UNHCR Standardized Expanded Nutrition Surveys in Maratane's Refugee Camp, Mozambique

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Final Report

UNHCR's Operations in Southern Africa

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LIST OF ACRONYMS

ANC	Antenatal Care
CI	Confidence Interval
ENA	Emergency Nutrition Assessment
Epi Info	Name of CDC software for epidemiological investigations including nutrition Surveys
GAM	Global Acute Malnutrition
Hb	Haemoglobin
HH	Household(s)
INAR	Instituto Nacional de Apoio aos Refugiados
IYCF	Infant and Young Child Feeding Practices
JAM	Joint Assessment Mission
LLIN	Long-Lasting Insecticidal Net
LPPPD	Litres Per Person Per Day
MAM	Moderate Acute Malnutrition
MUAC	Mid-Upper Arm Circumference
NCHS	National Center for Health Statistics
ODK	Open Data Kit
SAM	Severe acute malnutrition
SENS	Standardised Expanded Nutrition Survey
SMART	Standardised Monitoring and Assessment of Relief and Transitions
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
WASH	Water, Sanitation, and Hygiene
WHO	World Health Organisation
WFP	World Food Programme

ACKNOWLEDGEMENTS

EXECUTIVE SUMMARY

The Maratane refugee camp has been the only official settlement for asylum seekers and refugees in Mozambique since 2003. Instituto Nacional de Apoio aos Refugiados (INAR), a government agency nested within the Ministry of Foreign Affairs manages the camp and deals with the registration and reception arrangements and provides protection and assistance to the refugees and asylum seekers. According to the latest statistics from INAR and ProGres, there are a total of 13,217 refugees in Mozambique and around 7,360 refugees in the camp, nearly all of whom are from the Great Lakes Region, the majority being from the Democratic Republic of Congo, followed by Rwanda and Burundi.

The previous nutrition survey conducted in September 2012 found a stable level of acute malnutrition, but persistent high levels of chronic malnutrition amongst children, and anaemia amongst both children and adult women.
UNHCR conducted two nutrition surveys in Maratane's refugee camp between the 25th of April and the 2nd of May 2015, one with a representative sample of the refugee population of the camp and another with the children of refugees who have arrived within the last six months to the camp.

Survey 1: All Refugees in Maratane's Camp

The first survey had 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 infant and young child feeding (IYCF) practices among children aged 0-23 months.
8. To determine the population's access to, and use of, improved water, sanitation and hygiene (WASH) facilities.
9. To determine the ownership of mosquito nets (all types and long-lasting insecticidal nets (LLINs)) in households.
10. To determine the utilisation of mosquito nets (all types and LLINs) by the total population, children 0-59 months and pregnant women.
11. To establish recommendations on actions to be taken to address the situation in Maratane's refugee camp.
The survey was based on the SMART methodology and UNHCR Standardised Expanded Nutrition Survey (SENS) Guidelines for Refugee Populations (v 1.3, March 2012). Simple random sampling was used to select a target sample of 167 children under 5 years from 224 households from the general food distribution lists. A resultant sample size of 205 children and 173 households was achieved. A total of 4 survey teams collected data over a period of 7 days on child anthropometry and health; infant and young child feeding; child and adult women anaemia; water, sanitation and hygiene; and mosquito net coverage, following a 7-day training and standardisation test.

Survey 2: Newly Arrived Refugees

The second survey had the following objectives:
1. To measure the prevalence of acute malnutrition in children of new arrivals aged 6-59 months.
2. To measure the prevalence of stunting in children of new arrivals aged 6-59 months.
3. To determine the coverage of measles vaccination among children of new arrivals aged 9-59 months.

4. To determine the coverage of vitamin A supplementation received during the last 6 months among children of new arrivals aged 6-59 months.
5. To assess the two-week period prevalence of diarrhoea among children of new arrivals aged 6-59 months.
6. To measure the prevalence of anaemia in children of new arrivals aged 6-59 months.
7. To investigate IYCF practices among children of new arrivals aged 0-23 months.

A list of all the names of children aged 6-59 months of refugees who have arrived in the camp within the last six months was generated from ProGres. The children were called to present themselves to a central place in the camp over a period of two days. Fourty-three (43) children could be surveyed out of the 82 children on the list. This survey was also based on the Standardised Monitoring and Assessment of Relief and Transitions (SMART) methodology and UNHCR SENS Guidelines for Refugee Populations.

Android mobile phones with Open Data Kit (ODK) software were used for data collection and entry. The Emergency Nutrition Assessment (ENA) for SMART February 2015 version was used to analyse anthropometric data, and the rest of the data was analysed using Epi Info 6, July 2012 version.

TABLE 1: Summary of results – All refugees in Maratane's camp (Survey 1)

	Number of Cases/ Sample Size	% (95% CI)	Target (where applicable)
Children 6-59 Months			
Acute Malnutrition (WHO 2006 Growth Standards)			
Global Acute Malnutrition (GAM)	4/181	2.2 (0.9-5.5)	Critical if ≥15%
Moderate Acute Malnutrition (MAM)	4/181	2.2 (0.9-5.5)	
Severe Acute Malnutrition (SAM)	0/181	0.0 (0.0-2.1)	
Oedema	0/181	0.0	
Stunting (WHO 2006 Growth Standards)			
Total Stunting	52/182	28.6 (22.5-35.5)	High if ≥30%
Severe Stunting	12/182	6.6 (3.8-11.2)	
Mid Upper Arm Circumference (MUAC)			
Total MUAC Malnutrition (<12.5 or oedema)	6/184	3.3 (1.5-6.9)	
Moderate MUAC Malnutrition (11.5-12.4 cm)	6/184	3.3 (1.5-6.9)	
Severe MUAC Malnutrition (<11.5 or oedema)	0/184	0.0 (0.0-2.0)	
Anaemia			
Total Anaemia (Hb<11 g/dl)	131/184	71.2 (64.1-77.6)	High if ≥40%
Mild (Hb 10-10.9 g/dl)	56/184	30.4 (23.9-37.6)	
Moderate (Hb 7-9.9 g/dl)	72/184	39.1 (32.0-46.6)	
Severe (Hb<7 g/dl)	3/184	1.6 (0.3-4.7)	
Programme Coverage			
Measles Vaccination (Card or Recall)	159/176	90.3 (85.0-94.3)	≥95%
Vitamin A Supplementation (Card or Recall)	108/184	58.7 (51.2-65.9)	≥90%

Diarrhoea			
Diarrhoea In the Past Two Weeks	45/184	24.5 (18.4-31.3)	
Women 15-49 Years			
Anaemia (Non-Pregnant)			
Total Anaemia (Hb<12 g/dl)	48/85	56.5 (45.3-67.2)	High if ≥40%
Mild (Hb 11-11.9 g/dl)	19/85	22.4 (14.0-32.7)	
Moderate (Hb 8-10.9 g/dl)	23/85	27.1 (18.0-37.8)	
Severe (Hb<8 g/dl)	6/85	7.1 (2.6-14.7)	
Children 0-23 Months			
IYCF Indicators			
Timely Initiation of Breastfeeding	59/83	71.1 (60.1-80.5)	
Exclusive Breastfeeding	26/38	68.4 (51.3-82.5)	
Continued Breastfeeding at 1 Year	18/18	100.0 (100.0-100.0)	
Continued Breastfeeding at 2 Years	10/15	66.7 (38.4-88.2)	
Introduction of Solid, Semi-Solid or Soft Foods	3/8	37.5 (8.5-75.5)	
Consumption of Iron-Rich or Iron-Fortified Foods	14/66	21.2 (12.1-33.0)	
Bottle Feeding	7/86	8.1 (3.3-16.1)	
WASH			
Water Quality			
Proportion of Households Using an Improved Drinking Water Source	87/87	100.0 (100.0-100.0)	
Proportion of Households that Use a Covered or Narrow Necked Container for Storing Their Drinking Water	78/87	89.7 (81.3-95.2)	
Water Quantity			
Proportion of Households that Use:			
≥20 lpppd	32/87	36.8 (26.7-47.8)	
15-<20 lpppd	15/87	17.2 (10.0-26.8)	≥20 lpppd
<15 lpppd	40/87	46.0 (35.2-57.0)	
Satisfaction With the Drinking Water Supply			
Proportion of Households that Say They Are Satisfied with the Drinking Water Supply	31/87	35.6 (25.6-46.6)	
Safe Excreta Disposal			
Proportion of Households Using an Improved Excreta Disposal Facility	51/87	58.6 (47.6-69.1)	
Proportion of Households Using a Shared Family Toilet	16/87	18.4 (10.9-28.1)	
Proportion of Households Using a Communal Toilet	11/87	12.6 (6.5-21.5)	

	Number of Cases/ Sample Size	%	Target (where applicable)
Proportion of Households Using an Unimproved Toilet	9/87	10.3 (4.8-18.7)	
Proportion of Households with Children <3 y.o. Disposing of Faeces Safely	52/56	92.9 (82.7-98.0)	
MOSQUITO NET COVERAGE			
Mosquito Net Ownership			
Proportion of Households Owning At Least One Mosquito Net of Any Type	70/87	80.5 (70.6-88.2)	
Proportion of Households Owning At Least One LLIN	67/87	77.0 (66.8-85.4)	>80%
Mosquito Net Utilisation			
Average Number of Persons Per LLIN	3.7		2 persons/LLIN
	331/484	68.4	
Proportion of Children 0-59 Months Who Slept Under a LLIN	81/110	73.6	
Proportion of Pregnant Women Who Slept Under a LLIN	8/12	66.7	

Table 2: Summary of results – Newly arrived refugees (Survey 2)

	Number of Cases/ Sample Size	%	Target (where applicable)
Children 6-59 Months			
Acute Malnutrition (WHO 2006 Growth Standards)			
Global Acute Malnutrition (GAM)	1/41	2.4	Critical if ≥15%
Moderate Acute Malnutrition (MAM)	1/41	2.4	
Severe Acute Malnutrition (SAM)	0/41	0.0	
Oedema	0/41	0.0	
Stunting (WHO 2006 Growth Standards)			
Total Stunting	20/37	54.1	High if ≥30%
Severe Stunting	9/37	24.3	
Mid Upper Arm Circumference (MUAC)			
Total MUAC Malnutrition (<12.5 or oedema)	1/41	2.4	
Moderate MUAC Malnutrition (11.5-12.4 cm)	1/41	2.4	
Severe MUAC Malnutrition (<11.5 or oedema)	0/41	0.0	
Anaemia			
Total Anaemia (Hb<11 g/dl)	25/41	61.0	High if ≥40%

Mild (Hb 10-10.9 g/dl)	7/41	17.1	
Moderate (Hb 7-9.9 g/dl)	17/41	41.5	
Severe (Hb<7 g/dl)	1/41	2.4	
Programme Coverage			
Measles Vaccination (Card or Recall)	37/41	90.2	≥95%
Vitamin A Supplementation (Card or Recall)	25/41	61.0	≥90%
Diarrhoea			
Diarrhoea In the Past Two Weeks	9/41	22.0	
Children 0-23 Months			
IYCF Indicators			
Timely Initiation of Breastfeeding	9/12	75.0	
Exclusive Breastfeeding	2/2	100.0	
Continued Breastfeeding at 1 Year	2/3	66.7	
Continued Breastfeeding at 2 Years	2/3	66.7	
Introduction of Solid, Semi-Solid or Soft Foods	0/0	-	
Consumption of Iron-Rich or Iron-Fortified Foods	2/11	18.2	
Bottle Feeding	1/13	7.7	

Interpretation of results

• Maratane's refugee camp continues to have stable levels of acute malnutrition and persistent levels of chronic malnutrition and anaemia since 2010. The severity of the stunting prevalence in children remains medium to high and anemia levels remain critical in both children and women.
• Children seem to be arriving to the camp with critical levels of chronic malnutrition and anaemia, although the small sample size makes it hard to generalize the findings.
• The programme coverage of both vitamin A supplementation and measles vaccination (assessed by card or recall) is low in both the camp refugee population and the newly arrived refugees and has decreased significantly compared to 2010 and 2012.
• Around 71% of children were breastfed within an hour of birth and only two-thirds of children under 6 months were exclusively breastfed. All children 12-15 months were still breastfeeding, whilst two-thirds of children 20-23 months were still breastfeeding. Only two out of five of children 6-8 months had been introduced to solid foods and only one out of five consumed iron-rich or iron-fortified foods. Bottle feeding and formula feeding were fairly uncommon. These below-par practices were comparable to those observed in 2012 and fairly comparable to the ones observed in the newly arrived refugees, despite the small sample size.
• All households reported access to an improved drinking water source. However, only a third was satisfied with the drinking water supply and several water taps were non-functional at the time of the survey. Still 10.3% of households used an unimproved toilet facility.
• More than three quarters of the households owned at least one LLIN, but there was an average of 3.7 people per LLIN, which is almost twice higher than the recommended UNHCR target of no more than two persons per LLIN and higher than the average reported in 2012.

Recommendations and Priorities

Immediate
1. Blanket provision of Micronutrient Powder (MNP) for children 6-59 months or 6-23 months, or blanket provision of CSB++ in children aged 6-24 months of age depending on resource availability, to address the high prevalence of anaemia among children.
2. Blanket provision of iron and folate supplements or maternal micronutrient supplements including iron to pregnant women.
3. Distribution of LLINs to reduce the risk of malaria infection, which exacerbates anemia levels.
4. Organisation of a measles vaccination and vitamin A supplementation campaign.
5. Repair of non-funtioning water taps.

