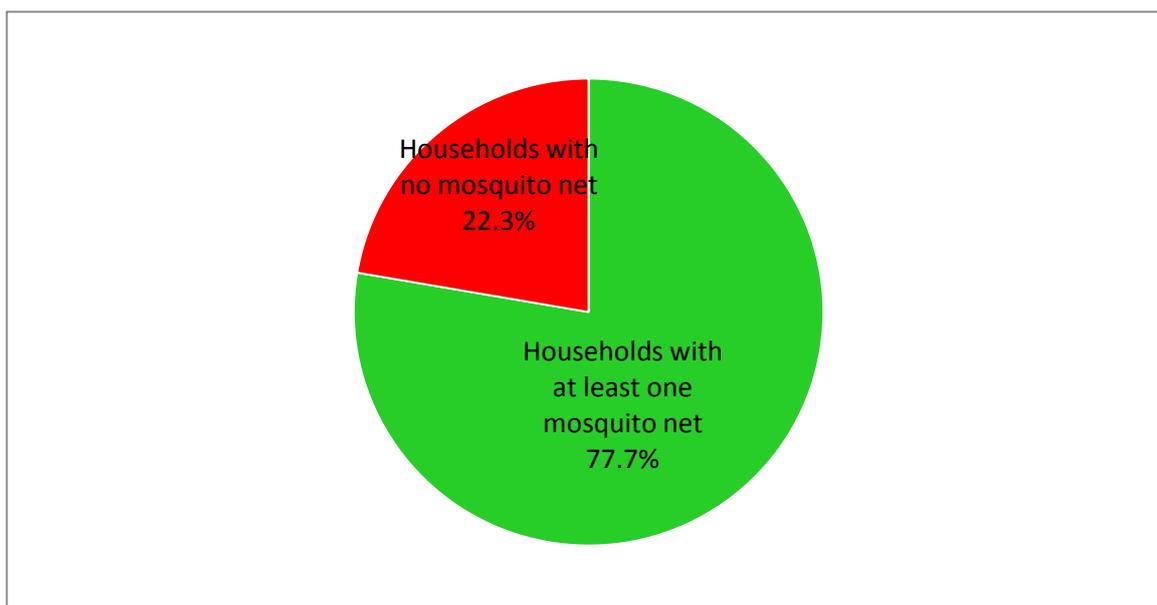


Figure 46: Household ownership of at least one LLIN

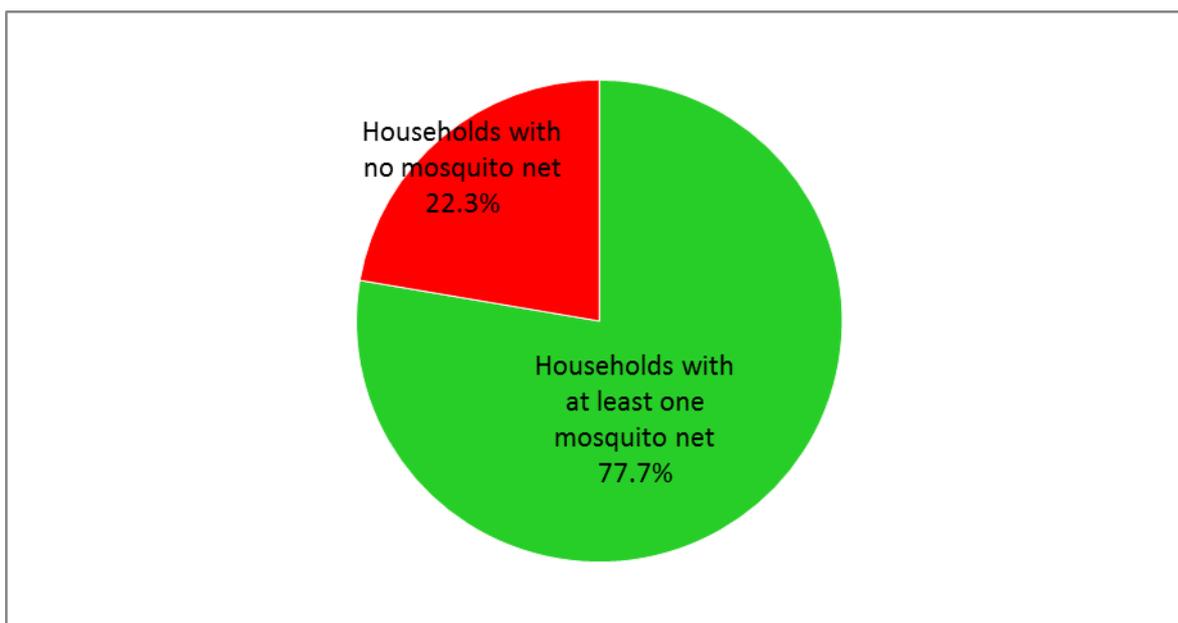


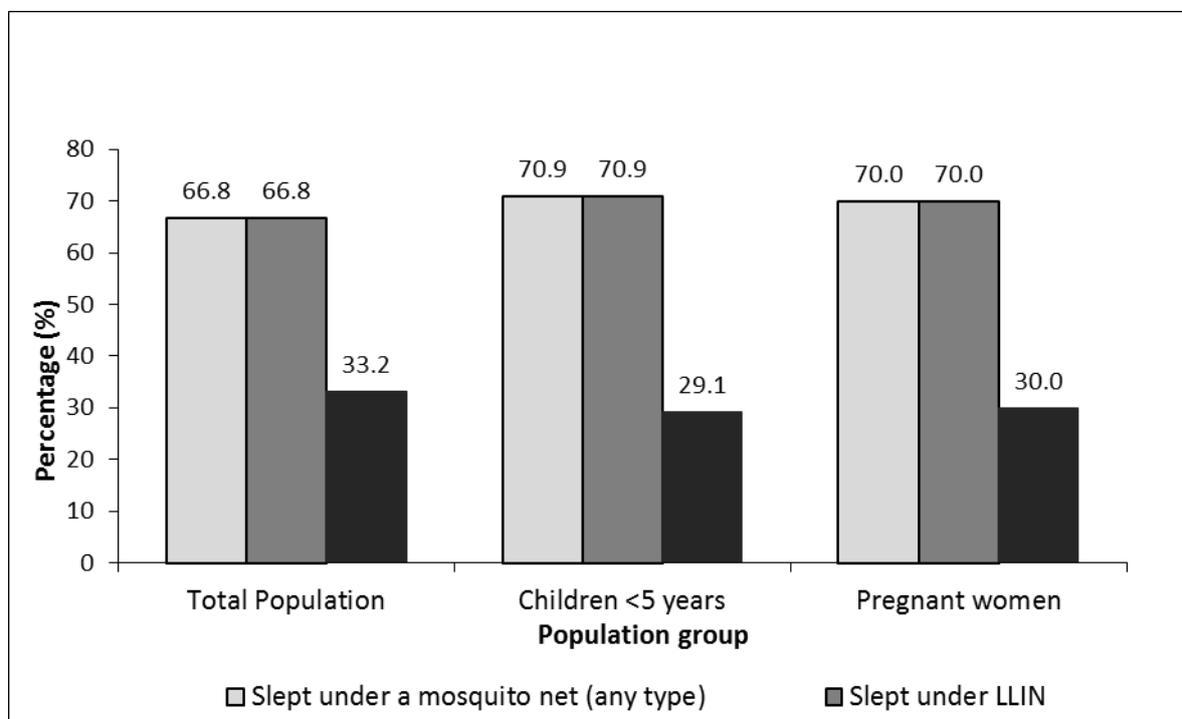
Table 95 : Number of nets

Average number of LLINs per household	Average number of persons per LLIN
1.8	3.7

Table 96 : Mosquito net Utilisation.

	Proportion of total population (all ages)		Proportion of 0-59 months		Proportion of pregnant women	
	Total No=796	%	Total No=193	%	Total No=20	%
Slept under net of any type	532	66.8%	137	70.9%	14 %	70.0%
Slept under LLIN	532	66.8%	137	70.9%	14 %	70.0%

Figure 47: Mosquito Net Utilisation by sub-group



5. LIMITATIONS

- **Poor quality of age data:** 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 (mother) languages. It is possible that in the course of translations some messages might have been incorrectly conveyed.
- **Use of smart phones:** Data collection was technology was new to many of the survey team members, which may have also introduced some errors.
- **Construction of mud dubbed houses:** During the survey refugees, especially in Bahn and PTP camps, were constructing new houses by mud wall. In the process use of water was inevitable, and could not certainly tell where they fetch water for mudding. This could have changed the meaning of water consumption when is meant only for domestic use and not for construction activities
- **Camp consolidation and relocation:** Solo camp was initially planned to be closed by end of December 2013 and refugees to be relocated to PTP camp. It was difficult to predict the actual population of Solo camp at the time of the survey due to vigorous movement / relocations, which was also on-going in one the data collection days. This could have affected sampling information and probably quality of the data collected as well as results due to poor representativeness of the sample obtained.
- **ProGres data vs. actual camp population:** Sample size based on sampling unit (household) was calculated based on the data obtained through the ProGres. Completion of the required household resulted in more than 100% of the expected number of children. This may imply inaccurate data in the ProGres, resulting to overburdening the teams during data collection.

6. DISCUSSION

6.1: Nutritional status of children under-fives.

Overall representation of boys was higher than girls (sex ratio 1.2 boys to girls) ranging from 1.0 in PTP to 1.5 in Solo camp among children aged 6 to 59 months. Representation of sex ratio was with the recommended range of 0.8 to 1.2 boys to girls and thus, both sexes were equally represented. In Solo camp however, representation among boys was much higher than girls.

The global acute malnutrition rate in the four camps remained within WHO recommended standards of below 5%. The highest observed GAM was 3.2% (1.9 - 5.3; 95%CI) in PTP. The weighted prevalence of global acute malnutrition for the 2013 was nutrition survey was 2.7%.

