STANDARDISED EXPANDED NUTRITION SURVEY

(SENS)

Refugee camps: Bahn, Dougee, Solo, PTP and Little Wlebo

Survey conducted: October 2012

Report finalized: January 2013

UNHCR IN COLLABORATION WITH
WFP, AHA, IRC, MERLIN, MERCI AND MoHSW
LIBERIA

Executive summary

The nutrition survey was conducted in the five Ivoirian refugee camps situated in the south-Eastern part of Liberia (Nimba, Grand Gedeh and Maryland Counties) bordering Cote d'Ivoire (CDI). The survey was organized by UNHCR and WFP in close collaboration with Implementing partners (IPs), Operational partners (OPs), and Ministry of Health and Social Welfare (MoHSW) of the Republic of Liberia and conducted in Dougee, Solo, PTP, Little Wlebo and Bahn camps in October 2012. This was the second survey conducted since the last influx of refugees from CDI following the post–election conflict in 2010.

The nutrition survey was based on the UNHCR SENS guidelines with certain adaptations according to the needs and resources available in Liberia. Three modules including anthropometry, Health, Anaemia among women and children, and Infant and Young Children Feeding (IYCF) practices were included.

The main objectives of the nutrition survey were:

1. To measure the prevalence of acute malnutrition in children aged 6-59 months;
2. To measure the prevalence of underweight in children aged 6-59 months;
3. To measure the prevalence of stunting in children aged 6-59 months;
4. To measure the prevalence of anaemia in children aged 6-59 months and in women of reproductive age between 15-49 years (non-pregnant);
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 estimate the coverage of the feeding programme among children 6-59 months; and
9. To investigate IYCF practices among children aged 0-23 months.

The five refugee camps were merged and a representative sample of 715 households for children aged 6 – 59 months for anthropometry and health, and sub sample for assessment of anaemia in the same age group was targeted. A sub-sample of women of reproductive age 15 – 49 year was targeted for assessment of anaemia. The number of household to be visited in each camp was calculated based on weighted population.

There was a central training that involved key staff from IPs/OPs which thereafter continued at camp level for training of enumerators. The central training took place for three days while the rollout training was for two days prior to data collection in respective camps. The enumerators were trained mainly on anthropometric measurements, blood sampling for assessment of anaemia, and on entering data on data sheets and smart phone applications.

A systematic random sampling was used during the survey and a sampling interval was calculated in each camp to obtain houses to be visited. Team leaders guided their respective teams and all information was collected using smart phones. Information including age, weight, height, and haemoglobin level was written in the hardcopy as a back-up.

Blood testing was done among children aged 6 – 59 months and non-pregnant women aged 15 – 49 years. Information was later uploaded through the server and then downloaded to the laptop. Analysis of data was done using ENA for SMART (delta version, 23rd July 2012) and EPI info (version 3.5.4, 30th July 2012) software.

Table 1. Summary of results

Indicator	Number of cases/sample size	%; (95% CI)	Classification of public health significance / target (where applicable)
CHILDREN 6-59 months			
No. of children surveyed=653			
Acute Malnutrition (n=637): (WHO 2006 Growth Standards)			
Global Acute Malnutrition (GAM)	25	3.9%; (2.7 - 5.7% CI)	Acceptable if < 5%
Moderate Acute Malnutrition (MAM)	23	3.6%; (2.4 - 5.4% CI)	
Severe Acute Malnutrition (SAM)	2	0.3%; (0.1 - 1.1% CI)	
Oedema	2	0.3%	
Stunting (n=608): (WHO 2006 Growth Standards)			
Total Stunting	275	45.2% (41.2-49.1% CI)	Acceptable if <20%
Severe Stunting	119	19.5% (16.6-22.9% CI)	
MUAC Malnutrition: (n=653)			
MUAC < 125mm and/or oedema	26	4.0 %; (2.7 - 5.8%)	
MUAC 115-124mm	20	3.1 %; (2.0 - 4.7%)	
MUAC < 115mm and/or oedema	6	0.9 %; (0.4 - 2.0%)	
Anaemia (n=349)			
Total Anemia(Hb<11.0 g/dl)	258	73.9%; (69.0-78.5%)	High if >40%
Mild (Hb 10.0-10.9 g/dl)	100	28.7%; (24.0-33.8%)	
Moderate (Hb 7.0-9.9 g/dl)	142	40.7%; (35.5-46.1%)	
Severe (Hb<7.0 g/dl)	16	4.6%; (2.7-7.5%)	
Additional indicators			
Measles vaccination with card or recall (9-59m) n=614	420	68.4%; (64.5-72.0%)	Target ≥95%
Measles vaccination with card (9-59m) n=614	126	20.5%; (17.4-24.0%)	
Vitamin A supplementation in last 6 months (6-59m) n=651	494	75.9%; (72.4-79.1%)	Targetof≥90%
Diarrhoea			
Diarrhoea in the past 2 weeks (6-59m) n=623	146	23.4%; (20.2-27.0%)	

Indicator	Number of cases/sample size	%; (95% CI)	Classification of public health significance / target (where applicable)
WOMEN 15-49 years (n=290)			
Total Anaemia(Hb<12 g/dl)	164	56.6%; (50.6-62.3%)	High if >40%
Mild (Hb11-11.9 g/dl)	73	25.2%; (20.3-30.6%)	
Moderate (Hb 8-10.9 g/dl)	83	28.6%; (23.5-34.2%)	
Severe (Hb<8 g/dl)	8	2.8%; (1.2-5.4%)	
INFANTS 0-5 months (n=65)			
Exclusive Breastfeeding	48	73.8%; (61.5-84.0%)	
INFANTS 6-8 months (n=39)			
Introduction of solid foods	14	35.9%; (21.2-52.8%)	
CHILDREN 0-23 months (n=293)			
Breastfed within an hour of birth n=269	162	60.2%; (54.1-66.1%)	
Bottle feeding n=293	13	4.4%; (2.4-7.5%)	

Interpretation of the results

The GAM rate of 3.9% (2.7 - 5.7% CI), i.e., MAM of 3.6% (2.4 - 5.4% CI) and SAM of 0.3% (0.1 - 1.1% CI), among children aged 6 – 59 months is within the acceptable range for malnutrition prevalence according to WHO cut-off point 5%. However, the maximum CI for both GAM and MAM was above the WHO limits, meaning that malnutrition rate in some camps may be beyond the WHO recommended upper level.

Chronic malnutrition among the same age group revealed a global stunting of 45.2% (41.2-49.1% CI) including severe stunting of 19.5% (16.6-22.9% CI). The stunting prevalence is above the maximum acceptable level of 20% as recommended by WHO.

The 73.9% global anaemia among children and 57% among women of child bearing age are above the acceptable maximum level according to WHO standards. WHO recommends an anaemia level of below 20% among both women of child bearing age and children below five years.

Measles vaccination (68%) and vitamin A (76%) revealed low coverage according to sphere standards. WHO recommends coverage of at least 90% and 95% for vitamin A supplementation and measles vaccination respectively.

Results among infant and young children revealed an exclusive breastfeeding of 78% among 0 – 5 moths; introduction of solid food among children aged 6 – 8 months was 36%; and initiation breastfeeding with one hour was 60%. The rate of bottle feeding among children aged 0 – 23 months was as low at 4.4%. All these are within the recommended public health levels.

Recommendations

I. Put in place strategies to consider blanket distribution of Micronutrient powder (MNP) to children 6-59 (depending on availability of resources) to increase micronutrient content of the children's diet. This will help ensure that all children get the product, to prevent anaemia in some children and to treat it in others.

II. Consider training of IPs and OPs in prevention and management of anaemia and other micronutrient deficiencies.

III. Equip the IPs/OPs with rapid diagnostic testing machines for anaemia (e.g. HaemoCue) and supplies that will help for checking of haemoglobin levels among young children.

IV. Promote home backyard gardening targeting green leafy vegetables and fruits that will increase absorption of non-heam iron consumed from cereals and pulses distributed in the general ration and other coping strategies.

V. Scale up malaria prevention activities, especially the proper use of insecticide impregnated mosquito nets, to prevent more malaria cases and malaria related anaemia.

VI. Strengthen the antenatal coverage to ensure adequate iron supplementation and IPT for malaria for pregnant women.

VII. Intensify the outreach program in the camps for "active case finding"; promote health seeking behaviour, and nutrition education on dietary diversity.

Contents

Acronyms

BCG	Bacillus Chalmette–Guérin vaccination
BO –M	Branch Office – Monrovia (UNHCR)
CDI	Cote d'Ivoire
CI	Confidence Interval
CSB	Corn Soy Blend (renamed to SuperCereal)
ENA	Emergency Nutrition Assessment
GAM	Global Acute Malnutrition
IP	Implementing Partner
IPT	Intermittent Preventive Treatment (for malaria)
IYCF	Infant and Young Child Feeding Practices
JAM	Joint Assessment Mission
MAM	Moderate Acute Malnutrition
MNP	Micronutrient Powder
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
TOT	Training of Trainers
UNHCR	United Nations High Commissioner for Refugees
WFP	World Food Programme
WHO	World Health Organisation

1. Introduction

Geographic description of survey area and population

Côte d'Ivoire (CDI) refugees began to arrive in Liberia in December 2010, fleeing the post-election violence that followed the disputed November 28th, 2010 presidential election. The refugee population peaked at around 224,000 in September 2011. Despite an overall improvement in the security situation in Côte d'Ivoire which encouraged 168,566 CDI refugees to return home, persisting violence and weak rule of law especially in the western area of Côte d'Ivoire have deemed repatriation too dangerous for many. As a result, 63,272 CDI refugees[1] remain in Liberia as per data on 31st of August living in four border counties (Grand Gedeh, Maryland, Nimba, and River Gee). Of these 32,666 (about 52%) refugees were hosted in camps; and the number of children under five years of age residing in the camps was 7,187 (22%).