Medium-Term
6. Explore the possibility of providing cash instead of the actual food ration, as this would give refugees more options to consume a varied and nutritious diet.
7. Awareness and sensitization around IYCF best practices including regarding timely introduction of solid foods and feeding children iron-rich or iron-fortified foods.
8. Health education, especially for anaemia prevention, including nutrition education on dietary diversity and sensitization on the importance of ANC and iron and folate supplementation during pregnancy.
9. Support the production of iron-rich crops, such as green leafy vegetables, legumes and iron-rich cereals, potentially through small scale nutrition gardening projects financed by agencies involved in food security.
10. Regular checks of water quality and supply in the camp and support to upgrade non-improved toilet facilities or to build toilets, where needed.

Longer term
11. Foster intersectoral linkages and explore innovative solutions to further reduce anaemia and stunting levels in the camp.
12. Further investigate possible causes of anaemia in children and women and monitor trends in malaria infections.

INTRODUCTION

The Maratane refugee camp has been the only official settlement for asylum seekers and refugees in Mozambique since 2003. INAR, a government agency nested within the Ministry of Foreign Affairs manages the camp and deals with the registration and reception arrangements and provides protection and assistance to the refugees and asylum seekers.

According to the latest statistics from INAR and ProGres, there are a total of 13,217 refugees in Mozambique and around 7,360 refugees in the camp, nearly all of whom are from the Great Lakes Region, the majority being from the Democratic Republic of Congo, followed by Rwanda and Burundi. Other nationalities mainly include Somalis and Ethiopians. There are a steady number of new arrivals.

Food is supplied by the World Food Program (WFP) and distributed jointly by INAR and UNHCR. Reduced ration (Table 3) is provided on the assumption that most refugees have agricultural activities adding to partial food security.

Table 3: Composition, quantity and energy content of food aid ration provided

Item	Vulnerable Head of HH, HH with a vulnerable member		Rest of camp population	
	Quantity (kg/person/month)	Average Kilocalories/Day	Quantity (kg/person/month)	Average Kilocalories/Day
Maize	12.5	1460	7	816
Pulses	1.8	201	0.9	101
Cooking oil	1.2	354	0.6	177

The previous nutrition survey conducted in September 2012 found a stable level of acute malnutrition, but persistent high levels of chronic malnutrition amongst children, and anaemia amongst both children and adult women.

With a view to follow-up on the recommendations of the 2012 survey report and in anticipation of a joint assessment mission (JAM) planned for early May 2015, UNHCR conducted two nutrition surveys in Maratane's refugee camp between the 25th of April and the 2nd of May 2015, one with a representative sample of the whole refugee population of the camp and another with the children of refugees who have arrived within the last six months to the camp.

SURVEY OBJECTIVES

Survey 1: All Refugees in Maratane's Camp

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 population's access to, and use of, improved WASH facilities.

9. To determine the ownership of mosquito nets (all types and LLINs) in households.
10. To determine the utilisation of mosquito nets (all types and LLINs) by the total population, children 0-59 months and pregnant women.
11. To establish recommendations on actions to be taken to address the situation in Maratane's refugee camp.

Survey 2: Newly Arrived Refugees

1. To measure the prevalence of acute malnutrition in children of new arrivals aged 6-59 months.
2. To measure the prevalence of stunting in children of new arrivals aged 6-59 months.
3. To determine the coverage of measles vaccination among children of new arrivals aged 9-59 months.
4. To determine the coverage of vitamin A supplementation received during the last 6 months among children of new arrivals aged 6-59 months.
5. To assess the two-week period prevalence of diarrhoea among children of new arrivals aged 6-59 months.
6. To measure the prevalence of anaemia in children of new arrivals aged 6-59 months.
7. To investigate IYCF practices among children of new arrivals aged 0-23 months.

METHODOLOGY

Sample size

Module 1: **Anthropometry and Health**

Survey 1: ENA for SMART was used to determine the required sample size with the assumption that the food distribution lists are the most likely to disclose the refugees who are truly residing in the camp as there was no other way to determine how many refugees were and who these refugees were. The list of the beneficiaries of the December 2014 distribution (carried out in February 2015) was used as the list of the beneficiaries of the January 2015 distribution (carried out in March 2015) was not ready yet. A 20% non-response rate was accounted for in the sample as some refugees on the food distribution were known to reside in Nampula and to only come to the camp to collect food aid.
· Population figures from the December 2014 food distribution beneficiaries' list:
-Total population: 7,360
-Number of children below 5 years: 1, 944 (26%) – the total number of registered refugees' children was used as children were most likely to stay in the camp.
-Number of households: 1,784
· Other parameters:
-Estimated prevalence: 2.8% (Upper 95% C.I of 2012 survey)
-Desired precision: 2.5% (SMART guidelines)
-Non-response rate: 20%
· Resultant sample size:
-Number of households: 224
-Number of children: 167

Survey 2: A list of all the names of children aged 6-59 months of refugees who have arrived in the camp within the last six months was generated from ProGres, resulting in a total of 82 children.

Module 2: **Anaemia (children 6-59 months and women of reproductive age 15-49 years)**

Survey 1: All children 6-59 months in all the sampled households (224 households) and women of reproductive age 15-49 years in half of the total household sample size (112 households).

Survey 2: All children on the list.

Module 3: **IYCF (children 0-23 months)**

Survey 1: All children 0-23 months in all sampled households (224 households).

Survey 2: All children 0-23 months.

Module 4: **WASH**

Survey 1: Half of the total household sample size = 112 households.

Module 5: **Mosquito Net Coverage**

Survey 1: Half of the total household sample size = 112 households.

Sampling procedure

Survey 1: All Refugees in Maratane's Camp

The required sample of 224 households was randomly selected, following the simple random sampling method, from the food distribution lists. The camp administrator was only able to provide addresses for 150 of these households. Another 83 households were randomly selected and addresses were provided for 56 of them, resulting in a total of 206 households with addresses.

Module 1 – Anthropometry and Health (children 6-59 months): All eligible children within all of the sampled households were assessed for anthropometry, measles vaccination, vitamin A supplementation in last 6 months and diarrhoea in the last 2 weeks.
Module 2 – Anaemia (children 6-59 months and women of reproductive age 15-49 years): All eligible children within all of the sampled households and all eligible women in half of the sampled households were assessed for anaemia.
Module 3-IYCF (children 0-23 months): All eligible children within all of the sampled households were assessed for IYCF practices.
Module 4 –WASH: Half of the selected households were included for the assessment of water, sanitation and hygiene practices.
Module 5 - Mosquito Net Coverage (household as a whole): Half of the households were included for the assessment of mosquito net coverage.

Survey 2: Newly Arrived Refugees

All children aged 6-59 months of refugees who have arrived in the camp within the last six months were called to present themselves to a central place in the camp over a period of two days. When the mother or caretaker arrived with a younger sibling (i.e. less than 6 months old), the sibling was sampled as well.

Module 1 – Anthropometry and Health (children 6-59 months): All children 6-59 months were assessed for anthropometry, measles vaccination, vitamin A supplementation in the last 6 months and diarrhoea in the last 2 weeks.
Module 2 – Anaemia (children 6-59 months): All children 6-59 months were assessed for anaemia.
Module 3-IYCF (children 0-23 months): All children 0-23 months were assessed for IYCF practices.

■ 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 three 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. Only one household refused to participate.
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 administered to the household and any eligible women.
Disabled child: If a physical deformity prevented the measurement of child's weight or height, the child was to be recorded as missing for these variables, but the child was to be included for the assessment of the other indicators (e.g. oedema, measles vaccination, vitamin A supplementation). The survey team did not encounter any children with disabilities.
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.

Questionnaire and measurement methods

Questionnaire

The SENS standard questionnaire was adapted to the survey context and used in its French, Portuguese and Kiswahili versions and refugees and enumerators alike came from a variety of backgrounds and spoke various languages. The pre-existing Portuguese and Kiswahili translations had to be reviewed by local translators as they were deemed inaccurate and incomplete. The final versions of the translations could not be tested prior to the survey owing to time constraints.

The questionnaire is attached in Appendix 4 and had the following five modules:
Module 1 -Anthropometry and health: Included data on anthropometry, 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-WASH: Included data on access to improved drinking water sources, storage of water, quantity of water used per household, satisfaction with water supply, type and quality of excreta disposal facility in use and safe disposal of young children's stools for households.
Module 5-Mosquito Net Coverage: Included data on mosquito net ownership (type and number) and on the members of household (all, U5, pregnant) who slept under a mosquito net last night (by type).

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 a child health card, birth notification or certificate if available. If no reliable proof of age was available, age was estimated in months using a local events calendar (Appendix 5).

Weight: children were weighed without clothes whenever possible using an electronic scale (UNISCALE) and recorded to the nearest 100 grams.

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

Oedema: presence or absence of oedema was measured by finger pressure.

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

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

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

Haemoglobin (Hb) concentration in children 6-59 months and women 15-49 years: Hb concentration was taken from a capillary blood sample from the fingertip and recorded to the closest gram per decilitre using a portable HemoCue Hb 201 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.

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.

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. Where two families 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, using the World Health Organisation (WHO) 2006 standards (Table 4).

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

Categories of Acute Malnutrition	Z-Scores (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.

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

Categories of Stunting	Z-Scores (WHO Growth Standards 2006)
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 (Table 6).

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

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

Acute malnutrition was also assessed by MUAC according to the cut-offs shown in Table 7:

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

Categories of MUAC Malnutrition	MUAC Reading
Total MUAC Malnutrition	< 125 mm
Moderate MUAC Malnutrition	≥ 115 and <125 mm
Severe MUAC Malnutrition	< 115 mm

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

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

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.

Infant and young child feeding practices were assessed based on standard WHO recommendations (WHO, 2008) 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.

$$\frac{\text{Children 0-23 months who were put to the breast within an hour of birth}}{\text{Children 0-23 months}}$$

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 infants and young children, or that is fortified in the home

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

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 201 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 Anemia (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

Classification of public health problems and targets

Anthropometry and Anaemia

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

Table 9: Simplified classification of the severity of Global Acute Malnutrition (GAM), anaemia and stunting in refugee settings (UNHCR, 2011)

Prevalence %	High		Medium	Low
GAM	≥15 Critical	10-14 Serious	5-9	<5
Anaemia	≥40		20-39	5-19
Stunting	≥30		20-29	<20

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 10.

Table 10: Relevant UNHCR WASH Programme Standards

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

Mosquito Net Coverage

UNHCR recommends that >80% of households must have at least one LLIN. WHO and UNHCR further recommend a target of no more than 2 persons per LLIN to achieve universal coverage.

Training, coordination and supervision

Training of enumerators took place at the Maratane camp over 7 days between the 18th and 24th of April 2015. The training was facilitated by the survey technical team (Appendix 1) and covered the following topics: survey objectives; introduction to malnutrition; introduction to nutrition surveys; sampling and household selection; anthropometric measurements; anaemia measurement; use of mobile phones for data collection and interviewing skills.
The training included an anthropometric standardisation test, in which each of the enumerators measured 10 children each twice, with an interval between the two measurements. A pre-test of the data collection was also conducted. A total of 4 survey teams, with a total of 20 enumerators participated in the survey, supervised by a UNHCR Nutrition Officer and the Coordinator of the

Camp, who attended the training. Android mobile phones with ODK software were used for data collection and entry. Data entered on the phones was checked daily for accuracy and completeness.

Data analysis

Data analysis was conducted by the UNHCR Nutrition Officer using ENA for SMART, February 2015 version for child anthropometry data, and Epi Info 6, July 2012 version for the remaining modules. SMART flags (+/-3 SD WHZ, HAZ, WAZ) were used for exclusion of outliers for anthropometric data.

RESULTS

Survey 1: All Refugees in Maratane's Camp

A total of 205 children 0-59 months were measured against a target of 167, translating to 122% of the target. Of these children, 185 were 6-59 months old. The survey covered 173 households.

Table 11: Characteristics of the survey population

Total HHs Surveyed	173
Total Population Surveyed	964
Total U5 Surveyed	205
Average HH Size	5.6

Survey 2: Newly Arrived Refugees

Half (i.e. 41 out of 82) of the children aged 6-59 months of refugees who have arrived in the camp within the last six month could be surveyed. The remainder of the children seemed to be living outside of the camp. Two children less than six months old presented with their 6-59 months old siblings and were surveyed as well, resulting in a total of 43 children surveyed.

Anthropometric results in children 6-59 months

Survey 1: All Refugees in Maratane's Camp

The age and sex distribution of the sample (Table 12) showed that both males and females were equally represented (total sex ratio was 1.0), and the plausibility check (Appendix 2) also showed an excellent age distribution.

Table 12: Children 6-59 months: Distribution of age and sex of sample

	Boys		Girls		Total		Ratio
AGE (mo)	no.	%	no.	%	no.	%	Boy:girl
6-17	17	39.5	26	60.5	43	23.4	0.7
18-29	19	47.5	21	52.5	40	21.7	0.9
30-41	20	48.8	21	51.2	41	22.3	1.0
42-53	21	63.6	12	36.4	33	17.9	1.8
54-59	13	48.1	14	51.9	27	14.7	0.9
Total	90	48.9	94	51.1	184	100.0	1.0

Percentage of children with no exact birthday: 37%

Acute malnutrition in children 6-59 months

As observed in the 2010 and 2012 surveys, the prevalence of GAM based on weight-for-height, 2.2 % (0.9 – 5.5 95% C.I), was low and below emergency levels (see Table 9). There were no children with severe acute malnutrition (SAM) and no children with oedema in the sample (Tables 13 and 14).

