UNHCR SENS

Nutrition Survey in

Dzaleka refugee camp Malawi

27 June-5 July 2012

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UNHCR
in collaboration with
WFP

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LIST OF ACRONYMS

ANC	Antenatal Care
CI	Confidence Interval
ENA	Emergency Nutrition Assessment
ENA for SMART	Name of a SMART nutrition survey software
EPI	Expanded Programme on Immunisation
Epi Info	Name of CDC software for epidemiological investigations including nutrition surveys
FBF	Fortified blended foods
GAM	Global Acute Malnutrition
HAZ	Height-for-age z-score
Hb	Haemoglobin
HDDS	Household dietary diversity score
HH	Household
HIS	Health Information System
ID	Identification
IYCF	Infant and Young Child Feeding Practices
JAM	Joint Assessment Mission
LLIN	Long-lasting Insecticidal Net
LNS	Lipid-based nutrient supplements
lppd	Litres per person per day
MNP	Micronutrient powder
MUAC	Mid-Upper Arm Circumference
NCHS	National Center for Health Statistics
NFI	Non-food items
ProGres	Registration database for refugee population data
SAM	Severe acute malnutrition
SENS	Standardised Expanded Nutrition Survey
SFP	Supplementary feeding programme
SMART	Standardised Monitoring and Assessment of Relief and Transitions
TFP	Therapeutic feeding programme
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
WAZ	Weight-for-age z-score
WASH	Water, Sanitation, and Hygiene
WFP	World Food Programme
WHZ	Weight-for-height z-score

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EXECUTIVE SUMMARY

Dzaleka refugee camp in Malawi has been hosting refugees since 1994 mainly from the Great Lakes Region in Central Africa. Today, the camp has 14,014[1] registered individuals. Since 2002 WFP has been providing food assistance to the refugees, in accordance with the Memorandum of Understanding between WFP and UNHCR. Originally the ration provided was planned according to SPHERE standards at 2,100 kcal per person per day, but since February 2012, WFP has provided half ration due to funding shortages. WFP and UNHCR will together undertake a JAM in August 2012 to revise the current food assistance programme and the refugees' food security situation.

The last nutrition survey in Dzaleka refugee camp was conducted in 2008, and there have been no updated data on prevalence of malnutrition or other related indicators in the meantime. The last JAM was conducted in 2009. Since little data was available on the food and nutrition situation in the camp, a UNHCR Standardised Expanded Nutrition Surveys (SENS) was conducted among the refugees prior to the JAM to feed into the final analysis.

With technical support from WFP, UNHCR conducted a nutrition survey in Dzaleka refugee camp between 27 June and 5 July 2012, with the following objectives:

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

[1] UNHCR ProGres population data, May 2012.

The survey was based on the SMART methodology and UNHCR SENS (Standardised Expanded Nutrition Survey) Guidelines for Refugee Populations (v 1.3, March 2012). Simple random sampling was used to select a target sample of 504 households and 314 children under 5 years. A resultant sample size of 422 households and 365 children was achieved. A total of 6 survey teams collected data over a period of 8 days on child anthropometry and health; infant and young child feeding; child and adult women anaemia; food security; water, sanitation and hygiene; and mosquito net coverage, following a 5-day training and standardisation test. Supervision was provided by the UNHCR Health Coordinator, WFP Nutritionist and the Survey Coordinator. Data entry was done concurrently with data collection by 2 data entry clerks on excel templates. The ENA for SMART November 2011 version was used to analyse anthropometric data, and the rest of the data was analysed using EPI Info April 2012 version.

Table 1 Summary of results

	Number of cases/ sample size	**% (95% CI)**	**Classification of public health significance or target (where applicable)**
CHILDREN 6-59 months			
Acute Malnutrition (WHO 2006 Growth Standards)			
Global Acute Malnutrition (GAM)	5/361	1.4 (0.6-3.2)	Critical if ≥ 15%
Moderate Acute Malnutrition (MAM)	4/361	1.1 (0.4-2.8)	
Severe Acute Malnutrition (SAM)	1/361	0.3 (0.0-1.6)	
Oedema	1/361	0.3 (0.0-1.6)	
Mid Upper Arm Circumference (MUAC)			
Moderate malnutrition (11.5-12.4 cm)	7/365	1.9 (0.9-3.9)	
Severe malnutrition (<11.5 cm)	2/365	0.5 (0.2-2.0)	
Stunting[2] (WHO 2006 Growth Standards)			
Total Stunting	78/348	22.4 (18.3-27.1)	Critical if ≥ 40%
Severe Stunting	23/348	6.6 (4.4-9.7)	
Programme coverage			
Measles vaccination with card or recall (9-59 months)	315/350	90.0 (86.3-92.8)	Target of ≥ 95%

[2] Note that z-scores for height-for-age require accurate ages within two weeks (CDC/WFP: A manual: Measuring and Interpreting Mortality and Malnutrition, 2005).

	Number of cases/ sample size	% (95% CI)	Classification of public health significance or target (where applicable)
Vitamin A supplementation vaccination with card or recall	299/365	81.9 (77.5-85.7)	Target of ≥ 90%
Diarrhoea			
Diarrhoea in last 2 weeks	115/365	31.5 (26.8-36.6)	
Anaemia			
Total Anaemia (Hb<11 g/dl)	86/209	41.2 (34.4-48.2)	High if ≥ 40%
Mild (Hb 10-10.9)	39/209	18.7 (13.6-24.6)	
Moderate (Hb 7-9.9)	43/209	20.6 (15.3-26.7)	
Severe (Hb<7)	4/209	1.9 (0.5-4.8)	
CHILDREN 0-23 months			
IYCF indicators			
Timely initiation of breastfeeding	119/166	71.7 (64.2-78.4)	
Exclusive Breastfeeding under 6 months	29/48	60.4 (45.3-74.2)	
Continued breastfeeding at 1 year	28/31	91.7 (77.5-98.2)	
Continued breastfeeding at 2 years	11/23	47.8 (26.8-69.4)	
Introduction of solid, semi-sold or soft foods	11/15	73.3 (44.9-92.2)	
Consumption of iron-rich or iron-fortified foods	52/131	39.7 (31.3-48.6)	
Bottle feeding	12/169	7.1 (3.7-12.1)	
WOMEN 15-49 years Anaemia (non-pregnant)			
Total Anaemia (Hb<12 g/dl)	32/190	16.8 (11.8-22.9)	High if ≥ 40%
Mild (Hb 11-11.9)	10/190	5.3 (2.6-9.5)	
Moderate (Hb 8-10.9)	22/190	11.6 (7.4-17.0)	
Severe (Hb<8)	0/190	-	
FOOD SECURITY			
Food distribution			
Proportion of HH with a ration card	206/211	97.6 (94.6-99.2)	

	Number of cases/ sample size	% (95% CI)	Classification of public health significance or target (where applicable)
Average number of days GFR lasts out of 30[3] days	14.2 (Std dev 5.95)		
Negative household coping strategies			
Proportion of HH reporting using none of the coping strategies over the past month	21/211	10.0% (6.3-14.8)	
Household dietary diversity			
Average HDDS	5.5 (Std dev 1.48)		
Proportion of households where the diet consists entirely of staples, pulses and oils/fat from food aid ration (no other food sources)	0/211	-	
Proportion of households *not consuming any* vegetables, fruits, meat, eggs, fish/seafood, and milk/milk products	0/211	-	
WASH			
Water quality			
Proportion of households using improved drinking water source	210/211	99.5 (97.4-100.0)	
Proportion of households that use a covered or narrow necked container for storing their drinking water	136/211	64.5 (57.6-70.9)	
Water quantity			
Proportion of households that use:			Average quantity of water available per person / day ≥ 20 litres
≥ 20 lpppd	74/211	35.1 (28.7-41.9)	
15 - <20 lpppd	28/211	13.3 (9.0-18.6)	
<15 lpppd	109/211	51.7 (44.7-58.6)	
Proportion of households taking <30 minutes to collect their main	173/209	82.8 (77.0-87.6)	

[3] WFP provides half ration to last for 30 days together with other food intake.

	Number of cases/ sample size	% (95% CI)	Classification of public health significance or target (where applicable)
drinking water			
Satisfaction with drinking water supply			
Proportion of households that say they are satisfied with drinking water supply	125/211	59.2 (52.3-65.9)	
Safe excreta disposal			
Proportion of households using an improved excreta disposal facility[4]	72/206	35.0 (28.5-41.9)	
Proportion of HH using a shared family toilet	34/206	16.5 (11.7-22.3)	
Proportion of HH using a communal toilet	34/206	16.5 (11.7-22.3)	
Proportion of HH using an unimproved toilet	66/206	32.0 (25.7-38.9)	
Proportion of HH with children <3 yrs disposing of faeces safely	97/112	86.6 (78.9-92.3)	
MOSQUITO NET			
Mosquito net ownership			
Proportion of HHs owning at least one LLIN	117/211	55.5 (48.5-62.3)	Target of >75%
Average number of persons per LLIN	4.5		1.8 persons per LLIN
Mosquito net utilisation			
Total HH members (all ages) who slept under an LLIN	324/1061	30.5	
Children 0-59 months who slept under an LLIN	84/227	37.0	
Pregnant women who slept under an LLIN	8/24	33.3	

[4] "Improved excreta disposal facility" is one that hygienically separates human excreta from human contact and is not shared with other households.

Interpretation of results

- The overall nutrition situation in Dzaleka camp is stable, with acute and chronic malnutrition prevalence rates below the 15% and 40% thresholds, respectively.
- Malnutrition rates largely remained unchanged from 2008.
- The rate of anaemia in children 6-59 months is of concern, as it exceeds the 40% public health threshold set by WHO and therefore requires intervention.
- Amongst women of reproductive age, however, the rate of anaemia is acceptably low.
- The coverage of both Vitamin A supplementation and measles vaccination have slightly declined from 2008, and were below the SPHERE targets of 90% and 95%, respectively.
- Nearly a third of children failed to receive breast milk within the first hour of birth. However, more than half of infants below 6 months were being exclusively breastfed, and the rate of bottle feeding was very low. Less than three quarters of infants between 6 and 8 months having been introduced to solid foods. Nearly all children were still breastfeeding at 1 year, whilst slightly less than half were still breastfeeding at 2 years.
- Due to the half ration being given, most households' rations lasted for about half of the month.
- Nearly all households had access to improved drinking water sources. However, nearly a third were using unimproved toilets.
- Slightly more than half of households owned at least one LLIN, with the ownership (number of persons per LLIN) falling well below the target of 1.8 persons per LLIN. Only a third of the population was sleeping under LLINs, with utilisation rates generally low across all groups.

RECOMMENDATIONS AND PRIORITIES

Immediate

1. Blanket provision of Micronutrient Powder (MNP) for children 6-59 months or 6-23 months, depending on resource availability, to address the high prevalence of anaemia among children.
2. Conduct mosquito net hang-up campaign to put unused LLINs over sleeping surfaces to promote use.

Medium

3. Improve anaemia control programming through deworming, malaria control, antenatal care and nutrition gardens.
4. Increase information, education and communication for infant and young child feeding, anaemia prevention and mosquito net use.
5. Further investigate coping mechanisms with regard to trade and exchange between food and other goods and services.
6. Investigate possible causes of anaemia in children.

Longer term

7. Design food security interventions to complement the current food assistance through agricultural interventions and income generating activities.
8. Increase coverage of toilets so as to reduce sharing.

1. INTRODUCTION

Dzaleka refugee camp is located in Dowa district in the Central Region of Malawi. Dowa is an agricultural district, which focuses on cotton, tobacco and groundnut farming, and the main food crops produced in the district are maize, sweet potatoes and pulses.

Dzaleka refugee camp was established by the United Nations High Commissioner for Refugees (UNHCR) in 1994 in response to a wave of forcibly displaced people fleeing genocide, violence and wars in Burundi, Rwanda and the Democratic Republic of Congo. Prior to becoming a refugee camp, the Dzaleka facility had served as a political prison.

Today, Dzaleka refugee camp has 14,014[5] registered individuals. Approximately 41% of the total population is recognized as refugees, while the remaining part (59%) consists of asylum seekers at various stages of the Refugee Status determination (RSD) process. The population mainly consists of refugees and asylum seekers from the Democratic Republic of Congo (44%), Rwanda (32%) and Burundi (23%).

The planned general food ration in Dzaleka refugee camp is according to SPHERE standards (Table 2). But since February 2012 WFP has only been able to provide half ration. The population is presently receiving a monthly food ration from WFP consisting of 7kg cereal, 0.9kg pulses, 0.375kg oils, 0.75kg CSB, 0.225kg sugar, and 0.075kg iodised salt per person per month. The WFP general food ration provides 311 grams/person/day, translating to 1,158 Kcal, which is about half of SPHERE standard recommended requirements (Table 2). However, since June 2012 WFP has been able to provide full ration of some of the commodities, and especially cereals will be provided in full quantity for the remaining of 2012.

Table 2 Planned content of the general food ration-Dzaleka refugee camp

	Grams/person/day	Kilocalories	Energy provided (%)
Cereals	400	1,400	67.6
Pulses	60	200	9.7
Oils	25	220	10.6
Corn soya blend	50	190	9.2
Sugar	15	60	2.9
Iodised salt	5	0	0.0
	555	2,070	100

Recommended daily Kcal=2, 100

There are two main agricultural seasons in Malawi, the rainy season between December and March, and the dry season between November and April. The survey was conducted in June/July during the dry season.

[5] UNHCR ProGres population data, May 2012.

Dzaleka refugee camp has a health facility, which provides basic health services, including immunisation, pre-natal and antenatal care, and also therapeutic feeding (for severely malnourished children) and supplementary feeding (for moderately malnourished children). Admission numbers, however, are very low.

1.1 SURVEY OBJECTIVES

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

2. METHODOLOGY

2.1 Sample size

Simple random sampling was used to select the sample. The justification for the sampling method was that, despite the availability of updated household population statistics, the arrangement of households within Dzaleka was not ordered such as to enable systematic movement from one household to another.

ENA for SMART was used to determine the required sample size for **Module 1: Anthropometry and Health**, with the assumptions and justification shown in Table 3:

Table 3 Assumptions for sample size calculation-anthropometry and health

Parameter		**Assumption /Explanation**
Total population	8,911*	Malawi Red Cross Society May 2012 household count
No. of households	1,959	Malawi Red Cross Society May 2012 household count
% under 5	17.5%	Pro Gres database
Average household size	4.5	Malawi Red Cross Society May 2012 household count
Estimated prevalence	4.4%	2008 JAM upper 95% confidence limit
Desired precision	2%	SMART
Non response	10%	
Calculation results		
Children to be included	314	
Households to be included	492**	

**The population figures from UNHCR ProGres and Malawi Red Cross Society differ, and after much consideration it was decided to base the sampling on the MRCS's figures as these were believed to better reflect the camp population as UNHCR ProGres also includes refugees that are registered in the camp but in fact are not living there.*

***The no. of households was rounded to 504 for 6 days of data collection with a target of 12 households per team per day*

The sample sizes for the remaining modules were calculated according to UNHCR SENS guidelines, as follows:

Module 2: Anaemia (children 6-59 months and women of reproductive age 15-49 years): Half of the total household sample size = 252 households.