In the refugee affected counties, agricultural production is greatest in Nimba County, followed by Maryland, Grand Gedeh and River Gee. Production has marginally expanded as a result of the increased availability of skilled agricultural labour with the refugee influx.[2] Liberians and refugees in affected counties are mostly engaged in multiple livelihood strategies, such as agro forestry, hunting, fishing, petty trade and gold and diamond mining. Mining opportunities are

[1] Population used to calculate sample for the survey.

[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)

prolific in Grand Gedeh County, and to a lesser extent in River Gee County.[3]

Food security situation

The refugee influx put additional strain on a precarious food security situation in the four refugee impacted counties. The highest incidence of poverty is concentrated in the south-eastern counties of Maryland (72.5%) and River Gee (82.5%). Levels of food insecurity are relatively more favourable in Nimba (32.4%) and Grand Gedeh (42.0%) counties.[4] Despite prevailing food insecurity, when the refugee influx occurred in 2011, the refugees were readily welcomed by their Liberian hosts who generously shared with them their food and rice seed stocks.

The July 2012, Liberia Market Bulletin indicated that the food security situation remains precarious especially in the counties hosting CDI refugees. The Market Bulletin, which is the only recent food security data available on the affected region, highlighted that current retail prices of the basic staple (rice) are at least 22% higher than at the same period in 2011 in most parts of the country. Indeed, Liberia remains vulnerable to global market dynamics due to its reliance on food imports, including staples. Although rice prices remain stable at the global level, the prevailing drought in the USA, a major player in the cereal market, is likely to have far reaching implications on domestic food prices.

The general food ration to refugees before and during the survey period was as indicated in the table below.

Table 2. Food rations to refugees during the survey.

Food Item	Grams/p/d	Kcal - provided	% Kcal
Rice	420	1512	71
Pulses	50	168	8
CSB	50	266	12
Veg. Oil	30	188	9
Salt	5	0	0
Total	555	2133	100

[3] 2012, February, Cross Border Assessment Between Liberia and Côte d'Ivoire, January and February 2012: Security Stabilization and Food Security, UNDP
[4] Comprehensive Food Security and Nutrition Survey

Nutrition and health situation

None of the camp health facilities have reported any critical degree of malnutrition in 2011 and 2012.

According to the surveys conducted by the Nutrition Sector (in Grand Gedeh and in Maryland July-August 2011), and by ACF (in Nimba in December 2011), the malnutrition rates among refugees and Liberians are indicated below in Table 3[5]. This shows the general situation in the second half of 2011.

Table 3: Nutrition situation in refugee camp in 2011

County	Grand Gedeh	Maryland	Nimba
Period	July- August 2011	Aug-11	Dec-11
#of children	322	140	N/A
% of total	53%	21%	N/A
GAM	2.0% (0.9-4.3)	1.4% (0.4-5.0)	1.4 % (0.4-5.3)
SAM	1.0% (0.3-3.1)	0.7% (0.1-5.1)	0.2 % (0.0-2.7)
MAM	1.0% (0.3-3.1)	0.7% (0.1-5.0)	N/A
Stunting	48.5% (42.1-55.0)	40.6% (31.5-50.3)	N/A
Underweight	15.0% (10.6-20.7)	13.8% (10.0-18.7)	N/A

No proper nutrition survey had been conducted exclusively in the refugee camps in Liberia since the influx of Ivoirian refugees in late 2010; hence no data exist to indicate the exact picture and situation of malnutrition in the camps. This was the first time that UNHCR, WFP and partners have conducted nutrition surveys exclusively in refugee camps in Liberia.

Malnourished refugees receive nutritional treatment through the nutrition programmes in the existing health facilities in the respective camps, which are run by implementing partners (IPs) and funded by UNHCR. Treatments of severe and moderate acute malnutrition are

[5] These surveys were not specific to refugee camps, but included refugees in host communities, in camps, and Liberians, using cluster sampling methodology. The samples were non-exclusive, and communities were purposively selected to include refugee camps, (Solo camp, Dougee transit centre, Toe Town transit centre, and Ziah camp in Grand Gedeh County; Bishop Ferguson transit centre and Little Wlebo camp in Maryland County; Bahn camp in Nimba), refugee hosting communities, and typical Liberian communities without refugees. This was in accordance with the SMART survey methodology given that the majority of refugees were then living in host villages where there is neither an orderly linear arrangement of dwelling units nor a household listing.

provided through outpatient therapeutic programme (OTP) and supplementary feeding programmes (SFP) respectively.

Severely malnourished children with medical complications that need intensive care are usually 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). After discharge from the SNUs, the cases are admitted at OTPs, and later at SFPs in the camps for rehabilitation.

From January till June 2011, WFP provided food assistance for 5034 under five children in with moderate acute malnourished children in host communities of which 1097 were refugees. A recovery rate of 90.31% has been achieved which is 10% above the SPHERE standards. WFP assisted also 1433 pregnant and lactating women (PLW) in host communities of which 312 were refugees. Data from July till December is currently being processed.

The current survey was conducted in three counties (Maryland, Grand Gedeh, and Nimba) and in four refugee camp: Little Wlebo in Maryland; Solo, PTP, and Dougee in Grand Gedeh; and in Bahn camp in Nimba. The survey was conducted from 10-31 October 2012, which was in the rainy season in Liberia. The rainy season, which normally commences in April and ends in September, is the lean season during which, malnutrition rates increase. This means that the survey captured the nutrition situation in the most vulnerable period during the year.

1.1 Survey Objectives

The general objective of the nutrition survey is to determine the prevalence of acute malnutrition (Moderate, Severe and Global) and level of Micronutrients deficiencies among the refugee population, especially among children 6- 59 months and women of reproductive age. This information will assist UNHCR, WFP and its partners to improve the implementation of nutrition programme tailored to the need of refugees and to better plan assistance to refugees for both food and non-food items.

The specific objectives of this nutrition survey are;

1. To measure the prevalence of acute malnutrition in children aged 6-59 months;
2. To measure the prevalence of underweight in children aged 6-59 months;
3. To measure the prevalence of stunting in children aged 6-59 months;
4. To measure the prevalence of anaemia in children aged 6-59 months and in women of reproductive age between 15-49 years (non-pregnant);
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 estimate the coverage of the feeding programme among children 6-59 months; and
9. To investigate IYCF practices among children aged 0-23 months.

2. Methodology

2.1 Sample size

Based on the UNHCR SENS guidelines for refugee populations (v1.3) and the Standardized Monitoring and Assessment of Relief and Transitions (SMART) methodology (v1), a systematic sampling technique without list was used. Five camps were merged and sample was drawn from each camp based on weighted population.

From the weekly and monthly reports from the camps, the prevalence of acute malnutrition was below 10% and thus, this was regarded as expected prevalence during sample size calculation by ENA for SMART software. The desired precision was 2.5, under five children 21%, average household 4.1 and non-response rate was estimated at 10%.

According to ProGres the population of children aged below five year in the camp was below 10,000, therefore correction for small population of 26,800 residing in refugee camps was applied. Through ENA for SMART software, a total of 715 households had to be visited to obtain around 510 children aged 6 – 59 children for anthropometry and health assessment.

For assessment of anaemia among children aged 6 – 59 months and women aged 15 – 49 years a sub-sample was targeted consisting of all eligible children and women in every second household visited. In each household that was visited all children aged 0 – 23 months, were assessed for Infant and Young Children Feeding practices. Measles vaccination status was assessed among children 9-59 months, while diarrhoea and vitamin A supplementation was assessed among children 6-59 months.

During the survey, the sample size has been adjusted since the non-response rate was higher than estimated at the first place. The sample size adjusted has been initiated in Little Wlebo and Bahn Camps to keep the targeted number of households.

2.2 Sampling procedure: selecting households and children

The survey was carried out among children aged 0 to 59 months of age, and women of child bearing age (15 – 49 years), excluding pregnant and lactating mothers.

All children between 6 and 59 months of age underwent anthropometric measurement, morbidity, and vaccination and supplementation assessment. Children between 0 and 23 months were solely assessed on IYCF practices. Women in each second household were tested

on anaemia. Mothers, caretakers or heads of households provided information required to complete the data collection that did not require anthropometric measurements.

Households were selected using a sampling interval, depending on the sample size and estimated households. The first household was randomly selected by the team with a raffle. Each selected household was asked whether children under 5 or women 15-49 year belonged to that particular household. All children and women in the household were selected for the survey. If no targeted children or women in the selected household, the household was marked "no eligible sample" on the "household control sheet" and the next household was selected using the appropriate sampling interval.

If children or women were members of the household but were not present at time of the survey, the households were revisited the same day. If in that same day the women or children were not present, the household was marked as absent.

2.3 Questionnaire and measurement methods

The questionnaire was based on UNHCR SENS guidelines with adaptations according to the needs and resources available in Liberia. The guidelines include six different modules for collecting data at individual and household level. In Liberia only the individual modules, module 1-3, were used targeting children under five years of age and women of child bearing age (15-49 years).