Table 13: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex (based on WHO Growth Standards)

	All n = 181	**Boys** n = 89	**Girls** n = 92
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(4) 2.2 % (0.9 - 5.5 95% C.I.)	(2) 2.2 % (0.6 - 7.8 95% C.I.)	(2) 2.2 % (0.6 - 7.6 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(4) 2.2 % (0.9 - 5.5 95% C.I.)	(2) 2.2 % (0.6 - 7.8 95% C.I.)	(2) 2.2 % (0.6 - 7.6 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(0) 0.0 % (0.0 - 2.1 95% C.I.)	(0) 0.0 % (0.0 - 4.1 95% C.I.)	(0) 0.0 % (0.0 - 4.0 95% C.I.)

The prevalence of oedema is 0.0 %

Table 14: Distribution of acute malnutrition and oedema based on weight-for-height z-scores (based on WHO Growth Standards)

	<-3 z-score	**>=-3 z-score**
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 0 (0.0 %)	Not severely malnourished No. 184 (100.0 %)

The prevalence of acute malnutrition has remained relatively stable in Maratane's camp over the past five years (Figure 1).

Figure 1: Prevalence of acute malnutrition in Maratane's camp from 2010 to 2015 (based on WHO Growth Standards)
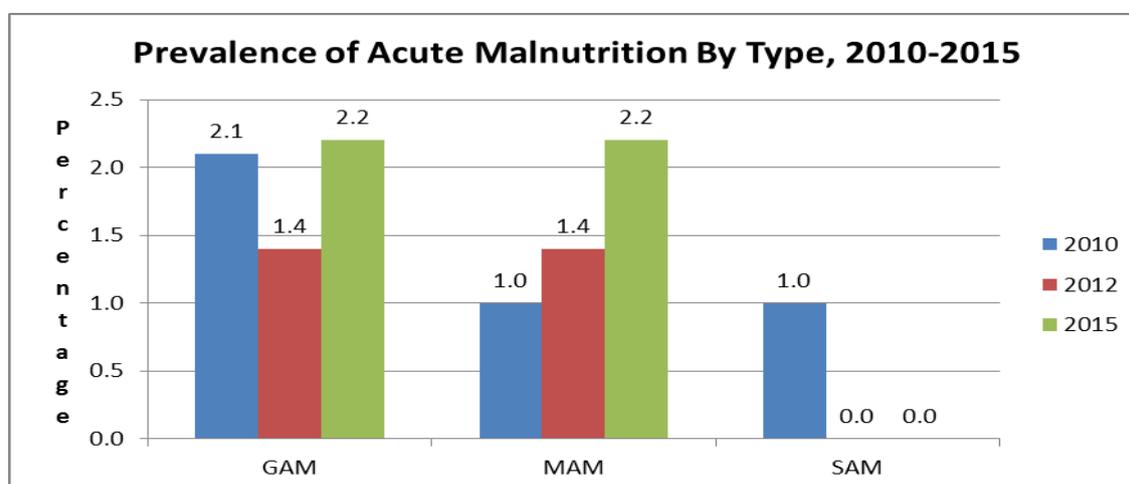
Analysis of acute malnutrition by age group (Table 15) indicated that the 6-17 months age group seems to have the highest prevalence of acute malnutrition, which would be consistent given that acute malnutrition is usually higher in younger children.

Table 15: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema (based on WHO Growth Standards)

Age (mo)	Total no.	Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-17	42	0	0.0	3	7.1	39	92.9	0	0.0
18-29	38	0	0.0	0	0.0	38	100.0	0	0.0
30-41	41	0	0.0	1	2.4	40	97.6	0	0.0
42-53	33	0	0.0	0	0.0	33	100.0	0	0.0
54-59	27	0	0.0	0	0.0	27	100.0	0	0.0
Total	181	0	0.0	4	2.2	177	97.8	0	0.0

The survey weight-for-height z-scores' distribution was very close to the WHO standard (Figure 2).

Figure 2: Distribution of weight-for-height z-scores of the survey population compared to a reference population (based on WHO Growth Standards; the reference population is shown in green and the surveyed population is shown in red)
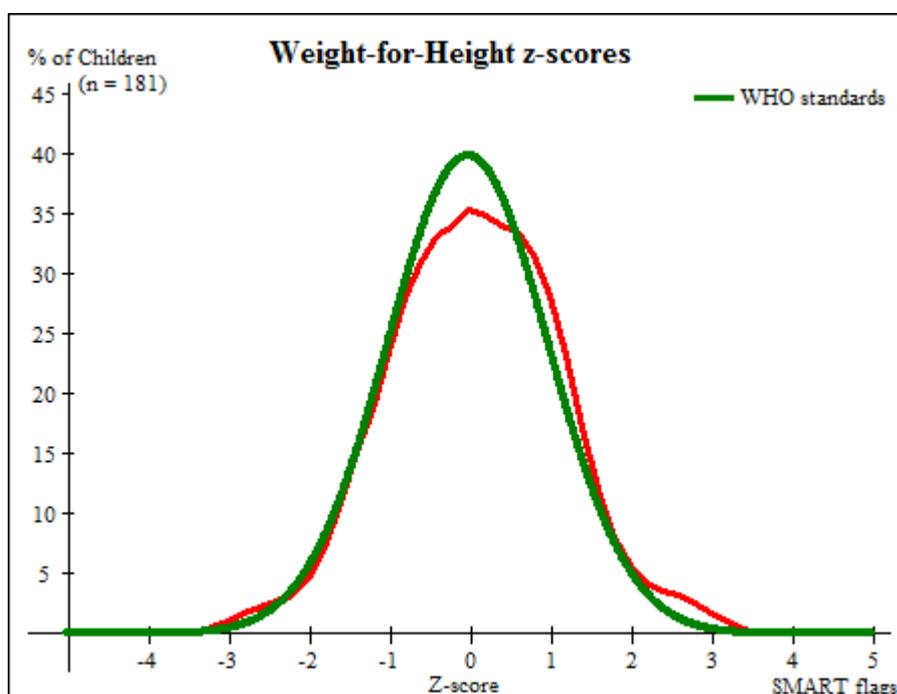
The prevalence of GAM based on the NCHS Growth Reference was 1.6% (0.6-4.7, 95% CI) (Table 16), with the 6-17 months old age group seeming to have the highest prevalence of malnutrition compared to other age groups (Table 17).

Table 16: Prevalence of acute malnutrition based on the percentage of the median and/or oedema (using the NCHS Growth Reference)

	n = 182
Prevalence of global acute malnutrition (<80% and/or oedema)	(3) 1.6 % (0.6 - 4.7 95% C.I.)
Prevalence of moderate acute malnutrition (<80% and >= 70%, no oedema)	(3) 1.6 % (0.6 - 4.7 95% C.I.)
Prevalence of severe acute malnutrition (<70% and/or oedema)	(0) 0.0 % (0.0 - 2.1 95% C.I.)

Table 17: Prevalence of malnutrition by age, based on weight-for-height percentage of the median and oedema (using the NCHS Growth Reference)

Age (mo)	Total no.	Severe wasting (<70% median)		Moderate wasting (>=70% and <80% median)		Normal (> =80% median)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-17	43	0	0.0	2	4.7	41	95.3	0	0.0
18-29	38	0	0.0	1	2.6	37	97.4	0	0.0
30-41	41	0	0.0	0	0.0	41	100.0	0	0.0
42-53	33	0	0.0	0	0.0	33	100.0	0	0.0
54-59	27	0	0.0	0	0.0	27	100.0	0	0.0
Total	182	0	0.0	3	1.6	179	98.4	0	0.0

The computed prevalence of GAM based on MUAC was 3.3% (1.5 – 6.9, 95% C.I), which is slightly higher but not significantly different to the prevalence by weight-for-height. No children were identified as having SAM based on MUAC (Table 18).

Table 18: Prevalence of MUAC malnutrition and/or oedema and by sex

	All n = 184	Boys n = 90	Girls n = 94
Prevalence of MUAC< 125 mm and/or oedema	(6) 3.3 % (1.5 - 6.9 95% C.I.)	(2) 2.2 % (0.6 - 7.7 95% C.I.)	(4) 4.3 % (1.7 - 10.4 95% C.I.)
Prevalence of MUAC< 125 mm and >= 115 mm, no oedema	(6) 3.3 % (1.5 - 6.9 95% C.I.)	(2) 2.2 % (0.6 - 7.7 95% C.I.)	(4) 4.3 % (1.7 - 10.4 95% C.I.)
Prevalence of MUAC< 115 mm and/or oedema	(0) 0.0 % (0.0 - 2.0 95% C.I.)	(0) 0.0 % (0.0 - 4.1 95% C.I.)	(0) 0.0 % (0.0 - 3.9 95% C.I.)

Analysis of MUAC malnutrition by age group (Table 19) also indicated that the 6-17 months age group seems to have the highest prevalence of acute malnutrition.

Table 19: Prevalence of MUAC malnutrition by age, based on MUAC cut offs and/or oedema

Age (mo)	Total no.	MUAC< 115 mm		MUAC>=115 mm and <125 mm		MUAC>=125 mm		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-17	43	0	0.0	5	11.6	38	88.4	0	0.0
18-29	40	0	0.0	1	2.5	39	97.5	0	0.0
30-41	41	0	0.0	0	0.0	41	100.0	0	0.0
42-53	33	0	0.0	0	0.0	33	100.0	0	0.0
54-59	27	0	0.0	0	0.0	27	100.0	0	0.0
Total	184	0	0.0	6	3.3	178	96.7	0	0.0

Chronic malnutrition in children 6-59 months

The survey results revealed that 28.6% (22.5- 35.5 95% C.I.) of the children aged 6-59 months were stunted, whilst 6.6 % (3.8 - 11.2 95% C.I.) were severely stunted (Table 20). The severity of the stunting prevalence is medium to high (see Table 9).

Table 20: Prevalence of stunting based on height-for-age z-scores and by sex (based on WHO Growth Standards)

	All n = 182	Boys n = 89	Girls n = 93
Prevalence of stunting (<-2 z-score)	(52) 28.6 % (22.5 - 35.5 95% C.I.)	(25) 28.1 % (19.8 - 38.2 95% C.I.)	(27) 29.0 % (20.8 - 38.9 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(40) 22.0 % (16.6 - 28.5 95% C.I.)	(17) 19.1 % (12.3 - 28.5 95% C.I.)	(23) 24.7 % (17.1 - 34.4 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(12) 6.6 % (3.8 - 11.2 95% C.I.)	(8) 9.0 % (4.6 - 16.7 95% C.I.)	(4) 4.3 % (1.7 - 10.5 95% C.I.)

Stunting was highest in the 18-53 months age groups (Table 21).

Table 21: Prevalence of stunting by age based on height-for-age z-scores (based on WHO Growth Standards)

Age (mo)	Total no.	Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
		No.	%	No.	%	No.	%
6-17	42	3	7.1	5	11.9	34	81.0
18-29	39	3	7.7	10	25.6	26	66.7
30-41	41	4	9.8	11	26.8	26	63.4
42-53	33	1	3.0	10	30.3	22	66.7
54-59	27	1	3.7	4	14.8	22	81.5
Total	182	12	6.6	40	22.0	130	71.4

The distribution of height-for-age z-scores was positioned to the left of the WHO curve, indicating that the refugee population in Maratane has a higher level of stunting than the reference population (Figure 3).

Figure 3: Distribution of Height-for-Age z-scores of the survey population compared to a reference population (based on WHO growth standards; the reference population is shown in green and the surveyed population is shown in red)
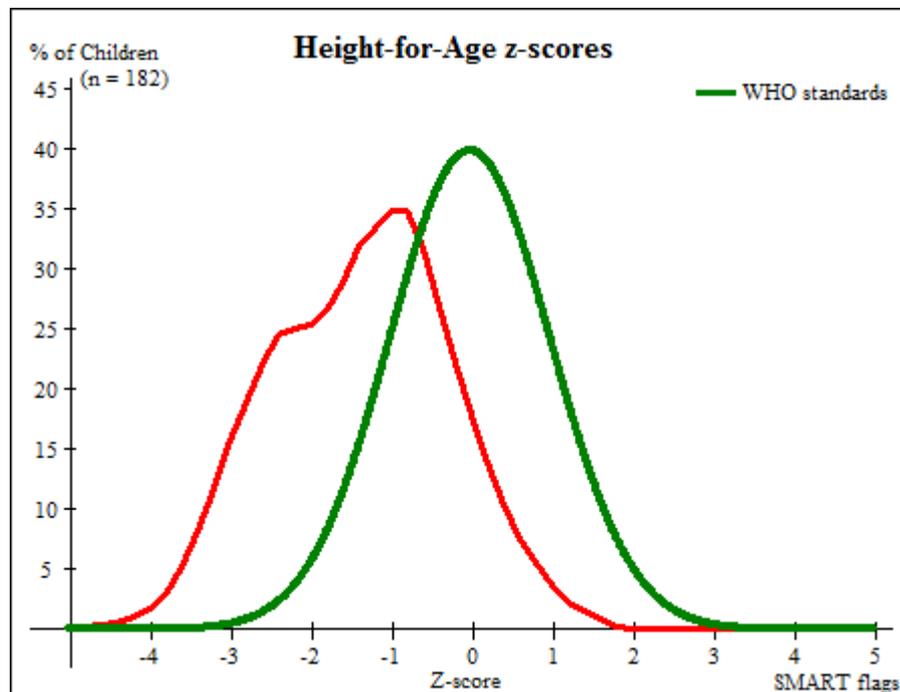
Stunting has been persistent in Maratane's camp since 2010. Figure 4 compares the stunting prevalence in 2010, 2012 and 2015. Although the prevalence has slightly increased again in 2015, it is not statistically significantly different from that of 2012 (25.8%, 22.2-29.8, 95% CI).