Acute malnutrition rate based on MUAC was within acceptable level as well except in PTP camp where the rate was 5.3% (3.6 - 7.8; 95%CI). There was no severe wasting or oedema that was observed during the survey across all the camps although the overall upper limit was 1.2%.

The overall global acute malnutrition in children aged 6 – 23 months was 5.4% based on 2006 WHO growth standards. Although the nutritional status is still poor, it may indicate a slight decrease when compared to 8.5% among the same age group in the survey conducted in 2012. (See reasons in IYCF section)

Stunting is a strong indicator of chronic food insecurity or chronic malnutrition. In this survey, stunting rate among children aged 6 – 59 months was 37% in Bahn, 41% in Little Wlebo, 47% in Solo and 48% in PTP camp. The weighed prevalence of stunting for the four camps was 43.1%. In the 2012 year's survey, the overall stunting rate among the same age group was 45.2% (41.2-49.1% CI). The WHO classifies stunting rate as "very high" when $\geq 40\%$, implying that the overall stunting rate remained beyond the acceptable level according to WHO cut-off.

According to MOHSW of the National Republic of Liberia, the survey, which was conducted in June 2013, revealed a stunting rate of 49% in Grand Gedeh, 45% in Nimba and 40% in Maryland counties. The national prevalence rate stands at 36%, which was an improvement from 42% in the last four years⁸. Prevalence of stunting looks similar among Ivorian refugees and the hosting community.

Supplementary feeding programme (SFP) and out-patient therapeutic programme (OTP) remained operational throughout the reporting period. Performance and impact indicators were within normal limits. UNHCR provided ready to use nutrition items: PlumpyNut,

⁸ Liberia comprehensive food security and nutrition survey, June 2013

PlumpySup and PlumpyDoz for treatment of SAM, MAM and prevention of acute malnutrition respectively.

6.2. Programme coverage

6.2.1. Measles:

The coverage of measles vaccination was 52% in Bahn, 55% in PTP, 56% in Solo and 57 in Little Wlebo camps. In the 2012 nutrition survey, the overall coverage of measles was 68%, while in 2013 is 55%; however, HIS report indicated measles vaccination coverage of 61.2%. The coverage remained below the recommended target of 95% among children aged 9 – 59 months. This was linked to MOHSW policy where immunization coverage is calculated for infants as opposed to UNHCR, which recommends among under five children; this also leads to receipt of low quantity of antigens from the county health offices; and to poor documentation and recording of antigens in the child health book in some cases. The calculation was based on UNHCR recommendations among under five, hence gives falsely low coverage results. According to routine vaccination in the health clinics, the coverage of measles stands over and above 80% in all camps.

6.2.2. Vitamin A:

Supplementation coverage of vitamin A among under-fives was 58% in Little Wlebo, 59% in PTP, 60% in Bahn and 62% in solo camps, and thus, 59.3% overall coverage. When compared to 76% overall coverage in the last nutrition survey conducted in 2012, it may indicate a slight decrease.

The national immunization campaign, which was carried in three phases in 2013, included polio vaccination, deworming and vitamin A supplementation. The coverage of vitamin A supplementation during this campaign was above 95% in Nimba, Grand Gedeh and Maryland counties⁹. The last phase was conducted in two months prior to start of the nutrition survey and thus, the supplement was still valid and would have been reflected on the road-to-health booklets of easily recalled by parents or caretakers.

As the highest coverage in the camps was 62% in the 2013 nutrition survey as compared to the National Campaign of 95%. This may imply poor documentation and record keeping in health facilities in the camps, as well as failure to recall by some of respondents. Since some parents and caretaker could not recall, it may also imply inadequate skills imparted by health care providers during campaigns and/or inadequate knowledge of such vital supplements among refugee communities.

⁹ UNICEF Liberia SITREP # 73 [July 2013]

6.2.3. Feeding program coverage:

Feeding programme coverage based on mixed admission criteria ranged from 0 to 100% for both SFP and OTP. Similarly, the coverage based on MUAC revealed the same at SFP and OTP. Since the prevalence rate of acute malnutrition was low, probably the number children enrolled in the feeding program was also small to be captured during data collection.

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 12.4% in Solo, 20.0% in PTP, 20.6% in Bahn and 25.2% in Little Wlebo camp. The overall prevalence of diarrhoea was thus, 20.9% which indicates a slight decrease when compared to 23% in the 2012 nutrition survey.

Diarrheal diseases have never been among the top five causes of outpatient morbidity in camp clinics. In 2013 diarrhoea accounted for about 7.2% of under-five morbidity, and 2% of crude morbidity.

6.3. ANC and iron-folic acid supplementation:

The antenatal clinic coverage indicates 81% of pregnant women enrolled in the programme and 76% receiving iron folic acid supplement in PTP camp. Enrolment coverage for Bahn, Solo and Little Wlebo was 100% each, while pregnant women receiving folic acid supplement in Bahn camp was 94% and 100% in Solo and Little Wlebo camps.

Despite high ANC enrolment and 75% iron folic acid supplementation rate, this does not mean that the uptake of the supplements at home would necessarily be high too. All pregnant women need iron because a woman will become iron deficient with or without anaemia by the end of her pregnancy, if she does not take iron supplements¹⁰.

6.4. Anaemia in young children and women

Prevalence of anaemia among children aged 6 – 59 months remained critical in all camps. The rate was 73.7% (68.7-78.4) in Little Wlebo, 76.0% (71.0 - 80.5) in Bahn, 80.5% (76.5 - 84.1) in PTP and 81.7% (75.2-87.1) in Solo camp and thus, an overall prevalence of 78%. Anaemia among children aged 6 – 23 months was 78% in Little Wlebo and Bahn, 86% in PTP, 88% in Solo camps and thus, 82% overall. In the 2012 nutrition survey, the overall prevalence of anaemia in children aged 6 – 59 months across all camps was 74% and 80% in children aged 6 – 23 months. When compared, results of the two surveys indicate a slight increase in 2013 in both age groups; from 74% to 78% and 80% to 82% in children aged 6 – 59 and 6 - 23 months respectively.

Anaemia has also been reported in most of the camps through data tracking tool (HIS) which ranks it as the fifth leading cause of morbidity among under five children. Several

¹⁰ The Potential Impact of Iron Supplementation during Adolescence on Iron Status in Pregnancy, 2000

interventions were implemented following recommendations drawn out of the 2012 nutrition survey.

The prevalence of anaemia among non-pregnant women aged 15-49 years was 43.3% (31.2-56.0) in Solo, 50.0% (41.8-58.2) in Little Wlebo, 50.8% (41.6-60.0) in Bahn and 52.7% (45.3-60.0) in PTP camps. The overall prevalence of anaemia was 50%, which indicates a slight decrease when compared to the overall prevalence of 57% among the same group in the 2012 nutrition survey. Prevalence of total anaemia among children aged 6 - 59 was very high, as it was in 2012; 78% on average. The level of anaemia among women of child bearing age was 49.2%. Results among women of child bearing age group showed decreased level as compared to the 2012 survey, but still the above the acceptable level. World Health Organization recommends anaemia to not exceed 20% in the under-fives population as well as women of child bearing age.

A project was developed by UNHCR, WFP, UNICEF, and UNHCR IPs, and agreed on rolling out of the project in July 2013. Full interventions for anaemia, and stunting (chronic malnutrition) could not implement full project due to lack of resources; but instituted the following activities: Community sensitization, sensitisations on home backyard gardening and eating habits; livelihood support to communities; distribution of insecticide impregnated long lasting mosquito nets; routine supplementation of iron and folic acid and intermittent presumptive treatment of malaria to pregnant women; health education and promotion; active case finding; promotion of health seeking behaviour; and trainings to implementing partners.

Started blanket supplementation of CSB (corn soya bean blend) to pregnant and lactating women started in December 2013, targeting 1000 women.

Among interventions that were recommended was supplementary feeding for pregnant women from second trimester to six months post-delivery. This intervention could not start soon until December 2013 when resources were available. Pregnant and lactating women are now receiving super Cereal under blanket supplementary feeding programme.

The fortified blended food (CSB) in 2012 was part of refugee food basket in the general ration. The item was removed as of April 2013.

6.5. IYCF indicators

The lowest rate of initiation to breastfeeding within the first one hour was in Little Wlebo 51.6% while the highest rate was in Bahn camp at 67%. Exclusive breastfeeding ranged from 50.0% (11.8-88.2) in Solo camp to 81.6% (71.0-89.5) in Bahn camp. Consumption of iron-rich or iron-fortified foods was as lower as 1.8% (0.0-9.4) in Solo, 3.4% (1.1-7.9) in PTP, 3.4% (0.9-8.5) in Bah camp and 6.0% (3.0-10.4) in Little Wlebo camp. Bottle feeding was ranging between 2.7% (0.9-6.1) in PTP to 6.0% (3.0-10.4) in Little Wlebo camp.

The 2013 health statistics gathered through HIS indicates 97% of the total deliveries were carried out in health facilities; this might also encourage initiation breastfeeding with one hour of delivery. Ideally we could expect much higher percentage of women initiate breastfeeding than it has been shown during the survey. Contributing factors might include that, the question was not clear to respondents, or low skills on breastfeeding and IYCF package of healthcare providers attending deliveries or.

The timely initiation to breastfeeding has an influence for exclusive breastfeeding. Despite low rate for initiation, EBF indicators were all above 50% with higher level of confidence limit. This may indicate high skills among healthcare providers on EBF.

Consumption of iron-rich food or fortified food was very low among children 6 – 23 months. This could be linked to the high anaemia. Refugees were entirely dependent on the general ration as the major source of fortified or iron-rich food in their diet.

Although some of the indicators were below the expected level it is better than in the local communities in which early breastfeeding is initiated by only half of mothers while the exclusive breast feeding rate is very low at 47%. Minimum diet diversity among Liberians is extremely low at 28% for children of 6-23 months with female children consuming a less diverse diet than male. Minimum meal frequency is low at 35% for children of 6-23 months¹¹.