As part of the UNHCR SENS initiative to improve and standardise the way nutrition surveys are collected in refugee camps, UNHCR is increasingly recommending the use of mobile phones for survey implementation. In Liberia mobile phone technology was used for data collection and entry. Mobile phones, laptop and router were provided by UNHCR HQ in Geneva. The UNHCR Nutritionists set up the equipment and software in-country; coding of questionnaires and technical support was provided by CartONG remotely. Before implementation of the surveys, the UNHCR Branch Office-Monrovia (BO-M) Nutritionist had been trained on the use of the phones for data collection, setting up the phone-router-computer connection, downloading and uploading questionnaires on the phones, and managing the database.

The questionnaire was designed in English but local languages or dialect was used to ask the questions to the respondents: Questionnaire-Appendix 8.3.

2.4 Case definitions and inclusion criteria

Households were defined as people who share the same meal, whether living together in the same house or not. Households were only included if children and women of child bearing age lived in the household.

Age of children was assessed using birth certificates or UNHCR registration papers. If none of these papers could be obtained, age was estimated in months by the mother using a local calendar.

Childs length or heights was assessed using the height board. Children were measured lying down if they were younger than two years or were afraid of standing. Children above the age of two were measured standing up.

Bilateral oedema was tested by putting pressure on both ankles at the same time and if pitting occurred the child was considered to have bilateral oedema.

Haemoglobin level was measured with the use of the HemoCue. Children and women were asked permission to take a blood sample and were informed that the blood will only be tested on anaemia and not on other diseases.

Immunization coverage was assessed using either immunization cards or were recalled by the caretaker.

2.5 Classification of public health problems and targets

The below table describes the individual cut-off point of the relevant nutrition indicators and the benchmark on prevalence at population level for the indicators included in the survey. These cut-off points and benchmarks were used to determine the prevalence rates and the presents and/or severity of the public health problems.

Table 4: classification of public health problems

Indicator	Cut-off point at individual level		Benchmarks of prevalence at population level	
	Category	Cut-off point	Category	Threshold (%)
Stunting[6](H/A)			Acceptable	<20
	Global	< -2 z-scores	Poor	20-29
	Severe	<-3 z-scores	Serious	30-39
	moderate	Between -2 z-scores and -3 z-scores	critical	≥40
Wasting[7](W/H)			Acceptable	<5
	Global	< -2 z-scores	Poor	5-9
	Severe	<-3 z-scores	Serious	10-14
	moderate	Between -2 z-scores and -3 z-scores	critical	≥15
Underweight[8](W/A)			Acceptable	< 10
	Global	< -2 z-scores	Poor	10>19
	Severe	<-3 z-scores	Serious	20>29
	moderate	Between -2 z-scores and -3 z-scores	critical	≥30
MUAC - children[9](cm)	Mild	12.5-13.5	No thresholds	
	Global	< 12.5		
	Severe	<11.5		
	moderate	11.5-12.5		
Anaemia - 6-59 months[10](Haemoglobin	Anaemia	< 11.0	No problem	≤4.9
			Mild	5-19.9

[6] WHO, child growth standards, 2006
[7] WHO, child growth standards, 2006
[8] WHO, child growth standards, 2006
[9] Adjusted from EFSA handbook, second edition, WFP, 2009
[10] Iron deficiency anaemia: assessment, prevention and control, a guide for programme managers. WHO, 2001

(g/dl)			Moderate	20-39.9
			severe	≥40
Anaemia – lactating women and adults[11] (Haemoglobin (g/dl)	Anaemia	< 12.0	No problem	≤4.9
			Mild	5-19.9
			Moderate	20-39.9
			severe	≥40

2.6 Training, Coordination and supervision

A three days central training of trainers (ToT) (key staff from IPs/OPs) was conducted at Zwedru in Grand Gedeh County from 4-6 October 2012 followed by rollout training to enumerators in respective camps; BO-M Nutritionist and UNHCR HQ Nutritionist facilitated the ToT. The ToT focused on various elements of the nutrition survey including the roles of supervisors and important quality related errors to be checked during the survey, in addition to sessions on how to facilitate the camp-level training. After the training the participants returned to their respective camps where they facilitated training of enumerators. All supervisors were qualified health workers. In total 12 supervisors were trained and supervised the teams during data collection.

The training of enumerators lasted for two days. The first day focused on practical data collection, anthropometry and haemoglobin measurements, while the second day, covered topics on practical exercises, field test and training for data collection. Anthropometric standardization exercise was conducted and necessary corrections were made to participants. One enumerator of each team was trained on handling the questionnaires on the phones. The selected enumerators, appointed by the respective IPs, were believed to be the ones with highest technological skills. The UNHCR BO-M Nutritionist, and the WFP nutritionist who joined in Bahn camp, facilitated the enumerator's trainings. A total of 125 enumerators have been trained to conduct the survey.

Survey teams comprised on average of 4 to 5 enumerators each with his or her owns' responsibility. The team included a team leader, a blood taker, 2 enumerators who were responsibly for anthropometric measurements and one translator where necessary. In the teams where a translator was not required each of these enumerators translated the

[11] Iron deficiency anaemia: assessment, prevention and control, a guide for programme managers. WHO, 2001

questionnaire in the local language to the respondent. Performance of the teams was continuously monitored throughout the fieldwork and assistance from supervisors was provided when necessary.

Normally in nutrition surveys the same teams would conduct data collection throughout the whole survey duration. In Liberia it was found difficult to release staff from the various camps to participate in data collection in camps where they do not normally work. This was because the camps are spread out in different counties and areas with challenging road communication, and most enumerators would be refugee incentive staffs who would not be allowed to leave the camps where they reside. Hence, the team leaders decided to conduct a ToT at central level where nutrition and health centre staff from the various camps would get an intensive training preparing them for camp level training of enumerators in their respective camps.

2.7 Data analysis

Data entry was not necessary for this survey as data entry was immediately done with the use of the mobile phones. Anthropometric measurements were also written down on hard copies to increase accurate and quality data. Data in the mobile phones were checked by the supervisors in reference to hard copies and corrected where necessary, uploaded to the server and downloaded onto the laptop at the end of the survey each day. Any errors that were noted were highlighted to the team members the following day.

Data cleaning was done using a standard data cleaning PGM file in Epi info software. Data analysis was conducted using ENA for SMART (delta version, 23rd October 2012) software to generate anthropometry results and 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 anaemia and information related to IYCF practices.

3. Results

3.1. Children 6-59 months

Sample size

A total number of children aged 6 – 59 months surveyed were 653 as compared to the targeted 510. See table below.

Table 5: Target and actual number captured

	Target (No.)	Total surveyed (No.)	% of the target
Children 6-59 months	510	653	128

Table 6: Distribution of age and sex of sample

	Boys		Girls		Total		Ratio
AGE (mo)	**no.**	**%**	**no.**	**%**	**no.**	**%**	**Boy: girl**
6-17	58	43.9	74	56.1	132	20.2	0.8
18-29	78	48.8	82	51.3	160	24.5	1.0
30-41	69	46.3	80	53.7	149	22.8	0.9
42-53	81	52.9	72	47.1	153	23.4	1.1
54-59	35	59.3	24	40.7	59	9.0	1.5
Total	321	49.2	332	50.8	653	100.0	1.0

Plausibility report indicated 42% of children survey with no exact birthdates. Their ages were determined using local event calendar, attached in appendix 1. The boy to girl sex ratio was 0.8 and 1.5 among younger and older children groups respectively. However, the overall sex ratio of boy to girl was 1.0

Anthropometric results (based on WHO standards 2006):

Global acute malnutrition was defined as <-2 z scores weight-for-height and/or oedema while severe acute malnutrition defined as <-3z scores weight-for-height and/or oedema. During analysis, exclusion of z-scores from Observed mean SMART flags were; WHZ -3 to 3, HAZ -3 to 3 and WAZ -3 to 3.

Table 7: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or Oedema) and by sex

	All n = 637[12]	Boys n = 312	Girls n = 325
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(25) 3.9 % (2.7 – 5.7 95% C.I.)	(16) 5.1 % (3.2 – 8.2 95% C.I.)	(9) 2.8 % (1.5 – 5.2 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(23) 3.6 % (2.4 – 5.4 95% C.I.)	(15) 4.8 % (2.9 – 7.8 95% C.I.)	(8) 2.5 % (1.3 – 4.8 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(2) 0.3 % (0.1 – 1.1 95% C.I.)	(1) 0.3 % (0.1 – 1.8 95% C.I.)	(1) 0.3 % (0.1 – 1.7 95% C.I.)

The acute malnutrition seemed more pronounced among boys than girls. The prevalence of oedema is 0.3 % with equal distribution in both sexes.

Table 8: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or Oedema

		Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	130	0	0.0	11	8.5	118	90.8	1	0.8
18-29	156	0	0.0	5	3.2	151	96.8	0	0.0
30-41	146	0	0.0	5	3.4	140	95.9	1	0.7
42-53	149	0	0.0	2	1.3	147	98.7	0	0.0
54-59	56	0	0.0	0	0.0	56	100.0	0	0.0
Total	637	0	0.0	23	3.6	612	96.1	2	0.3

[12] Total number of children analysed

Results from this survey showed no children with severe wasting (<-3z-score). However, 0.3% of the analysed children were found with bilateral pitting oedema which is defined as severe form of acute malnutrition. The most affected age group seemed to be younger children (6-17) which counted 11 out of 23 cases of MAM and 1 of the 2 cases of bilateral pitting oedema. Overall this age group presented 12 out of 25 (nearly 50%) children with GAM.