Figure 4: Prevalence of stunting in Maratane's camp from 2010 to 2015 (based on WHO Growth Standards)
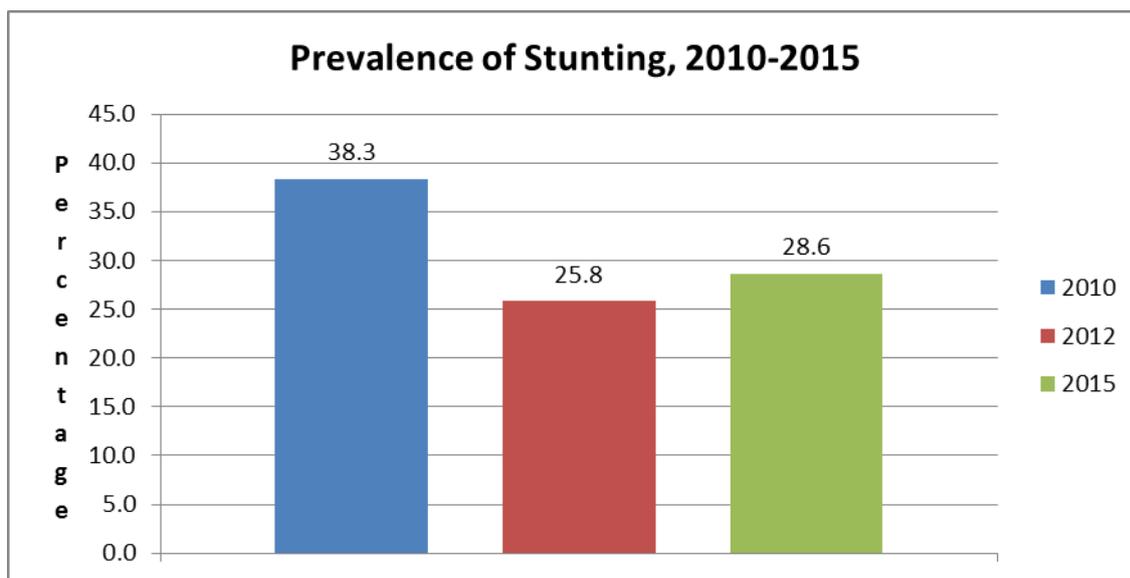
Underweight in children 6-59 months

The prevalence of underweight was 11.0% (7.3-16.5, 95% C.I), with 1.1% (0.3-3.9, 95% C.I) being severely underweight (Table 22). The prevalence of underweight children aged 6-59 months has statistically significantly increased compared to 2012 (4.8% (3.3-7.0, 95% CI) and is not statistically significantly different to that of 2010 (8.4% (5.3-11.5, 95% CI)) (Figure 5).

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

	All n = 181	**Boys** n = 89	**Girls** n = 92
Prevalence of underweight (<-2 z-score)	(20) 11.0 % (7.3 - 16.5 95% C.I.)	(11) 12.4 % (7.0 - 20.8 95% C.I.)	(9) 9.8 % (5.2 - 17.6 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(18) 9.9 % (6.4 - 15.2 95% C.I.)	(9) 10.1 % (5.4 - 18.1 95% C.I.)	(9) 9.8 % (5.2 - 17.6 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(2) 1.1 % (0.3 - 3.9 95% C.I.)	(2) 2.2 % (0.6 - 7.8 95% C.I.)	(0) 0.0 % (0.0 - 4.0 95% C.I.)

Figure 5: Prevalence of underweight in Maratane's camp from 2010 to 2015 (based on WHO Growth Standards)
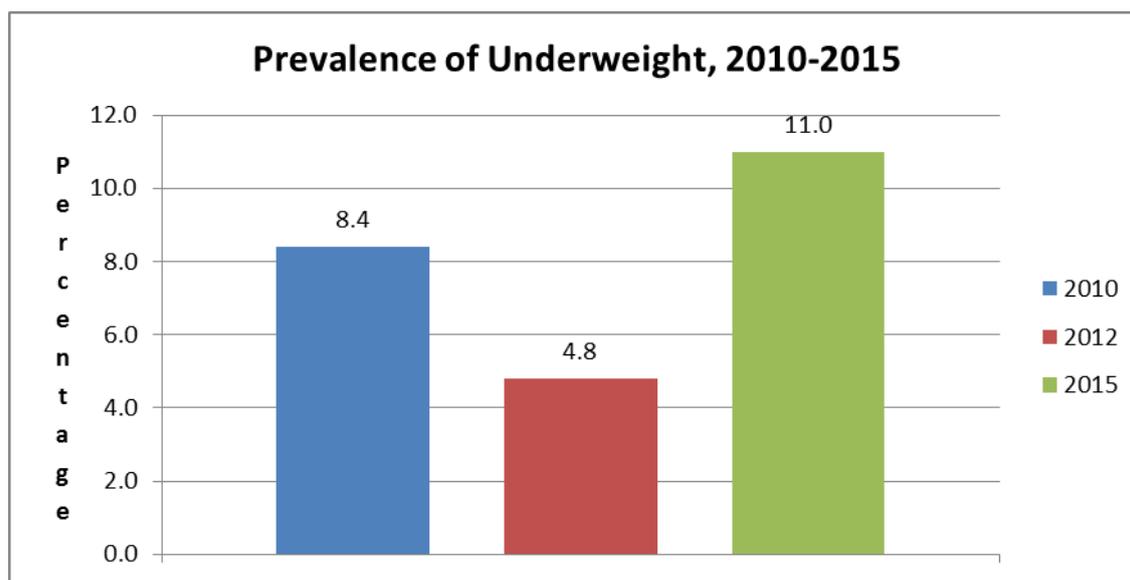
The calculated mean z-scores for weight-for-height, weight-for-age and height-for-age all fell within the recommended ranges for acceptable quality (Table 23).

Table 23: 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	181	0.08±1.04	1.00	0	3
Weight-for-Age	181	-0.70±1.02	1.00	0	3
Height-for-Age	182	-1.37±1.08	1.00	0	2

* contains WHZ and WAZ for children with oedema

Mean z-scores, design effects and excluded subjects by ENA for SMART for weight-for-height z-scores are shown in figure 6.

Figure 6: Mean z-scores, design effects and excluded subjects by ENA for SMART
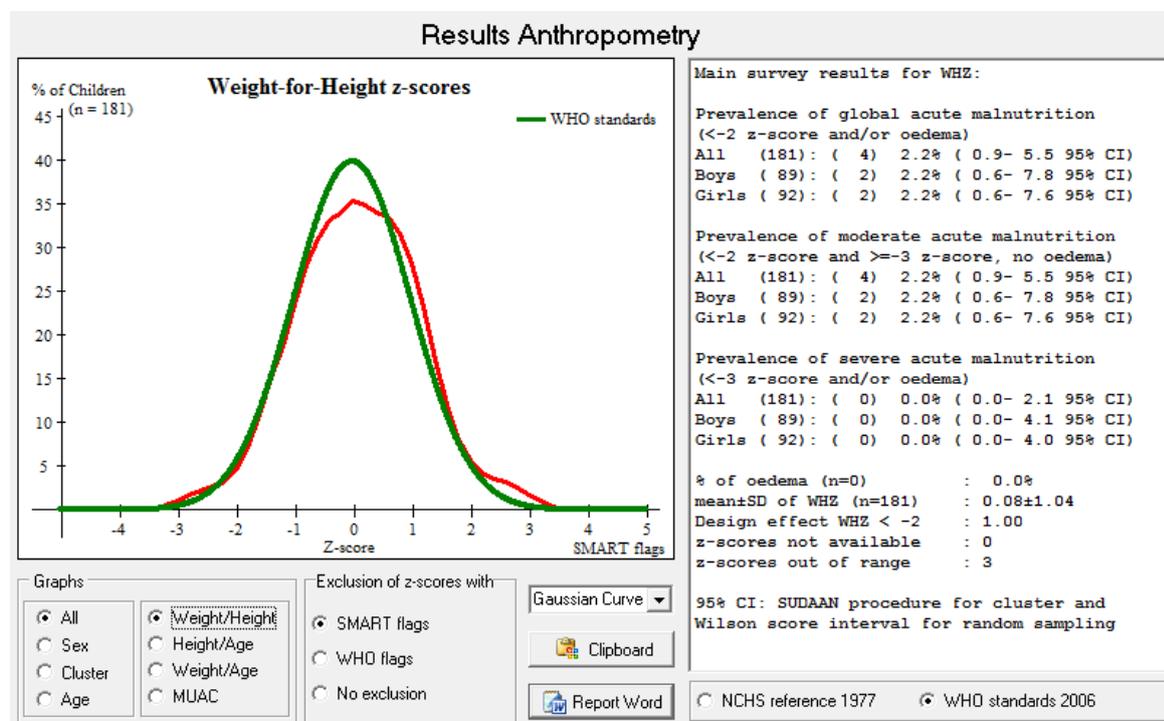
Measles vaccination coverage

A total of 90.3% (85.0-94.3, 95% CI) of children 9-59 months (Table 24) received measles vaccination with card or recall, which was comparable to the findings from 2012 (94.7% (92.2-96.4, 95% C.I)) but is a statistically significant decrease compared to 2010 (96.5% (95.0-98.5, 95% C.I)) (Figure 7). The UNHCR target is ≥95%.

Table 24: Measles vaccination coverage for children aged 9-59 months (n=176)

	Measles (with card) n= 90	Measles (with card or confirmation from mother) n= 159
YES	51.1% (43.5-58.7 95% CI)	90.3% (85.0-94.3 95% CI)

Figure 7: Coverage of measles vaccination in children 6-59 months from 2010-2015

Coverage of Measles Vaccination, 2010-2015
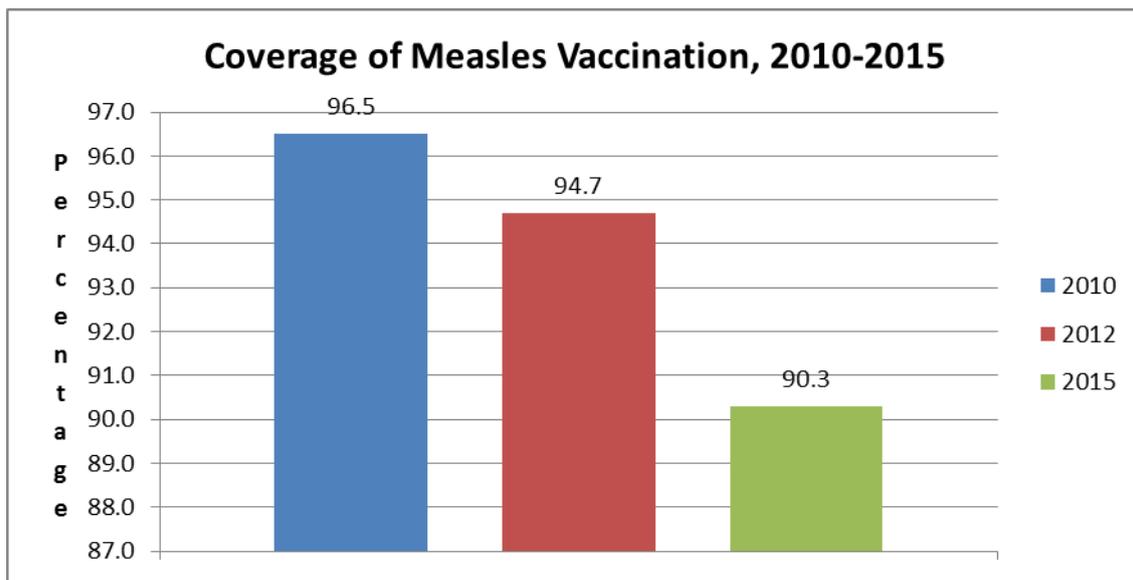
Vitamin A supplementation coverage

A total of 58.7% (51.2-65.9, 95% CI) of children aged 6-59 months received Vitamin A supplementation in the past 6 months with card or recall (Table 25), a statistically significant decrease compared to 2010 and 2012 (Figure 8), and well below the UNHCR target of >90%.

Table 25: Vitamin A supplementation for children aged 6-59 months in past 6-months (n=184)

	Vitamin A capsule (with card) n= 48	Vitamin A capsule (with card or confirmation from mother) n= 108
YES	26.1% (19.9-33.1 95% CI)	58.7% (51.2-65.9 95% CI)

Figure 8: Coverage of vitamin A supplementation in children 6-59 months from 2010-2015

Coverage of Vitamin A Supplementation, 2010-2015
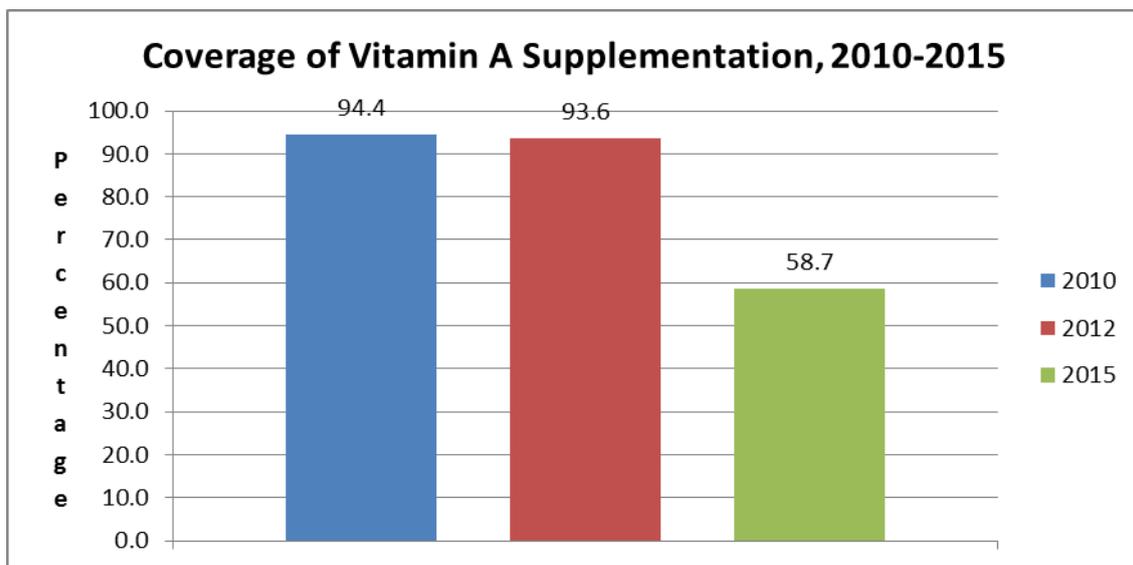
Diarrhoea

A total of 24.5% (18.4-31.3, 95% C.I) of children reported having experienced diarrhoea in the previous 2 weeks (Table 26).