6.6. Food security

Results revealed over 98% of refugee families were possessing ration cards, only a few had no card majority being new arrivals. Food aid from general ration could last for an average of 21 out of 30 planned days. Majority (>80%) of the families claimed that the ration is not enough to cover the targeted period and only an average of 33% of the household could last for more than three quarter of the targeted 30 days period.

To cover the gap, family members could therefore engage in negative coping strategies. Most of the families preferred borrowing of food with expectation of reimbursement in the next distribution period. Begging of food from relatives and neighbours was the second preferred coping strategy followed by reducing both, quantity and frequency of meals as they wait for the next food distribution. Few families reported on either engaging in risky coping strategies or selling of non-food items and more than 75% reported of using none of the negative coping strategies as a result of food shortage.

Dietary diversity at household level was at around half (HDDS=6.6) of the total food groups (HDDS=12). This may imply that families are consuming half of the recommended number of food groups in a day.

¹¹ Liberia comprehensive food security and nutrition survey, June 2013

Refugees would prefer to engage in farming if government authorities could allow access to farm land and encourage donation of agricultural tools from potential actors. Improved livelihood opportunities could be an ideal approach of improving food security and thus, reduced high levels of harmful coping mechanisms.

Suspected micronutrient deficiency secondary to Riboflavin (vitamin B2) deficiency also occurred in 2012, but was controlled. In the beginning of July 2013, some cases of mouth sores (angular stomatitis) suspected to be linked with micronutrient deficiencies particularly riboflavin (Vitamin. B2) were reported from Little Wlebo camp through routine clinical consultations at the camp clinic. The cases kept on increasing in number and similar cases were reported from Solo camp. This prompted UNHCR and partners¹² to do rapid assessments in all camps; at the end of the survey in September 2013, a total of **1,451** cases were reported from all four camps. This represented that about 4% entire refugee populations residing in the camps has been affected, categorized as **“moderate”**. The most affected age group was children aged between 5 to 18 years accounting for 63% of all cases. Sex ratio of male to female was approximately 1:1 (50.3% male and 49.7% female). About 85% of the cases reported that the conditions started in the last two to three months, with few recurrent cases over the last six months. Dietary history indicated that 99% of the cases depend entirely on food aid through general ration. From the assessment findings, chronology of the onset of the symptoms and signs, the feeding habits of refugees, and the current food basket, it is suspected that this is a micronutrient deficiency, specifically Vitamin B deficiency of which riboflavin (Vitamin B2) deficiency is the most likely cause. Pending confirmation of the cause, UNHCR recommended provision of Vitamin B-complex to all cases, and the majority responded to the treatments over a course of two to eight weeks. As of the beginning of October 2013 number of cases has significantly reduced. Outpatient clinical staff in each camp were oriented on case detection and management, and surveillance was strengthened to capture all emerging cases and treat them according. Reports from the camps indicate a contained situation and a diminishing trend of active cases in all camps.

Thiamine deficiency (confirmed) also occurred in PT camp in 2012.

6.7. Water, Sanitation and Hygiene

Close to 100% of households in all camps collect water from improved sources, mainly from deep wells piped to water collection points or protected dug well with hand pumps. This shows that refugees have access to potable water. There was no water related outbreak in the refugee camps since the Ivorian refugee emergency in 2013. Standards were met in all

¹² MOHSW, CHTs, IRC, AHA, Merlin

camps¹³; average water consumption was 20.25 litres / person / day, ranging from 24 litre/per/person /day in Solo camp to 18 litres per /person /day in PTP. 70.15% of the households received ≥ 20 litres per person per day.

99.5% of households use improved drinking water sources; 91.1% of households were satisfied with drinking water supply, ranging from 82.2% (76.7-86.9) in PTP to 96.2% (91.9-98.6) in Little Wlebo camps; and 98% practice collection of safe water from either tab stand and/ or hand pump. These imply that almost all refugees have enjoyed potable drinking water from improved sources, and thus, a minimal chance of acquiring water bone diseases.

Water satisfaction is very high among refugees, however, <5% of the surveyed households were not satisfied with the supplied drinking water, the major reasons being "bad taste" followed by "bad quality". Community members prefers water collected from protected dug well hand pumps than tap stand gravitated from water reservoir tanks, since this is usually warm, and thus, chlorine can be easily tasted. There have been major constraints in sanitation activities, especially in the first half of the year due to resource shortage; however, UNHCR and partners have managed to upgrade several sanitation facilities with funding in the second half. By the end of 2013, overall the performance and quality of services in WASH have been at acceptable level. Standards were met with average of 17.8 persons / cubicle, while the UNHCR standard is 20 person / drop hole. About 80% of the refugees have improved toilet facilities, of which 1.3% was one toilet per household; 3.4% had shared family toilets, one per 2 households; and 75% of household had communal toilets (improved toilet facility, 3 households or more). In Little Wlebo camp 4.5% of the surveyed household were using one toilet by single family.

Knowledge-Aptitude-Practice (KAP) surveys were conducted in all camps; in PTP, Bahn, and Solo, the results showed signs of improvements, especially in hygiene practice; 85% of the people in PTP camp wash their hands after using the latrine; over 70% of the women use soap and water to clean food and cooking utensils; and 80% of the interviewees assessed that the houses were not heavily infested with flies.

The overall proportion of the surveyed households that were using unimproved toilet facilities was around 22%. In PTP camps for example, some of refugee said were defecating in the bush because of shortage of latrines. This could be linked with the filled latrines which needed decommissioning and replacement to maintain the same level of coverage. This however, could not be possible in the 2013 due lack of funding. There were few instances of increasing trend of diarrheal cases; however, with rigorous health messages, hygiene

¹³ The UNHCR standard is 20 litres per person per day as opposed to 15 litres for sphere.

promotion activities, case management, line listing, surveillance, and follow-up, the situation was put under control.

6.8: Mosquito nets coverage

Proportion of household owning at least one LLIN (Long lasting impregnated bed net) was 73.6% (61.9-83.3) in Solo, 76.9% (71.0-82.2) in PTP, 77.7% (70.4-84.0), in Little Wlebo and 86.4%(79.6-91.6) in Bahn camps. Bahn camp surpassed the UNHCR target of $\geq 80\%$. The average number of persons per LLIN was around 4 persons as compared to UNHCR recommendation of 2 persons per LLIN.; UNHCR planned to procure over 16,000 LLIN but UNHCR distributed only 10, 346 LLINs in 2013 due to shortage of funds. Proportion of individual sleeping under LLIN ranged from 58% to 76% in all age group, 67% to 86% among under-fives children and 62% to 82% in pregnant women. Refugees complains of heat when sleeps under mosquito net and thus do not prefers it. Health education has been conducted by both community health workers and hygiene promoters and in the camp to raise LLIN utilization rate and this has been increasing in small pace though.

7. CONCLUSIONS

- Overall the performance and quality of services in nutrition have been at acceptable levels. The prevalence of global acute malnutrition among Ivorian refugees in camps in Liberia has been contained within the recommended UNHCR and WHO standards (<5%); however, nutritional status among children aged below two years of age slightly above the maximum acceptable level, with overall global acute malnutrition of 5.4%. Stunting remained a major concern among the same group but more in older children above 2years.
- Prevalence of anaemia among children aged 6 – 59 months and non-pregnant women aged 15 – 49 years remained critical, under two years children being highly affected. The level of anaemia among younger children (6 – 23months) was almost twice as much as that of non-pregnant women. High acute malnutrition and anaemia among young children was linked to poor practice of IYCF, inadequate fortified and iron-rich food, insufficient micronutrients, as well as insufficient household dietary diversities.
- Measles vaccination and vitamin A supplementation coverage were reported low. The coverage for measles vaccination could be linked to MOHSW policy where immunization coverage is calculated for infants as opposed to UNHCR, which recommends among under five children; this also leads to receipt of low quantity of antigens from the county health offices; and to poor documentation and recording of antigens in the child health book in some cases. The calculation was based on UNHCR recommendations among under five, hence gives falsely low coverage results. .
- Food security indicators were fairly good with 100% of refugee possessing ration cards. However, the irregular food basket content and the absence of fortified food could exacerbate the existing micronutrient deficiencies and anaemia. Majority of refugee do not engage in harmful or risk activities to cover gaps as a result of inadequate food aid obtained from general ration, however, other negative coping strategies are commonly practiced. Refugees were not happy of engaging themselves in such practice if there could be an alternative ways including support to livelihood activities.
- Water, sanitation and hygiene services were within the recommended UNHCR and sphere standards. However, funding shortage could hamper WASH activities, especially sanitation, including provision of sufficient toilets and hygiene promotion activities. The sanitation aspect is yet to be very optimal (78% overall coverage), where a sizable percentage of refugee population still do not have access to improved toilet facilities according to the survey.

- Mosquito net coverage among refugee population is still below the recommended UNHCR standards; >80% of households owning at least one LLIN and an average of 2 persons sleeping under one LLIN.

8. RECOMMENDATIONS AND PRIORITIES

Immediate term:

1. UNHCR and partners should investigate the main causes of anaemia, with technical support from HQs.
2. UNHCR to start blanket supplementation of nutributter and micronutrients to children aged between 6 – 23 and 24 – 59 months respectively to reduce the critical level of anaemia and stunting.
3. Avail sufficient resources to prevent and control micronutrient deficiencies. Outbreaks of thiamine deficiency and riboflavin deficiency, though at low levels, occurred in Liberia in 2012 and in 2013 respectively.
4. UNHCR should continue providing Ready-to-Use nutrition items for nutrition programmes in refugee camps while WFP and UNICEF provides the same items for refugee residing in the host communities as well as to the locals .
5. WFP to maintain the recommended level of kilocalories / food basket in the general food ration with constant supply.
6. WFP and UNHCR to continue with blanket supplementary feeding programme for pregnant and lactating women from second trimester until 6 months post-delivery. This would address the increased requirement of both macro and micronutrients needed due to physiological changes in this target group.
7. Health partners should provide continued and increased awareness on proper use of the supplementary foods including green leafy vegetables through household visits, education, and mother-to-mother support groups.
8. Improve documentation of Vitamin A supplementation and measles vaccinations in child health books.
9. Start calculation of vaccination among infants rather than among under-fives children. This is possible as the camps are in stable situation and should abide to MOHSW policy.
10. Continue and strengthen prevention and control activities as well as effective case management of malaria cases to contribute to the reduction the alarming level of anaemia among children. Ensure adequate amount of rapid diagnostic supplies for malaria and anaemia are provided partners in a timely manner.
11. WASH and health partners to continue sensitizing the communities on importance of mosquito nets to ensure high retention and proper utilization.