Figure 1: Trends in the prevalence of wasting by age in children 6-59 months

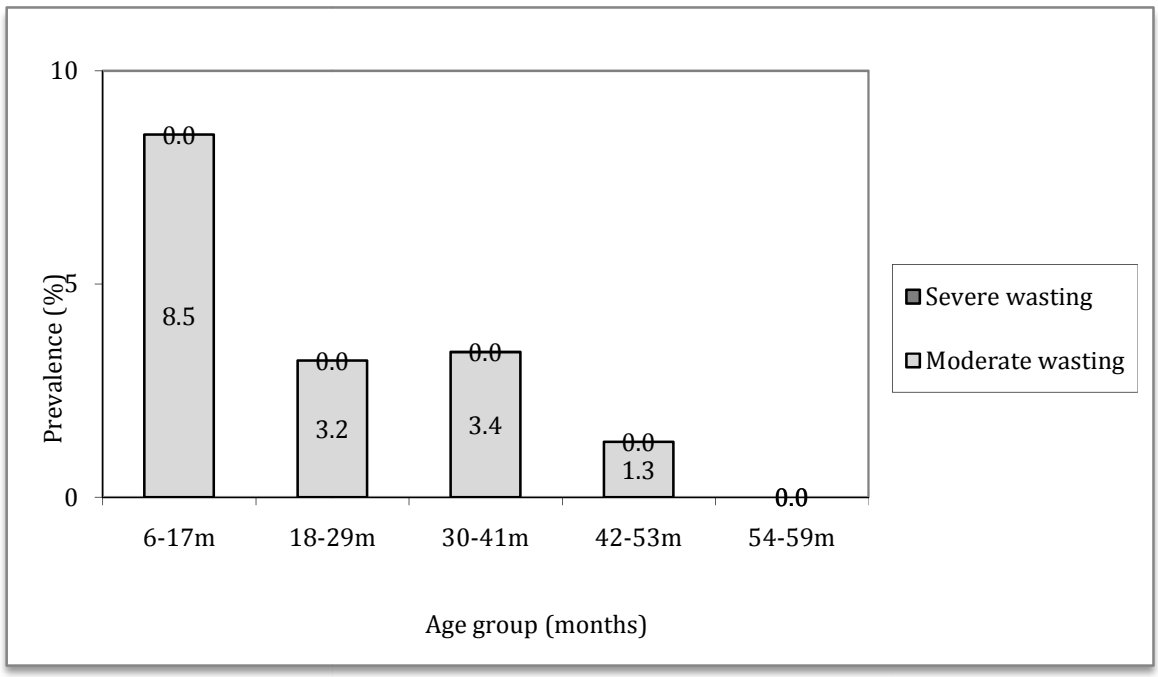

Figure 2: Distribution of weight-for-height z-scores (based on WHO Growth Standards; the reference population in shown in green and the surveyed population is shown in red) of the survey population compared to reference population

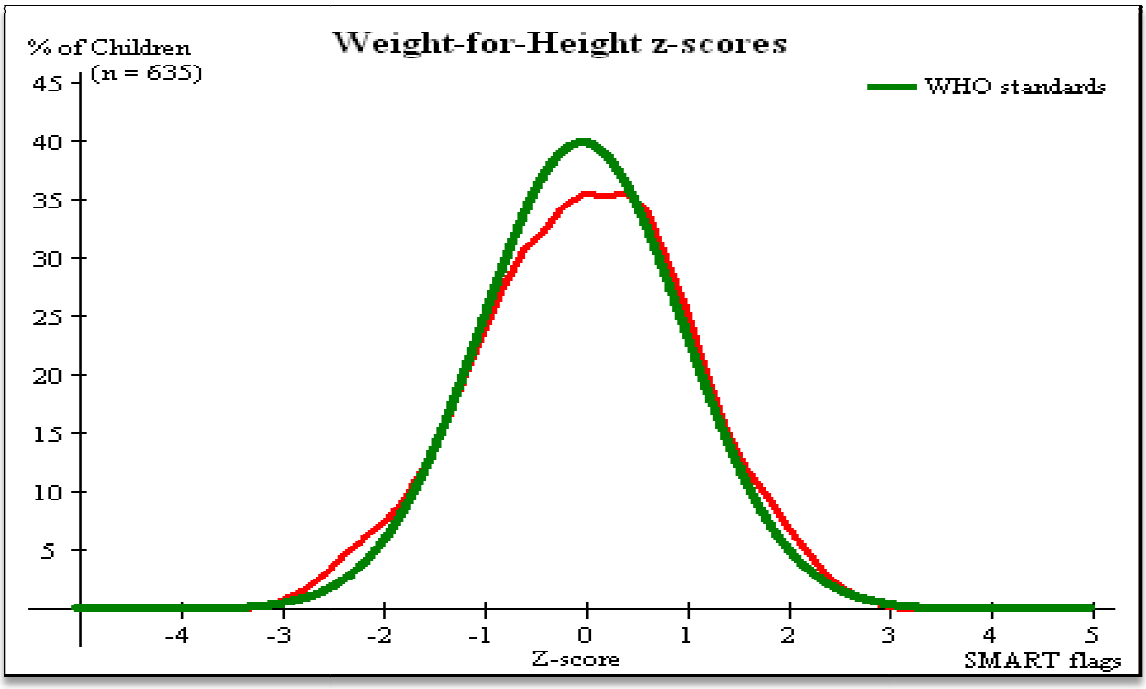

Table 9: Prevalence of underweight based on weight-for-age z-scores by sex

	All n = 633[13]	**Boys** n = 308	**Girls** n = 325
Prevalence of underweight (<-2 z-score)	(116) 18.3 % (15.5 – 21.5 95% C.I.)	(61) 19.8 % (15.7 – 24.6 95% C.I.)	(55) 16.9 % (13.2 – 21.4 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(81) 12.8 % (10.4 – 15.6 95% C.I.)	(44) 14.3 % (10.8 – 18.6 95% C.I.)	(37) 11.4 % (8.4 – 15.3 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(35) 5.5 % (4.0 – 7.6 95% C.I.)	(17) 5.5 % (3.5 – 8.7 95% C.I.)	(18) 5.5 % (3.5 – 8.6 95% C.I.)

[13] Total number of children analysed

Table 10: Prevalence of underweight by age, based on weight-for-age z-scores

		Severe underweight (<-3 z-score)		Moderate underweight (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	126	7	5.6	12	9.5	107	84.9	1	0.8
18-29	156	10	6.4	27	17.3	119	76.3	0	0.0
30-41	141	8	5.7	17	12.1	116	82.3	1	0.7
42-53	153	6	3.9	18	11.8	129	84.3	0	0.0
54-59	57	4	7.0	7	12.3	46	80.7	0	0.0
Total	633	35	5.5	81	12.8	517	81.7	2	0.3

Table 11: Prevalence of stunting based on height-for-age z-scores and by sex

	All n = 608[14]	**Boys** n = 300	**Girls** n = 308
Prevalence of stunting (<-2 z-score)	(275) 45.2 % (41.3 – 49.2 95% C.I.)	(152) 50.7 % (45.0 – 56.3 95% C.I.)	(123) 39.9 % (34.6 – 45.5 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(156) 25.7 % (22.3 – 29.3 95% C.I.)	(80) 26.7 % (22.0 – 31.9 95% C.I.)	(76) 24.7 % (20.2 – 29.8 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(119) 19.6 % (16.6 – 22.9 95% C.I.)	(72) 24.0 % (19.5 – 29.1 95% C.I.)	(47) 15.3 % (11.7 – 19.7 95% C.I.)

[14] Total number of children analysed

Table 12: Prevalence of stunting by age based on height-for-age z-scores

		Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	119	11	9.2	14	11.8	94	79.0
18-29	150	34	22.7	48	32.0	68	45.3
30-41	136	33	24.3	39	28.7	64	47.1
42-53	147	30	20.4	39	26.5	78	53.1
54-59	56	11	19.6	16	28.6	29	51.8
Total	608	119	19.6	156	25.7	333	54.8

Figure 3: Trend in the prevalence of stunting by age in children aged 6-59 months

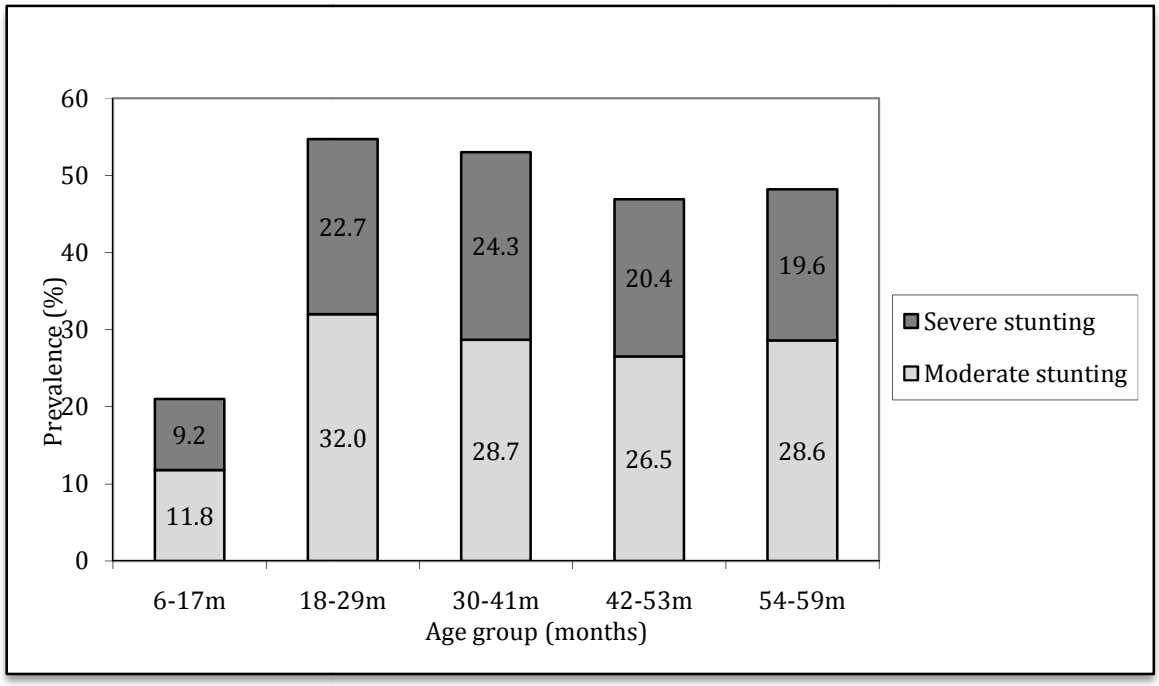

Figure 4: Distribution of height-for-age z-scores (based on WHO Growth Standards; the reference population is shown in green and the surveyed population is shown in red) of the survey population compared to reference population