Table 26: Period prevalence of diarrhoea

	Number/total	% (95% CI)
Diarrhoea in the last two weeks	45/184	24.5 (18.4-31.3)

Anaemia

Amongst children 6-59 months, 71.2% (64.1-77.6, 95% CI) were anaemic (Table 27) and 40.8% (33.6-48.2, 95% CI) moderately and severely anaemic (Table 28), showing that the situation has remained a persistent public health problem (above the 40% threshold) since 2010 (Figure 9).

Table 27: Prevalence of total anaemia, anaemia categories and mean haemoglobin concentration in children 6-59 months of age and by age group

	6-59 months n = 184	**6-23 months** n= 66	**24-59 months** n= 118
Total Anaemia (Hb<11.0 g/dL)	(131) 71.2% (64.1-77.6 95% CI)	(59) 89.4% (79.4-95.6 95% CI)	(72) 61.0% (51.6-69.9 95% CI)
Mild Anaemia (Hb 10.0-10.9 g/dL)	(56) 30.4% (23.9-37.6 95% CI)	(22) 33.3% (22.2-46.0 95% CI)	(34) 28.8% (20.8-37.9 95% CI)
Moderate Anaemia (7.0-9.9 g/dL)	(72) 39.1% (32.0-46.6 95% CI)	(35) 53.0% (40.3-65.4 95% CI)	(37) 31.4% (23.1-40.5 95% CI)
Severe Anaemia (<7.0 g/dL)	(3) 1.6% (0.3-4.7 95% CI)	(2) 3.0% (0.4-10.5 95% CI)	(1) 0.8% (0.0-4.6 95% CI)
Mean Hb, g/dL **(SD)** **[range]**	10.1 g/dL (1.4) [4.5-13.3]	9.6 g/dL (1.3) [6.5-13.3]	10.4 g/dL (1.3) [4.5-12.8]

Table 28: Prevalence of moderate and severe anaemia in children 6-59 months of age and by age group

	6-59 months n = 184	**6-23 months** n= 66	**24-59 months** n= 118
Moderate and Severe Anaemia (Hb<10.0 g/dL)	(75) 40.8% (33.6-48.2 95% CI)	(37) 56.1% (43.3-68.3 95% CI)	(38) 32.2% (23.9-41.4 95% CI)

Figure 9: Prevalence of anaemia in children aged 6-59 months from 2010 to 2015
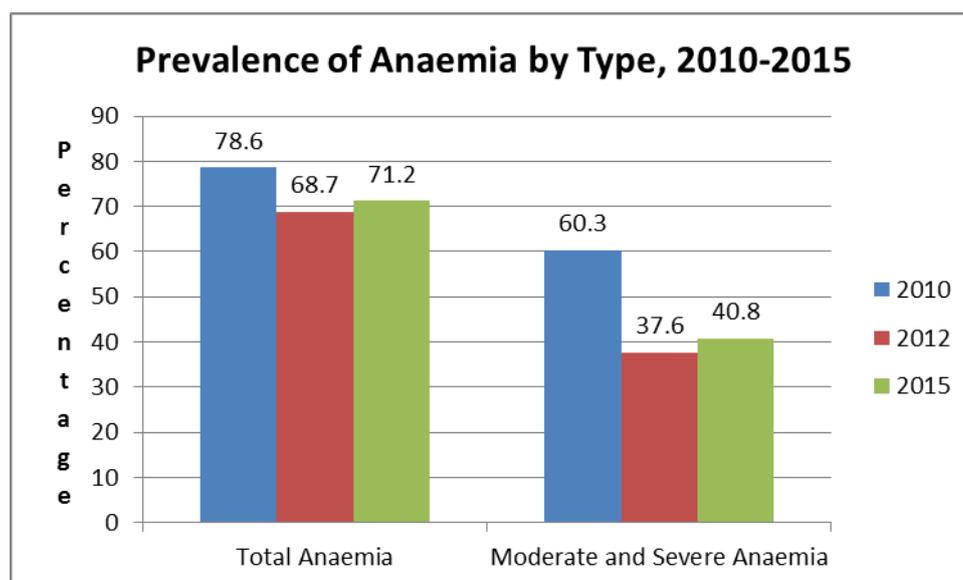
Survey 2: Newly Arrived Refugees

The age and sex distribution of the sample (Table 29) showed that both males and females were equally represented (total sex ratio was 1.0), and the plausibility check (Appendix 2) also showed an excellent age distribution. The percentage of children with no exact birthday was relatively high (83%), yet this was expected, given that these children have recently arrived to the camp and may have fled their countries without documentation.

Table 29: Children 6-59 months: Distribution of age and sex of sample

	Boys		**Girls**		**Total**		**Ratio**
AGE (mo)	no.	%	no.	%	no.	%	**Boy:girl**
6-17	4	57.1	3	42.9	7	17.1	1.3
18-29	6	66.7	3	33.3	9	22.0	2.0
30-41	5	41.7	7	58.3	12	29.3	0.7
42-53	3	30.0	7	70.0	10	24.4	0.4
54-59	2	66.7	1	33.3	3	7.3	2.0
Total	20	48.8	21	51.2	41	100.0	1.0

Percentage of children with no exact birthday: 83%

Acute malnutrition in children 6-59 months

The prevalence of GAM based on weight-for-height, 2.4 % (only one child out of 41 screened), was very low yet slightly higher than that of the total refugee population (Figure 10). There were no children with severe acute malnutrition (SAM) and no children with oedema in the sample (Tables 30 and 31).

Table 30: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex (based on WHO Growth Standards)

	All n = 41	Boys n = 20	Girls n = 21
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(1) 2.4 %	(1) 5.0 %	(0) 0.0 %
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(1) 2.4 %	(1) 5.0 %	(0) 0.0 %
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(0) 0.0 %	(0) 0.0 %	(0) 0.0 %

The prevalence of oedema is 0.0 %

Table 31: Distribution of acute malnutrition and oedema based on weight-for-height z-scores (based on WHO Growth Standards)

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 0 (0.0 %)	Not severely malnourished No. 41 (100.0 %)

Figure 10: Prevalence of acute malnutrition by type in the total refugee population and new arrivals (based on WHO Growth Standards)
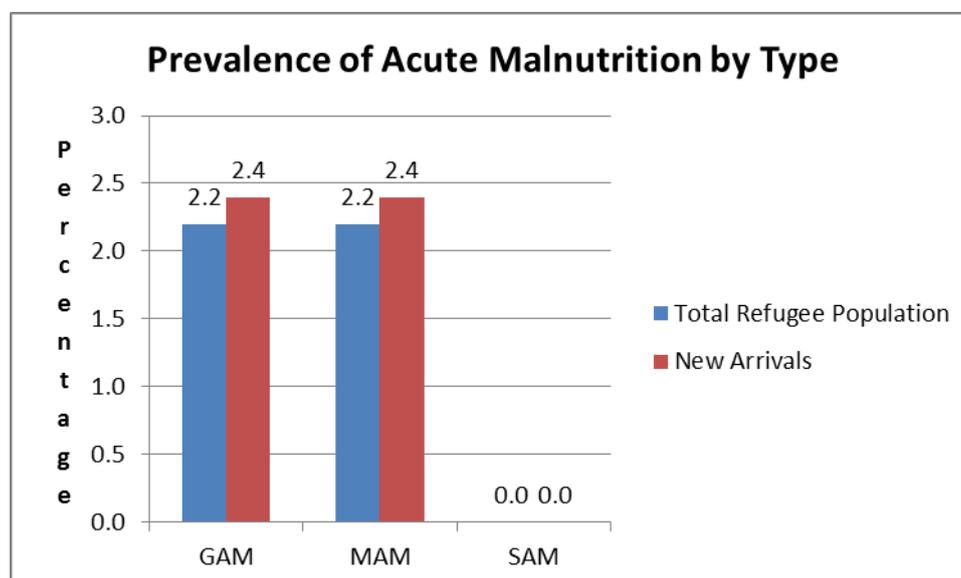
The one child who had MAM based on weight-for-height fell in the 6-17 months age group (Table 32).

Table 32: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema (based on WHO Growth Standards)

Age (mo)	Total no.	Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-17	7	0	0.0	1	14.3	6	85.7	0	0.0
18-29	9	0	0.0	0	0.0	9	100.0	0	0.0
30-41	12	0	0.0	0	0.0	12	100.0	0	0.0
42-53	10	0	0.0	0	0.0	10	100.0	0	0.0
54-59	3	0	0.0	0	0.0	3	100.0	0	0.0
Total	41	0	0.0	1	2.4	40	97.6	0	0.0

The survey weight-for-height z-scores' distribution was very close to the WHO standard (Figure 11). The peak observed is most probably due to the very small sample size.

Figure 11: Distribution of weight-for-height z-scores of the survey population compared to a reference population (based on WHO Growth Standards; the reference population is shown in green and the surveyed population is shown in red)
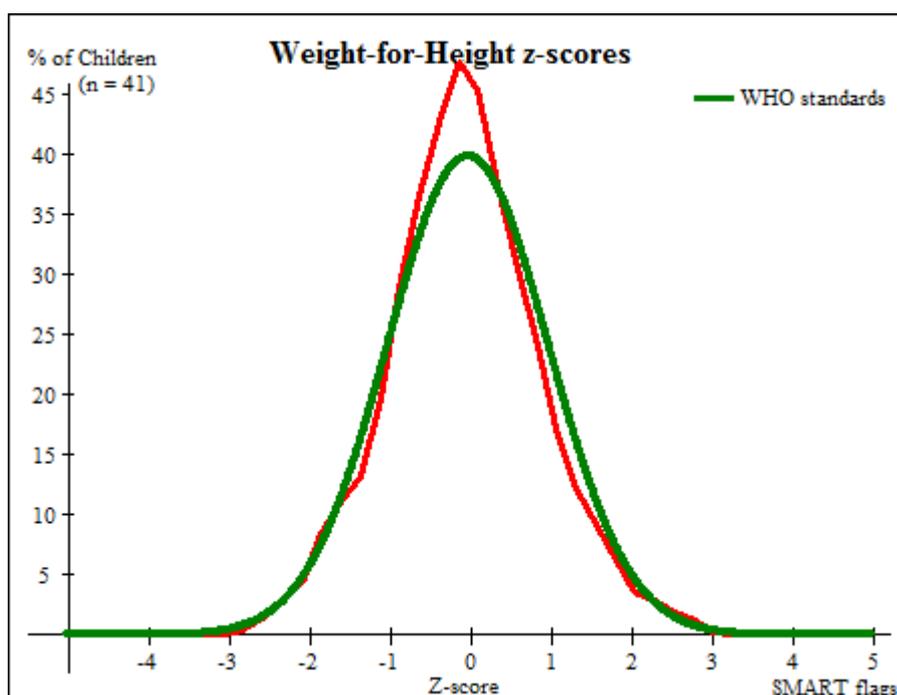
The prevalence of GAM based on the NCHS Growth Reference was 0.0% (Tables 33 and 34).

Table 33: Prevalence of acute malnutrition based on the percentage of the median and/or oedema (using the NCHS Growth Reference)

	n = 41
Prevalence of global acute malnutrition (<80% and/or oedema)	(0) 0.0 %
Prevalence of moderate acute malnutrition (<80% and >= 70%, no oedema)	(0) 0.0 %
Prevalence of severe acute malnutrition (<70% and/or oedema)	(0) 0.0 %

Table 34: Prevalence of malnutrition by age, based on weight-for-height percentage of the median and oedema (using the NCHS Growth Reference)

Age (mo)	Total no.	Severe wasting (<70% median)		Moderate wasting (>=70% and <80% median)		Normal (> =80% median)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-17	7	0	0.0	0	0.0	7	100.0	0	0.0
18-29	9	0	0.0	0	0.0	9	100.0	0	0.0
30-41	12	0	0.0	0	0.0	12	100.0	0	0.0
42-53	10	0	0.0	0	0.0	10	100.0	0	0.0
54-59	3	0	0.0	0	0.0	3	100.0	0	0.0
Total	41	0	0.0	0	0.0	41	100.0	0	0.0

The computed prevalence of GAM based on MUAC was 2.4% (only one child out of the 41 children screened), which is lower than that of the total refugee population and identical to the prevalence by weight-for-height. No children were identified as having SAM based on MUAC (Table 35).

Table 35: Prevalence of MUAC malnutrition and/or oedema and by sex

|	All n = 41	Boys n = 20	Girls n = 21
Prevalence of MUAC< 125 mm and/or oedema	(1) 2.4 %	(1) 5.0 %	(0) 0.0 %
Prevalence of MUAC< 125 mm and >= 115 mm, no oedema	(1) 2.4 %	(1) 5.0 %	(0) 0.0 %
Prevalence of MUAC< 115 mm and/or oedema	(0) 0.0 %	(0) 0.0 %	(0) 0.0 %

The one child who had MAM based on MUAC fell in the 18-29 months age group (Table 36).