12. Continue strengthening antenatal and postnatal services at the clinics including enrolment and management of pregnant women and lactating mothers and provision of iron and folic acid supplements, intermittent presumptive treatment for malaria, and reproductive health education.

Medium term:

8. Health partners to plan and conduct KAP surveys on IYCF to assess complementary feeding practices among children aged 6-23 months, including local and traditional behaviours that may have negative impact on health and nutrition status.
9. UNHCR to procure and supply sufficient LLIN to cover the gap of about 21% deficit and reduce the current average of 4 persons sleeping under one LLIN to 2 persons.
10. UNHCR in collaboration with WASH partners to increase the number of household drinking water storage containers for refugees to ensure protection of water contamination at household level.
11. UNHCR and WASH partners to source adequate funds to improve coverage and maintenance of sanitation facilities through decommissioning of filled latrines and replace with new ones.
12. Livelihood partners in collaboration with health partners to be mandated for improvement of dietary diversity at household level, including continued scale-up of backyard home gardening, poultry and related projects, provision of seeds, training and technical support.
13. UNHCR and health partners to start implementing the onsite food basket monitoring during general ration distribution to ensure the actual ration delivered to beneficiaries.
14. Health partners should continue with the on-job training to relevant staffs on IMAM/CMAM, anaemia, IYCF skills, malaria etc., so as to improve knowledge among healthcare providers.

Long term:

4. UNHCR to continue pursuing the Government of Liberia for acquisition of land that will be used for cultivation for refugees. Food crops will be used to increase income and to complement general food ration.
5. UNHCR and partners to implement prevention and control of malaria through “epidemiologic triad” approach targeting host, agent and environment, which include; increased distribution of bed nets, indoor residual spraying (IRS), and timely diagnosis and treatment of cases. IRS has not been sufficiently carried out in refugee camps except in Bahn in 2011.
6. Conduct standardised nutrition surveys in refugee camps on annual intervals to ensure continued monitoring of trends and to plan interventions accordingly.

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11. APPENDICES

Appendix 1: SMART Plausibility Check Report

Overall data quality for Bahn camp

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	Score
Missing/Flagged data (% of in-range subjects)	Incl	%	0-2.5 0	>2.5-5.0 5	>5.0-10 10	>10 20	0 (2.4 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<0.000 10	0 (p=0.202)
Overall Age distrib (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<0.000 10	0 (p=0.244)
Dig pref score - weight	Incl	#	0-5 0	5-10 2	10-20 4	> 20 10	0 (4)
Dig pref score - height	Incl	#	0-5 0	5-10 2	10-20 4	> 20 10	10 (29)
Standard Dev WHZ	Excl	SD	<1.1 0	<1.15 2	<1.20 6	>1.20 20	0 (1.02)
Skewness WHZ	Excl	#	<±1.0 0	<±2.0 1	<±3.0 3	>±3.0 5	0 (-0.21)
Kurtosis WHZ	Excl	#	<±1.0 0	<±2.0 1	<±3.0 3	>±3.0 5	0 (-0.09)
Poisson dist WHZ-2	Excl	p	>0.05 0	>0.01 1	>0.001 3	<0.000 5	0 (p=)
Timing	Excl	Not determined yet					
			0	1	3	5	
OVERALL SCORE WHZ =			0-5	5-10	10-15	>15	10 %

At the moment the overall score of this survey is 10 %, this is good.

Overall data quality for PTP

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	Score
Missing/Flagged data (% of in-range subjects)	Incl	%	0-2.5 0	>2.5-5.0 5	>5.0-10 10	>10 20	5 (3.5 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<0.000 10	0 (p=0.849)
Overall Age distrib (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<0.000 10	0 (p=0.621)
Dig pref score - weight	Incl	#	0-5 0	5-10 2	10-20 4	> 20 10	0 (5)
Dig pref score - height	Incl	#	0-5 0	5-10 2	10-20 4	> 20 10	4 (12)
Standard Dev WHZ	Excl	SD	<1.1 0	<1.15 2	<1.20 6	>1.20 20	2 (1.10)
Skewness WHZ	Excl	#	<±1.0 0	<±2.0 1	<±3.0 3	>±3.0 5	0 (-0.03)
Kurtosis WHZ	Excl	#	<±1.0 0	<±2.0 1	<±3.0 3	>±3.0 5	0 (-0.24)
Poisson dist WHZ-2	Excl	p	>0.05 0	>0.01 1	>0.001 3	<0.000 5	0 (p=)
Timing	Excl	Not determined yet					
			0	1	3	5	
OVERALL SCORE WHZ =			0-5	5-10	10-15	>15	11 %

At the moment the overall score of this survey is 11 %, this is acceptable.

Overall data quality for Solo camp

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	Score
Missing/Flagged data (% of in-range subjects)	Incl	%	0-2.5	>2.5-5.0	>5.0-10	>10	0 (1.7 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1	>0.05	>0.001	<0.000	4 (p=0.005)
Overall Age distrib (Significant chi square)	Incl	p	>0.1	>0.05	>0.001	<0.000	2 (p=0.075)
Dig pref score - weight	Incl	#	0-5	5-10	10-20	> 20	2 (7)
Dig pref score - height	Incl	#	0-5	5-10	10-20	> 20	2 (6)
Standard Dev WHZ	Excl	SD	<1.1	<1.15	<1.20	>1.20	0 (1.05)
Skewness WHZ	Excl	#	<±1.0	<±2.0	<±3.0	>±3.0	0 (0.02)
Kurtosis WHZ	Excl	#	<±1.0	<±2.0	<±3.0	>±3.0	0 (-0.05)
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<0.000	0 (p=)
Timing	Excl	Not	determined	yet			
OVERALL SCORE WHZ =			0-5	5-10	10-15	>15	10 %

At the moment the overall score of this survey is 10 %, this is good.

Overall data quality for Little Wlebo camp

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	Score
Missing/Flagged data (% of in-range subjects)	Incl	%	0-2.5	>2.5-5.0	>5.0-10	>10	0 (1.5 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1	>0.05	>0.001	<0.000	0 (p=0.448)
Overall Age distrib (Significant chi square)	Incl	p	>0.1	>0.05	>0.001	<0.000	4 (p=0.008)
Dig pref score - weight	Incl	#	0-5	5-10	10-20	> 20	2 (7)
Dig pref score - height	Incl	#	0-5	5-10	10-20	> 20	4 (11)
Standard Dev WHZ	Excl	SD	<1.1	<1.15	<1.20	>1.20	0 (1.06)
Skewness WHZ	Excl	#	<±1.0	<±2.0	<±3.0	>±3.0	0 (-0.04)
Kurtosis WHZ	Excl	#	<±1.0	<±2.0	<±3.0	>±3.0	0 (-0.17)
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<0.000	0 (p=)
Timing	Excl	Not	determined	yet			
OVERALL SCORE WHZ =			0-5	5-10	10-15	>15	10 %

At the moment the overall score of this survey is 10 %, this is good.

Appendix 2: Name of Contributors

Survey coordination, supervision and technical team	Survey Team Leaders	Overall team members
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Survey Enumerators		
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Appendix 3: Result Tables for NCHS growth reference 1977

Bah camp

Table 3.2: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex

	All n = 326	Boys n = 174	Girls n = 152
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(9) 2.8 % (1.5 - 5.2 95% C.I.)	(5) 2.9 % (1.2 - 6.5 95% C.I.)	(4) 2.6 % (1.0 - 6.6 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(9) 2.8 % (1.5 - 5.2 95% C.I.)	(5) 2.9 % (1.2 - 6.5 95% C.I.)	(4) 2.6 % (1.0 - 6.6 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(0) 0.0 % (0.0 - 1.2 95% C.I.)	(0) 0.0 % (0.0 - 2.2 95% C.I.)	(0) 0.0 % (0.0 - 2.5 95% C.I.)

The prevalence of oedema is 0.0 %

Table 3.3: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema

Age (months)	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	117	0	0.0	7	6.0	110	94.0	0	0.0
24-29	45	0	0.0	1	2.2	44	97.8	0	0.0
30-41	70	0	0.0	0	0.0	70	100.0	0	0.0
42-53	57	0	0.0	1	1.8	56	98.2	0	0.0
54-59	28	0	0.0	0	0.0	28	100.0	0	0.0
Total	317	0	0.0	9	2.8	308	97.2	0	0.0

Table 3.4: 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. 3 (0.9 %)	Not severely malnourished No. 330 (99.1 %)

Table 3.5: Prevalence of acute malnutrition based on MUAC cut offs (and/or oedema) and by sex

	All n = 334	Boys n = 177	Girls n = 157
Prevalence of global malnutrition (< 125 mm and/or oedema)	(3) 0.9 % (0.3 - 2.6 95% C.I.)	(2) 1.1 % (0.3 - 4.0 95% C.I.)	(1) 0.6 % (0.1 - 3.5 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(3) 0.9 % (0.3 - 2.6 95% C.I.)	(2) 1.1 % (0.3 - 4.0 95% C.I.)	(1) 0.6 % (0.1 - 3.5 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(0) 0.0 % (0.0 - 1.1 95% C.I.)	(0) 0.0 % (0.0 - 2.1 95% C.I.)	(0) 0.0 % (0.0 - 2.4 95% C.I.)