Module 3: IYCF (children 0-23 months): All sampled households = 504 households.

Module 4: Food Security (household as a whole): Half of the total household sample size = 252 households.

Module 5: WASH: Half of the total household sample size = 252 households.

Module 6: Mosquito Net Coverage: Half of the total household sample size = 252 households.

2.2 Sampling procedure: selecting households and individuals

A sample of 504 households was randomly drawn from a household list of 1,959 households provided by Malawi Red Cross Society, a partner of UNHCR in the camp.

Households for inclusion were then placed in their respective zones for ease of identification and organisation.

Module 1 – *Anthropometry and Health (children 6-59 months):* All eligible children within all of the sampled households were assessed for anthropometry, enrolment in treatment feeding programme, measles vaccination, Vitamin A supplementation in last 6 months and diarrhoea in last 2 weeks.

Module 2 – *Anaemia (children 6-59 months and women of reproductive age 15-49 years)*: Half of the selected households were randomly assessed for anaemia and all eligible children and women found in these households should be assessed for anaemia.

Module 3-*IYCF (children 0-23 months):* With all eligible children within all of the sampled households were assessed for IYCF practices.

Module 4 – *Food Security*: Half of the selected households were randomly sampled for the assessment of food security.

Module 5 – *WASH:* Half of the selected households were randomly sampled for the assessment of food security.

Module 6 - *Mosquito Net Coverage (household as a whole):* Half of the households were randomly sampled for the assessment of mosquito net coverage.

The following procedures were followed in special cases:

*Absences***:** If an individual or an entire household was absent, the team leader recorded this information and determined another time to return on the same day. The team returned to an absent household or revisited an absent individual up to two times, if it was logistically feasible, on the same survey day. If they were unsuccessful after this, the individual or household was recorded as an absence and was not replaced with another household or individual.

*Refusals***:** If an individual or an entire household refused to participate, then it was considered a refusal and this information was recorded. Absent individuals or households and refusals were not replaced.

*Abandoned households***:** A household was considered abandoned if neighbours reported that nobody has lived in that household for more than one month or if the inhabitants had been repatriated. This household was replaced by another household and it was considered as abandoned.

Household with no children: If it was determined that a selected household did not have any eligible children, the questionnaire was still be administered to the household and any eligible women.

Child in nutrition/health centre: The team went to the centre if it was feasible to do so to take the measurements and information from the child. If it was impossible to visit the centre, the child was considered as absent and not replaced.

Disabled child: If a physical deformity prevented the measurement of child's weight or height, the child was recorded as missing for these variables, but the child was included

for the assessment of the other indicators (e.g. oedema, measles vaccination, vitamin A supplementation).

The survey respondent was the mother of children aged below 5 years or the primary caretaker of those children. Alternatively, the respondent was the head of household.

2.3 Questionnaire and measurement methods

Questionnaire

Kiswahili was the main language in which the questionnaire was administered. In a few instances, where the respondent was conversant in English, then it was used. The questionnaire was in English and was not translated into Kiswahili as all enumerators were conversant in English. The questionnaire was pre-tested in Chiwamba village on the outskirts of Lilongwe, before the survey began. The questionnaire (included in **Appendix 4)** had the following six modules:

Module 1 -*Anthropometry and health*: Included data on anthropometry, enrolment in treatment feeding programmes, measles vaccination, Vitamin A supplementation, and diarrhoea for children 6-59 months.

Module 2 -*Anaemia*: Included data on Haemoglobin measurements for children 6-59 months and women15-49 years, as well as data on pregnancy status, ANC enrolment and iron and folic acid pills coverage for women 15-49 years.

Module 3- *IYCF*: Included data on breastfeeding initiation, exclusivity and duration and feeding practices for children aged 0-23 months.

Module 4-*Food Security*: Included data on all access to food distribution, duration of the general food ration, use of negative coping strategies, level of household dietary diversity and performance of food aid distribution system for households.

Module 5-*WASH*: Included data on access to improved drinking water sources, storage of water, quantity of water used per household, time to collect water, satisfaction with water supply, type and quality of excreta disposal facility in use and safe disposal of young children's stools for households.

Module 6-*Mosquito Net Coverage*: Included data on mosquito net ownership (all type and LLINs), number of LLIN mosquito nets per household, and number of persons per LLIN members of household (all, U5, pregnant) who slept under a mosquito net last night (all type and LLIN).

Measurement methods

Sex: gender was recorded as male or female.

Birth date or age in months: the exact date of birth (day, month, year) was recorded from either an EPI card, registration card, child health card, birth notification or certificate if available. If no reliable proof of age wasavailable, age was estimated in months using a local event calendar or by comparing the selected child with a sibling or the child of a neighbour whose age was known, and was recorded in months on the questionnaire.

Weight: children were weighed without clothes whenever possible using a SECA 877 electronic scale and recorded to the nearest 100 grams.

Height/Length: children's height or length was taken to the closest millimetre using a wooden height board. Childrenbelow 87cm were measured lying down (length) and children above 87cm were measured standing up (height).

Oedema: presence or absence of oedema was measured by observation.

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

Child enrolment in supplementary or therapeutic feeding programme: coverage of supplementary and therapeutic feeding programmes was assessed by recall from the mother and primary caretaker of children.

Measles vaccination: measles vaccination was assessed by checking for the measles vaccine on the EPI card if available or by asking the caregiver to recall if no EPI card is available. Measles vaccination was assessed for all children aged 6-59 months to make data collection easier, however analysis was only done on the target age group (9-59 months).

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

Diarrhoea in last 2 weeks: caregivers were asked if their child had suffered from diarrhoea in the past two weeks.

Haemoglobin (Hb) concentration in children 6-59 months and women 15-49 years: Hob concentration was taken from a capillary blood sample from the fingertip and recorded to the closest gram per decilitre using a portable Hemo Cue Hb 301 machine.

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

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

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

Food security: information was obtained from carrying out interviews with the person who was most involved in food preparation in the household.

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

Mosquito net coverage: variables were assessed using interviews with the head of household (male or female) or in their absence a responsible adult (preferably over the age of 18 years) and through direct observation of the mosquito nets in the household.

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

2.4 Case definitions, inclusion criteria and calculations

A **household** was defined as: *a group of people who live together and routinely eat out of same pot.* Wheretwofamilies share the same pot, they were assessed as one household**.**

For **child anthropometry and health**, children aged 6 to 59 months were included. Acute malnutrition was defined using the weight-for-height index, with the main results presented using the WHO 2006 standards (Table 4). Results using the NCHS 1977 reference are shown in **Appendix 3**.

Table 4 Definitions of acute malnutrition using weight-for-height and/or oedema in children 6–59 months

Categories of acute malnutrition	**Z-scores (NCHS Growth Reference 1977 and WHO Growth Standards 2006)**	**Bilateral oedema**
Global acute malnutrition	< -2 z-scores	Yes/No
Moderate acute malnutrition	< -2 z-scores and ≥ -3 z-scores	No
Severe acute malnutrition	> -3 z-scores	Yes
	< -3 z-scores	Yes/No

Stunting was classified according to height-for-age z-scores as shown in Table 5. In the main results, the WHO 2006 reference was used. A comparison with the NCHS 1977 reference is contained in **Appendix 3.**

Table 5 Definitions of stunting using height-for-age in children 6–59 months

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

Underweight was assessed using weight-for-age z-scores, with the main results presented using the WHO 2006 reference (Table 6). A comparison with the NCHS 1977 reference is displayed in **Appendix 3.**

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

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

Acute malnutrition was also assessed by Mid-Upper Arm Circumference (MUAC) according to the cut-offs in Table 7.

Table 7 Classification of (acute) malnutrition based on MUAC in children 6-59 months (WHO)

Categories of acute malnutrition	MUAC Reading
Moderate acute malnutrition	≥ 115 <125 mm
Severe acute malnutrition	< 115 mm

Measles vaccination: measles vaccination was assessed by checking for the measles vaccine on the EPI card if available or by asking the caregiver to recall if no EPI card was available.

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

Oedema: bilateral oedema was assessed by applying gentle thumb pressure on to the tops of both feet of the child for a period of three seconds and thereafter observing for the presence or absence of an indent.

Diarrhoea: was defined as having 3 or more loose or watery stools per day.

Child enrolment in supplementary and therapeutic feeding programme

Feeding programme coverage was estimated during the nutrition survey using the direct method as follows:

Coverage of SFP programme (%) =

$$100 \times \frac{\text{No. of respondents attending SFP}}{\text{No. of children with MAM } \textit{according to SFP admission criteria} \text{ not attending SFP} + \text{No. of respondents attending SFP}}$$

Coverage of TFP programme (%) =

$$100 \times \frac{\text{No. of respondents attending TFP}}{\text{No. of children with SAM } \textit{according to TFP admission criteria} \text{ not attending TFP} + \text{No. of respondents attending TFP}}$$

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

Timely initiation of breastfeeding: Proportion of children 0-23 months of age who were put to the breast within an hour of birth.

$$\frac{\text{Children born in the last 24 months who were put to the breast within an hour of birth}}{\text{Children born in the last 24 months}}$$

Exclusive breastfeeding under 6 months: Proportion of infants 0-5 months who are fed exclusively with breast milk.

$$\frac{\text{Infants 0-5 months of age who received only breast milk in the previous day}}{\text{Infants 0-5 months of age}}$$

Continued breastfeeding at 1 year: Proportion of children 12-15 months of age who are fed breast milk.

$$\frac{\text{Children 12-15 months of age who received breast milk during the previous day}}{\text{Children 12-15 months of age}}$$

Continued breastfeeding at 2 years: Proportion of children 20-23 months of age who are fed breast milk.

$$\frac{\text{Children 20-23 months of age who received breast milk during the previous day}}{\text{Children 20-23 months of age}}$$

Introduction of solid, semi-solid or soft foods: Proportion of infants 6-8 months of age who receive solid, semi-solid or soft foods.

$$\frac{\text{Infants 6-8 months of age who received solid, semi-solid or soft foods during the previous day}}{\text{Infants 6-8 months of age}}$$

Consumption of iron-rich or iron-fortified foods: Proportion of children 6-23 months of age who received an Iron-rich food or Iron-fortified food that is specially designed for infant and young children, or that is fortified in the home

$$\frac{\text{Children 6-23 months of age who received an Iron-rich food or Iron-fortified food that isspecially designed for infant and young children, or that was fortified in the home with a product that included Iron during the previous day}}{\text{Children 6-23 months of age}}$$

Bottle feeding: Children 0-23 months of age who are fed with a bottle.

$$\frac{\text{Children 0-23 months of age who were fed with a bottle during the previous day}}{\text{Children 0-23 months of age}}$$

Anaemia was measured using a HemoCue Hb 301 machine, and defined and categorised according to WHO recommended cut-offs shown in Table 8 to determine the prevalence of anaemia.

Table 8 Definition of anaemia (WHO 2000)

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

2.5 Classification of public health problems and targets

Anthropometry

The classification of public health significance for anthropometric results for children aged 6-59 months is shown in Table 9.

Table 9 Classification of public health significance for children aged 6-59 months (WHO 1995, 2000)

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

Selective feeding programmes

Performance indicators for selective feeding programmes according to the UNHCR Strategic Plan for Nutrition and Food Security are contained in Table 10.

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

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

Anaemia
The thresholds for public health significance for anaemia prevalence for all groups according to WHO, are displayed in Table 11. The Strategic Plan for Nutrition and Food Security (2008-2010) recommends that the prevalence of anaemia for all groups must be low (5-19%).

Table 11 Classification of public health significance (WH0 2000)

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

Measles vaccination coverage
UNHCR recommends measles vaccination coverage to be >95% among children aged 9-59 months.

Vitamin A supplementation coverage
UNHCR recommends vitamin A supplementation coverage to be >90% among children aged 6-59 months..

WASH
Relevant UNHCR standards for WASH indicators are shown in Table 12.

Table 12 Relevant UNHCR WASH Programme Standards

UNHCR Standard	Indicator
Average quantity of water available per person/day	≥20 litres
Communal latrine coverage	20 people/latrine

Mosquito net coverage
UNHCR recommends that >75% of households must have at least one LLIN/ITN WHO and UNHCR further recommends a target of no more than 1.8 persons per LLIN to achieve universal coverage.

2.6 Training, coordination and supervision

A 4-day training of enumerators took place between the 22nd of June and 25thof June 2012 in Lilongwe. The training was facilitated by the Survey Manager and covered the following topics: survey objectives; introduction to malnutrition; introduction to nutrition surveys; sampling and household selection; anthropometric measurements; anaemia measurement; and interviewing skills.

The training was followed by a 1-day anthropometric standardisation, where each of the 6 survey team's anthropometry measurers measured 10 children each twice. A pre-test of the questionnaire was also conducted on the same day. A total of 6 survey teams with a total of 30 enumerators participated in the survey, supervised by the Survey Coordinator, UNHCR Health Coordinator and WFP Nutritionist.

2.7 Data analysis

Data entry was conducted by two data entry clerks and took place at the UNHCR office concurrently with data collection. Excel templates were used for data entry, with anthropometric data being transferred to ENA for checking and identification of outliers. Random checks were implemented by the Survey Manager to check for errors in data entry.

Data analysis was conducted by the Survey Manager using ENA for SMART, November 2011 version for child anthropometry data, and Epi Info 7, April 2012 version for the remaining modules. SMART flags (+/-3 SD WHZ, HAZ, WAZ) were used for exclusion of outliers for anthropometric data.

3. RESULTS

Table 13 shows that 422 households were surveyed, with a total population, giving an average household size of 5.4. The target sample size for aged 6-59 months was 314 according to the assumptions on which the sample size calculation was based. The actual sample size achieved was 365, representing 116% of the target (Table 14).

Table 13 Sample size

Total HHs surveyed	422
Total population surveyed	1130
Total U5 surveyed	365
Average HH size	5.4

Table 14 Target and actual number captured

	Target (No.)	**Total surveyed (No.)**	**% of the target**
Children 6-59 months	314	365	116%

In terms of sex distribution, girls constituted 48.8% compared to 51.2% for boys, giving a sex ratio of 1.1 which is acceptable as it lies between 0.8 and 1.2 (Table 15).

Table 15 Children 6-59 months

	Boys		**Girls**		**Total**		**Ratio**
	no.	**%**	**no.**	**%**	**no.**	**%**	**Boy: Girl**
6-17 months	45	43.7	58	56.3	103	28.2	0.8
18-29 months	47	54.0	40	46.0	87	23.8	1.2
30-41 months	45	57.0	34	43.0	79	21.6	1.3
42-53 months	40	50.0	40	50.0	80	21.9	1.0
54-59 months	10	62.5	6	37.5	16	4.4	1.7
Total	187	51.2	178	48.8	365	100.0	1.1

33% of children did not have exact birth dates.

3.1 Anthropometric results in children 6-59 months (based on WHO 2006 Growth Standards)

Acute malnutrition in children 6-59 months

The prevalence of Global Acute Malnutrition (GAM) based on WHZ and oedema was 1.4% (0.6-3.2 95% C.I), with a Severe Acute Malnutrition (SAM) prevalence of 0.3% (0.0-1.6 95% C.I). The GAM prevalence is within the acceptable margin according to WHO classification (Table 16).