Table 36: Prevalence of MUAC malnutrition by age, based on MUAC cut offs and/or oedema

Age (mo)	Total no.	MUAC< 115 mm		MUAC>=115 mm and <125 mm		MUAC>=125 mm		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-17	7	0	0.0	0	0.0	7	100.0	0	0.0
18-29	9	0	0.0	1	11.1	8	88.9	0	0.0
30-41	12	0	0.0	0	0.0	12	100.0	0	0.0
42-53	10	0	0.0	0	0.0	10	100.0	0	0.0
54-59	3	0	0.0	0	0.0	3	100.0	0	0.0
Total	41	0	0.0	1	2.4	40	97.6	0	0.0

Chronic malnutrition in children 6-59 months

The survey results revealed that 54.1% of the children were stunted, whilst 24.3% were severely stunted (Table 37). Children of new arrivals seem to have a higher prevalence of stunting compared to the total refugee population although it is hard to generalize those findings given the small sample size (Figure 12).

Table 37: Prevalence of stunting based on height-for-age z-scores and by sex (based on WHO Growth Standards)

	All n = 37	Boys n = 18	Girls n = 19
Prevalence of stunting (<-2 z-score)	(20) 54.1 %	(12) 66.7 %	(8) 42.1 %
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(11) 29.7 %	(5) 27.8 %	(6) 31.6 %
Prevalence of severe stunting (<-3 z-score)	(9) 24.3 %	(7) 38.9 %	(2) 10.5 %

Figure 12: Prevalence of stunting by type in the total refugee population and new arrivals (based on WHO Growth Standards)
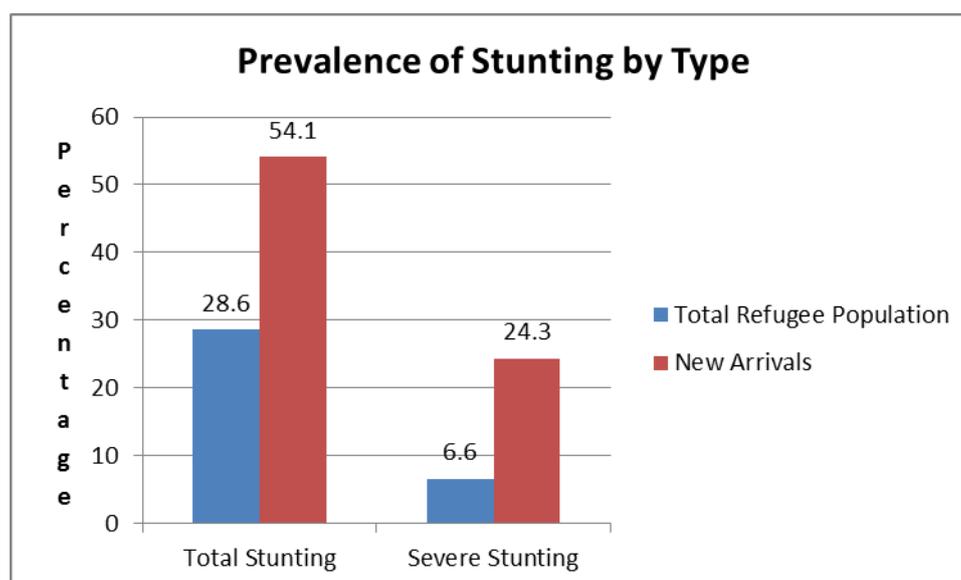
Stunting was highest amongst the 18-29 age group (Table 38).

Table 38: Prevalence of stunting by age based on height-for-age z-scores (based on WHO Growth Standards)

Age (mo)	Total no.	Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
		No.	%	No.	%	No.	%
6-17	7	0	0.0	3	42.9	4	57.1
18-29	8	5	62.5	2	25.0	1	12.5
30-41	10	3	30.0	1	10.0	6	60.0
42-53	9	1	11.1	3	33.3	5	55.6
54-59	3	0	0.0	2	66.7	1	33.3
Total	37	9	24.3	11	29.7	17	45.9

The distribution of height-for-age z-scores was positioned to the left of the WHO curve, indicating that the children of new arrivals had a higher level of stunting than the reference population; similar to what was observed in the total refugee population (Figure 13).

Figure 13: Distribution of Height-for-Age z-scores of the survey population compared to a reference population (based on WHO growth standards; the reference population is shown in green and the surveyed population is shown in red)
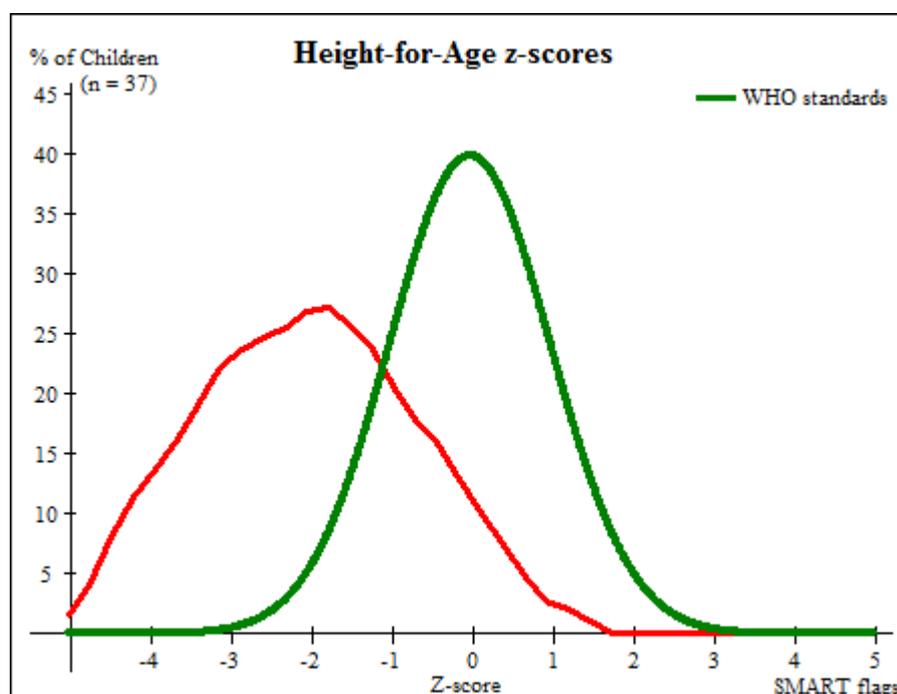

Underweight in children 6-59 months

The prevalence of underweight was 22.5%, with 5.0% being severely underweight. Boys seem to have a higher prevalence of underweight compared to girls (Table 39). Children of new arrivals

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seem to have a higher prevalence of underweight compared to the total refugee population (Figure 14).

Table 39: Prevalence of underweight based on weight-for-age z-scores by sex

	All n = 40	Boys n = 20	Girls n = 20
Prevalence of underweight (<-2 z-score)	(9) 22.5 %	(8) 40.0 %	(1) 5.0 %
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(7) 17.5 %	(6) 30.0 %	(1) 5.0 %
Prevalence of severe underweight (<-3 z-score)	(2) 5.0 %	(2) 10.0 %	(0) 0.0 %

Figure 14: Prevalence of underweight by type in the total refugee population and new arrivals (based on WHO Growth Standards)
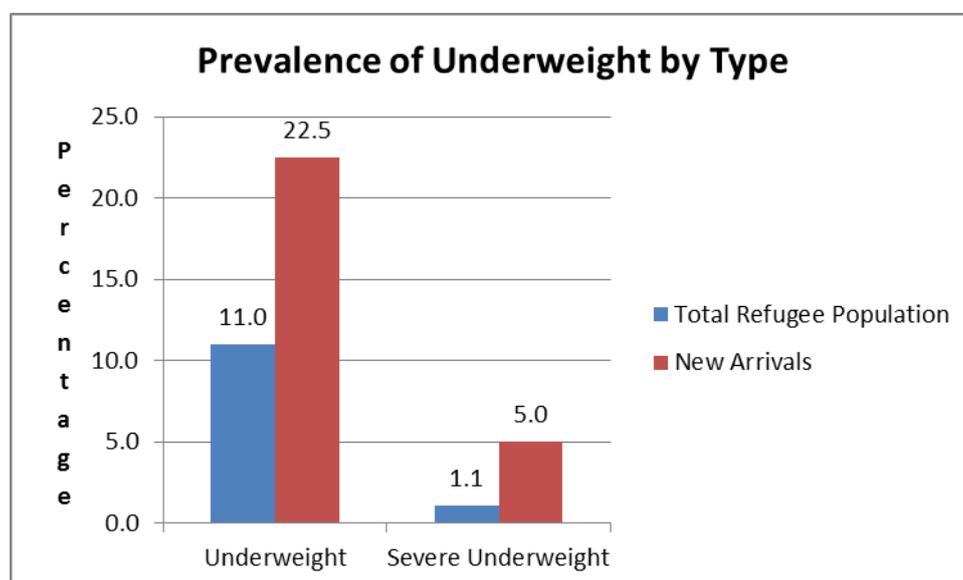
The calculated mean z-scores for weight-for-height, weight-for-age and height-for-age all fell within the recommended ranges for acceptable quality (Table 40).

Table 40: 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	41	-0.04±0.88	1.00	0	0
Weight-for-Age	40	-1.08±1.17	1.00	0	1
Height-for-Age	37	-2.01±1.26	1.00	0	4

* contains for WHZ and WAZ the children with edema.

Mean z-scores, design effects and excluded subjects by ENA for SMART for weight-for-height z-scores are shown in figure 15.

Figure 15: Mean z-scores, design effects and excluded subjects by ENA for SMART
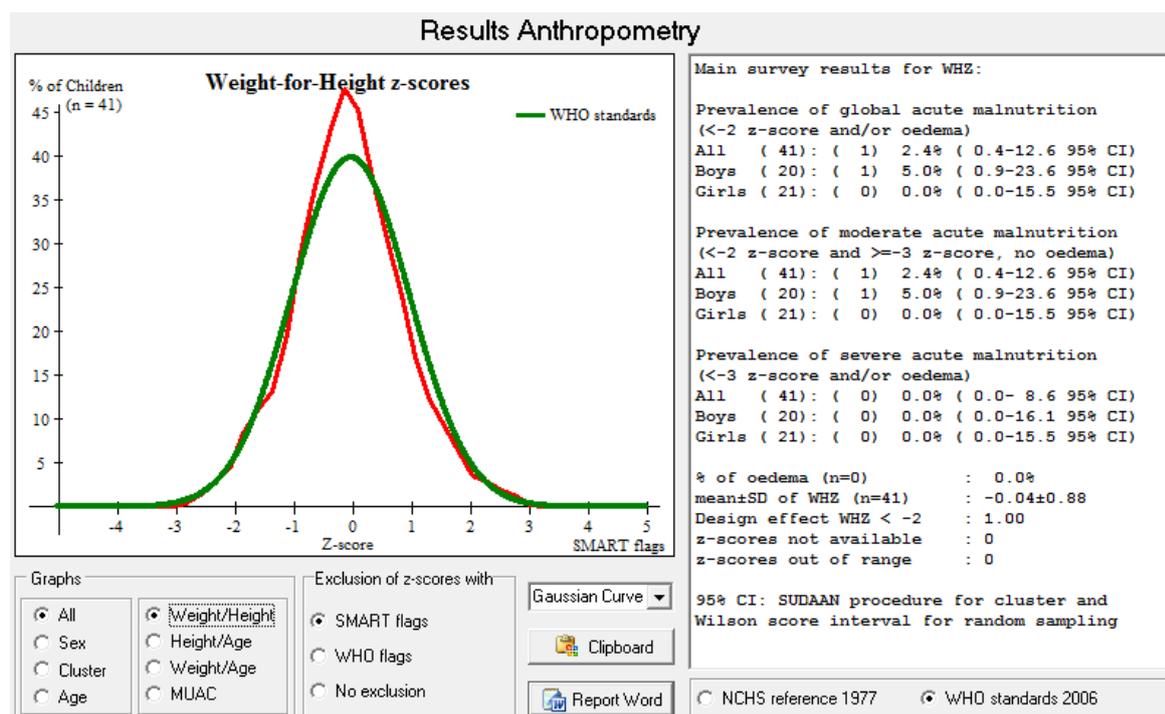
Measles vaccination coverage

A total of 90.2% of children 9-59 months (Table 41) received measles vaccination with card or recall, which was comparable to the prevalence observed in the total refugee population (Figure 16). The UNHCR target is ≥95%.

Table 41: Measles vaccination coverage for children aged 9-59 months (n=41)

	Measles (with card) n= 3	Measles (with card or confirmation from mother) n= 37
YES	7.3%	90.2%

Figure 16: Coverage of measles vaccination in children 6-59 months in the total refugee population and new arrivals
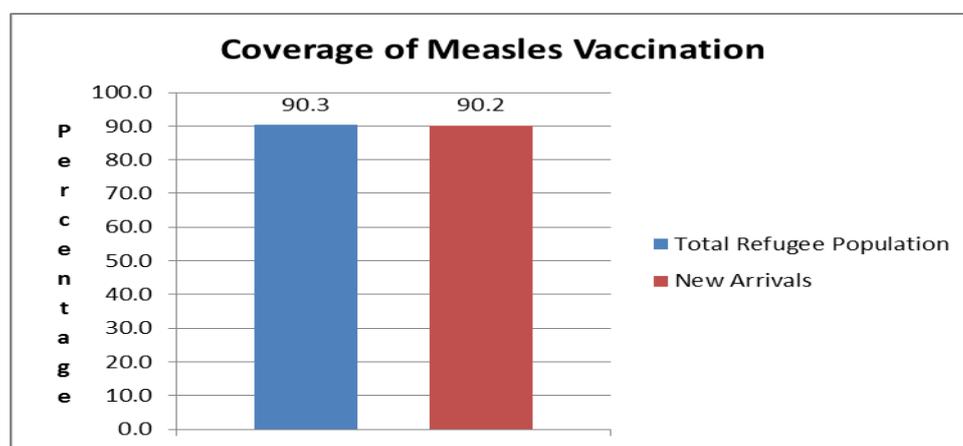
Vitamin A supplementation coverage

A total of 61.0% of children aged 6-59 months received Vitamin A supplementation in the past 6 months with card or recall (Table 42), which is slightly higher than the prevalence observed in the total refugee population (Figure 17), and well below the UNHCR target of >90%.