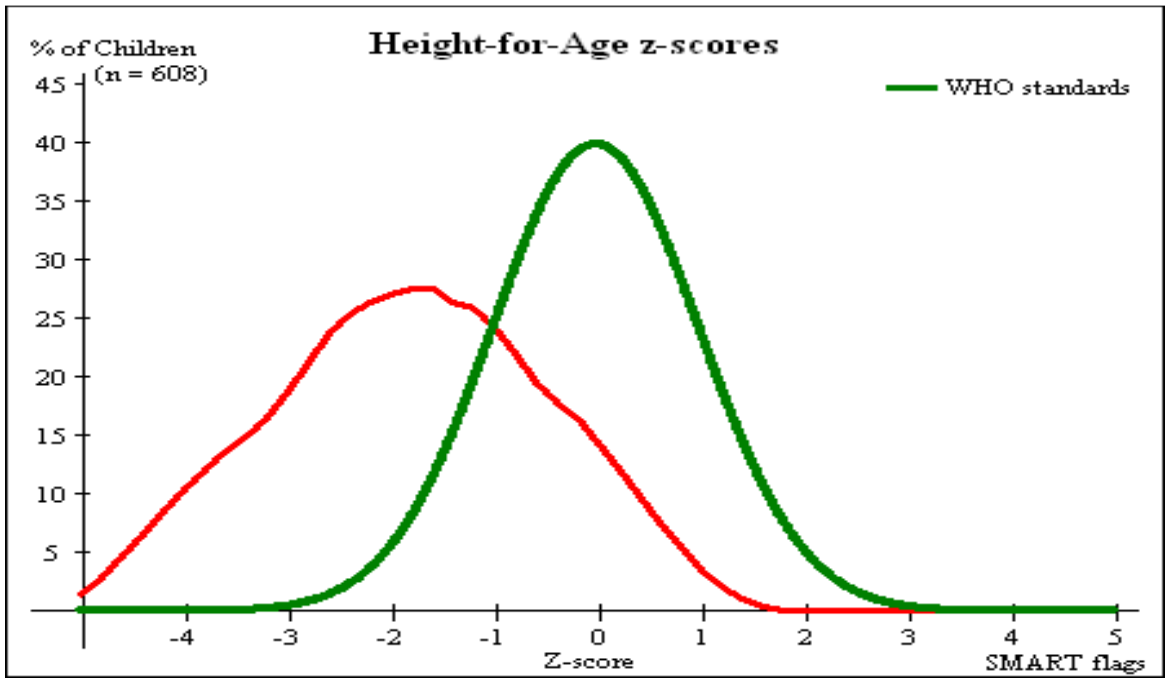

Table 13: Mean z-scores, Design Effects and excluded subjects

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	635	-0.01±1.04	1.00	2	16
Weight-for-Age	633	-1.03±1.13	1.00	5	15
Height-for-Age	608	-1.81±1.31	1.00	3	42

* contains for WHZ and WAZ the children with oedema.

Table 14: Prevalence of malnutrition based on MUAC

	(n=653)
Moderate acute malnutrition (≥ 115mm and <125 mm)	(20) 3.1 %; (2.0 – 4.7% CI)
Severe acute malnutrition (< 115mm)	(6) 0.9 %; (0.4 – 2.0% CI)

Feeding programme coverage results

Table 15: Programme coverage for acutely malnourished children (WHZ<-2 and/or Oedema)

	Number/total	% (95% CI)
Supplementary feeding programme coverage	6/23	26.1; (10.2-48.4)
Therapeutic feeding programme coverage	1/2	50.0; (1.3-98.7)

This took an account of malnourished children based on WHZ and/oedema who were attending feeding program by the time of this survey.

Table 16: Programme coverage for acutely malnourished children (MUAC)

	Number/total	% (95% CI)
Supplementary feeding programme coverage	11/20	55.0; (31.5-76.9)
Therapeutic feeding programme coverage	4/5	80.0; (28.4-99.5)

This looked at number of malnourished children based on MUAC who were attending feeding program during the survey.

Measles vaccination coverage results

Table 17: Measles vaccination coverage for children aged 9-59 months (or other context-specific target group) (n=614)

	Measles (with card) n=126	Measles (with card or confirmation from mother) n=420
YES	20.5 % (17.4-24.0%; 95% CI)	68.4 % (64.5-72.0%; 95% CI)

Vitamin A supplementation coverage results

Table 18: Vitamin A supplementation for children aged 6-59 months within past 6 months (or other context-specific target group) (n=651)

	Vitamin A capsule (with card) n=147	Vitamin A capsule (with card or confirmation from mother) n=494
YES	22.6% (19.5-26.0%; 95% CI)	75.9% (72.4% 79.1%; 95% CI)

Diarrhoea results

Table 19: Period prevalence of diarrhea

	Number/total	% (95% CI)
Diarrhoea in the last two weeks	146/623	23.4; (20.2-27.0)

Anaemia results

Table 20: Prevalence of anaemia and haemoglobin concentration in children 6-59 months of age

Anaemia in Children 6-59 months	**All** n = 349
Total Anaemia (Hb<11.0 g/dL)	(258) 73.9%; (69.0-78.5%; 95% CI)
Mild Anaemia (Hb 10.0-10.9 g/dL)	(100) 28.7%; (24.0-33.8%; 95% CI)
Moderate Anaemia (7.0-9.9 g/dL)	(142) 40.7%; (35.5-46.1%; 95% CI)
Severe Anaemia (<7.0 g/dL)	(16) 4.6%; (2.7-7.5%; 95% CI)
Mean Hb (g/dL)	9.90g/dL (1.54 SD) [3.9min, 13.9max]

Table 21: Prevalence of anaemia by age

		Severe Anaemia (<7.0 g/dL)		Moderate Anaemia (7.0-9.9 g/dL)		Mild Anaemia (Hb 10.0-10.9 g/dL)		Total Anaemia (Hb<11.0 g/dL)		Normal (Hb≥11.0 g/dL)	
Age (mo)	Total no.	No.	% (95% CI)	No.	% (95% CI)	No.	% (95% CI)	No.	% (95% CI)	No.	% (95% CI)
6-23	117	6	37.5% (15.2-64.6%)	51	35.9% (28.0%-44.4%)	37	37.0% (27.6-47.2%)	94	36.4% (30.6-42.6%)	23	25.3% (16.7-35.5%)
24-35	72	5	31.3% (11.0-58.7%)	28	19.7% (13.5%-27.2%)	23	23.0% (15.2-32.5%)	56	21.7% (16.8-27.2%)	26	17.6% (10.4-27.0%)

36-59	160	5	31.3% (11.0-58.7%)	63	44.4% (36.0-52.9%)	40	40.0% (30.3-50.3%)	108	41.9% (35.8-48.1%)	52	57.1% (46.3-67.5%)
Total	349	16	100%	142	100%	100	100%	258	100%	91	100%

2.2. Children 0-23 months

Table 22: Prevalence of Infant and Young Child Feeding Practices Indicators

Indicator	Age range	Number/total	Prevalence (%)	95% CI
Timely initiation of breastfeeding	0-23 months	162/293	60.2	54.1-66.1
Exclusive breastfeeding under 6 months	0-5 months	48/65	73.8	61.5-84.0
Continued breastfeeding at 1 year	12-15 months	36/36	100	100-100
Continued breastfeeding at 2 years	20-23 months	30/53	56.6	42.3-70.2
Introduction of solid, semi-solid or soft foods	6-8 months	14/39	35.9	21.2-52.8
Consumption of iron-rich or iron-fortified foods	6-23 months	175/224	78.1	72.1-83.4
Bottle feeding	0-23 months	13/293	4.4	2.4-7.5

Prevalence of intake

Infant formula

Table 23: 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)	8/289	2.8 (1.2-5.4)

Fortified blended foods (FBF)

Table 24: FBF intake in children aged 6-23 months [PRODUCT TO BE ADAPTED: the FBF may be CSB Supercereal for example]

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive FBF	112/223	50.2 (43.5-57.0)

Special nutrition products (SNP)

Table 25: LNS special products intake in children aged 6-23 months [PRODUCT TO BE ADAPTED: the LNS product may be Nutributter® or Plumpy'doz® for example]