Table 16 Prevalence of acute malnutrition in children 6-59 months based on weight-for-height z-scores (and/or oedema) and by sex

	All n = 361	**Boys** n = 184	**Girls** n = 177
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(5) 1.4 % (0.6 - 3.2 95% C.I.)	(1) 0.5 % (0.1 - 3.0 95% C.I.)	(4) 2.3 % (0.9 - 5.7 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(4) 1.1 % (0.4 - 2.8 95% C.I.)	(1) 0.5 % (0.1 - 3.0 95% C.I.)	(3) 1.7 % (0.6 - 4.9 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(1) 0.3 % (0.0 - 1.6 95% C.I.)	(0) 0.0 % (0.0 - 2.0 95% C.I.)	(1) 0.6 % (0.1 - 3.1 95% C.I.)

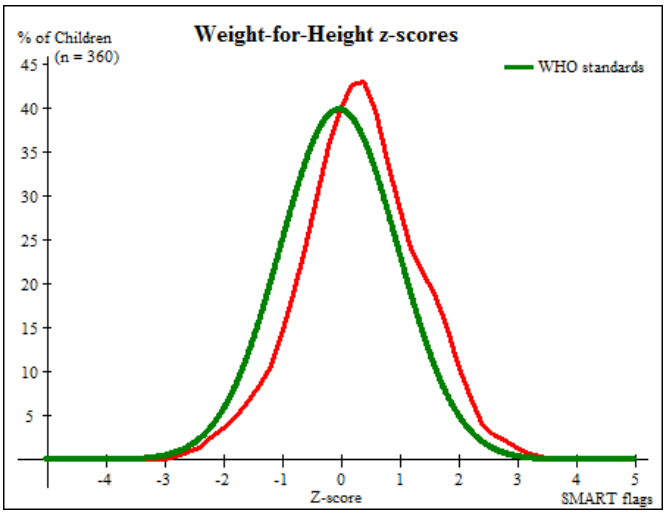
The prevalence of oedema is 0.3%

Table 17 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	101	0	0.0	3	3.0	98	97.0	0	0.0
18-29	87	0	0.0	0	0.0	86	98.9	1	1.1
30-41	78	0	0.0	0	0.0	78	100.0	0	0.0
42-53	79	0	0.0	1	1.3	78	98.7	0	0.0
54-59	16	0	0.0	0	0.0	16	100.0	0	0.0
Total	361	0	0.0	4	1.1	356	98.6	1	0.3

Figure 1 shows the weight-for-height distribution for the survey sample (red) compared to the WHO 2006 reference. The survey curve closely follows the WHO 2006 curve, with a mean SD WHZ of 0.33 +/- 0.97.

Figure 1 Distribution of weight-for-height z-scores (WHO 2006 Growth Standards).



Chronic malnutrition in children 6-59 months (WHO 2006 Growth Standards)
There were 29.0% (24.5-34.0 95% C.I) stunted children in the sample, with 6.6% (4.4-9.7 95% C.I) with severe stunting. The prevalence of stunting is within the "poor" category according to WHO classification (Table 20).

Table 20 Prevalence of stunting in children 6-59 months based on height-for-age z-scores and by sex

	All n = 348	**Boys** n = 177	**Girls** n = 171
Prevalence of stunting (<-2 z-score)	(101) 29.0 % (24.5 - 34.0 95% C.I.)	(53) 29.9 % (23.7 - 37.1 95% C.I.)	(48) 28.1 % (21.9 - 35.2 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(78) 22.4 % (18.3 - 27.1 95% C.I.)	(39) 22.0 % (16.6 - 28.7 95% C.I.)	(39) 22.8 % (17.2 - 29.7 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(23) 6.6 % (4.4 - 9.7 95% C.I.)	(14) 7.9 % (4.8 - 12.8 95% C.I.)	(9) 5.3 % (2.8 - 9.7 95% C.I.)

Stunting was highest in the 18-29 age group, which shows the expected trend, whereby stunting increases progressively and reaches a plateau at 2 years in children (Table 21 and Figure 2).

Table 21 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	100	9	9.0	16	16.0	75	75.0
18-29	81	6	7.4	23	28.4	52	64.2
30-41	77	5	6.5	17	22.1	55	71.4
42-53	75	3	4.0	19	25.3	53	70.7
54-59	15	0	0.0	3	20.0	12	80.0
Total	348	23	6.6	78	22.4	247	71.0

Figure 2 Trends in the prevalence of stunting by age in children 6-59 months

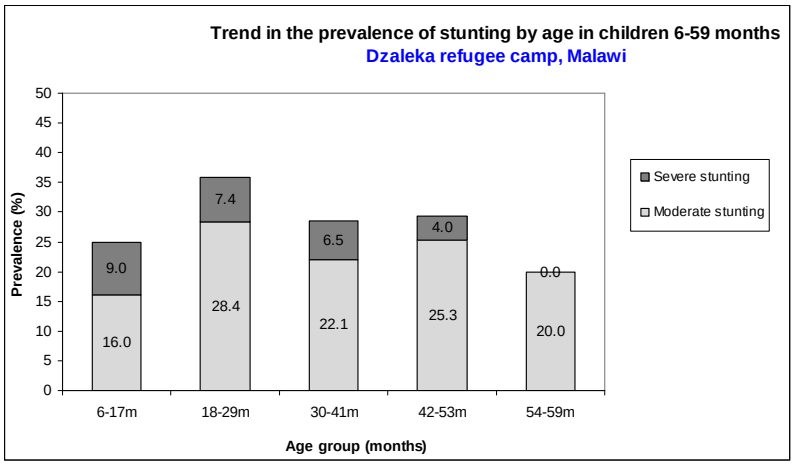


Figure 3 Distribution of height-for-age z-scores (based on WHO Growth Standards)

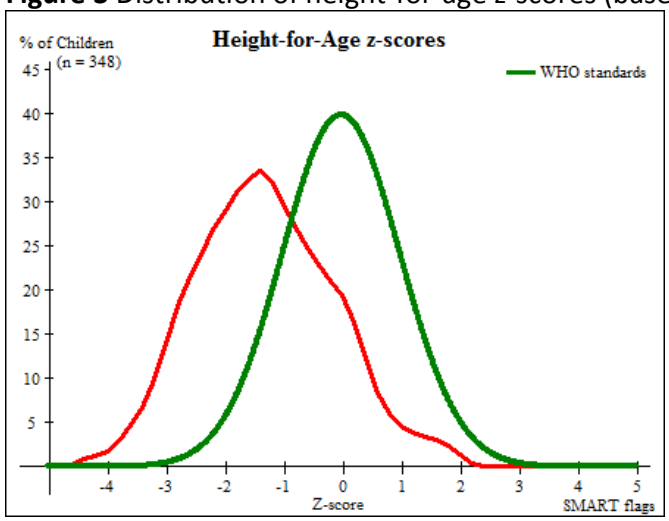
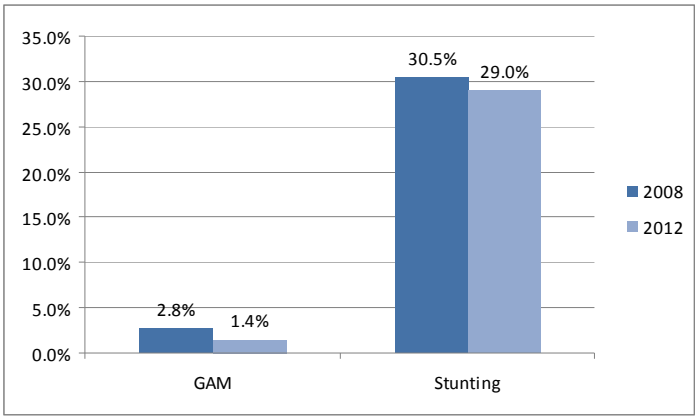


Figure 4 shows a comparison of the prevalence of malnutrition between 2008 and 2012. There was a slight decline in the prevalence of GAM from the 2008 JAM (2.8%, 1.1-4.4 95% C.I) to 2012 (1.4%, 0.6-3.2, 95% C.I). However, the decline was not statistically significant.

Figure 4 Prevalence of malnutrition in children 6-59 months from 2008 and 2012, based on WHO 2006 Standards**.**



Underweight in children 6-59 months (WHO 2006 Growth Standards)
The prevalence of underweight was 5.3% (3.4-8.1 95% C.I), with 0.8% (0.3-2.4 95% C.I) severely underweight (Table 19).

Table 19 Prevalence of underweight in children 6-59 months based on weight-for-age z-scores by sex

	All n = 358	**Boys** n = 186	**Girls** n = 172
Prevalence of underweight (<-2 z-score)	(19) 5.3 % (3.4 - 8.1 95% C.I.)	(13) 7.0 % (4.1 - 11.6 95% C.I.)	(6) 3.5 % (1.6 - 7.4 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(16) 4.5 % (2.8 - 7.1 95% C.I.)	(10) 5.4 % (2.9 - 9.6 95% C.I.)	(6) 3.5 % (1.6 - 7.4 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(3) 0.8 % (0.3 - 2.4 95% C.I.)	(3) 1.6 % (0.6 - 4.6 95% C.I.)	(0) 0.0 % (0.0 - 2.2 95% C.I.)

Mean z-scores and standard deviations are shown in Table 22 for the three main indicators of nutritional status.

Table 22 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	360	0.33±0.97	1.00	1	4
Weight-for-Age	358	-0.42±1.03	1.00	1	6
Height-for-Age	348	-1.31±1.15	1.00	0	17

MUAC in children 6-59 months

The prevalence of acute malnutrition based on MUAC classification shows a higher prevalence of both MAM (1.9% compared to 1.4%) and SAM (0.5% compared to 0.3%) than WHZ classification. MUAC tends to preferentially identify younger children (Table 23).

Table 23 Prevalence of malnutrition based on MUAC

	n = 365
Moderate acute malnutrition (≥ 115mm and <125 mm)	(7) 1.9% (0.9 - 3.9 95% C.I)
Severe acute malnutrition (< 115mm)	(2) % 0.5 % (0.2 - 2.0 95% C.I)

Selective Feeding Programme coverage results

A total of 8 children in the sample were enrolled in the Therapeutic Feeding Programme, whilst 6 were enrolled in the Supplementary Feeding Programme. However, as Table 24 shows, none of the children identified as having SAM or MAM were enrolled into Therapeutic or Supplementary feeding programmes at the time of the survey.

Table 24 Programme coverage for acutely malnourished children

	Number/total	% (95% CI)
Supplementary feeding programme coverage	0	0
Therapeutic feeding programme coverage	0	0

Measles vaccination coverage results

The proportion of children aged 9-59 months who had been vaccinated against measles was 90.0% (51.4% with card), which is below the UNHCR target of 95% (Table 25).

Table 25 Measles vaccination coverage for children aged 9-59 months (n=350)

	Measles (with card) n=180	**Measles (with card or confirmation from mother) n=315**
YES	51.4% (46.1-56.8 C.I.)	90.0% (86.4-92.9 C.I.)

Vitamin A supplementation coverage results

The proportion of children who had received Vitamin A supplementation was 81.9% (77.5-85.7, 95% C.I), which was also below the UNHCR target of >90% (Table 26).

Table 26 Vitamin A supplementation for children aged 6-59 months within past 6 months (n=365)

	Vitamin A capsule (with card) n=134	**Vitamin A capsule (with card or confirmation from mother) n=299**
YES	36.7% (31.8-41.9 C.I.)	81.9 (77.6-85.7 C.I.)

Diarrhoea results

Of the sampled children 6-59 months, 31.5% (26.8-36.6 95% C.I) reported having experienced diarrhoea in the preceding 2 weeks (Table 27).

Table 27 Period prevalence of diarrhoea

	Number/total	**% (95% C.I.)**
Diarrhoea in the last two weeks	115/365	31.5 (26.8-36.6 C.I.)

Anaemia results

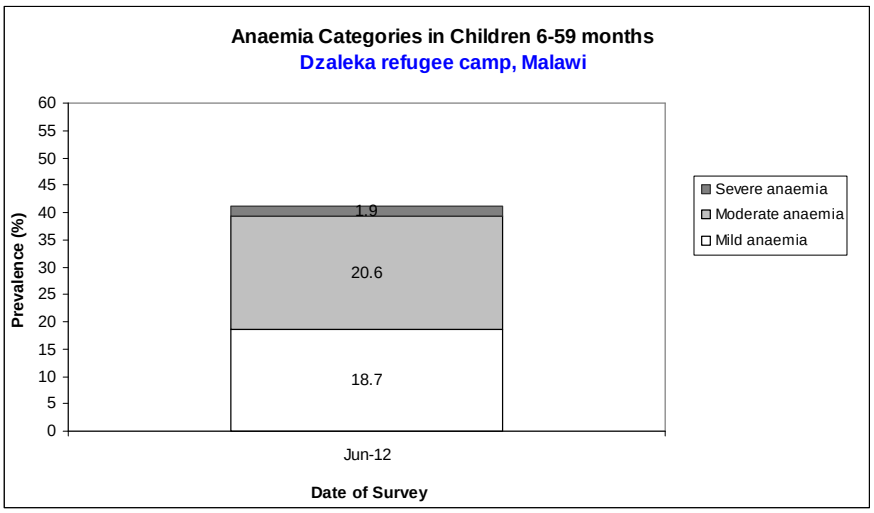
Table 28 shows the prevalence of anaemia for children 6-59 months by category of severity. A total of 41.2% (34.4-48.2 95% C.I) of children were anaemic (<11g/dL), which falls within the "high" category of the WHO classification and is a cause for concern. 1.9% (0.5-4.8 95% C.I) of children were severely anaemic (<7g/dl) and were referred to the health centre for treatment.

Table 28 Prevalence of anaemia and haemoglobin concentration in children 6-59 months

Anaemia in Children 6-59 months	**All** n = 209
Total Anaemia (Hb<11.0 g/dL)	(86) 41.1% (34.4-48.1 C.I.)
Mild Anaemia (Hb 10.0-10.9 g/dL)	(39) 18.7% (13.6-24.6 C.I.)
Moderate Anaemia (7.0-9.9 g/dL)	(43) 20.6% (15.3-26.7 C.I.)
Severe Anaemia (<7.0 g/dL)	(4) 1.9% (0.5-4.8 C.I.)
Mean Hb (g/dL)	11.3 g/dL (SD 1.7) [min 5.5,max 14.8]

The majority of children with anaemia were in the "moderate" category (Figure 6). The mean haemoglobin concentration was 11.3g/dL (standard deviation 1.7).

Figure 6 Anaemia categories in children 6-59 months



Further analysis of anaemia prevalence by age (Table 29) revealed that the anaemia prevalence was highest in the 6-23 months age group (57.7%, 47.3-67.7 95% C.I), and decreased with increasing age. Low dietary intake from complementary foods may explain the higher prevalence in the 6-23 months age group.