Table 42: Vitamin A supplementation for children aged 6-59 months in past 6-months (n=41)

	Vitamin A capsule (with card) n= 0	Vitamin A capsule (with card or confirmation from mother) n= 25
YES	0.0%	61.0%

Figure 17: Coverage of vitamin A supplementation in children 6-59 months in the total refugee population and new arrivals
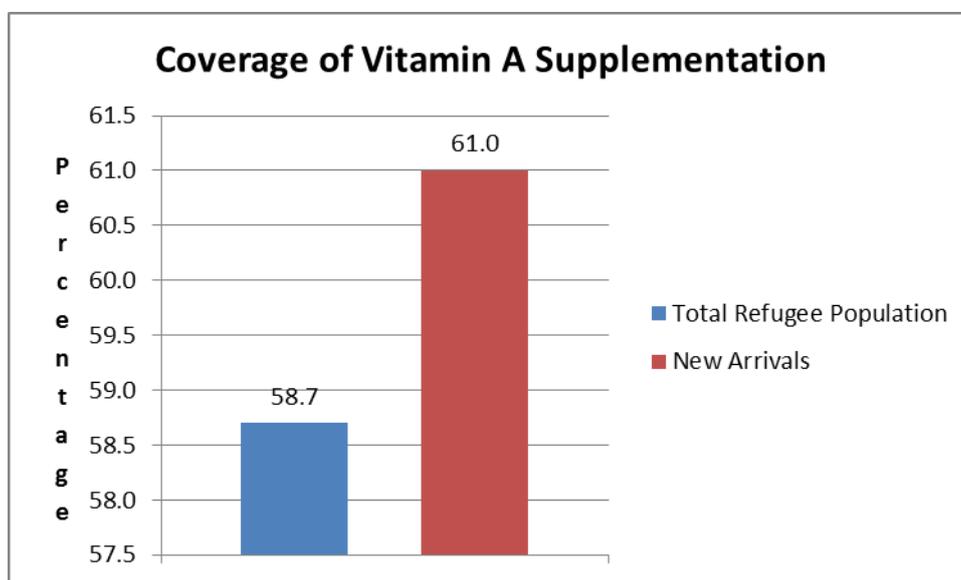
Diarrhoea

A total of 22.0% of children reported having experienced diarrhoea in the previous 2 weeks (Table 43). This prevalence is slightly lower than that observed in the total refugee population (Figure 18).

Table 43: Period prevalence of diarrhoea

	Number/total	%
Diarrhoea in the last two weeks	9/41	22.0
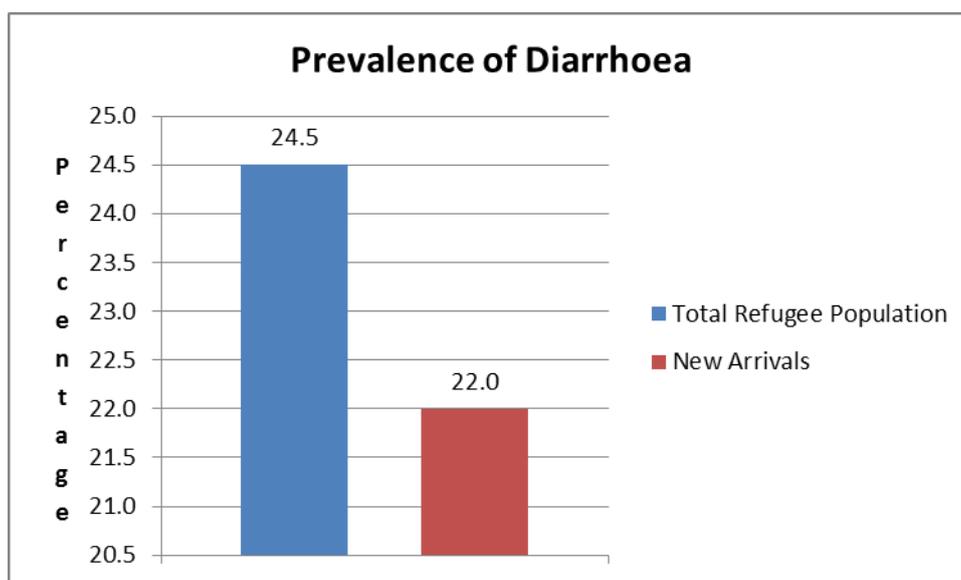
Anaemia

Amongst children 6-59 months, 61.0% were anaemic (Table 44) and 43.9% were moderately and severely anaemic (Table 45), showing that although total anaemia is lower in new arrivals, the prevalence of moderate and severe anaemia seems to be similar to that observed in the total refugee population (Figure 19).

Table 44: Prevalence of total anaemia, anaemia categories and mean haemoglobin concentration in children 6-59 months of age and by age group

	6-59 months n = 41	6-23 months n= 11	24-59 months n= 30
Total Anaemia (Hb<11.0 g/dL)	(25) 61.0%	(9) 81.8%	(16) 53.3%
Mild Anaemia (Hb 10.0-10.9 g/dL)	(7) 17.1%	(1) 9.1%	(6) 20.0%
Moderate Anaemia (7.0-9.9 g/dL)	(17) 41.5%	(7) 63.6%	(10) 33.3%
Severe Anaemia (<7.0 g/dL)	(1) 2.4%	(1) 9.1%	(0) 0.0%
Mean Hb, g/dL **(SD)** **[range]**	10.3 g/dL (1.4) [6.1-12.5]	9.4 g/dL (1.6) [6.1-11.8]	10.7 g/dL (1.2) [8.5-12.5]

Table 45: Prevalence of moderate and severe anaemia in children 6-59 months of age and by age group

	6-59 months n = 41	6-23 months n= 11	24-59 months n= 30
Moderate and Severe Anaemia (Hb<10.0 g/dL)	(18) 43.9%	(8) 72.7%	(10) 33.3%

Figure 19: Prevalence of anaemia in children aged 6-59 months in the total refugee population and new arrivals
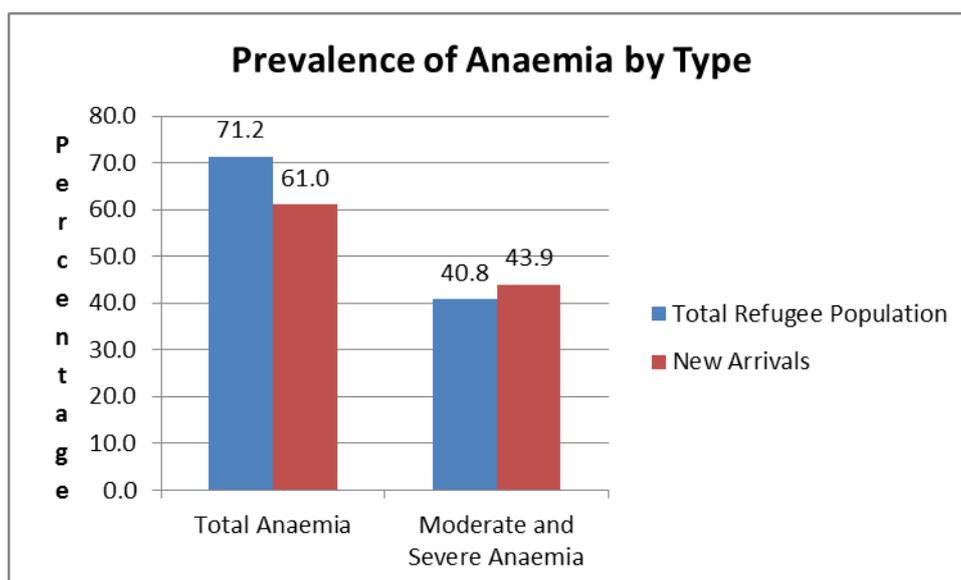
Children 0-23 months

Survey 1: All Refugees in Maratane's Camp

Table 46 shows the prevalence of IYCF practices indicators among children aged 0-23 months. The rate of timely initiation of breastfeeding was 71.1% (60.1-80.5, 95%CI), and that of exclusive breastfeeding was 68.4% (51.3-82.5, 95% CI). All children 12-15 months were still breastfeeding, whilst 66.7% (38.4-88.2, 95% CI) of children 20-23 months were still breastfeeding. Only 37.5% (8.5-75.5, 95% CI) of children 6-8 months had been introduced to solid foods, only 21.2% (12.1-33.0, 95% CI) consumed iron-rich or iron-fortified foods and only 6.1% (1.7-14.8, 95% CI) consumed fortified blended foods (Table 47). These practices were not statistically significantly different from those observed in 2012 (Figure 20).

Table 46: Prevalence of IYCF practices indicators

Indicator	Age range	Number/ total	Prevalence (%)	95% CI
Timely initiation of breastfeeding	0-23 months	59/83	71.1	60.1-80.5
Exclusive breastfeeding under 6 months	0-5 months	26/38	68.4	51.3-82.5
Continued breastfeeding at 1 year	12-15 months	18/18	100.0	100.0-100.0
Continued breastfeeding at 2 years	20-23 months	10/15	66.7	38.4-88.2
Introduction of solid, semi-solid or soft foods	6-8 months	3/8	37.5	8.5-75.5
Consumption of iron-rich or iron-fortified foods	6-23 months	14/66	21.2	12.1-33.0
Bottle feeding	0-23 months	7/86	8.1	3.3-16.1

Table 47: FBF intake in children aged 6-23 months

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive FBF	4/66	6.1 (1.7-14.8)

Figure 20: IYCF practices in children aged 0-23 months in 2012 and 2015
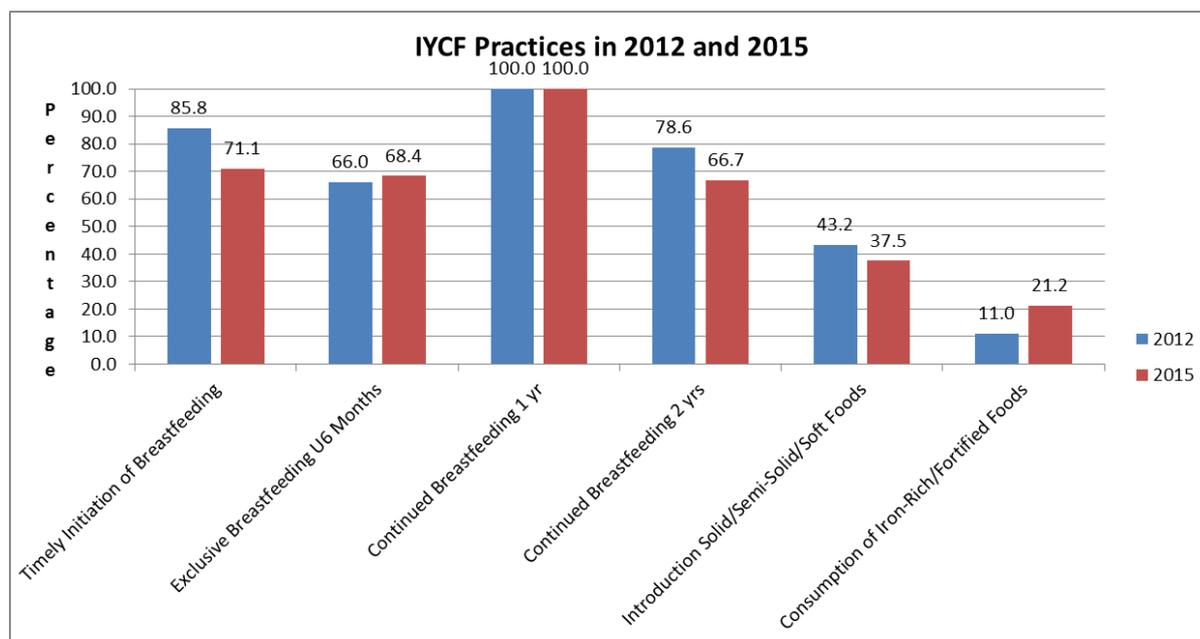
Bottle feeding was fairly uncommon (only reported for 8.1% (3.3-16.1, 95% CI) of the children) as well as formula feeding (Table 48); although they seem to have increased compared to 2012, this increase was not significant (Figure 21).