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive LNS	12/222	5.4 (2.8-9.3)

2.3. Women 15-49 years

Table 26: Women physiological status and age

Physiological status	Number/total	% of sample
Non-pregnant	309/333	92.8
Pregnant	24/333	7.2
Mean age (range)	29.2 years [15.0 Min, 49.0 Max]	

Table 27: 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=290
Total Anaemia (<12.0 g/dL)	(164)56.6% (50.6-62.3%; 95% CI)
Mild Anaemia (11.0-11.9 g/dL)	(73)25.2% (20.3-30.6%; 95% CI)
Moderate Anaemia (8.0-10.9 g/dL)	(83) 28.6 % (23.5-34.2%; 95% CI)
Severe Anaemia (<8.0 g/dL)	(8) 2.8 % (1.2-5.4%; 95% CI)
Mean Hb (g/dL)	11.60g/dL (1.68 SD) [5.7 min, 19.0max]

Table 28: **ANC enrolment and iron-folic acid pills coverage among pregnant women (15-49 years)**

	Number /total	**% (95% CI)**
Currently enrolled in ANC programme	21/24	87.5; (67.6-97.3)
Currently receiving iron-folic acid pills	20/24	83.3; (62.6-95.3)

2.4. Limitations

- Poor quality of age data: It was noted during the survey that documents reliable for extraction of birthdates including birth certificates and child's rod-to-health cards were very few. Recording of age of children was entirely extracted from UNHCR registration cards and recall from the mother using local event calendar. Most of the UNHCR registration card had rounded age with birthdates of 1st January. This may have affected stunting and underweight results due inaccurate recorded age.

- Language barrier: Training of surveyors was done in English with translation to French by a few participants. It is possible that in the course of the training some participants could not get right some of the key issues and/or could not able to ask for clarification on some areas due to some fear.

- Digit preference for Height/Length: Plausibility check indicated a score of 30, which is categorised under "problematic" as it exceeds 20. This may have affected the results especially on prevalence of acute malnutrition based on WHZ and stunting.

- Changing of surveyors: In this survey, team members were changing from camp to another. It always takes sometimes to acclimatize to the questionnaire; get used to the whole sequence and asking questions to the respondents. This consumes time and at some point this may be a source to introduce some errors in the gathered data.

- Use of smart phones: This technology which was new to many of the survey team may also have introduced some errors and thus inaccuracy of some collected.

3. Discussion

4.1. Nutritional status of young children

Representation of girls was higher than boys (sex ratio 0.8 boys to girls) among younger children when compared to older age group. The reverse was observed among older children where representation of boys was higher than girls (sex ratio 1.5 boys to girls). However, overall no bias was noted as the sex ratio of boys to girls remained at 1.0 implying that both boys and girls were equally represented.

Prevalence of GAM of 3.9% (2.7 – 5.7%) in the refugee camps was fairly acceptable being within WHO standard of below 5%. However, the upper limit of the 95% CI lies beyond acceptable level according to WHO cut-off, and thus, should be interpreted with caution. The prevalence of MAM, 3.6% (2.4 – 5.4) and SAM, 03% (0.1 – 1.1%) were also within acceptable level as per WHO standards.

In 2010 a comprehensive food security and nutrition survey[15] was conducted and the GAM level was estimated at 2.8% in Liberia. In Côte d'Ivoire GAM levels in 2011 were estimated at 5.4%[16]. The GAM levels found in the refugee camps reflect the GAM levels found in Liberia and Cote d'Ivoire and GAM has not significantly increased during the emergency. Community awareness activities by partners in the camps, relatively stable food pipeline and coping mechanisms including cultivation of food crops in some of the camps might have contributed to the stable and low GAM level found among the refugee population in the camps.

Stunting is found to be 45.2% (41.2-49.1% CI), which is critical according to WHO standards. The comprehensive food security and nutrition survey from 2010 estimated a stunting level of 41.8% among children under 5 in Liberia. Stunting levels in Côte d'Ivoire was 40.1 in 2006[17]. More recent data from Côte d'Ivoire is not available. Rural stunting levels are higher than those in urban areas and most of the refugee populations came from the rural areas in Côte d'Ivoire.

[15] CFSNS, MOH, MOA, WFP, 2010
[16] SMART survey, Cote d'Ivoire, 2011
[17] MICS, 2006

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 was no statistically significant difference between boys and girls for the GAM (P=0.137).

3.2. Anaemia in children and women

The overall anaemia level of 73.9% (69.0-78.5%) for children 6-59 months is extremely high and is categorized as a severe public health concern according to the WHO standards. The prevalence of anaemia among non-pregnant women is estimated at 56.6% (50.6-62.3%) which is also considered to be a severe public health concern.

In a survey conducted by the government and UNICEF in 2011[18], anaemia level was found to be 59.1% among children 6-35 months whereas non-pregnant women had anaemia levels of 33.2%.

The main causes for the high levels of anaemia are most likely the limited intake of iron rich food and the high prevalence of malaria.

Accessibility to iron-rich foods is very limited among the refugee communities in Liberia. The only reliable source of iron is Super Cereal (formally known as Corn Soy Blend (CSB), an iron-fortified food item, which is distributed in the general food ration, but in a limited amount with a major focus of supplementing proteins and calories). Poor access to iron-rich foods accelerates vulnerability and susceptibility to anaemia and other micro-nutrient deficiencies.

Malaria remains the leading cause of morbidity in Liberia in general, including in the refugee camps. UNHCR continued to distribute long lasting insecticide impregnated mosquito bed nets. Other prevention measures including indoor residual spraying in Bahn camp have been implemented. One of the common complications in malaria is the development of anaemia [19]. The severity of anaemia depends on several factors such as age and type of contracted malaria. Especially in young children and women, malaria related anaemia causes severe morbidity and mortality. Data on the contribution of malaria on anaemia are not available but research in Kenya and Ghana estimate that the death among anaemia patients related to malaria are 12.2% and 21.6% respectively. As this percentage only reflects the death caused

[18] Liberia National Micronutrient Survey, Lisgis, MOH, UNICEF, 2011
[19] Pathogenesis of anaemia in malaria: a concise review, Kanjaksha Ghosh, Kinjalka Ghosh, Parasitology Research, November 2007, Volume 101, Issue 6, pp 1463-1469

by malaria the actual incidence of malaria contribution to anaemia is higher[20]. Considering that malaria prevalence is high in Liberia it can be assumed that malaria is contributing to the high levels of anaemia found in the refugee camps.

Since the survey was conducted in October 2012, the end of the lean season it is expected that the survey captures the most vulnerable period for the refugees. Therefore it is expected that the nutrition situation will gradually improve after October when the rainy comes to an end.

3.3. Programme coverage

The average vitamin A v coverage is 75.9% (72.4-79.1%) whereas the international standards recommend that 90% of all children under 5 should receive a vitamin A supplementation in the last 6 months. While the goal is universal coverage; coverage of 70% represents the minimal coverage to observe reduction in child mortality related to vitamin A deficiency[21].

In the micronutrient survey conducted in 2011[22] it was found that 86% of children between 6 and 35 months have received vitamin A supplementation in Liberia. In Cote d'Ivoire coverage in 2010 was estimated at 100%[23]. Although the current vitamin A coverage is lower than the national averages of Liberia and Cote d'Ivoire, it is still above the minimum standard of 70% and therefore acceptable. However, there is still a room for improvement to increase the coverage of vitamin A supplementation to 90% to reach the international standards.

Feeding programme coverage based on admission criteria of WHZ <-2 and/Oedema was as low as 50% and below. Only 26.1% (10.2-48.4) of children surveyed who were moderately malnourished were registered to SFP and 50% (1.3-98.7%) were attending OTP.

The number of moderately malnourished children based on MUAC who were attending at SFP during was 55.0% (31.5-76.9) while those attending at OTP were 66.7% (28.4-99.5). The upper confidence limits safeguards the coverage, but this is attributed by the small sample size. These coverage are far below the recommended sphere standard of >75 for both OTP and SFP regardless of the wider confidence intervals.

[20] An Analysis of Anemia and Child Mortality, Bernard J. Brabin,et al, 2001 The American Society for Nutritional Sciences
[21] Vitamin A supplementation, A decade of progress, UNICEF, 2007
[22] Liberia National Micronutrient Survey, Lisgis, MOH, UNICEF, 2011
[23] Vitamin A supplementation coverage, ChildInfo, UNICEF, 2010

Measles vaccination as recorded from health card among children aged 9-59 months revealed a low coverage of 20.5% (17.4-24.0%). Majority of women responded to the question mainly by recall since they had no cards. The coverage by both recall and card was 68.4% (64.5-72.0%) which is still low compared to sphere standards requirement of >95%.

According to this survey the prevalence of diarrhoea was 23.4% (20.2-27.0%) among all children surveyed. The HIS reports from the camps however, revealed a prevalence of around 7% which is far from that observed during the survey. Diarrhoea is attributed by poor hygiene due insufficient water quality and quantity and may lead to severe dehydration and deaths especially among under five children.

3.4. IYCF indicators

In terms of IYCF, exclusive breastfeeding is provided to 73.8% among children 0 to 5 months. In 2006 the national average of percentage of exclusively breastfed in Cote d' ivory was only 4% according to the MICS 2006 data analysed by UNICEF[24]. Considering the low percentage of exclusive breastfeeding in Cote d'Ivoire before and the emergency situation, the percentage found is rather high as during emergencies generally the rate of exclusive breastfeeding decreases significantly and within the recommended public health levels

Breastfeeding within an hour is estimated at 60.2% (54.1-66.1%) among the refugee population. A possible explanation for this percentage is that many deliveries took place outside the refugee camps (87%)[25] primarily because of absence of delivery services in the camps. However, on average expecting mothers had 2 antenatal visits per pregnancy with and antennal care coverage close to 86% which is within the parameters of international standards.