Table 29 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 (months)	**Total no.**	**No.**	**% (95% CI)**	**No.**	**% (95% CI)**	**No.**	**% (95% CI)**	**No.**	**% (95% CI)**	**No.**	**% (95% CI)**
6-23	97	3	3.1% (0.6-8.8)	31	32.0% (22.9-42.2)	22	22.7% (14.8-32.3)	56	57.7% (47.3-67.7)	41	42.3% (32.3-52.7)
24-35	36	0	-	7	19.4% (8.2-36.0)	7	19.4% (8.2-36.0)	14	38.9 (23.1-56.5)	22	61.1% (43.5-76.9)
36-59	76	1	1.3% (0.0-7.1)	5	6.6% (2.2-14.7)	10	13.2% (6.5-22.9)	16	21.1% (12.5-31.9)	60	79.0% (68.1-87.5)
Total	**209**	4	1.9% (0.5-4.8)	43	20.6%(15.3-26.7)	39	18.7% (13.6-24.6)	86	41.2% (34.4-48.2)	123	58.9 (51.9-65.6)

3.2 Infant and Young Child Feeding practices in children 0-23 months

The prevalence of IYCF practices is shown in Table 30. Of the sampled children aged below 2 years, 98.2% (94.9-99.6, 95% C.I) had ever been breastfed, with 71.7% (64.2-78.4, 95% C.I) of children in the same age group having been breastfed within the first hour of birth. The proportion of children below 6 months who were being exclusively breastfed was 60.4% (45.3-74.2, 95% C.I), which is relatively high despite the fact that 100% is desirable.

91.7% (77.5-98.2, 95% C.I) of children were still breastfed at 1 year, whilst 47.8% (26.8-69.4, 95% C.I) were still breastfed at 2 years. These results must be interpreted with caution given the low sample sizes for age sub-groups. Of the 6-8 months age group, 73.3% (44.9-92.2, 95% C.I) had been introduced to solid, semi-solid or soft foods, a proportion which should be 100% according to WHO infant and young child feeding recommendations.

Only 7.1% (3.7-12.1, 95% C.I) of children 0-23 months were bottle-fed. Less than half (39.7%, 31.3-48.6, 95% C.I) of children 6-23 months had received iron-rich foods the day before the survey.

Table 30 Prevalence of Infant and Young Child Feeding Practices Indicators

Indicator	Age range	Number/total	Prevalence (%)	95% CI
Children ever breastfed	0-23 months	166/169	98.2%	94.9-99.6
Timely initiation of breastfeeding	0-23 months	119/166	71.7%	64.2-78.4
Exclusive breastfeeding under 6 months	0-5 months	29/48	60.4%	45.3-74.2
Continued breastfeeding at 1 year	12-15 months	33/36	91.7%	77.5-98.2
Continued breastfeeding at 2 years	20-23 months	11/23	47.8%	26.8-69.4
Introduction of solid, semi-solid or soft foods	6-8 months	11/15	73.3%	44.9-92.2
Consumption of iron-rich or iron-fortified foods	6-23 months	52/131	39.7%	31.3-48.6
Bottle feeding	0-23 months	12/169	7.1%	3.7-12.1

Additional analysis showed that formula feeding was relatively low for the 0-23 age group (5.9%, 2.8-10.5 95% C.I). A total of 19.9% (13.4-27.7, 95% C.I) of children 6-23 months had received fortified blended foods, whilst only 0.8% (0.0-4.2, 95% C.I) of the same age group had received lipid-based nutrient supplements (Table 31-33). The LNS were from the therapeutic feeding programme.

Table 31 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)	10/171	5.9% (2.8-10.5)

Table 32 FBF intake in children aged 6-23 months

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive FBF (Corn soya blend)	26/131	19.9% (13.4-27.7)

Table 33 LNS special products intake in children aged 6-23 months

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive LNS (therapeutic food)	1/131	0.8% (0.0-4.2)

3.3 Anaemia and Programme Enrolment in Women 15-49 years

Of the sampled women of reproductive age (15-49 years), 9.9% were pregnant, and the mean age was 27, with a minimum of 15 and a maximum of 47 (Table 34).

Table 34 Women physiological status and age

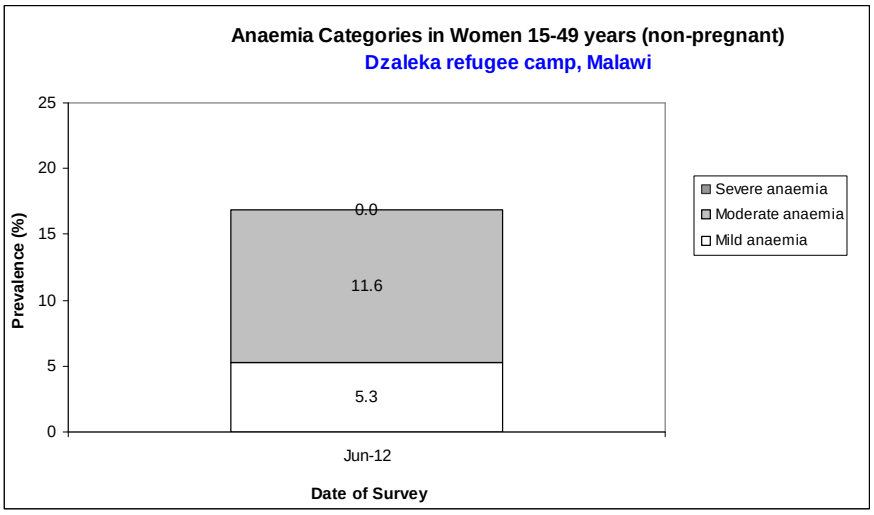
Physiological status	Number/total	% of sample
Non-pregnant	191	90.1%
Pregnant	21	9.9%
Mean age in years (range)	27 (15-47)	

16.8% (11.8-22.9, 95% C.I) of women were anaemic, with none having severe anaemia. The prevalence is within the "low" prevalence WHO category (Table 35 and Figure 7). The mean haemoglobin concentration was 13.3g/dL (standard deviation 1.9).

Table 35 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 = 190
Total Anaemia (<12.0 g/dL)	(32) 16.8% (11.8-22.9)
Mild Anaemia (11.0-11.9 g/dL)	(10) 5.3% (2.6-9.5)
ModerateAnaemia (8.0-10.9 g/dL)	(22) 11.6% (7.4-17.0)
Severe Anaemia (<8.0 g/dL)	(0) 0% -
Mean Hb (g/dL)	13.3 g/dL (SD 1.9) [8.0, 17.9]

Figure 7 Anaemia categories in women of reproductive age (non-pregnant)



Analysis of data on ANC enrolment (Table 36) found that 45.0% (23.1-68.5, 95% C.I) of pregnant women were enrolled in the ANC programme, which is below half and a cause for concern, whilst only 42.9% (21.8-66.0, 95% C.I) were receiving iron-folic pills. It is likely that nearly all those who were not attending ANC were not receiving iron-folic acid pills.

Table 36 ANC enrolment and iron-folic acid pills coverage among pregnant women (15-49 years)

	Number /total	**% (95% CI)**
Currently enrolled in ANC programme	9/20	45.0% (23.1-68.5)
Currently receiving iron-folic acid pills	9/21	42.9% (21.8-66.0)

3.4 Food security

Households in Dzaleka camp have, since February 2012, been receiving a half ration due to budgetary constraints in WFP. The fact that the respondents only receive half ration needs to be taken into account when interpreting the findings in the food security section.

A total of 211 households were surveyed for food security out of the planned 252, which was 84% of the target (Table 37).

Table 37 Food security information

Household data	**Planned**	**Actual**	**% of target**
Total households surveyed for Food Security	252	211	84%

Food distribution results

Nearly all households (97.6%, 94.6-99.2, 95% C.I) had ration cards (Table 38).

Table 38 Ration card coverage

	Number/total	**% (95% CI)**
Proportion of households with a ration card	206/211	97.6% (94.6-99.2

The average number of days the food ration lasted was 14.2 (standard deviation 5.95), which represented 47% (Table 39). Keep in mind that half ration was being provided.

Table 39 Reported duration of general food ration

Average number of days the food ration lasts (Standard deviation or 95% CI)
14.2 (std dev 5.95)

Only 2.8% (1.1-6.1, 95% C.I) of households reported that the food ration had lasted the entire duration of the cycle (30 days), with only 6.2% (3.3-10.3, 95% C.I) reporting that the ration had lasted more than 75% of the cycle (Table 40). Keep in mind that half ration was being provided.

Table 40 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 (30 days)	6/211	2.8% (1.1-6.1)
Proportion of households reporting that the food ration lasted:		
≤75% of the cycle [22 days]	198/211	93.8% (89.7-96.7)
>75% of the cycle [22 days]	13/211	6.2% (3.3-10.3)

Negative coping strategies results

Household coping strategies are presented in Table 41. The most common coping strategy was reducing the quantity and/or frequency of meals (67.8%, 61.0-74.0, 95% CI.), followed by borrowing without interest (45.5%, 38.7-52.5, 95% C.I) and begging (44.6%, 37.7-51.5, 95% C.I). Only 10.0% (6.3-14.8, 95% C.I) of households had not used any of the coping strategies.

Table 41 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 *without interest*	96/211	45.5% (38.7-52.5)
Borrowed cash, food or other items *with interest*	38/211	18.0% (13.1-23.9)
Sold any assets (furniture, seed stocks, tools, other NFI, livestock etc.)	88/211	41.7% (35.0-48.7)
Requested increase remittances or gifts as compared to normal	34/211	16.1% (11.4-21.8)
Reduced the quantity and/or frequency of meals	143/211	67.8% (61.0-74.0)
Begged	94/211	44.6% (37.7-51.5)
Engaged in potentially risky or harmful activities (theft, prostitution, drug abuse, drug smuggling, child trafficking, child labour or early marriage)	17/211	8.1% (4.8-12.6)
Sent at least one child to work outside the	28/168	16.7% (11.4-23.2)

household in order get cash or in-kind goods or services		
Proportion of households reporting using none of the coping strategies over the past month	21/211	10.0% (6.3-14.8)

Household dietary diversity results

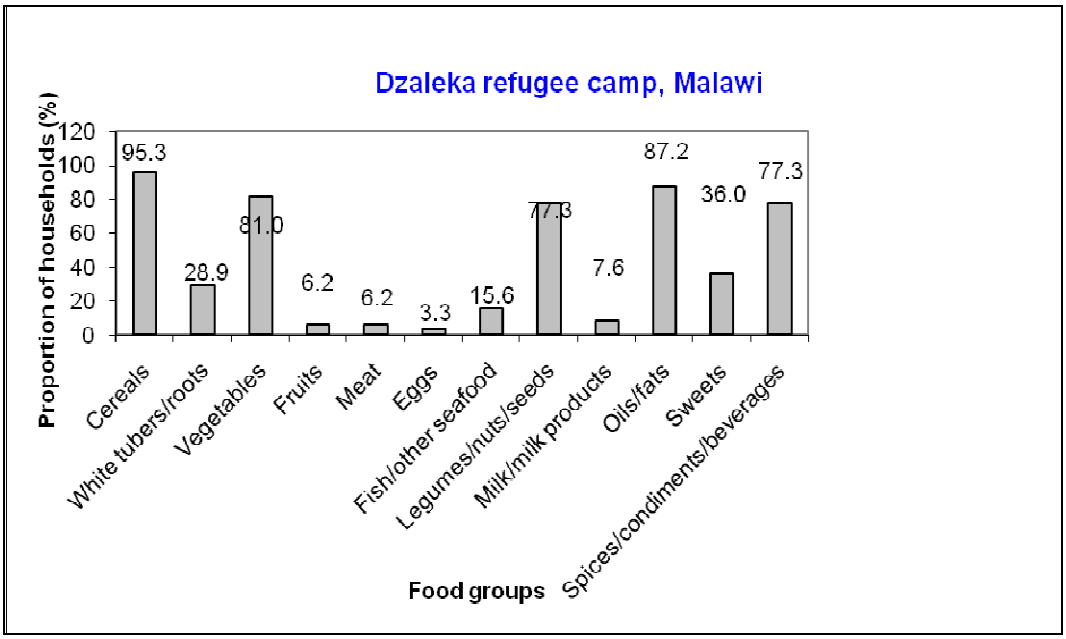
The last general food distribution ended 12 days prior to the start of the survey data collection. The survey was conducted during the dry season, although not long after the harvest. The average HDDS was 5.5 (standard deviation 1.48).

Table 42 Average HDDS

Average HDDS	5.5 (Std dev 1.48)

Cereals were the food group consumed by the highest proportion of households (95.3%). A relatively high proportion of households consumed oils/fats (87.2%) and vegetables (81.0%). The food products consumed by the lowest proportions were eggs (3.3%), meat (6.2%) and fruits (6.2%) as displayed in Figure 8.

Figure 8 Proportion of households consuming different food groups within the last 24 hours



In 15.4% of households, the staples consumed were only from the food ration (Table 43). There were no households where the diet consisted of staples, pulses and oils/fats from the food ration only, and there were no households where vegetables, fruits, meat, eggs, fish/seafood, and milk/milk products were not consumed. 60.7% of households consumed

either a plant or animal source of Vitamin A, whilst only 17.1% of households consumed food sources of haem iron, and 32.7% consumed fortified blended foods.

Table 43 Consumption of food aid commodities and micronutrient rich foods by households

	Number/total	**% (95% CI)**
Proportion of households where staples consumed are *only* from food aid ration (no other staples)	31/201	15.4% (10.7-21.2)
Proportion of households where the diet consists entirely of staples, pulses and oils/fat from food aid ration (no other food sources)	0/211	0%
Proportion of households *not consuming any* vegetables, fruits, meat, eggs, fish/seafood, and milk/milk products	0/211	0%
Proportion of households consuming either a plant or animal source of vitamin A	128/211	60.7% (53.7-67.3)
Proportion of households consuming organ meat/flesh meat, or fish/seafood (food sources of haem iron)	36/211	17.1% (12.3-22.8)
Proportion of households consuming fortified blended foods	69/211	32.7% (26.4-39.5)

3.5 Food Aid Flow

Analysis of food aid showed that since only half ration is distributed to the refugees in Dzaleka camp, the current ration was insufficient in all nutrients (Table 44), and below the 2, 100 Kcal requirement (SPHERE standards).