Table 3.6: Prevalence of acute malnutrition by age, based on MUAC cut offs and/or oedema

Age (months)	Total no.	Severe wasting (< 115 mm)		Moderate wasting (>= 115 mm and < 125 mm)		Normal (>= 125 mm)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-23	120	0	0.0	3	2.5	117	97.5	0	0.0
24-29	46	0	0.0	0	0.0	46	100.0	0	0.0

30-41	71	0	0.0	0	0.0	71	100.0	0	0.0
42-53	59	0	0.0	0	0.0	59	100.0	0	0.0
54-59	29	0	0.0	0	0.0	29	100.0	0	0.0
Total	325	0	0.0	3	0.9	322	99.1	0	0.0

Table 3.5: Prevalence of acute malnutrition based on the percentage of the median and/or oedema

	n = 326
Prevalence of global acute malnutrition (<80% and/or oedema)	(4) 1.2 % (0.5 - 3.1 95% C.I.)
Prevalence of moderate acute malnutrition (<80% and >= 70%, no oedema)	(4) 1.2 % (0.5 - 3.1 95% C.I.)
Prevalence of severe acute malnutrition (<70% and/or oedema)	(0) 0.0 % (0.0 - 1.2 95% C.I.)

Table 3.6: Prevalence of malnutrition by age, based on weight-for-height percentage of the median and oedema

Age (months)	Total no.	Severe wasting (<70% median)		Moderate wasting (>=70% and <80% median)		Normal (>=80% median)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-23	117	0	0.0	4	3.4	113	96.6	0	0.0
24-29	45	0	0.0	0	0.0	45	100.0	0	0.0
30-41	70	0	0.0	0	0.0	70	100.0	0	0.0
42-53	57	0	0.0	0	0.0	57	100.0	0	0.0
54-59	28	0	0.0	0	0.0	28	100.0	0	0.0
Total	317	0	0.0	4	1.3	313	98.7	0	0.0

Table 3.7: Prevalence of underweight based on weight-for-age z-scores by sex

	All n = 322	Boys n = 173	Girls n = 149
Prevalence of underweight (<-2 z-score)	(62) 19.3 % (15.3 - 23.9 95% C.I.)	(37) 21.4 % (15.9 - 28.1 95% C.I.)	(25) 16.8 % (11.6 - 23.6 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and ≥-3 z-score)	(55) 17.1 % (13.4 - 21.6 95% C.I.)	(32) 18.5 % (13.4 - 24.9 95% C.I.)	(23) 15.4 % (10.5 - 22.1 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(7) 2.2 % (1.1 - 4.4 95% C.I.)	(5) 2.9 % (1.2 - 6.6 95% C.I.)	(2) 1.3 % (0.4 - 4.8 95% C.I.)

Table 3.8: Prevalence of underweight by age, based on weight-for-age z-scores

Age (months)	Total no.	Severe underweight (<-3 z-score)		Moderate underweight (≥-3 and <-2 z-score)		Normal (≥-2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-23	119	4	3.4	22	18.5	93	78.2	0	0.0
24-29	45	0	0.0	10	22.2	35	77.8	0	0.0
30-41	71	1	1.4	6	8.5	64	90.1	0	0.0
42-53	58	0	0.0	11	19.0	47	81.0	0	0.0
54-59	29	2	6.9	6	20.7	21	72.4	0	0.0
Total	322	7	2.2	55	17.1	260	80.7	0	0.0

Table 3.9: Prevalence of stunting based on height-for-age z-scores and by sex

	All n = 307	Boys n = 163	Girls n = 144
Prevalence of stunting (<-2 z-score)	(96) 31.3 % (26.3 - 36.7 95% C.I.)	(53) 32.5 % (25.8 - 40.0 95% C.I.)	(43) 29.9 % (23.0 - 37.8 95% C.I.)
Prevalence of moderate stunting	(70) 22.8 %	(41) 25.2 %	(29) 20.1 %

(<-2 z-score and ≥-3 z-score)	(18.5 - 27.8 95% C.I.)	(19.1 - 32.3 95% C.I.)	(14.4 - 27.4 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(26) 8.5 % (5.8 - 12.1 95% C.I.)	(12) 7.4 % (4.3 - 12.4 95% C.I.)	(14) 9.7 % (5.9 - 15.7 95% C.I.)

Table 3.10: Prevalence of stunting by age based on height-for-age z-scores

Age (mont hs)	Total no.	Severe stunting (<-3 z-score)		Moderate stunting (≥ -3 and <-2 z-score)		Normal (≥ -2 z score)	
		No.	%	No.	%	No.	%
6-23	114	4	3.5	26	22.8	84	73.7
24-29	43	1	2.3	8	18.6	34	79.1
30-41	68	7	10.3	10	14.7	51	75.0
42-53	56	9	16.1	12	21.4	35	62.5
54-59	26	5	19.2	14	53.8	7	26.9
Total	307	26	8.5	70	22.8	211	68.7

Table 3.13: Mean z-scores, Design Effects and excluded subjects

Indicator	n	Mean z- scores \pm SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for- Height	326	-0.18 \pm 0.92	1.00	1	7
Weight-for-Age	322	-1.04 \pm 1.07	1.00	9	3
Height-for-Age	307	-1.44 \pm 1.20	1.00	10	17

* contains for WHZ and WAZ the children with edema.

PTP Camp

Table 3.2: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex

	All n = 440	Boys n = 221	Girls n = 219
Prevalence of global malnutrition (< -2 z-score and/or oedema)	(14) 3.2 % (1.9 - 5.3 95% C.I.)	(8) 3.6 % (1.8 - 7.0 95% C.I.)	(6) 2.7 % (1.3 - 5.8 95% C.I.)
Prevalence of moderate malnutrition (< -2 z-score and ≥ -3 z-score, no oedema)	(14) 3.2 % (1.9 - 5.3 95% C.I.)	(8) 3.6 % (1.8 - 7.0 95% C.I.)	(6) 2.7 % (1.3 - 5.8 95% C.I.)
Prevalence of severe malnutrition (< -3 z-score and/or oedema)	(0) 0.0 % (0.0 - 0.9 95% C.I.)	(0) 0.0 % (0.0 - 1.7 95% C.I.)	(0) 0.0 % (0.0 - 1.7 95% C.I.)

The prevalence of oedema is 0.0 %

Table 3.3: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema

Age (months)	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	143	0	0.0	10	7.0	133	93.0	0	0.0
24-29	54	0	0.0	1	1.9	53	98.1	0	0.0
30-41	96	0	0.0	2	2.1	94	97.9	0	0.0
42-53	97	0	0.0	1	1.0	96	99.0	0	0.0
54-59	39	0	0.0	0	0.0	39	100.0	0	0.0
Total	429	0	0.0	14	3.3	415	96.7	0	0.0

Table 3.4: Distribution of acute malnutrition and oedema based on weight-for-height z-scores

	< -3 z-score	≥ -3 z-score
Oedema present	Marasmic kwashiorkor	Kwashiorkor

	No. 0 (0.0 %)	No. 0 (0.0 %)
Oedema absent	Marasmic No. 4 (0.9 %)	Not severely malnourished No. 448 (99.1 %)

Table 3.5: Prevalence of acute malnutrition based on MUAC cut offs (and/or oedema) and by sex

	All n = 453	Boys n = 225	Girls n = 228
Prevalence of global malnutrition (< 125 mm and/or oedema)	(24) 5.3 % (3.6 - 7.8 95% C.I.)	(11) 4.9 % (2.8 - 8.5 95% C.I.)	(13) 5.7 % (3.4 - 9.5 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and ≥ 115 mm, no oedema)	(20) 4.4 % (2.9 - 6.7 95% C.I.)	(7) 3.1 % (1.5 - 6.3 95% C.I.)	(13) 5.7 % (3.4 - 9.5 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(4) 0.9 % (0.3 - 2.2 95% C.I.)	(4) 1.8 % (0.7 - 4.5 95% C.I.)	(0) 0.0 % (0.0 - 1.7 95% C.I.)

Table 3.6: Prevalence of acute malnutrition by age, based on MUAC cut offs and/or oedema

Age (months)	Total no.	Severe wasting (< 115 mm)		Moderate wasting (≥ 115 mm and < 125 mm)		Normal (≥ 125 mm)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-23	148	3	2.0	16	10.8	129	87.2	0	0.0
24-29	56	0	0.0	2	3.6	54	96.4	0	0.0
30-41	99	1	1.0	2	2.0	96	97.0	0	0.0
42-53	100	0	0.0	0	0.0	100	100.0	0	0.0
54-59	39	0	0.0	0	0.0	39	100.0	0	0.0
Total	442	4	0.9	20	4.5	418	94.6	0	0.0

Table 3.5: Prevalence of acute malnutrition based on the percentage of the median and/or oedema

	n = 440
Prevalence of global acute malnutrition (<80% and/or oedema)	(9) 2.0 % (1.1 - 3.8 95% C.I.)
Prevalence of moderate acute malnutrition (<80% and \geq 70%, no oedema)	(9) 2.0 % (1.1 - 3.8 95% C.I.)
Prevalence of severe acute malnutrition (<70% and/or oedema)	(0) 0.0 % (0.0 - 0.9 95% C.I.)