The introduction of solid food among children 6 to 8 months is rather low with 35.9%. Data from the MICS estimate the introduction of solid food at 54% in Cote d'Ivoire. The difference might be contributed to nutrition education and counselling.

[24] Infant and young child feeding, UNICEF, MICS 2006
[25] JAM, UNHCR, WFP, November 2011

4. Conclusions

The survey results revealed that the nutrition situation among Ivoirian refugees residing in camps in Liberia remains within WHO recommended level of acute malnutrition, but with very high prevalence of anaemia for both children and women of reproductive age group.

GAM level is 3.9% and thus acceptable according to WHO standards. Stunting levels are higher and considered severe with a stunting prevalence of 45.2% among children under five. This high stunting prevalence reflects the overall stunting prevalence in Liberia and Cote d'Ivoire of 41.8% and 40.1% respectively. Compared to these data the stunting prevalence in the refugee camps are slightly elevated which could be caused by the rural Ivorian population that sought refuge in the Liberian camps since stunting in rural areas is higher compared to stunting in urban areas.

Prevalence of anaemia among children aged 6-59 months is 74% and 56.6% among non-pregnant women aged 15 to 49 years. This very high prevalence of anaemia in children and non-pregnant women are above the acceptable upper limit of 40% and are considered a severe public health problem. A low intake of iron reach food commodities and malaria most likely contribute to the high level of anaemia.

IYCF indicators reveal that initiation of early breastfeeding is 60.2% and exclusive breastfeeding is 73.8%. Considering the emergency situation these results are rather positive. Coverage of vitamin A supplementation is 75.9% which is below the international standards of 90%. However, the coverage is higher than the minimum standard of 70% but nonetheless efforts should be made to increase the coverage to a higher level.

5. Recommendations and priorities

A. Conduct training for health workers of the UNHCR health and nutrition implementing partners in the camps and health workers in government referral health facilities and other partners on prevention and management of anaemia, including sessions on micronutrient deficiencies such as vitamin A.

B. Consider blanket feeding distribution of MNP's to children 6-59 months to prevent anaemia. The **treatment** of diagnosed iron deficiency anaemia should continue using the established supplementation regimens. Anaemia prevalence amongst children 6-59 months and women of reproductive age is a severe public health problem that urgently needs to be addressed. According to the joint statement of WHO, WFP and UNICEF[26] untargeted blanket supplementation of children with iron supplements should be avoided in areas where malaria is prevalent. In the absence of specific guidance, iron should be assumed to be included in micronutrient powders (MNP) such as Sprinkles and other food supplementation products such as lipid based nutrient supplements. Blanket MNP distribution is likely to decrease the prevalence rate of anaemia among children and women in a short term and decrease morbidity and mortality.

C. Equip the health facilities in refugee camps with rapid diagnostic testing machines for anaemia (e.g. HaemoCue) and related supplies in order to effectively manage anaemia. Currently diagnostic testing machines are not a**vailable i**n all camps while these testing kits are essential to detect anaemia for early diagnosis and effective treatment.

D. Promote home backyard gardening for green leafy vegetables and fruits that will increase absorption of non-heam iron consumed from cereals and pulses distributed in the general ration and other coping strategies. In order to implement home gardens sufficient equipment (including seeds) need to be provided and training need to be conducted.

E. Scale up malaria prevention activities, specifically the proper use of insecticide impregnated mosquito nets; consider indoor residual sprays; and improve intermittent presumptive treatment of malaria during pregnancy; and improve and

[26]WHO, WFP, and UNICEF (2006). Iron supplementation of young children in regions where malaria transmission is intense and infectious disease highly prevalent. Joint statement of the World Health Organization and the United Nations Children's Fund, (Un-dated).

strengthen rapid detection of malaria cases and management, including training in malaria case management. Malaria and the prevalence of anaemia are directly correlated and by preventing malaria a decrease of anaemia cases is to be expected.

F. Assess and strengthen the antenatal coverage in the camps to ensure iron supplementation and IPT for malaria among pregnant women. This will help prevent malnutrition among pregnant and lactating women and low birth weight. Malnourished women are likely to give birth to smaller infants. A low birth weight subsequently results in children who are likely to become stunting, followed by small adolescents and ultimately small adults[27]. This inter-generation cycle of malnutrition underlines the importance to target both young children and pregnant and lactating women to break the cycle and tackle the problem of malnutrition at it roots.

G. Intensify the nutrition outreach program in the camps for "active case finding". Promote active screening on malnutrition and strengthen growth monitoring in health facilities. This will ensure early determination of malnutrition and will have positive effects on the success and duration of treatment.

H. Promote health seeking behaviour to prevent unnecessary deterioration of the nutrition and health status.

I. Stress the importance of nutrition education on IYCF practices, dietary diversity, and food preparation to prevent malnutrition, especially among children under 5. Malnourished children are at increased risk of poor health, as well as of developing chronic diseases later in life[28]. Therefore it is recommended to promote the right nutrition behaviour among head of households and caretakers. This can be done by focus group discussion, radio spots, training, counselling at facility level and art performances.

J. Conduct another nutrition survey in 2013 to re-assess whether the nutrition situation, with an emphasis on anaemia prevalence, and with focus on individual camps.

K. Ensure close monitoring of the anaemia situation.

[27] *Maternal and child nutrition: global and regional exposures and health consequences.* Black, Robert E., et al. 2008, The Lancet, Vol. 371, pp. 243-260

[28] *Maternal and child nutrition: global and regional exposures and health consequences.* **Black, Robert E., et al.** 2008, The Lancet, Vol. 371, pp. 243-260.

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8. Appendices

8.1 Appendix 1: Plausibility Report

Overall data quality

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

At the moment the overall score of this survey is 0 %, this is excellent.

Digit preference Height:

Digit .0 : ##

Digit .1 : ##########

Digit .2 : ################

Digit .3 : ##############

Digit .4 : ##########

Digit .5 : ###################################

Digit .6 : #########

Digit .7 : #########

Digit .8 : ######
Digit .9 : ###

Digit Preference Score: **30** (0-5 excellent, 6-10 good, 11-20 acceptable and > 20 problematic)
p-value for chi2: 0.000 (significant difference)

8.2. Appendix 2: Result Tables according to the NCHS growth reference 1977

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

	All n = 641	**Boys** n = 312	**Girls** n = 329
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(21) 3.3 % (2.2 - 5.0 95% C.I.)	(10) 3.2 % (1.8 - 5.8 95% C.I.)	(11) 3.3 % (1.9 - 5.9 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(19) 3.0 % (1.9 - 4.6 95% C.I.)	(9) 2.9 % (1.5 - 5.4 95% C.I.)	(10) 3.0 % (1.7 - 5.5 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(2) 0.3 % (0.1 - 1.1 95% C.I.)	(1) 0.3 % (0.1 - 1.8 95% C.I.)	(1) 0.3 % (0.1 - 1.7 95% C.I.)

The prevalence of oedema is 0.3 %

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

		Severe wasting (<-3 z-score)		**Moderate wasting (>= -3 and <-2 z-score)**		**Normal (> = -2 z score)**		**Oedema**	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	130	0	0.0	6	4.6	123	94.6	1	0.8
18-29	157	0	0.0	5	3.2	152	96.8	0	0.0
30-41	145	0	0.0	5	3.4	139	95.9	1	0.7
42-53	151	0	0.0	2	1.3	149	98.7	0	0.0
54-59	58	0	0.0	1	1.7	57	98.3	0	0.0
Total	641	0	0.0	19	3.0	620	96.7	2	0.3

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

	All n = 653	**Boys** n = 321	**Girls** n = 332
Prevalence of global malnutrition (< 125 mm and/or oedema)	(26) 4.0 % (2.7 - 5.8 95% C.I.)	(13) 4.0 % (2.4 - 6.8 95% C.I.)	(13) 3.9 % (2.3 - 6.6 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(20) 3.1 % (2.0 - 4.7 95% C.I.)	(9) 2.8 % (1.5 - 5.2 95% C.I.)	(11) 3.3 % (1.9 - 5.8 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(6) 0.9 % (0.4 - 2.0 95% C.I.)	(4) 1.2 % (0.5 - 3.2 95% C.I.)	(2) 0.6 % (0.2 - 2.2 95% C.I.)

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

		Severe wasting (< 115 mm)		**Moderate wasting (>= 115 mm and < 125 mm)**		**Normal (> = 125 mm)**		**Oedema**	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	132	2	1.5	9	6.8	121	91.7	1	0.8
18-29	160	1	0.6	7	4.4	152	95.0	0	0.0
30-41	149	1	0.7	3	2.0	145	97.3	1	0.7
42-53	153	0	0.0	1	0.7	152	99.3	0	0.0
54-59	59	1	1.7	0	0.0	58	98.3	0	0.0
Total	653	5	0.8	20	3.1	628	96.2	2	0.3

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

	n = 641
Prevalence of global acute malnutrition (<80% and/or oedema)	(14) 2.2 % (1.3 - 3.6 95% C.I.)
Prevalence of moderate acute malnutrition (<80% and >= 70%, no oedema)	(12) 1.9 % (1.1 - 3.2 95% C.I.)
Prevalence of severe acute malnutrition (<70% and/or oedema)	(2) 0.3 % (0.1 - 1.1 95% C.I.)