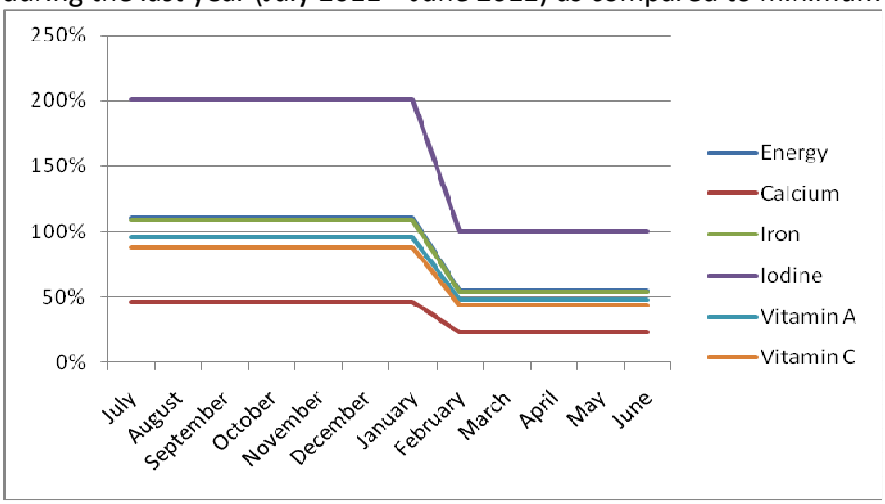
Table 44 Analysis of current food ration

Item	**Standard recommendation**	**Provision by the ration**
Energy	2,100 Kcal	1,158 Kcal
Lipids	40 gr (17% of total energy)	23.7 gr
Proteins	53 gr (10% of total energy)	33.8 gr
Iron	32 mg	12.0 mg
Iodine	138 micro g	150.0 micro g
Calcium	989 mg	104.0 mg
Vitamin A	550 micro g RAE	238.0 micro g RAE
Vitamin C	41.6 mg	12.0 mg

The trend of energy and micronutrients provided by the food ration over the past 12 months is shown in Figure 10. Throughout the period, iodine was sufficient, with most nutrients being sufficient from July 2011 to January 2012, when a full ration was being

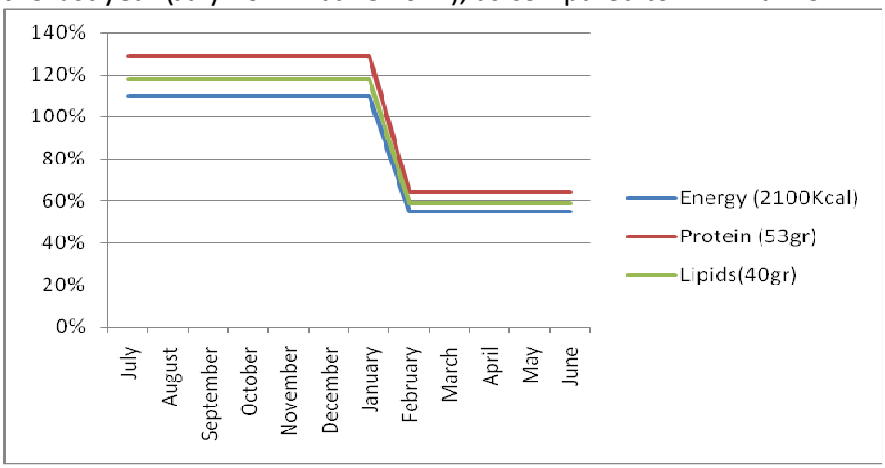
given by WFP. From February 2012, when the ration was cut to half, most nutrients were approximately half of the recommended amount (Figure 9).

Figure 9 Trends in energy and selected micronutrients provided in the general food ration during the last year (July 2011 – June 2012) as compared to minimum SPHERE standards



Analysis of macronutrients (Figure 10) further showed that the general ration was inadequate for proteins, energy and lipids from February 2012, when the ration was cut to half.

Figure 10 Trends in energy, protein and lipids provided in the general food ration during the last year (July 2011 – June 2012), as compared to minimum SPHERE standards



3.6 Water, Sanitation and Hygiene (WASH)

A total of 211 households were surveyed for WASH against a target of 252, representing 84% (Table 45).

Table 45 WASH information

Household data	Planned	Actual	% of target
Total households surveyed for WASH	252	211	84%

Nearly all households (99.5%, 97.4-100.0, 95% C.I) were using an improved drinking water source, with 64.5% (57.6-70.9, 95% C.I) having covered or narrow-necked containers for storage (Table 46).

Table 6 Water Quality

	Number/total	% (95% CI)
Proportion of households using an improved drinking water source	210/211	99.5% (97.4-100.0)
Proportion of households that use a covered or narrow necked container for storing their drinking water	136/211	64.5% (57.6-70.9)

Data on water usage revealed that, on average, 17.1 litres were being used per person per day, with only 35.1% (28.7-41.9) meeting the UNHCR target of ≥20 lpppd (Table 47).

Table 47 Amount of litres of water used per person per day

Proportion of households that use:	Number/total	% (95% CI)
≥ 20 lpppd	74/211 (78/211)	35.1% (28.7-41.9)
15 – <20 lpppd	28/211 (29/211)	13.3% (9.0-18.6)
<15 lpppd	109/211 (104/211)	51.7% (44.7-58.6)

Average lpppd=17.1

In terms of time for collection of drinkling water, 82.8% (77.0-87.6, 95% C.I) of households took less than 30 minutes, which is relatively high (Table 48).

Table 48 Time to collect water

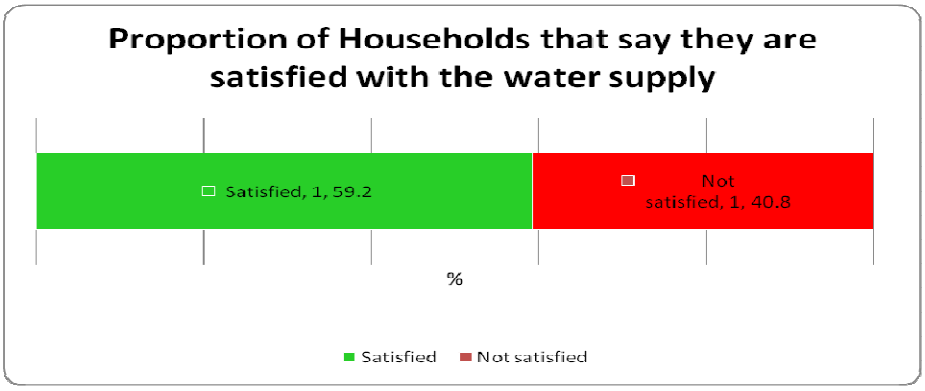
	Number/total	% (95% CI)
Proportion of households that take 30 minutes or less to collect their main drinking water source	173/209	82.8% (77.0-87.6)

Despite the high access to improved drinking water, only 59.2% (52.3%, 95% C.I) of households were satisfied with the drinking water supply (Table 49, Figure 11).

Table 49 Satisfaction with water supply

	Number/total	% (95% CI)
Proportion of households that say they are satisfied with the drinking water supply	125/211	59.2% (52.3-65.9)

Figure 11 Proportion of households that say they are satisfied with the water supply



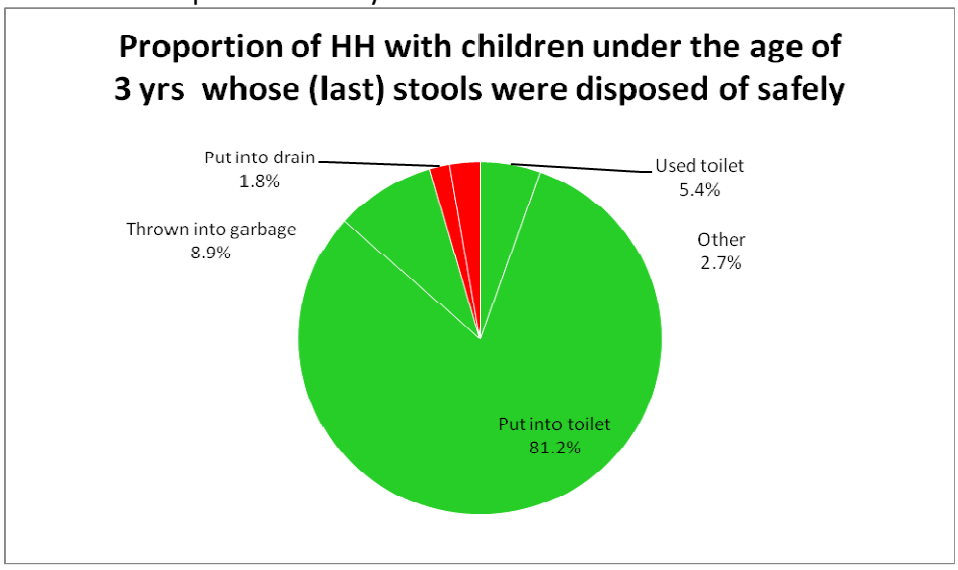
Only 35.0% (28.5-41.9, 95% C.I) of households were using an improved excreta disposal facility, whilst 32.0% (25.7-38.9, 95% C.I) were using unimproved toilets. The remainder were either using shared family toilets or communal toilets (Table 50).

Table 50 Safe Excreta disposal

	Number/total	% (95% CI)
Proportion of households using an improved excreta disposal facility (improved toilet facility, not shared)	72/206	35.0% (28.5-41.9)
Proportion of households using a shared family toilet	34/206	16.5% (11.7-22.3)
Proportion of households using a communal toilet	34/206	16.5% (11.7-22.3)
Proportion of households using an unimproved toilet	66/206	32.0% (25.7-38.9)
The proportion of households with children under three years old that dispose of faeces safely.	97/112	86.6% (78.9-92.3)
Proportion of households with a household or shared family toilet in use	103/106	97.2% (92.0-99.4)

A high proportion (89.4%, 82.2-94.4, 95% C.I) of households who had children below 3 years disposed their faeces safely (Figure 12).

Figure 12 Proportion of households with children under the age of 3 years whose (last) stools were disposed of safely**.**



3.7 Mosquito Net Coverage

211 out of 252 targeted households (84%) were surveyed for the Mosquito Net Coverage module (Table 51).

Table 51 Mosquito net coverage information

Household data	Planned	Actual	% of target
Total households surveyed for mosquito net coverage	252	211	84%

In terms on ownership of mosquito nets, 65.9% (59.1-72.3, 95% C.I) of households owned at least one mosquito net of any type, whilst 55.5% (48.5-62.3, 95% C.I) owned at least one LLIN (Table 6), falling way below the UNHCR target of >75% (Table 52, Figure 13).

Table 52 Household Mosquito net ownership

	Number/total	% (95% CI)
Proportion of households owning at least one mosquito net of any type	139/211	65.9% (59.1-72.3)
Proportion of households owning at least one LLIN	117/211	55.5% (48.5-62.3)

Figure 13 Household ownership of at least one mosquito net

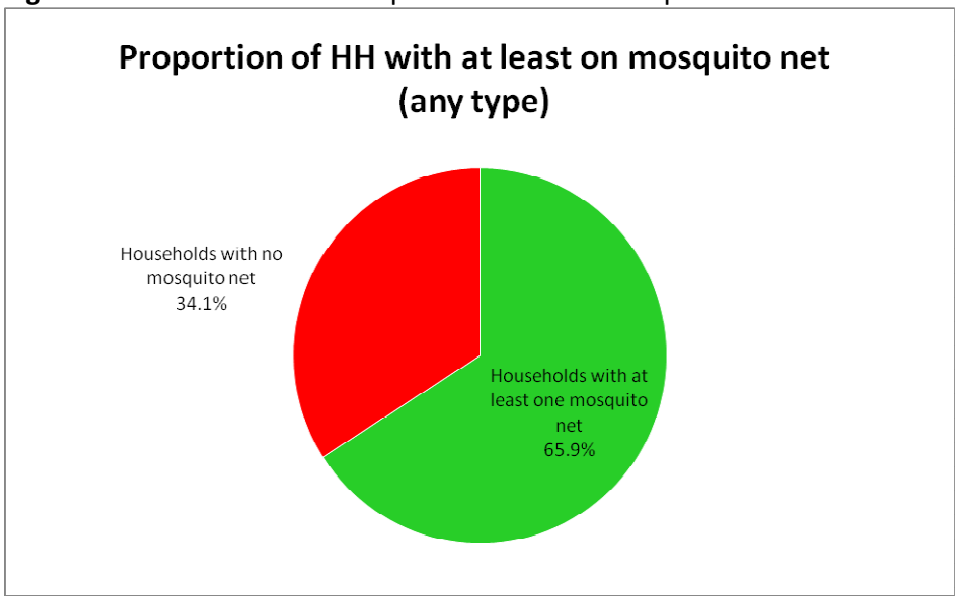
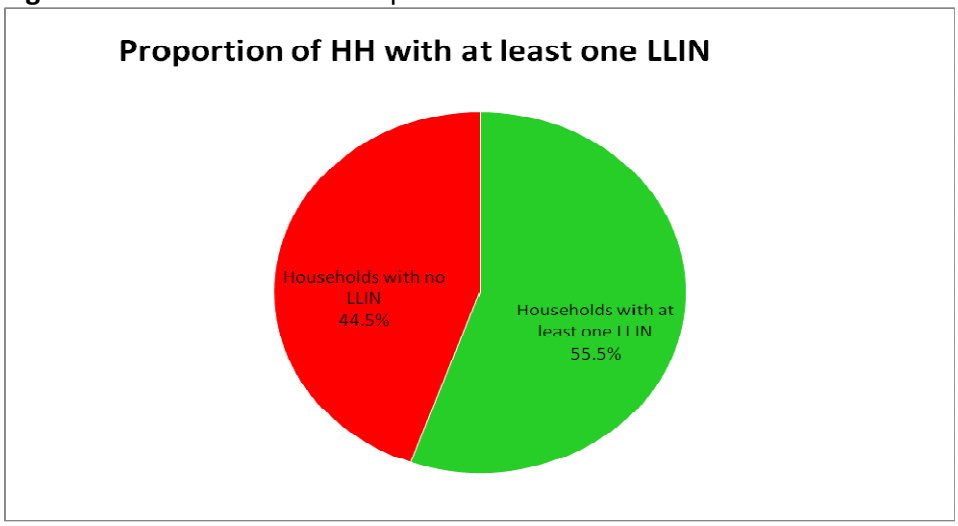


Figure 14 Household ownership of at least one LLIN



On average, there were 1.7 LLINs per household and 4.5 persons per LLIN, which is well below the WHO-recommended threshold of no more than 1.8 persons per LLIN for universal coverage (Table 53, Figure 14).