Table 3.6: Prevalence of malnutrition by age, based on weight-for-height percentage of the median and oedema

Age (months)	Total no.	Severe wasting (<70% median)		Moderate wasting (\geq 70% and <80% median)		Normal (\geq 80% median)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-23	143	0	0.0	7	4.9	136	95.1	0	0.0
24-29	54	0	0.0	1	1.9	53	98.1	0	0.0
30-41	96	0	0.0	1	1.0	95	99.0	0	0.0
42-53	97	0	0.0	0	0.0	97	100.0	0	0.0
54-59	39	0	0.0	0	0.0	39	100.0	0	0.0
Total	429	0	0.0	9	2.1	420	97.9	0	0.0

Table 3.7: Prevalence of underweight based on weight-for-age z-scores by sex

	All n = 430	Boys n = 218	Girls n = 212
Prevalence of underweight (<-2 z-score)	(109) 25.3 % (21.5 - 29.7 95% C.I.)	(56) 25.7 % (20.3 - 31.9 95% C.I.)	(53) 25.0 % (19.7 - 31.2 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and \geq -3 z-score)	(77) 17.9 % (14.6 - 21.8	(38) 17.4 % (13.0 - 23.0	(39) 18.4 % (13.8 - 24.2 95%

	95% C.I.)	95% C.I.)	C.I.)
Prevalence of severe underweight (< -3 z-score)	(32) 7.4 % (5.3 - 10.3 95% C.I.)	(18) 8.3 % (5.3 - 12.7 95% C.I.)	(14) 6.6 % (4.0 - 10.8 95% C.I.)

Table 3.8: Prevalence of underweight by age, based on weight-for-age z-scores

Age (months)	Total no.	Severe underweight (< -3 z-score)		Moderate underweight (≥ -3 and < -2 z- score)		Normal (≥ -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-23	143	12	8.4	29	20.3	102	71.3	0	0.0
24-29	53	6	11.3	9	17.0	38	71.7	0	0.0
30-41	97	6	6.2	21	21.6	70	72.2	0	0.0
42-53	98	6	6.1	11	11.2	81	82.7	0	0.0
54-59	39	2	5.1	7	17.9	30	76.9	0	0.0
Total	430	32	7.4	77	17.9	321	74.7	0	0.0

Table 3.9: Prevalence of stunting based on height-for-age z-scores and by sex

	All n = 395	Boys n = 201	Girls n = 194
Prevalence of stunting (< -2 z-score)	(174) 44.1 % (39.2 - 49.0 95% C.I.)	(78) 38.8 % (32.3 - 45.7 95% C.I.)	(96) 49.5 % (42.5 - 56.5 95% C.I.)
Prevalence of moderate stunting (< -2 z-score and ≥ -3 z-score)	(98) 24.8 % (20.8 - 29.3 95% C.I.)	(43) 21.4 % (16.3 - 27.6 95% C.I.)	(55) 28.4 % (22.5 - 35.1 95% C.I.)
Prevalence of severe stunting (< -3 z-score)	(76) 19.2 % (15.7 - 23.4 95% C.I.)	(35) 17.4 % (12.8 - 23.3 95% C.I.)	(41) 21.1 % (16.0 - 27.4 95% C.I.)

Table 3.10: Prevalence of stunting by age based on height-for-age z-scores

	Severe stunting	Moderate stunting	Normal
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Age (months)	Total no.	(<-3 z-score)		(>= -3 and <-2 z-score)		(> = -2 z score)	
		No.	%	No.	%	No.	%
6-23	136	14	10.3	30	22.1	92	67.6
24-29	48	10	20.8	9	18.8	29	60.4
30-41	83	18	21.7	22	26.5	43	51.8
42-53	91	21	23.1	27	29.7	43	47.3
54-59	37	13	35.1	10	27.0	14	37.8
Total	395	76	19.2	98	24.8	221	55.9

Table 3.13: Mean z-scores, Design Effects and excluded subjects

Indicator	n	Mean z-scores \pm SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	440	-0.25 \pm 0.97	1.00	1	12
Weight-for-Age	430	-1.26 \pm 1.11	1.00	11	12
Height-for-Age	395	-1.79 \pm 1.28	1.00	12	46

* contains for WHZ and WAZ the children with oedema.

Solo camp

Table 3.2: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex

	All n = 172	Boys n = 104	Girls n = 68
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(1) 0.6 % (0.1 - 3.2 95% C.I.)	(0) 0.0 % (0.0 - 3.6 95% C.I.)	(1) 1.5 % (0.3 - 7.9 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(1) 0.6 % (0.1 - 3.2 95% C.I.)	(0) 0.0 % (0.0 - 3.6 95% C.I.)	(1) 1.5 % (0.3 - 7.9 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(0) 0.0 % (0.0 - 2.2 95% C.I.)	(0) 0.0 % (0.0 - 3.6 95% C.I.)	(0) 0.0 % (0.0 - 5.3 95% C.I.)

The prevalence of oedema is 0.0 %

Table 3.3: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema

Age (mont hs)	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	57	0	0.0	0	0.0	57	100.0	0	0.0
24-29	20	0	0.0	0	0.0	20	100.0	0	0.0
30-41	53	0	0.0	1	1.9	52	98.1	0	0.0
42-53	29	0	0.0	0	0.0	29	100.0	0	0.0
54-59	13	0	0.0	0	0.0	13	100.0	0	0.0
Total	172	0	0.0	1	0.6	171	99.4	0	0.0

Table 3.4: 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. 1 (0.6 %)	Not severely malnourished No. 174 (99.4 %)

Table 3.5: Prevalence of acute malnutrition based on MUAC cut offs (and/or oedema) and by sex

	All n = 175	Boys n = 106	Girls n = 69
Prevalence of global malnutrition (< 125 mm and/or oedema)	(7) 4.0 % (2.0 - 8.0 95% C.I.)	(4) 3.8 % (1.5 - 9.3 95% C.I.)	(3) 4.3 % (1.5 - 12.0 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(5) 2.9 % (1.2 - 6.5 95% C.I.)	(2) 1.9 % (0.5 - 6.6 95% C.I.)	(3) 4.3 % (1.5 - 12.0 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(2) 1.1 % (0.3 - 4.1 95% C.I.)	(2) 1.9 % (0.5 - 6.6 95% C.I.)	(0) 0.0 % (0.0 - 5.3 95% C.I.)

Table 3.6: Prevalence of acute malnutrition by age, based on MUAC cut offs and/or oedema

Age (months)	Total no.	Severe wasting (< 115 mm)		Moderate wasting (>= 115 mm and < 125 mm)		Normal (>= 125 mm)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-23	58	1	1.7	3	5.2	54	93.1	0	0.0
24-29	20	1	5.0	1	5.0	18	90.0	0	0.0
30-41	53	0	0.0	1	1.9	52	98.1	0	0.0
42-53	30	0	0.0	0	0.0	30	100.0	0	0.0

54-59	14	0	0.0	0	0.0	14	100.0	0	0.0
Total	175	2	1.1	5	2.9	168	96.0	0	0.0

Table 3.5: Prevalence of acute malnutrition based on the percentage of the median and/or oedema

	n = 172
Prevalence of global acute malnutrition (<80% and/or oedema)	(1) 0.6 % (0.1 - 3.2 95% C.I.)
Prevalence of moderate acute malnutrition (<80% and >= 70%, no oedema)	(1) 0.6 % (0.1 - 3.2 95% C.I.)
Prevalence of severe acute malnutrition (<70% and/or oedema)	(0) 0.0 % (0.0 - 2.2 95% C.I.)

Table 3.6: Prevalence of malnutrition by age, based on weight-for-height percentage of the median and oedema

Age (months)	Total no.	Severe wasting (<70% median)		Moderate wasting (>=70% and <80% median)		Normal (>=80% median)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-23	57	0	0.0	0	0.0	57	100.0	0	0.0
24-29	20	0	0.0	0	0.0	20	100.0	0	0.0
30-41	53	0	0.0	1	1.9	52	98.1	0	0.0
42-53	29	0	0.0	0	0.0	29	100.0	0	0.0
54-59	13	0	0.0	0	0.0	13	100.0	0	0.0
Total	172	0	0.0	1	0.6	171	99.4	0	0.0

Table 3.7: Prevalence of underweight based on weight-for-age z-scores by sex

	All n = 172	Boys n = 103	Girls n = 69
Prevalence of underweight	(34) 19.8 %	(26) 25.2 %	(8) 11.6 %

(<-2 z-score)	(14.5 - 26.4 95% C.I.)	(17.8 - 34.4 95% C.I.)	(6.0 - 21.2 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and ≥-3 z-score)	(30) 17.4 % (12.5 - 23.8 95% C.I.)	(23) 22.3 % (15.4 - 31.3 95% C.I.)	(7) 10.1 % (5.0 - 19.5 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(4) 2.3 % (0.9 - 5.8 95% C.I.)	(3) 2.9 % (1.0 - 8.2 95% C.I.)	(1) 1.4 % (0.3 - 7.8 95% C.I.)

Table 3.8: Prevalence of underweight by age, based on weight-for-age z-scores

Age (months)	Total no.	Severe underweight (<-3 z-score)		Moderate underweight (≥-3 and <-2 z-score)		Normal (≥-2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-23	57	1	1.8	12	21.1	44	77.2	0	0.0
24-29	19	2	10.5	2	10.5	15	78.9	0	0.0
30-41	52	1	1.9	10	19.2	41	78.8	0	0.0
42-53	30	0	0.0	3	10.0	27	90.0	0	0.0
54-59	14	0	0.0	3	21.4	11	78.6	0	0.0
Total	172	4	2.3	30	17.4	138	80.2	0	0.0

Table 3.9: Prevalence of stunting based on height-for-age z-scores and by sex

	All n = 163	Boys n = 98	Girls n = 65
Prevalence of stunting (<-2 z-score)	(63) 38.7 % (31.5 - 46.3 95% C.I.)	(42) 42.9 % (33.5 - 52.7 95% C.I.)	(21) 32.3 % (22.2 - 44.4 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and ≥-3 z-score)	(44) 27.0 % (20.8 - 34.3 95% C.I.)	(26) 26.5 % (18.8 - 36.0 95% C.I.)	(18) 27.7 % (18.3 - 39.6 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(19) 11.7 % (7.6 - 17.5	(16) 16.3 % (10.3 - 24.9	(3) 4.6 % (1.6 - 12.7

	95% C.I.)	95% C.I.)	95% C.I.)
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Table 3.10: Prevalence of stunting by age based on height-for-age z-scores

Age (months)	Total no.	Severe stunting (< -3 z-score)		Moderate stunting (≥ -3 and < -2 z-score)		Normal (≥ -2 z score)	
		No.	%	No.	%	No.	%
6-23	55	0	0.0	15	27.3	40	72.7
24-29	17	2	11.8	8	47.1	7	41.2
30-41	50	10	20.0	12	24.0	28	56.0
42-53	28	5	17.9	6	21.4	17	60.7
54-59	13	2	15.4	3	23.1	8	61.5
Total	163	19	11.7	44	27.0	100	61.3

Table 3.13: Mean z-scores, Design Effects and excluded subjects

Indicator	n	Mean z-scores \pm SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	172	-0.07 \pm 0.88	1.00	0	3
Weight-for-Age	172	-1.04 \pm 1.05	1.00	0	3
Height-for-Age	163	-1.65 \pm 1.23	1.00	0	12

* contains for WHZ and WAZ the children with oedema.