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

		Severe wasting (<70% median)		**Moderate wasting (>=70% and <80% median)**		**Normal (> =80% median)**		**Oedema**	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	130	0	0.0	3	2.3	126	96.9	1	0.8
18-29	157	0	0.0	4	2.5	153	97.5	0	0.0
30-41	145	0	0.0	4	2.8	140	96.6	1	0.7
42-53	151	0	0.0	0	0.0	151	100.0	0	0.0
54-59	58	0	0.0	1	1.7	57	98.3	0	0.0
Total	641	0	0.0	12	1.9	627	97.8	2	0.3

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

	All n = 634	**Boys** n = 309	**Girls** n = 325
Prevalence of underweight (<-2 z-score)	(159) 25.1 % (21.9 - 28.6 95% C.I.)	(76) 24.6 % (20.1 - 29.7 95% C.I.)	(83) 25.5 % (21.1 - 30.5 95% C.I.)
Prevalence of moderate	(117) 18.5 %	(57) 18.4 %	(60) 18.5 %

underweight (<-2 z-score and >=-3 z-score)	(15.6 - 21.7 95% C.I.)	(14.5 - 23.1 95% C.I.)	(14.6 - 23.0 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(42) 6.6 % (4.9 - 8.8 95% C.I.)	(19) 6.1 % (4.0 - 9.4 95% C.I.)	(23) 7.1 % (4.8 - 10.4 95% C.I.)

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

		Severe underweight (<-3 z-score)		**Moderate underweight (>= -3 and <-2 z-score)**		**Normal (> = -2 z score)**		**Oedema**	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	126	9	7.1	21	16.7	96	76.2	1	0.8
18-29	157	16	10.2	37	23.6	104	66.2	0	0.0
30-41	142	9	6.3	25	17.6	108	76.1	1	0.7
42-53	151	4	2.6	24	15.9	123	81.5	0	0.0
54-59	58	4	6.9	10	17.2	44	75.9	0	0.0
Total	634	42	6.6	117	18.5	475	74.9	2	0.3

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

	All n = 608	**Boys** n = 304	**Girls** n = 304
Prevalence of stunting (<-2 z-score)	(227) 37.3 % (33.6 - 41.2 95% C.I.)	(123) 40.5 % (35.1 - 46.1 95% C.I.)	(104) 34.2 % (29.1 - 39.7 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(136) 22.4 % (19.2 - 25.8 95% C.I.)	(68) 22.4 % (18.0 - 27.4 95% C.I.)	(68) 22.4 % (18.0 - 27.4 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(91) 15.0 % (12.4 - 18.0 95% C.I.)	(55) 18.1 % (14.2 - 22.8 95% C.I.)	(36) 11.8 % (8.7 - 16.0 95% C.I.)

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

		Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	124	9	7.3	14	11.3	101	81.5
18-29	149	22	14.8	45	30.2	82	55.0
30-41	136	24	17.6	32	23.5	80	58.8
42-53	146	28	19.2	30	20.5	88	60.3
54-59	53	8	15.1	15	28.3	30	56.6
Total	608	91	15.0	136	22.4	381	62.7

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	639	-0.29±0.93	1.00	2	12
Weight-for-Age	634	-1.26±1.11	1.00	5	14
Height-for-Age	608	-1.58±1.27	1.00	3	42

* contains for WHZ and WAZ the children with edema.

8.3. Appendix 3: 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.

Household Control Sheet

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

Date: ___/ ___/ 2012							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.

Household Form – CHILDREN

Date __ _/ 10_/ 2012			**Camp**			**Team number**		
# HH*	**# Child***	**Name**	**M/F**	**Age** **Child: 6-59 mo**	**Weight** **Child 6-59 mo**	**Height** **Child 6-59 mo**	**MUAC** **Child 6-59 mo**	**Hb g/dL** **Child 6-59 mo**
* Give household and child same number as in the phone questionnaire.								

Household Form - WOMEN

Date __ _/ 10_/ 2012			**Camp**	**Team number**
# HH*	**# Woman***	**Name**	**Age** **Women: 15-49 y**	**Hb g/dL** **Non-pregnant women only**
* Give household and women same number as in the phone questionnaire.				

WOMEN ANAEMIA:

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

Date of interview : |__|__|/ 10 / 2012	**Camp**	**Block** |__|__|	**Team number** |__|

WM1	**WM2**	**WM3**	**WM4**	**WM5**	**WM6**	**WM7**	**WM8**
ID	**HH**	**Consent given** 1=yes 2=no 3=absent	**Age** (years)	**Are you pregnant?** 1=yes 2=no (GO TO HB) 8=DK (GO TO HB)	**Are you currently <u>enrolled</u> in the ANC programme?** 1=yes 2=no 8=DK	**Are you currently <u>receiving</u> 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 / 2012			**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)	**Weight** (kg) ±100g	**Height** (cm) ±0.1cm	**Oedema** (y/n)	**MUAC** (mm)	**Child enrolled** 1=SFP 2=OTP 3=None	**Measles** 1=yes card 2=yes recall 3=no or don't know	**Vit. A in past 6 months** (SHOW CAPSULE) 1=yes card 2=yes recall 3=no or don't know	**Diarrhoea in past 2 weeks** 1=yes 2=no 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: 1 questionnaire per child 0-23 months

(THIS QUESTIONNAIRE IS TO BE ADMINISTERED TO THE MOTHER OR THE MAIN CAREGIVER WHO IS RESPONSIBLE FOR FEEDING THE CHILD AND THE CHILD SHOULD BE BETWEEN 0 AND 23 MONTHS OF AGE)

Camp	**Block**	**Consent**
	|__|__|	yes / no / absent

Date of interview	**Team Number**	**HH Number**	**Infant number**
|__|__|/ 10 / 2012	|__|	|__|__|	|__|__|

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 hours 3	|__|

		DK..... 8	
IF6	Was [NAME] breastfed yesterday during the day or at night?	Yes..... 1 No..... 2 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 water, plain tea	7I.....1 2 8	

IF8	Yesterday, during the day or at night, did [NAME] eat solid or semi-solid (soft, mushy) food?	Yes……..1 No……..2 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	|__|

SECTION IF4			
IF10	Is child aged 6-23 months? REFER TO IF2	Yes……..1 No……..2	|__| **IF ANSWER IS 2 STOP NOW**
IF11	Now I would like to ask you about some particular foods [NAME] may eat. I am interested in whether your child had the item even if it was combined with other foods. Yesterday, during the day or at night, did [NAME] consume any of the following? ASK ABOUT EVERY ITEM. IF ITEM WAS GIVEN, CIRCLE '1'. IF ITEM WAS NOT GIVEN, CIRCLE '2'. IF CAREGIVER 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

8.4. Appendix 3: Local Event Calendar

Seasons	Religious Holidays	Other events	Local Events	Months / Years	Age (M)
Rainy season				October 2012	0
				September 2012	1
				August 2012	2
		African Women day 31		July 2012	3
Peak rainy season		International Child day 1 Day of the African Child 16 World Refugee Day 20		June 2012	4
		Labour day 1		May 2012	5
Start of rainy season	Easter			April 2012	6
		Women's international day 8		March 2012	7
				February 2012	8
		New year's day 1		January 2012	9
End of rainy season	Christmas	World Aids day 1 Human rights day 10		December 2011	10
				November 2011	11
Rainy season				October 2011	12
				September 2011	13
				August 2011	14
		African Women day 31		July 2011	15
Peak rainy season		International Child day 1 Day of the African Child 16 World Refugee Day 20		June 2011	16
		Labour day 1		May 2011	17
Start of rainy season	Easter			April 2011	18
		Women's international day 8		March 2011	19
				February 2011	20
		New year's day 1		January 2011	21
End of rainy season	Christmas	World Aids day 1 Human rights day 10		December 2010	22
				November 2010	23
Rainy season				October 2010	24
				September 2010	25
				August 2010	26
		African Women day 31		July 2010	27
Peak rainy season		International Child day 1 Day of the African Child 16 World Refugee Day 20		June 2010	28
		Labour day 1		May 2010	29
Start of rainy season	Easter			April 2010	30
		Women's international day 8		March 2010	31
				February 2010	32
		New year's day 1		January 2010	33
End of rainy season	Christmas	World Aids day 1 Human rights day 10		December 2009	34
				November 2009	35
Rainy season				October 2009	36
				September 2009	37
				August 2009	38
		African Women day 31		July 2009	39
Peak rainy season		International Child day 1 Day of the African Child 16 World Refugee Day 20		June 2009	40
		Labour day 1		May 2009	41
Start of rainy season	Easter			April 2009	42
		Women's international day 8		March 2009	43
				February 2009	44
		New year's day 1		January 2009	45
End of rainy season	Christmas	World Aids day 1 Human rights day 10		December 2008	46
				November 2008	47

Rainy season				October 2008	48
				September 2008	49
				August 2008	50
		African Women day 31		July 2008	51
Peak rainy season		International Child day 1 Day of the African Child 16 World Refugee Day 20		June 2008	52
		Labour day 1		May 2008	53
Start of rainy season	Easter			April 2008	54
		Women's international day 8		March 2008	55
				February 2008	56
		New year's day 1		January 2008	57
End of rainy season	Christmas	World Aids day 1 Human rights day 10		December 2007	58
				November 2007	59
				October 2007	60