Table 53 Number of nets

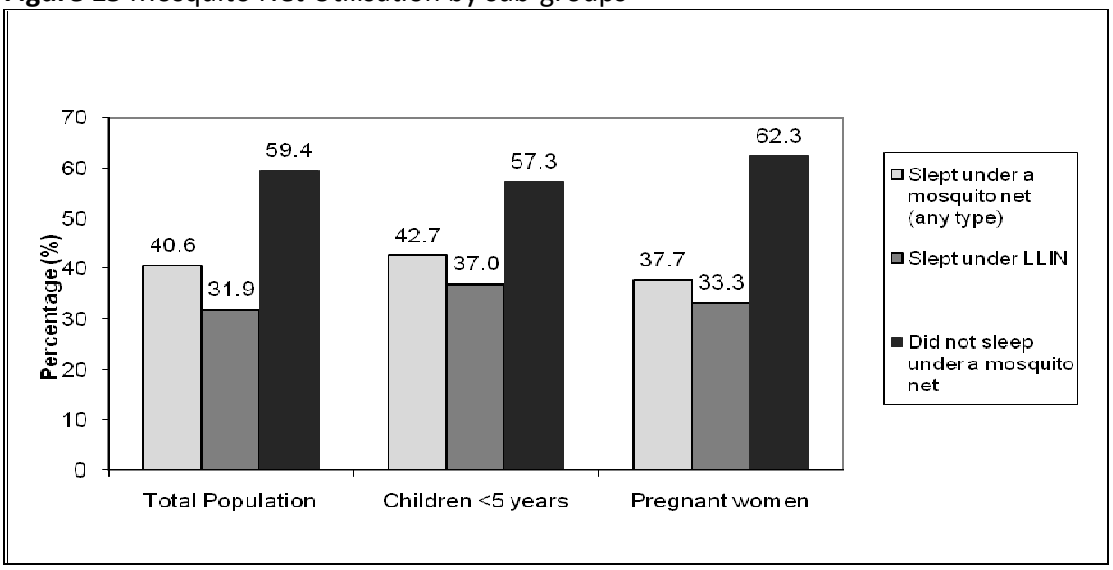
Average number of LLINs per household	Average number of persons per LLIN
1.7	4.5

In terms of mosquito net utilisation, only 40.6% of the population slept under any type of net, with 31.9% sleeping under a LLIN. For children below 5 years, 42.7% and 37.0% slept under any type of mosquito net and LLIN, respectively. For pregnant women, 37.5% were sleeping under any type of net and 33.3% under LLIN. This is of great concern for efforts to prevent malaria (Table 54).

Table 54 Mosquito net Utilisation

	Total population (all ages)		0-59 months		Pregnant	
	Total No 1016		Total No 227		Total No 24	
Slept under net of any type	413	40.6%	97	42.7%	9	37.5%
Slept under LLIN	324	31.9%	84	37.0%	8	33.3%

Figure 15 Mosquito Net Utilisation by sub-groups



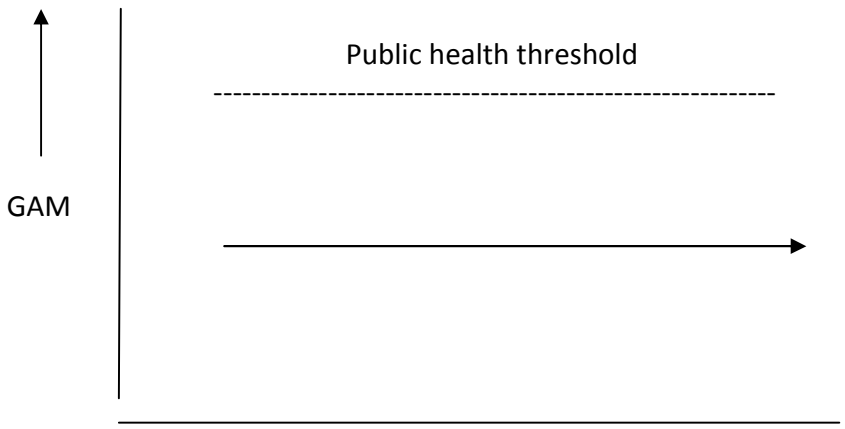
3.8 LIMITATIONS

- Household numbering in the refugee camp was not in chronological order and therefore difficult to locate, despite having included household head names on the lists. This resulted in enumerators taking longer to locate and survey households.
- There were numerous absent households due to the fact that some refugees were residing outside the refugee camp but had addresses inside the camp. The high number of absent households resulted in a lower household sample size than expected.
- The population data used for the survey did not have an estimate of the proportion of children under 5 (Malawi Red Cross statistics). The ProGres database was used to estimate the proportion of children under 5. This may either have resulted in over or underestimation of the proportion of under 5's in the sample.

4. DISCUSSION

4.1 Nutritional status of young children

The results revealed that Dzaleka refugee camp is stable in terms of acute malnutrition. The prevalence of GAM for Dzaleka was low according to WHO classification (<5%) at 1.4% (0.6-3.2 95% C.I), and slightly decreased from 2008 (2.8%, 1.1-4.4 95% C.I), although the difference is not statistically significant. Acute malnutrition was highest in the 6-17 months age group, which points to sub-optimal infant and young child feeding practices, particularly complementary feeding.



The prevalence of chronic malnutrition remained unchanged from 30.5% (25.0-36.0, 95% C.I) in 2008 to 29.0% (24.5-34.0, 95% C.I). The prevalence of stunting for 2012 falls within the "serious" category of WHO classification.

4.2 Measles vaccination and vitamin A supplementation coverage

The proportion of children vaccinated against measles between the ages 9 to 59 months was 90.0% (51.4% with card), which was a slight decline from 95% in 2008, and also below the UNHCR target of 95%. The Vitamin A coverage of 81.9% (77.5-85.7, 95% C.I) also fell from 90% in 2008 and was below the UNHCR target of >90%.

4.3 Anaemia in young children and women

The prevalence of anaemia for children 6-59 months was a cause for concern, at 41.2% (34.4-48.2, 95% C.I), as this is above the WHO "high" classification for public health significance. The prevalence decreased with age, ranging from 57.7% in the 6-23 months group to 21.1% in the 36-59 month group. However, in non-pregnant adult women (15-49 years), the prevalence was 16.8% (11.8-22.9, 95% C.I), which falls within the "low" category.

4.4 IYCF indicators

The rate of timely initiation of breastfeeding was 71.7% (64.2-78.4, 95% C.I), showing room for improvement as this proportion is expected to be 100% so as to reduce the risk of infant mortality. The rate of exclusive breastfeeding was 60.4% (45.3-74.2, 95% C.I), an increase from 45% in 2008. The proportion who had introduced solids between 6-8 months was 73.3% (44.9-92.2, 95% C.I) and 39.7% (31.3-48.6, 95% C.I) of children 6-23 months had consumed iron-rich foods.

4.5 Food security

Since February 2012, WFP has been providing a half ration to households in Dzaleka camp due to funding challenges. The food ration consists of cereals, pulses, vegetable oil, sugar, salt and corn soya blend. More than 97% of sampled households had ration cards, with

the average reported duration of the food ration being 14 days, which was not surprising given the half ration. Only 2.8% of households reported that the ration lasted the entire duration of the cycle, and 6.2% reported that the ration had lasted less than 75% of the cycle. The main household coping mechanisms reported were: reduced quantity/frequency of meals (67.8%), borrowing cash, food or others without interest (45.5%), begging (44.6%) and selling assets (41.7%). There were also very few households who indicated that they consumed Corn Soya Blend, despite it being part of the general ration. The high proportion of households engaging in negative coping strategies such as begging and selling assets indicates a situation where the households do not have the means to cover their basic needs. This is a key observation to take into consideration when evaluating the refugees' food security situation.

4.6 WASH

Access to an improved drinking water source was almost universal for the population, at 99.5% (97.4-100.0, 95% C.I). However, this was not the same for sanitation, with only 35.0% (28.5-41.9, 95% C.I) having access to an improved excreta disposal facility. Nearly a third (32.0%, 25.7-38.9, 95% C.I) of households were using unimproved toilet facilities. A high proportion of households with children below 3 years (86.6%, 78.9-92.3, 95% C.I) disposed of children's faeces safely. The average number of litres used per person per day was 17.1, with only 35.1% (28.7-41.9. 95% C.I) using the recommended ≥ 20 litres per person per day.

4.7 Mosquito net coverage

Of the sampled population, 65.9% (59.1-72.3, 95% C.I) of households owned at least one mosquito net of any type, with 55.5% (48.5-62.3, 95% C.I) owning at least one LLIN. This is much lower than the UNHCR target of >75%. Mosquito net ownership translated to 1.7 LLIN per household and 4.5 persons per LLIN, indicating a very low coverage given the WHO threshold of no more than 1.8 people per LLIN. Looking further at sub-groups, only 37.5% of pregnant women had slept under a mosquito net, and 33.3% under a LLIN. For children below 5 years, 42.7% had slept under any type of net and 37.0% under LLIN.

5. CONCLUSION

The situation is Dzaleka refugee camp for children is stable and below emergency thresholds with respect to acute malnutrition, and chronic malnutrition is relatively stable. However, anaemia is very high and above the emergency threshold for children, which requires urgent action. Furthermore, the rate of awareness on the use of mosquito nets must be raised, and future distributions should consider combining the exercise with health education. The coverage of sanitation should be increased by reducing sharing of toilets.

6. RECOMMENDATIONS AND PRIORITIES

Immediate

1. Blanket provision of Micronutrient Powder (MNP) for children 6-59 months or 6-23 months depending on resource availability, to address the high prevalence of anaemia among young children.
2. Conduct mosquito net hang-up campaign to put unused LLINs over sleeping surfaces to promote use.

Medium

9. Improve anaemia control programming through deworming, malaria control, antenatal care and nutrition gardens.
10. Increase information, education and communication for infant and young child feeding, anaemia prevention and mosquito net use.
11. Further investigate coping mechanisms with regard to trade and exchange between food and other goods and services.
12. Investigate possible causes of anaemia in children.

Longer term

13. Design food security interventions to complement the current food assistance through agricultural interventions and income generating activities.
14. Increase coverage of toilets so as to reduce sharing.

Future nutrition monitoring

The nutrition situation in the camp should be monitored on bi-annual basis. Future surveys should also look further at causes of anaemia, as well as reasons for lack of utilisation of mosquito nets, as well as looking further at usage of the food ration and possible exchange between the food ration and other goods and services.

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Appendix 1. *List of individuals involved in the survey*

Manager:
BLESSING MUREVERWI (Consultant)
Supervision:
LETICIA NANGWALE (UNHCR)
GRACE MACLAINE (WFP)
Logistics/administration:
FEDSON CHIKUSE (UNHCR)
EZEKIEL KAPAZIRA (UNHCR)
Data entry:
SAMSON MAGOMBO
LAWRENCE CHIPENDA

Data collection teams:

TEAM 1		**TEAM 4**	
SANDRA MKANDAWIRE	Team leader	YAMIKANI MTIMUNI	Team leader
CHIMWEMWE NJOLOMA		NSIMBENI CHIRWA	
SHERRY CHIBAMBO		TADALA ZIDANA	
DAMIANO MPAKENI		KELVIN	Interpreter
ILDEPHONSE	Interpreter		
TEAM 2		**TEAM 5**	
DIANA MATAYA	Team leader	JUDITH KAUNDA	Team leader
THOKOZIRE PHIRI		DALITSO MDINDA	
ALEX KAMBEWA		VICTORIA MATIYA	
PHILBERT MWENYASHYAKA	Interpreter	YAMIKANI PHIRI	
		FELIX	Interpreter
TEAM 3		**TEAM 6**	
STANLEY AKIM	Team leader	BRIDGET MWALE	Team leader
RICHARD CHIRWA		MAURICE SOLOLA	
JOANA MKANDAWIRE		CECILLIA PEREIRA	
LYDIA PHIRI		RUTH NYONDO	
CHARLOTTE	Interpreter	MWAMBA MAHUSHUWA	Interpreter

Appendix 2 *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** (1.1 %)
Overall Sex ratio	Incl	p	>0.1	>0.05	>0.001	<0.000	
(Significant chi square)			0	2	4	10	**0** (p=0.638)
Overall Age distrib	Incl	p	>0.1	>0.05	>0.001	<0.000	
(Significant chi square)			0	2	4	10	**4** (p=0.001)
Dig pref score - weight	Incl	#	0-5	5-10	10-20	> 20	
			0	2	4	10	**2** (6)
Dig pref score - height	Incl	#	0-5	5-10	10-20	> 20	
			0	2	4	10	**2** (10)
Standard Dev WHZ	Excl	SD	<1.1	<1.15	<1.20	>1.20	
			0	2	6	20	**0** (0.97)
Skewness WHZ	Excl	#	<±1.0	<±2.0	<±3.0	>±3.0	
			0	1	3	5	**0** (-0.05)
Kurtosis WHZ	Excl	#	<±1.0	<±2.0	<±3.0	>±3.0	
			0	1	3	5	**0** (0.08)
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	**8** %

At the moment the overall score of this survey is 8 %, this is good.

Appendix 3 ***Evaluation of Enumerators***

Weight:

	Precision: Sum of Square [W2-W1]	Accuracy: Sum of Square [Superv.(W1+W2)-Enum.(W1+W2]	No. +/- Precision	No. +/- Accuracy
Supervisor	0.03		3/0	
Enumerator 1	0.88 POOR	0.53 POOR	9/0	2/8
Enumerator 2	0.00 OK	0.03 OK	0/0	2/1
Enumerator 3	0.15 POOR	0.16 POOR	3/4	4/1
Enumerator 4	0.05 OK	0.06 OK	1/4	2/4
Enumerator 5	0.01 OK	0.06 OK	0/1	0/3
Enumerator 6	0.09 POOR	0.30 POOR	2/4	2/4
Enumerator 7	1.47 POOR	1.28 POOR	2/2	3/2
Enumerator 8	0.40 POOR	0.27 POOR	3/2	1/5
Enumerator 9	0.04 OK	0.05 OK	1/3	3/2
Enumerator 10	0.00 OK	0.07 OK	0/0	3/1

Height:

	Precision: Sum of Square [H2-H1]	Accuracy: Sum of Square [Superv.(H1+H2)-Enum.(H1+H2]	No. +/- Precision	No. +/- Accuracy
Supervisor	0.16		5/2	
Enumerator 1	1.81 POOR	5.33 POOR	8/0	3/7
Enumerator 2	0.18 OK	4.52 POOR	1/3	5/4
Enumerator 3	0.71 POOR	4.85 POOR	7/2	4/6
Enumerator 4	0.06 OK	2.42 POOR	3/3	6/4
Enumerator 5	0.03 OK	2.15 POOR	1/2	7/3
Enumerator 6	0.76 POOR	2.62 POOR	5/2	9/0
Enumerator 7	7.37 POOR	9.09 POOR	3/5	10/0
Enumerator 8	3.11 POOR	1.49 POOR	5/3	5/3
Enumerator 9	4.00 POOR	4.76 POOR	7/3	1/9
Enumerator 10	0.11 OK	7.47 POOR	4/4	4/5

MUAC:

	Precision: Sum of Square [MUAC2-MUAC1]	Accuracy: Sum of Square [Superv.(MUAC1+MUAC2)-Enum.(MUAC1+MUAC2]	No. +/- Precision	No. +/- Accuracy
Supervisor	0.24		6/1	
Enumerator 1	0.63 POOR	5.39 POOR	9/0	5/5
Enumerator 2	1.44 POOR	3.14 POOR	4/3	7/1
Enumerator 3	0.38 OK	1.40 POOR	4/5	5/5
Enumerator 4	0.54 POOR	0.72 POOR	7/0	3/5
Enumerator 5	0.08 OK	4.54 POOR	3/5	7/3
Enumerator 6	8.45 POOR	5.07 POOR	6/2	4/4
Enumerator 7	1.15 POOR	8.01 POOR	7/1	0/10
Enumerator 8	1.22 POOR	1.92 POOR	4/5	3/7
Enumerator 9	0.25 OK	1.63 POOR	6/2	6/4
Enumerator 10	0.31 OK	2.73 POOR	4/3	3/7

For evaluating the enumerators the precision and the accuracy of their measurements is calculated.
For precision the sum of the square of the differences for the double measurements is calculated. This value should be less than two times the precision value of the supervisor.
For the accuracy the sum of the square of the differences between the enumerator values (weight1+weight2) and the supervisor values (weight1+weight2) is calculated. This value should be less than three times the precision value of the supervisor.
To check for systematic errors of the enumerators the number of positive and negative deviations can be used.