Little Wlebo Camp

Table 3.2: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex

	All n = 336	Boys n = 176	Girls n = 160
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(9) 2.7 % (1.4 - 5.0 95% C.I.)	(4) 2.3 % (0.9 - 5.7 95% C.I.)	(5) 3.1 % (1.3 - 7.1 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and ≥-3 z-score, no oedema)	(8) 2.4 % (1.2 - 4.6 95% C.I.)	(4) 2.3 % (0.9 - 5.7 95% C.I.)	(4) 2.5 % (1.0 - 6.3 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(1) 0.3 % (0.1 - 1.7 95% C.I.)	(0) 0.0 % (0.0 - 2.1 95% C.I.)	(1) 0.6 % (0.1 - 3.5 95% C.I.)

The prevalence of oedema is 0.0 %

Table 3.3: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema

Age (months)	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	142	1	0.7	6	4.2	135	95.1	0	0.0
24-29	36	0	0.0	1	2.8	35	97.2	0	0.0
30-41	70	0	0.0	1	1.4	69	98.6	0	0.0
42-53	71	0	0.0	0	0.0	71	100.0	0	0.0
54-59	17	0	0.0	0	0.0	17	100.0	0	0.0
Total	336	1	0.3	8	2.4	327	97.3	0	0.0

Table 3.4: 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. 1 (0.3 %)	Not severely malnourished No. 339 (99.7 %)

Table 3.5: Prevalence of acute malnutrition based on MUAC cut offs (and/or oedema) and by sex

	All n = 340	Boys n = 177	Girls n = 163
Prevalence of global malnutrition (< 125 mm and/or oedema)	(11) 3.2 % (1.8 - 5.7 95% C.I.)	(3) 1.7 % (0.6 - 4.9 95% C.I.)	(8) 4.9 % (2.5 - 9.4 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(9) 2.6 % (1.4 - 5.0 95% C.I.)	(3) 1.7 % (0.6 - 4.9 95% C.I.)	(6) 3.7 % (1.7 - 7.8 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(2) 0.6 % (0.2 - 2.1 95% C.I.)	(0) 0.0 % (0.0 - 2.1 95% C.I.)	(2) 1.2 % (0.3 - 4.4 95% C.I.)

Table 3.6: Prevalence of acute malnutrition by age, based on MUAC cut offs and/or oedema

Age (months)	Total no.	Severe wasting (< 115 mm)		Moderate wasting (>= 115 mm and < 125 mm)		Normal (>= 125 mm)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-23	143	2	1.4	8	5.6	133	93.0	0	0.0
24-29	36	0	0.0	1	2.8	35	97.2	0	0.0
30-41	71	0	0.0	0	0.0	71	100.0	0	0.0
42-53	71	0	0.0	0	0.0	71	100.0	0	0.0
54-59	19	0	0.0	0	0.0	19	100.0	0	0.0
Total	340	2	0.6	9	2.6	329	96.8	0	0.0

Table 3.5: Prevalence of acute malnutrition based on the percentage of the median and/or oedema

	n = 336
Prevalence of global acute malnutrition (<80% and/or oedema)	(5) 1.5 % (0.6 - 3.4 95% C.I.)
Prevalence of moderate acute malnutrition (<80% and >= 70%, no oedema)	(5) 1.5 % (0.6 - 3.4 95% C.I.)
Prevalence of severe acute malnutrition (<70% and/or oedema)	(0) 0.0 % (0.0 - 1.1 95% C.I.)

Table 3.6: Prevalence of malnutrition by age, based on weight-for-height percentage of the median and oedema

Age (months)	Total no.	Severe wasting (<70% median)		Moderate wasting (>=70% and <80% median)		Normal (>=80% median)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-23	142	0	0.0	5	3.5	137	96.5	0	0.0
24-29	36	0	0.0	0	0.0	36	100.0	0	0.0
30-41	70	0	0.0	0	0.0	70	100.0	0	0.0
42-53	71	0	0.0	0	0.0	71	100.0	0	0.0
54-59	17	0	0.0	0	0.0	17	100.0	0	0.0
Total	336	0	0.0	5	1.5	331	98.5	0	0.0

Table 3.7: Prevalence of underweight based on weight-for-age z-scores by sex

	All n = 334	Boys n = 176	Girls n = 158
Prevalence of underweight (<-2 z-score)	(79) 23.7 % (19.4 - 28.5 95% C.I.)	(43) 24.4 % (18.7 - 31.3 95% C.I.)	(36) 22.8 % (16.9 - 29.9 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(62) 18.6 % (14.8 - 23.1 95% C.I.)	(33) 18.8 % (13.7 - 25.2 95% C.I.)	(29) 18.4 % (13.1 - 25.1 95% C.I.)

Prevalence of severe underweight (<-3 z-score)	(17) 5.1 % (3.2 - 8.0 95% C.I.)	(10) 5.7 % (3.1 - 10.1 95% C.I.)	(7) 4.4 % (2.2 - 8.9 95% C.I.)
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Table 3.8: Prevalence of underweight by age, based on weight-for-age z-scores

Age (months)	Total no.	Severe underweight (<-3 z-score)		Moderate underweight (>= -3 and <-2 z-score)		Normal (>= -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-23	141	7	5.0	26	18.4	108	76.6	0	0.0
24-29	33	3	9.1	7	21.2	23	69.7	0	0.0
30-41	70	4	5.7	16	22.9	50	71.4	0	0.0
42-53	71	2	2.8	11	15.5	58	81.7	0	0.0
54-59	19	1	5.3	2	10.5	16	84.2	0	0.0
Total	334	17	5.1	62	18.6	255	76.3	0	0.0

Table 3.9: Prevalence of stunting based on height-for-age z-scores and by sex

	All n = 312	Boys n = 163	Girls n = 149
Prevalence of stunting (<-2 z-score)	(108) 34.6 % (29.6 - 40.1 95% C.I.)	(57) 35.0 % (28.1 - 42.6 95% C.I.)	(51) 34.2 % (27.1 - 42.2 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(75) 24.0 % (19.6 - 29.1 95% C.I.)	(40) 24.5 % (18.6 - 31.7 95% C.I.)	(35) 23.5 % (17.4 - 30.9 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(33) 10.6 % (7.6 - 14.5 95% C.I.)	(17) 10.4 % (6.6 - 16.1 95% C.I.)	(16) 10.7 % (6.7 - 16.7 95% C.I.)

Table 3.10: Prevalence of stunting by age based on height-for-age z-scores

	Severe stunting (<-3 z-score)	Moderate stunting (>= -3 and <-2 z-score)	Normal (>= -2 z score)
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Age (months)	Total no.			score)			
		No.	%	No.	%	No.	%
6-23	137	5	3.6	33	24.1	99	72.3
24-29	29	3	10.3	8	27.6	18	62.1
30-41	64	7	10.9	18	28.1	39	60.9
42-53	67	16	23.9	12	17.9	39	58.2
54-59	15	2	13.3	4	26.7	9	60.0
Total	312	33	10.6	75	24.0	204	65.4

Table 3.13: Mean z-scores, Design Effects and excluded subjects

Indicator	n	Mean z-scores \pm SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	336	-0.27 \pm 0.95	1.00	0	4
Weight-for-Age	334	-1.13 \pm 1.13	1.00	0	6
Height-for-Age	312	-1.51 \pm 1.21	1.00	0	28

* contains for WHZ and WAZ the children with oedema.

Appendix 4: Questionnaires**UNHCR Standardised Expanded Nutrition Survey (SENS) Questionnaire****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 A HOUSEHOLD AS A GROUP OF PEOPLE WHO LIVE TOGETHER AND ROUTINELY EAT OUT OF SAME POT. 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 say no to take part and you can also stop at any time if you want to.
- We will measure your child's height and weight, and we will take blood from the finger to check for low blood in children and women. The blood is very small and quick, and we will only check for low blood.
- Do you have any questions?
- Thank you.

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Household Control Sheet

Grey windows mean that those measurements should be skipped in that specific shelter.

Date: ___/___/2013						Team No:	
HH No.	Children 0-59 months		Children 6-59 months BLOOD / HB		Women 15-49 years		Comments
	Number in HH	Number surveyed	Number in HH	Number surveyed	Number in HH	Number surveyed	
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							

PLEASE NOTE: If an eligible child or woman or entire HH are absent, team should re-revisit the household at least twice before leaving for the day to conduct the interview and/or measure the child or woman.

WOMEN ANAEMIA:

(THIS QUESTIONNAIRE IS TO BE ADMINISTERED TO ALL WOMEN AGED BETWEEN 15 AND 49 YEARS IN THE SELECTED HOUSEHOLD)

Date of interview :				Camp		Block	Team number
_ _ / 10 / 2013						_ _	_
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=DK (GO TO HB)	Are you currently enrolled in the ANC programme? 1=yes 2=no 8=DK	Are you currently receiving iron-folate pills (SHOW PILL)? 1=yes (STOP NOW) 2=no (STOP NOW) 8=DK (STOP NOW)	Hb* (g/dL) ONLY FOR NON-PREGNANT WOMEN

*If Hb<8 g/dl woman must be referred to health center for treatment.