-Changes were made to teams with poor scores, with replacement of measurer and assistants where necessary.

-One of the reasons for some poor scores on weight measurement was recording error.

Appendix 4 *Result Tables for NCHS growth reference 1977*

Table 4.1: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex

	All n = 362	**Boys** n = 185	**Girls** n = 177
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(10) 2.8 % (1.5 - 5.0 95% C.I.)	(4) 2.2 % (0.8 - 5.4 95% C.I.)	(6) 3.4 % (1.6 - 7.2 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(9) 2.5 % (1.3 - 4.7 95% C.I.)	(4) 2.2 % (0.8 - 5.4 95% C.I.)	(5) 2.8 % (1.2 - 6.4 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(1) 0.3 % (0.0 - 1.5 95% C.I.)	(0) 0.0 % (0.0 - 2.0 95% C.I.)	(1) 0.6 % (0.1 - 3.1 95% C.I.)

The prevalence of oedema is 0.3 %

Table 4.2: 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	103	0	0.0	6	5.8	97	94.2	0	0.0
18-29	86	0	0.0	2	2.3	83	96.5	1	1.2
30-41	78	0	0.0	0	0.0	78	100.0	0	0.0
42-53	79	0	0.0	1	1.3	78	98.7	0	0.0
54-59	16	0	0.0	0	0.0	16	100.0	0	0.0
Total	362	0	0.0	9	2.5	352	97.2	1	0.3

Table 4.3: 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. 1 (0.3 %)
Oedema absent	Marasmic No. 0 (0.0 %)	Not severely malnourished No. 361 (99.7 %)

Table 4.4: Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex

	All n = 365	**Boys** n = 187	**Girls** n = 178
Prevalence of global malnutrition (< 125 mm and/or oedema)	(9) 2.5 % (1.3 - 4.6 95% C.I.)	(5) 2.7 % (1.1 - 6.1 95% C.I.)	(4) 2.2 % (0.9 - 5.6 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(7) 1.9 % (0.9 - 3.9 95% C.I.)	(4) 2.1 % (0.8 - 5.4 95% C.I.)	(3) 1.7 % (0.6 - 4.8 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(2) 0.5 % (0.2 - 2.0 95% C.I.)	(1) 0.5 % (0.1 - 3.0 95% C.I.)	(1) 0.6 % (0.1 - 3.1 95% C.I.)

Table 4.5: 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	103	0	0.0	6	5.8	97	94.2	0	0.0
18-29	87	0	0.0	1	1.1	86	98.9	1	1.1
30-41	79	0	0.0	0	0.0	79	100.0	0	0.0
42-53	80	1	1.3	0	0.0	79	98.8	0	0.0
54-59	16	0	0.0	0	0.0	16	100.0	0	0.0
Total	365	1	0.3	7	1.9	357	97.8	1	0.3

Table 4.6: Prevalence of acute malnutrition based on the percentage of the median and/or oedema

	n = 362
Prevalence of global acute malnutrition (<80% and/or oedema)	(5) 1.4 % (0.6 - 3.2 95% C.I.)
Prevalence of moderate acute malnutrition (<80% and >= 70%, no oedema)	(4) 1.1 % (0.4 - 2.8 95% C.I.)
Prevalence of severe acute malnutrition (<70% and/or oedema)	(1) 0.3 % (0.0 - 1.5 95% C.I.)

Table 4.7: 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	103	0	0.0	4	3.9	99	96.1	0	0.0
18-29	86	0	0.0	0	0.0	85	98.8	1	1.2
30-41	78	0	0.0	0	0.0	78	100.0	0	0.0
42-53	79	0	0.0	0	0.0	79	100.0	0	0.0
54-59	16	0	0.0	0	0.0	16	100.0	0	0.0
Total	362	0	0.0	4	1.1	357	98.6	1	0.3

Table 4.8: Prevalence of underweight based on weight-for-age z-scores by sex

	All n = 356	**Boys** n = 185	**Girls** n = 171
Prevalence of underweight (<-2 z-score)	(33) 9.3 % (6.7 - 12.7 95% C.I.)	(18) 9.7 % (6.2 - 14.9 95% C.I.)	(15) 8.8 % (5.4 - 14.0 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(30) 8.4 % (6.0 - 11.8 95% C.I.)	(16) 8.6 % (5.4 - 13.6 95% C.I.)	(14) 8.2 % (4.9 - 13.3 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(3) 0.8 % (0.3 - 2.4 95% C.I.)	(2) 1.1 % (0.3 - 3.9 95% C.I.)	(1) 0.6 % (0.1 - 3.2 95% C.I.)

Table 4.9: 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	101	2	2.0	14	13.9	85	84.2	0	0.0
18-29	83	0	0.0	9	10.8	74	89.2	1	1.2
30-41	78	0	0.0	5	6.4	73	93.6	0	0.0
42-53	78	0	0.0	2	2.6	76	97.4	0	0.0
54-59	16	1	6.3	0	0.0	15	93.8	0	0.0
Total	356	3	0.8	30	8.4	323	90.7	1	0.3

Table 4.10: Prevalence of stunting based on height-for-age z-scores and by sex

	All n = 349	**Boys** n = 178	**Girls** n = 171
Prevalence of stunting (<-2 z-score)	(80) 22.9 % (18.8 - 27.6 95% C.I.)	(42) 23.6 % (18.0 - 30.3 95% C.I.)	(38) 22.2 % (16.6 - 29.0 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(67) 19.2 % (15.4 - 23.7 95% C.I.)	(35) 19.7 % (14.5 - 26.1 95% C.I.)	(32) 18.7 % (13.6 - 25.2 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(13) 3.7 % (2.2 - 6.3 95% C.I.)	(7) 3.9 % (1.9 - 7.9 95% C.I.)	(6) 3.5 % (1.6 - 7.4 95% C.I.)

Table 4.11: 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	101	9	8.9	12	11.9	80	79.2
18-29	83	3	3.6	19	22.9	61	73.5
30-41	75	0	0.0	13	17.3	62	82.7
42-53	75	1	1.3	20	26.7	54	72.0
54-59	15	0	0.0	3	20.0	12	80.0
Total	349	13	3.7	67	19.2	269	77.1

Table 4.12: 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	361	0.00±0.92	1.00	1	3
Weight-for-Age	356	-0.69±1.04	1.00	1	8
Height-for-Age	349	-1.15±1.11	1.00	0	16

* contains for WHZ and WAZ the children with edema.

Appendix 5 *Questionnaire*

UNHCR SENS Questionnaire

Dzaleka refugee camp, Malawi, 27 June-5 July 2012

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

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

Zone name:_____ _____**House No**: _____**Consent** : yes / no / absent

Date of interview (dd/mm/yyyy)	**Team name ( )**
|___|___|/|___|___|/|___|___||___|___|	|___|___|
Team Number	**HH Number**
|___|	|___|___|

No	**QUESTION**	**ANSWER CODES**	
SECTION FS1			
FS1	Does your household have a ration card?	Yes..... 1 No..... 2	|___| **IF ANSWER IS 1 GO TO FS3**
FS2	Why do you not have a ration card?	Not given one at registration ..... 1 Lost card..... 2 Traded card ..... 3 Not registered but eligible ..... 4 Not eligible (not in targeting criteria) ..... 5 Other..... 6	|___|
FS3	How many days did the food from the May 2012 general food ration last?	INSERT DAYS	|___|___|
FS4	In the last month, have you or anyone in your household borrowed cash, food or other items without interest?	Yes..... 1 No..... 2	|___|
FS5	In the last month, have you or anyone in your household borrowed cash, food or other items with interest?	Yes..... 1 No..... 2	|___|
FS6	In the last month, have you or anyone in your household sold any assets (furniture, seed stocks, tools, other NFI, livestock etc.)?	Yes..... 1 No..... 2	|___|
FS7	In the last month, have you or anyone in your household requested increased remittances or gifts as compared to normal?	Yes..... 1 No..... 2	|___|
FS8	In the last month, have you or anyone in your household either reduced the quantity or frequency of meals or both?	Yes..... 1 No..... 2	|___|
FS9	In the last month, have you or anyone in your household begged?	Yes..... 1 No..... 2	|___|
FS10	In the last month, have you or anyone in your	Yes..... 1	

	household engaged in potentially risky or harmful activities such as: theft, prostitution, drug abuse, drug smuggling, child trafficking, child labour or early marriage?	No..... 2	|___|
FS11	Do you have one or more children 14 years of age or younger currently living in the household?	Yes..... 1 No..... 2	|___| **IF ANSWER IS 2 GO TO SECTION FS2**
FS12	In the last month, have you or anyone in your household sent your child or children of 14 years of age or younger to work outside the household in order to get cash or in-kind goods or services?	Yes..... 1 No..... 2	|___|

SECTION FS2

FS13 Now I would like to ask you about the types of foods that you or anyone else in your household ate yesterday during the day and at night. I am interested in whether you or anyone else in your household had the item even if it was combined with other foods.

READ THE LIST OF FOODS AND DO NOT PROBE. PLACE A *ONE* IN THE BOX IF ANYONE IN THE HOUSEHOLD ATE THE FOOD IN QUESTION, PLACE A *ZERO* IN THE BOX IF NO ONE IN THE HOUSEHOLD ATE THE FOOD.

1A. Any wheat, corn/maize or any foods made from these such as bread or porridge (food aid)	1A……|___|
1B. Any rice, sorghum, millet or any other grains or foods made from these (such as bread, noodles, porridge or other grain products), *ugali/nsima, porridge or paste*	1B……|___|
2. Any green bananas, lotus root, parsnip, plantains, white potatoes, white yam, white cassava, sweet potatoes, or other foods made from roots	2……|___|
3A. Any carrot, pumpkin, squash, or sweet potato that are orange inside, or other locally available vitamin A rich vegetables such as red sweet pepper	3A……|___|
3B. Any dark green leafy vegetables, including wild forms and locally available vitamin A rich leaves such as amaranth, arugula, cassava leaves, kale, spinach, *chinese, mpiru, nkwani*	3B……|___|
3C. Any other vegetables (such as. bamboo shoots, cabbage, green pepper, tomato, onion, eggplant, zucchini)	3C……|___|
4A. Any mango (ripe, fresh and dried), cantaloupe melon (ripe), apricot (fresh or dried), ripe papaya, passion fruit (ripe), dried peach, and 100% fruit juice made from these	4A……|___|

	4B. Any other fruits such as apple, avocados, banana, coconut flesh, lemon, , including wild fruits and 100% fruit juice made from these	4B……|___|	
	5A. Any liver, kidney, heart or other organ meats or blood-based foods	5A……|___|	
	5B. Any beef, goat, lamb, mutton, pork, rabbit or other large wild (bush meat) or domesticated mammals chicken, duck, or other wild or domesticated birds, or dogs, cats cane rat, guinea pig, rat, agouti or other small wild (bush meat) or domesticated mammals frogs, snakes, and other reptiles insects	5B……|___|	
	6. Any eggs from chicken, duck, turkey, guinea fowl or any other egg	6……|___|	
	7. Any fresh or dried fish, canned fish (anchovies, tuna, sardines), or shellfish, *chambo, micheni, matemba, usiba, butter, domasi*	7……|___|	
	8A.Any dried beans, pigeon peas, soyabeans, groundnuts or foods made from these (food aid)	8A……|___|	
	8B. Any dried beans, pigeon peas, soyabeans, groundnuts or foods made from these (NON food aid)	8B……|___|	
	9. Any milk, infant formula, cheese, yogurt or other milk products, such as *Chambiko, chimombe*, first choice, NIDO, *Steri, vega*	9……|___|	
	10A. Vegetable oil (food aid)	10A……|___|	
	10B. Any oil, fats, ghee or butter added to food or used for cooking such as *stork, rama, blueband* (NON food aid)	10B……|___|	
	11. Any sugar, honey, sweetened soda or sweetened juice drinks, sugary foods such as chocolates, candies, cookies, sweet biscuits and cakes	11……|___|	
	12. Any spices (black pepper, salt), condiments (soy sauce, hot sauce), coffee, tea, alcoholic beverages	12……|___|	
FS14	Have you or anyone else in your household eaten CSB, *LikhuniPhala* or any food made from these yesterday during the day and at night?	Yes……..1 No……..2 DK……..8	|___|

WASH: 1 questionnaire per household *(*THIS QUESTIONNAIRE IS TO BE ADMINISTERED TO THE MAIN CARETAKER OR, IF THEY ARE ABSENT, ANOTHER ADULT MEMBER OF THE HOUSEHOLD)

Zone name:_____ _____**House No**: _____**Consent** : yes / no / absent

Date of interview (dd/mm/yyyy)	**Team name ( )**
|___|___|/|___|___|/|___|___||___|___|	|___|___|
Team Number	**HH Number**
|___|	|___|___|

No	QUESTION	ANSWER CODES	
SECTION WS1			
WS1	How many people live in this household?		|___|___|
WS2	What is the ***main*** source of drinking water for members of your household? DO NOT READ THE ANSWERS SELECT ONE ONLY	Piped water.....01 Public tap/standpipe .....02 Tubewell/borehole (& pump).....03 Protected dug well .....04 Protected spring.....05 Rain water collection.....06 UNHCR Tanker .....07 Unprotected spring .....08 Unprotected dug well.....09 Small water vendor .....10 Tanker truck.....11 Bottled water.....12 Surface water (e.g. river, pond) .....13 Other .....96 Don't know 98	|___|___|
WS3	How long does it usually take you to go to your main water source, get water, and come back? THIS RELATES TO DRINKING WATER	RECORD THE NUMBER OF MINUTES IF KNOWN (RECORD 000 IF ON PREMISE AND 998 IF UNKNOWN)	|___|___|___| Minutes
		SUPERVISOR TO SELECT ONE ONLY On premises.....1 Less than 30 minutes.....2 More than 30 minutes.....3 Don't know 8	|___|
WS4	Are you satisfied with the water supply? THIS RELATES TO THE DRINKING WATER SUPPLY	Yes .....1 No.....2 Other 6	|___|
WS5	What kind of toilet facility does this household use?	Flush to piped sewer system .....01 Flush to septic system .....02 Pour-flush to pit 03	

	DO NOT READ THE ANSWERS SELECT ONE ONLY	VIP/simple pit latrine with floor/slab ..... 04 Composting/dry latrine ..... 05 Flush or pour-flush elsewhere ..... 06 Pit latrine without floor/slab ..... 07 Service or bucket latrine ..... 08 Hanging toilet/latrine..... 09 No facility, field, bush, plastic bag ... 10	|___|___| **IF ANSWER IS 10 GO TO WS7**
WS6	How many ***households*** share this toilet?	RECORD NUMBER OF HOUSEHOLDS IF KNOWN (RECORD 96 IF PUBLIC TOILET OR 98 IF UNKNOWN)	|___|___| Households
		SUPERVISOR SELECT ONE ONLY Not shared (**1 HH**) .....1 Shared family (**2 HH**) .....2 Communal toilet (**3 HH or more**).....3 Public toilet (**in market or clinic etc**.).....4 Don't know 8	|___|
WS7	Do you have children under three years old?	Yes .....1 No.....2	|___| **IF ANSWER IS 2 GO TO WS9**
WS8	The last time [NAME OF YOUNGEST CHILD] passed stools, what was done to dispose of the stools? DO NOT READ THE ANSWERS CHECK ONE ONLY	Child used toilet/latrine..... 01 Put/rinsed into toilet or latrine..... 02 Buried ..... 03 Thrown into garbage ..... 04 Put/rinsed into drain or ditch ..... 05 Left in the open..... 06 Other (specify) ..... 96 Don't know 98	|___|___|

SECTION WS2
Observation Based Questions (*done after the initial questions to ensure the flow of the interview is not broken*)

No	OBSERVATION / QUESTION	ANSWER			
WS9	CALCULATE THE TOTAL AMOUNT OF WATER USED BY THE HOUSEHOLD PERDAY THIS RELATES TO ALL SOURCES OF WATER (DRINKING WATER AND NON-DRINKING WATER SOURCES)	Please show me the containers you used yesterday for collecting water ASSIGN A NUMBER TO EACH CONTAINER	Capacity in litres	Number of journeys made with each container	Total litres **SUPERVISOR TO COMPLETE HAND CACLULATION**
		1 Jerry can	25 L		
		2 Jerry can	20 L		
		3 Jerry can	18 L		

		4 Jerry can	5 L		
		5 Bucket	20 L		
		6 Bucket	10 L		
		7 Bucket	5 L		
		8			
		9			
		10			
		Total litres used by household			
WS10	Please show me where you store your drinking water. ARE THE DRINKING WATER CONTAINERS COVERED OR NARROW NECKED?	All are ..... 1 Some are ..... 2 None are..... 3			|____|
WS11	Please show me the toilet facility that is usually used by family members. CONFIRM ANSWER TO WS5 ABOVE	ONLY ANSWER THIS FOR TOILETS USED BY 1 OR 2 HH (SEE WS6). IF TOILETS USED BY 3 HH OR MORE, SKIP TO NEXT MODULE AND LEAVE BLANK Toilet in use ..... 1 Toilet not in use ..... 2 Not observed 3			|____|

MOSQUITO NET COVERAGE: 1 questionnaire per household (THIS QUESTIONNAIRE IS TO BE ADMINISTERED TO THE HEAD OF THE HOUSEHOLD OR, IF THEY ARE ABSENT, ANOTHER ADULT MEMBER OF THE HOUSEHOLD.

Zone name:_____ _____**House No**: _____**Consent** : yes / no / absent

Date of interview (dd/mm/yyyy)	**Team name ( )**
|___|___|/|___|___|/|___|___||___|___|	|___|___|
Team Number	**HH Number**
|___|	|___|___|

No	**QUESTION**		**ANSWER CODES**		
SECTION TN1					
TN1	How many people live in this household and slept here last night? INSERT NUMBER				|___|___|
TN2	How many children below 5 years of age live in this household and slept here last night? INSERT NUMBER				|___|___|
TN3	How many pregnant women live in this household and slept here last night? INSERT NUMBER				|___|___|
TN5	Do you have mosquito nets in this household that can be used while sleeping?		Yes..... 1 No..... 2		|___| **IF ANSWER IS 2 STOP NOW**
TN6	How many of these mosquito nets that can be used while sleeping does your household have? INSERT NUMBER		IF 4 NETS OR MORE, ENTER THE NUMBER AND USE ADDITIONAL NET QUESTIONNAIRE SHEETS ENTERING THE NUMBER OF THE NETS SEQUENTIALLY AT THE TOP		|___| Nets
TN7	ASK RESPONDENT TO SHOW YOU THE NET(S) IN THE HH. IF NETSARE NOT OBSERVED → CORRECT TN6 ANSWER	NET #|___|	NET #|___|	NET #|___|	NET #|___|
TN8	OBSERVE NETAND RECORD THE BRANDNAME OF NET ON THE TAG. IF NO TAG EXISTS OR IS UNREADABLE RECORD 'DK' FOR DON'T KNOW.				
TN9	**For supervisor only (not to be done during interview)**: WHAT TYPE OF NET IS THIS? BASED ON THE TAG INDICATE IF THIS IS A LLIN OR OTHER TYPE OF NET OR DON'T KNOW.	1=LLIN 2=Other/DK |___|	1=LLIN 2=Other/DK |___|	1=LLIN 2=Other/DK |___|	1=LLIN 2=Other/DK |___|
TN10	**For supervisor only (not to be done during interview)**: RECORD THE TOTAL NUMBER OF LLINs IN HH BY COUNTING THE NUMBER OF '1' IN TN9.				|___| LLINs

SECTION TN2							
Line no	**Household members**	**Sex**	**Age**	**Pregnancy status**	**Slept under net**	**Which net**	**Type of net**
#	**COL1**	**COL2**	**COL3**	**COL4**	**COL5**	**COL6**	**COL7**
	Please give me the names of the HH members who live here and who slept in your house last night	Sex m/f	Age years	FOR WOMEN ≥ 15 years, ASK: Is (NAME) currently pregnant? (CIRCLE not applicable '99' if female < 15 or male) Yes No/DK N/A	Did (NAME) sleep under a net last night? Yes No/DK	ASK THE RESPONDENT TO PHYSICALLY IDENTIFY WHICH OF THE OBSERVED NETS THEY SLEPT UNDER. CIRCLE THE NUMBER ORRESPONDING TO THE NET THEY USED. net#1 net#2 net# 3 net#4	**For supervisor only:** BASED ON THE OBSERVED NET BRANDNAME RECORDED (TN8) INDICATE IF IT IS AN LLIN OR OTHER OR UNKNOWN (DK) LLIN OTHER/DK
01		m f	<5 ≥5	1 0 99	1 0	1 2 3 4	1 2
02		m f	<5 ≥5	1 0 99	1 0	1 2 3 4	1 2
03		m f	<5 ≥5	1 0 99	1 0	1 2 3 4	1 2
04		m f	<5 ≥5	1 0 99	1 0	1 2 3 4	1 2
05		m f	<5 ≥5	1 0 99	1 0	1 2 3 4	1 2
06		m f	<5 ≥5	1 0 99	1 0	1 2 3 4	1 2
07		m f	<5 ≥5	1 0 99	1 0	1 2 3 4	1 2
08		m f	<5 ≥5	1 0 99	1 0	1 2 3 4	1 2
09		m f	<5 ≥5	1 0 99	1 0	1 2 3 4	1 2
10		m f	<5 ≥5	1 0 99	1 0	1 2 3 4	1 2
11		m f	<5 ≥5	1 0 99	1 0	1 2 3 4	1 2
12		m f	<5 ≥5	1 0 99	1 0	1 2 3 4	1 2
13		m f	<5 ≥5	1 0 99	1 0	1 2 3 4	1 2
14		m f	<5 ≥5	1 0 99	1 0	1 2 3 4	1 2
15		m f	<5 ≥5	1 0 99	1 0	1 2 3 4	1 2

Mosquito net summary (for supervisor only, not to be done during interview)						
	Total HH members		**Total <5**		**Total Pregnant**	
Slept under a net of any type	Count the number of '1' in COL5	**TN11** |___|___|	For children < 5 (COL3 is '<5'), count the number of '1' in COL5	**TN13** |___|___|	For pregnant women (COL4 is '1'), count the number of '1' in COL5	**TN15** |___|___|
Slept under an LLIN	Count the number of '1' in COL7	**TN12** |___|___|	For children <5 (COL3 is '<5'), count the number of '1' in COL7	**TN14** |___|___|	For pregnant women (COL4 is '1'), count the number of '1' in COL7	**TN16** |___|___|

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

Zone name:_____ _____**House No**: _____

Date of interview (dd/mm/yyyy): |___|___|/|___|___|/|___|___||___|___|	**Random Number ( )** |___|___|	**Team name ( )** |___|

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 (*SHOWPILL*)?** 1=yes (STOP NOW) 2=no (STOP NOW) 8=DK (STOP NOW)	**Hb** (g/L or g/dL)
01							
02							
03							
04							
05							
06							
07							
08							
09							
10							
11							
12							
13							
14							
…							

CHILDREN 6-59 MONTHS ANTHROPOMETRY, HEALTH AND ANAEMIA: 1 questionnaire per cluster / zones / sections *(*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*)*

Zone name:_____ _____**House No**: _____ **Team name ( )**

Date of interview (dd/mm/yyyy): |___|___|/|___|___|/|___|___||___|___|						**Random Number ( )** |___|___|					**Team number** |___|			
CH1	**CH2**	**CH3**	**CH4**	**CH5**	**CH6**	**CH7**	**CH8**	**CH9**	**CH10**	**CH11**	**CH12**	**CH13**	**CH14**	**CH 15**
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) ±0.1 cm	**Oedema** (y/n)	**MUAC** (mm)	**Child enrolled** 1=SFP 2=TFP 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/L or g/dL)*
01				/ /										
02				/ /										
03				/ /										
04				/ /										
05				/ /										
06				/ /										
07				/ /										
08				/										

				/										
09				/ /										
10				/ /										
11				/ /										
12				/ /										
…				/ /										

*The exact birth date should only be taken from an age documentation showing day, month and year of birth. It is only recorded if an official age documentation is available; if the mother recalls the exact date, this is not considered to be reliable enough. **Leave blank if no official age documentation is available.**

**If no age documentation is available, estimate age using local event calendar. If an official age documentation is available, record the age in months from the date of birth.

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

Zone name:_____ _____**House No**: _____**Consent** : yes / no / absent

Date of interview (dd/mm/yyyy)	**Team name ( )**
|___|___|/|___|___|/|___|___||___|___|	|___|___|
Team Number	**ID Number**
|___|	|___|___|

No	QUESTION	ANSWER CODES	
SECTION IF1			
IF1	Sex	Male..... 1 Female 2	|___|
IF2	Birthdate RECORD FROM AGE DOCUMENTATION. LEAVE BLANK IF NO VALID AGE DOCUMENTATION	Day/Month/Year…..|___|___| /|___|___| / |___|___||___|___|	
IF3	Child's age in months	IF AGE DOCUMENTATION NOT AVAILABLE, ESTIMATE USING EVENT CALENDAR. IF AGE DOCUMENTATION AVAILABLE, RECORD THE AGE IN MONTHS FROM THE DATE OF BIRTH	|___|___|
IF4	Has [NAME] ever been breastfed?	Yes..... 1 No .....2 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 Lactogen, S26, NAN	7B……1	2 8
	7C. Milk such as tinned, powdered, or fresh animal milk: for example *NIDO, Carry God, Cremora, Vega, Chimombe, First Choice*	7C……1	2 8
	7D. Juice or juice drinks such as *Kalambe, Davita, YES, Orange squash*	7D……1	2 8
	7E. Clear broth	7E……1	2 8
	7F. Sour milk or yogurt for example *Chambiko, Yogi*	7F……1	2 8
	7G. Thin porridge for example *Maheu, Thobwa*	7G……1	2 8
	7H. Tea or coffee with milk	7H……1	2 8
	7I. Any other water-based liquids for example sodas, other sweet drinks, herbal infusion, gripe water, clear tea with no milk, black coffee, ritual fluids	7I……..1	2 8
IF8	Yesterday, during the day or at night, did [NAME] eat solid or semi-solid (soft, mushy) food?	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. Beef, goat, lamb, mutton, pork, rabbit, chicken, duck, liver, kidney, heart	11A……..1	2 8
	11B. Corn Soya Blend and Wheat Soya Blend, *LikhuniPhala*	11B……1	2 8
	11C. Fortified Blended Foods ++ such as Corn Soya Soya Blend++	11C……1	2 8

	11D. Ready-to-use therapeutic foods suchasPlumpy'Nut® and eeZeePaste™ (SHOW SACHET)	11D……1 2 8
	11F. Lipid-based Nutrient supplements such asNutributter® and Plumpy'doz® (SHOW SACHET / POT)	11F……1 2 8
	11G. Infant formula such as Lactogen, S26	11G……1 2 8

Appendix 6 *Local event calendar*

Seasons	Religious Holidays	Other Events	Local Events	Months / Years	Age (M)
Start of winter				May 2012	1
Harvesting		Easter holiday Death of President waMutharika		April 2012	2
Rains		Martyr's day 3 March		March 2012	3
Rains				February 2012	4
Rains		NEW YEAR'S DAY 1 January John Chilembwe day 15 January		January 2012	5
Rains	CHRISTMAS	AIDS day 1 December		December 2011	6
Start of rainy season				November 2011	7
Dry season		Mother's day-2nd Monday		October 2011	8
Dry season				September 2011	9
End of winter	End of Ramadhan 19 August			August 2011	10
Winter	Start of Ramadhan 21 July	Independence day 6 July Demonstrations country-wide 20 July		July 2011	11
Winter		Freedom day 14 June World Refugee day 20 June		June 2011	12
Start of winter		Labour day 1 May		May 2011	13
Harvesting	EASTER			April 2011	14
Rains				March 2011	15
Rains				February 2011	16
Rains		NEW YEAR'S DAY 1 January John Chilembwe day 15 January		January 2011	17
Rains	CHRISTMAS	AIDS day 1 December		December 2010	18
Start of rainy season				November 2010	19
Dry season		Mother's day-2nd Monday		October 2010	20
Dry season				September 2010	21
End of winter				August 2010	22
Winter				July 2010	23
Winter				June 2010	24
Start of winter				May 2010	25
Harvesting	EASTER			April 2010	26
Rains				March 2010	27
Rains				February 2010	28
Rains		NEW YEAR'S DAY 1 January John Chilembwe day 15 January		January 2010	29
Rains	CHRISTMAS	AIDS day 1 December		December 2009	30
Start of rainy season				November 2009	31
Dry season		Mother's day-2nd Monday		October 2009	32
Dry season				September 2009	33
End of winter				August 2009	34
Winter				July 2009	35
Winter				June 2009	36
Start of winter		National elections 19 May		May 2009	37
Harvesting	EASTER			April 2009	38
Rains				March 2009	39
Rains				February 2009	40
Rains		NEW YEAR'S DAY 1 January John Chilembwe day 15 January		January 2009	41
Rains	CHRISTMAS	AIDS day 1 December		December 2008	42
Start of rainy season				November 2008	43
Dry season		Mother's day-2nd Monday		October 2008	44
Dry season				September 2008	45
End of winter				August 2008	46
Winter				July 2008	47
Winter				June 2008	48
Winter				May 2008	49
Harvesting	EASTER			April 2008	50
Rains				March 2008	51
Rains				February 2008	52
Rains		NEW YEAR'S DAY 1 January John Chilembwe day 15 January		January 2008	53
Rains	CHRISTMAS	AIDS day 1 December		December 2007	54
Start of rainy season				November 2007	55
Dry season		Mother's day-2nd Monday		October 2007	56
Dry season				September 2007	57
End of winter				August 2007	58
Winter				July 2007	59
Winter				June 2007	60