CHILDREN 6-59 MONTHS ANTHROPOMETRY, HEALTH AND ANAEMIA:

(THIS QUESTIONNAIRE IS TO BE ADMINISTERED TO ALL CARETAKERS OF A CHILD THAT LIVES WITH THEM AND IS BETWEEN 6 AND 59 MONTHS OF AGE)

Date of interview: _ _ /10/2013				Camp				Block _ _				Team number _		
CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8	CH9	CH10	CH11	CH12	CH13	CH14	CH15
ID	HH	Consent given 1=yes 2=no 3=absent	Sex (m/f)	Birth date* dd/mm/yyyy	Age** (months) ±100g	Weight (kg) ±100g	Height (cm) ±0.1cm	Oedema (y/n)	MUA C (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 8=DK	Hb*** (g/dL)
				/ /										
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*The exact birth date should only be taken from an age documentation showing day, month and year of birth. It is only recorded if 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.

***If Hb<8 g/dl child must be referred to health center for treatment.

IYCF: One 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)

Camp	Block	Consent	
	_ _	yes / no / absent	
Date of interview	Team Number	HH Number	Infant number
_ _ / 10 / 2013	_	_ _	_ _

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 DK.....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 hours3 __
		DK.....8
IF6	Was [NAME] breastfed yesterday during the day or at night?	Yes.....1 No2 __ DK.....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 DOESN'T KNOW, CIRCLE '8'. EVERY LINE MUST HAVE A CODE.

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 & My, Carnation, Peak milk, Jargo	7C.....1 2 8
7D. Juice or juice drinks such as fruit juice, powdered juice, Foster Clark, Icemax	7D.....1 2 8
7E. Clear soup or rice water	7E.....1 2 8
7F. Sour milk	7F.....1 2 8
7G. Watery porridge	7G.....1 2 8
7H. Tea or coffee with milk	7H.....1 2 8
7I. Any other water-based liquids for example sodas, coconut	7I.....1 2 8

	water, plain tea		
IF8	Yesterday, during the day or at night, did [NAME] eat solid or semi-solid (soft, mushy) food?	Yes.....1 No.....2 DK.....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 DK.....8	__
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SECTION IF4

F10	Is child aged 6-23 months? REFER TO IF2	Yes.....1 No.....2	__ IF ANSWER IS 2 STOP NOW
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F11 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 DOESN'T KNOW, CIRCLE '8'. EVERY LINE MUST HAVE A CODE. Yes No DK.

11A. Meat, chicken, fish	11A.....1 2 8
11B. CSB or cocodolo	11B.....1 2 8
11D. Plumpy'Nut® (SHOW SACHET)	11D.....1 2 8
11E. Plumpy'Sup® (SHOW SACHET)	11E.....1 2 8
11F. Plumpy'Doz® (SHOW SACHET / POT)	11F.....1 2 8
11G. Infant formula: for example SMA, Guigoz, Lactogen	11G.....1 2 8
11H. Cerelac, rice cereal, corn cereal, Nutrition, Bird Custard	11H.....1 2 8

Appendix 5: Local Event calendar

November 2013					
Seasons	Religious Holidays	Other events	Local Events	Months / Years	Age (M)
			Thanks giving Liberia, Day 1 decoration in CDI, Day 28 presidential election in CDI,	Nov-13	0
Rainy season				Oct-13	1
				Sep-13	2
			CDI Independence day 7	Aug-13	3
		African Women day 31,	Liberia Independence day 26	Jul-13	4
Peak rainy season		International Child day 1 Day of the African Child 16 World Refugee Day 20		Jun-13	5
		Labour day 1		May-13	6
Start of rainy season	Easter		Day 18, Arrest of Gbagbo	Apr-13	7
		Women's international day 8		Mar-13	8
			Inauguration of Bahn camp Day 18	Feb-13	9
		New year's day 1		Jan-13	10
End of rainy season	Christmas	World Aids day 1		Dec-12	11

		Human rights day 10			
			Thanks giving Liberia, Day 1 decoration in CDI, Day 28 presidential election in CDI,	Nov-12	12
Rainy season				Oct-12	13
				Sep-12	14
			CDI Independence day 7	Aug-12	15
		African Women day 31,	Liberia Independence day 26	Jul-12	16
Peak rainy season		International Child day 1 Day of the African Child 16 World Refugee Day 20		Jun-12	17
		Labour day 1		May-12	18
Start of rainy season	Easter		Day 18, Arrest of Gbagbo	Apr-12	19
		Women's international day 8		Mar-12	20
			Inauguration of Bahn camp Day 18	Feb-12	21
		New year's day 1		Jan-12	22
End of rainy season	Christmas	World Aids day 1 Human rights day 10		Dec-11	23
			Thanks giving Liberia, Day 1 decoration in	Nov-11	24

			CDI, Day 28 presidential election in CDI,		
Rainy season				Oct-11	25
				Sep-11	26
			CDI Independence day 7	Aug-11	27
		African Women day 31	Liberia Independence day 26	Jul-11	28
Peak rainy season		International Child day 1 Day of the African Child 16 World Refugee Day 20		Jun-11	29
		Labour day 1		May-11	30
Start of rainy season	Easter		Day 18, Arrest of Gbagbo	Apr-11	31
		Women's international day 8		Mar-11	32
			Inauguration of Bahn camp Day 18	Feb-11	33
		New year's day 1		Jan-11	34
End of rainy season	Christmas	World Aids day 1 Human rights day 10		Dec-10	35
			Thanks giving Liberia, Day 1 decoration in CDI, Day 28 presidential election in CDI,	Nov-10	36
Rainy season				Oct-10	37

				Sep-10	38
			CDI Independence day 7	Aug-10	39
		African Women day 31	Liberia Independence day 26	Jul-10	40
Peak rainy season		International Child day 1 Day of the African Child 16 World Refugee Day 20		Jun-10	41
		Labour day 1		May-10	42
Start of rainy season	Easter		Day 18, Arrest of Gbagbo	Apr-10	43
		Women's international day 8		Mar-10	44
			Inauguration of Bahn camp Day 18	Feb-10	45
		New year's day 1		Jan-10	46
End of rainy season	Christmas	World Aids day 1 Human rights day 10		Dec-09	47
			Thanks giving Liberia, Day 1 decoration in CDI, Day 28 presidential election in CDI,	Nov-09	48
Rainy season				Oct-09	49
				Sep-09	50
			CDI Independence day 7	Aug-09	51
		African Women	Liberia Independence	Jul-09	52

		day 31	day 26		
Peak rainy season		International Child day 1 Day of the African Child 16 World Refugee Day 20		Jun-09	53
		Labour day 1		May-09	54
Start of rainy season	Easter		Day 18, Arrest of Gbagbo	Apr-09	55
		Women's international day 8		Mar-09	56
			Inauguration of Bahn camp Day 18	Feb-09	57
		New year's day 1		Jan-09	58
End of rainy season	Christmas	World Aids day 1 Human rights day 10		Dec-08	59
				Nov-08	60

December 2013

Seasons	Religious Holidays	Other events	Local Events	Months / Years	Age (M)
End of rainy season	Christmas	World Aids day 1 Human rights day 10		Dec-13	0
			Thanks giving	Nov-13	1
				Oct-13	2
				Sep-13	3
				Aug-13	4

		African Women day 31	Liberia independence	Jul-13	5
Peak rainy season		International Child day 1 Day of the African Child 16 World Refugee Day 20		Jun-13	6
		Labour day 1		May-13	7
Start of rainy season	Easter			Apr-13	8
		Women's international day 8		Mar-13	9
				Feb-13	10
		New year's day 1		Jan-13	11
End of rainy season	Christmas	World Aids day 1 Human rights day 10		Dec-12	12
			Thanks giving	Nov-12	13
				Oct-12	14
				Sep-12	15
				Aug-12	16
		African Women day 31	Liberia independence	Jul-12	17
Peak rainy season		International Child day 1 Day of the African Child 16 World Refugee Day 20		Jun-12	18
		Labour day 1		May-12	19

Start of rainy season	Easter			Apr-12	20
		Women's international day 8		Mar-12	21
				Feb-12	22
		New year's day 1		Jan-12	23
End of rainy season	Christmas	World Aids day 1 Human rights day 10		Dec-11	24
			Thanks giving	Nov-11	25
				Oct-11	26
				Sep-11	27
				Aug-11	28
		African Women day 31	Liberia independence	Jul-11	29
Peak rainy season		International Child day 1 Day of the African Child 16 World Refugee Day 20		Jun-11	30
		Labour day 1		May-11	31
Start of rainy season	Easter			Apr-11	32
		Women's international day 8		Mar-11	33
				Feb-11	34
		New year's day 1		Jan-11	35
End of rainy season	Christmas	World Aids day 1		Dec-10	36

		Human rights day 10			
			Thanks giving	Nov-10	37
				Oct-10	38
				Sep-10	39
				Aug-10	40
		African Women day 31	Liberia independence	Jul-10	41
Peak rainy season		International Child day 1 Day of the African Child 16 World Refugee Day 20		Jun-10	42
		Labour day 1		May-10	43
Start of rainy season	Easter			Apr-10	44
		Women's international day 8		Mar-10	45
				Feb-10	46
		New year's day 1		Jan-10	47
End of rainy season	Christmas	World Aids day 1 Human rights day 10		Dec-09	48
			Thanks giving	Nov-09	49
				Oct-09	50
				Sep-09	51
				Aug-09	52
		African Women day 31	Liberia independence	Jul-09	53
Peak rainy		International		Jun-09	54

season		Child day 1 Day of the African Child 16 World Refugee Day 20			
		Labour day 1		May-09	55
Start of rainy season	Easter			Apr-09	56
		Women's international day 8		Mar-09	57
				Feb-90	58
		New year's day 1		Jan-09	59
				Oct-08	60