Table 48: Infant formula intake in children aged 0-23 months

	Number/total	% (95% CI)
Proportion of children aged 0-23 months who receive infant formula (fortified or non-fortified)	12/86	14.0 (7.4-23.1)

Figure 21: Prevalence of bottle and formula feeding in 2012 and 2015
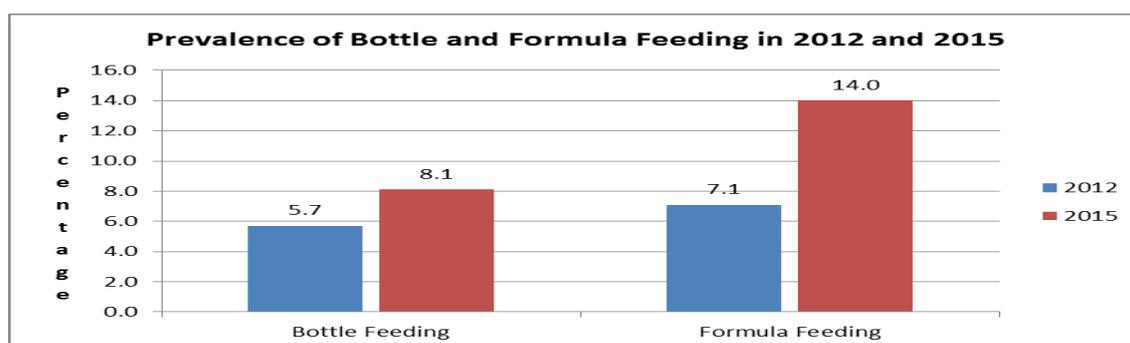
Survey 2: Newly Arrived Refugees

Table 49 shows the prevalence of IYCF practices indicators among children aged 0-23 months. The rate of timely initiation of breastfeeding was 75%. All children 0-5 months were exclusively breastfed. However, only 66.7% of children 12-15 months and 20-23 months were still breastfeeding. The sample did not include any children aged 6-8 months. Only 18.2% consumed iron-rich or iron-fortified foods and no children consumed fortified blended foods (Table 50). Figure 22 illustrates how these rates compare to those observed in the total refugee population, although it is hard to generalize those findings given the small sample size.

Table 49: Prevalence of IYCF practices indicators

Indicator	Age range	Number/ total	Prevalence (%)
Timely initiation of breastfeeding	0-23 months	9/12	75.0
Exclusive breastfeeding under 6 months	0-5 months	2/2	100.0
Continued breastfeeding at 1 year	12-15 months	2/3	66.7
Continued breastfeeding at 2 years	20-23 months	2/3	66.7
Introduction of solid, semi-solid or soft foods	6-8 months	0/0	-
Consumption of iron-rich or iron-fortified foods	6-23 months	2/11	18.2
Bottle feeding	0-23 months	1/13	7.7

Table 50: FBF intake in children aged 6-23 months

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive FBF	0/11	-

Figure 22: Prevalence of IYCF practices indicators in the total refugee population and new arrivals
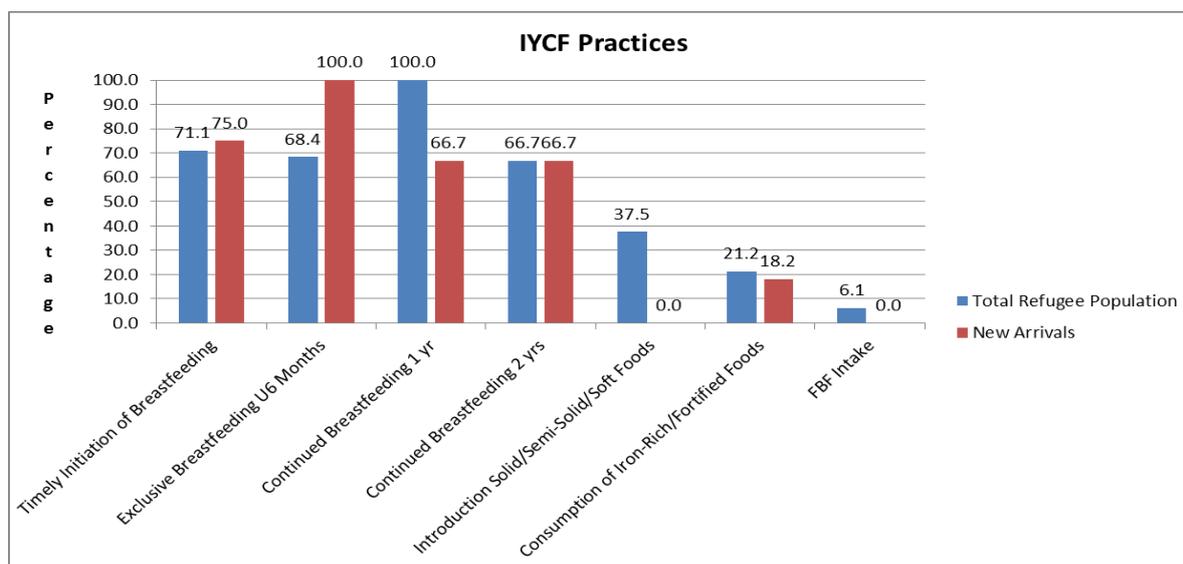
Bottle feeding and formula feeding were fairly uncommon (only reported for 7.7% of the children) (Table 51); similar to what was observed in the total refugee population, although the prevalence of formula feeding in the total refugee population was almost double that observed in the new arrivals (Figure 23).

Table 51: Infant formula intake in children aged 0-23 months

	Number/total	%
Proportion of children aged 0-23 months who receive infant formula (fortified or non-fortified)	1/13	7.7

Figure 23: Prevalence of bottle and formula feeding in the total refugee population and new arrivals
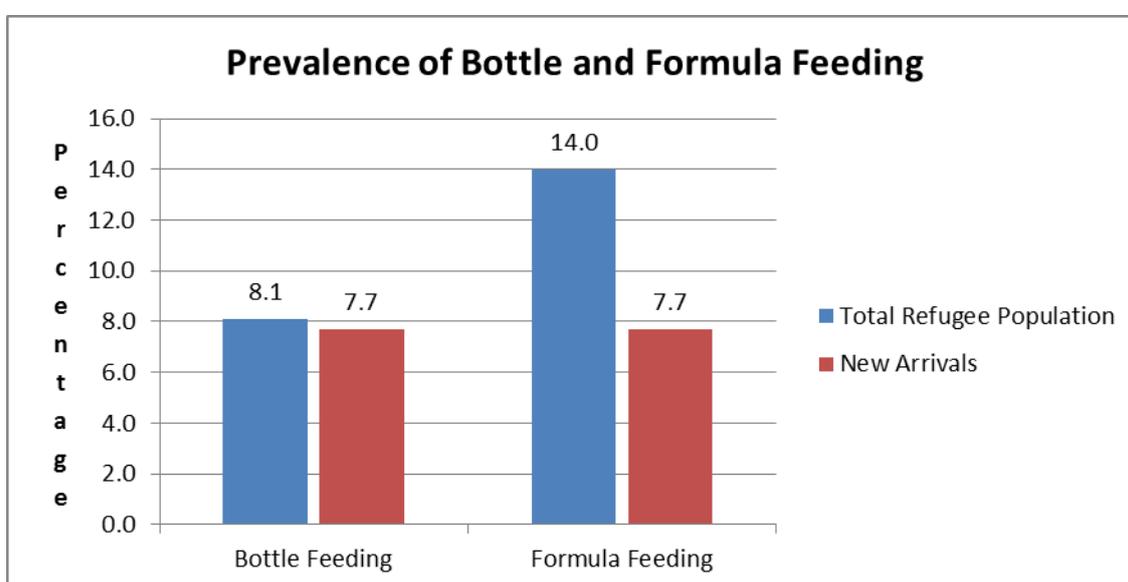
Women 15-49 years

Analysis revealed that 12.2% of the 98 surveyed women of reproductive age (15-49 years) were pregnant. The mean age of the surveyed women was 30 years (Table 52).

Table 52: Physiological status and age of surveyed women of reproductive age (15-49 years)

	Number/Total	% of Sample
Non-Pregnant Women	85/98	86.7
Pregnant Women	12/98	12.2
Mean Age (Age Range)	30 (Min. 15, Max. 46)	

As observed with children, the prevalence of anaemia for women (56.5% (45.3-67.2, 95% C.I)) was far beyond the public health significance threshold of 40%. The mean haemoglobin (Hb) for women was 11.3 g/dL (Table 53).

Table 53: Prevalence of anaemia and haemoglobin concentration in non-pregnant women of reproductive age (15-49 years)

Anaemia - Women of reproductive age 15-49 years	All n = 85
Total Anaemia (<12.0 g/dL)	(48) 56.5% (45.3-67.2 95% CI)
Mild Anaemia (11.0-11.9 g/dL)	(19) 22.4% (14.0-32.7 95% CI)
Moderate Anaemia (8.0-10.9 g/dL)	(23) 27.1% (18.0-37.8 95% CI)
Severe Anaemia (<8.0 g/dL)	(6) 7.1% (2.6-14.7 95% CI)
Mean Hb, g/dL (SD) [range]	11.3 g/dL (2.0) [5.2-15.3]

Although anaemia levels in general, and moderate anemia levels in particular, in non-pregnant women of reproductive age (15-49 years) may seem to have decreased compared to 2010 and 2012, the decrease is not statistically significant (Figure 24).

Figure 24: Prevalence of anaemia in non-pregnant women of reproductive age (15-49 years) from 2010 to 2015
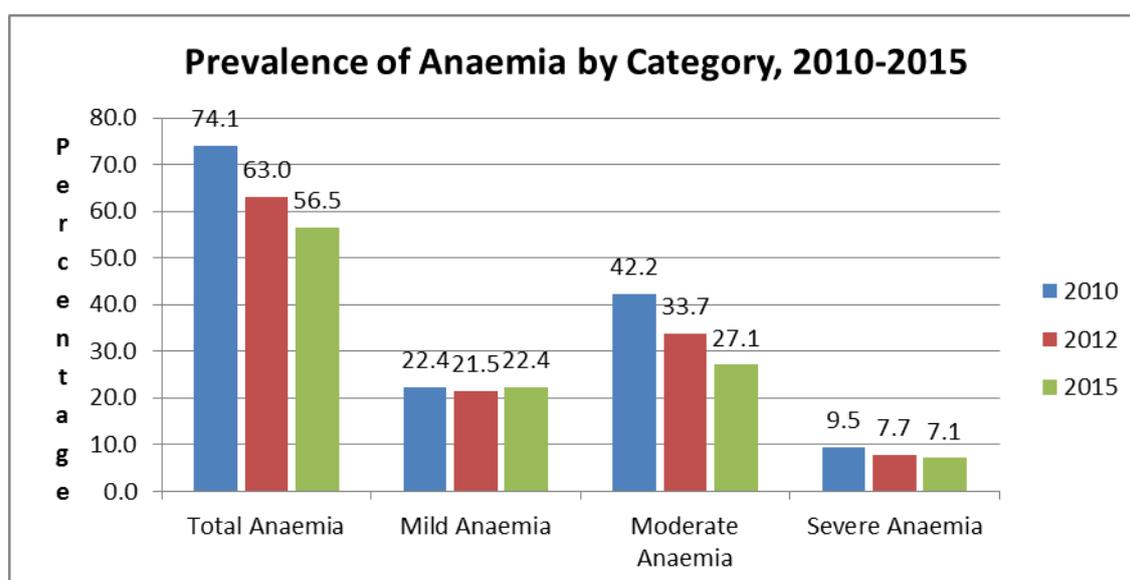
Figure 25 reveals a slight increase in the mean Hb concentration from 2010 to 2015.

Figure 25: Mean haemoglobin concentration (g/dL) in non-pregnant women of reproductive age (15-49 years) from 2010 to 2015
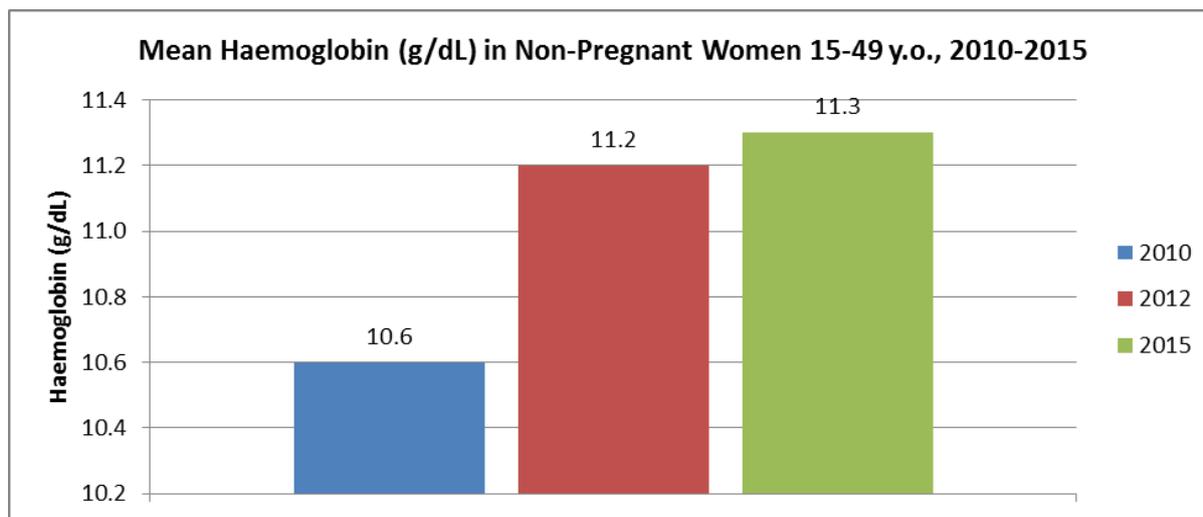
Of the pregnant women in the sample, only 66.7% (34.9-90.1, 95% C.I) were enrolled in the ANC programme, whilst only 25.0% (5.5-57.2, 95% C.I) were receiving iron-folic acid pills (Table 54). In interpreting this result, it is important to note that the sample size was very low (12) and because of this the confidence interval was very wide.

Table 54: ANC enrolment and iron-folic acid pills coverage among pregnant women (15-49 years)

	Number /total	% (95% CI)
Currently enrolled in ANC programme	8/12	66.7 (34.9-90.1)
Currently receiving iron-folic acid pills	3/12	25.0 (5.5-57.2)

These findings are not statitistically significantly different from those observed in 2012 (Figure 26).

Figure 26: ANC enrolment and iron-folic acid pills coverage among pregnant women (15-49 years) in 2012 and 2015
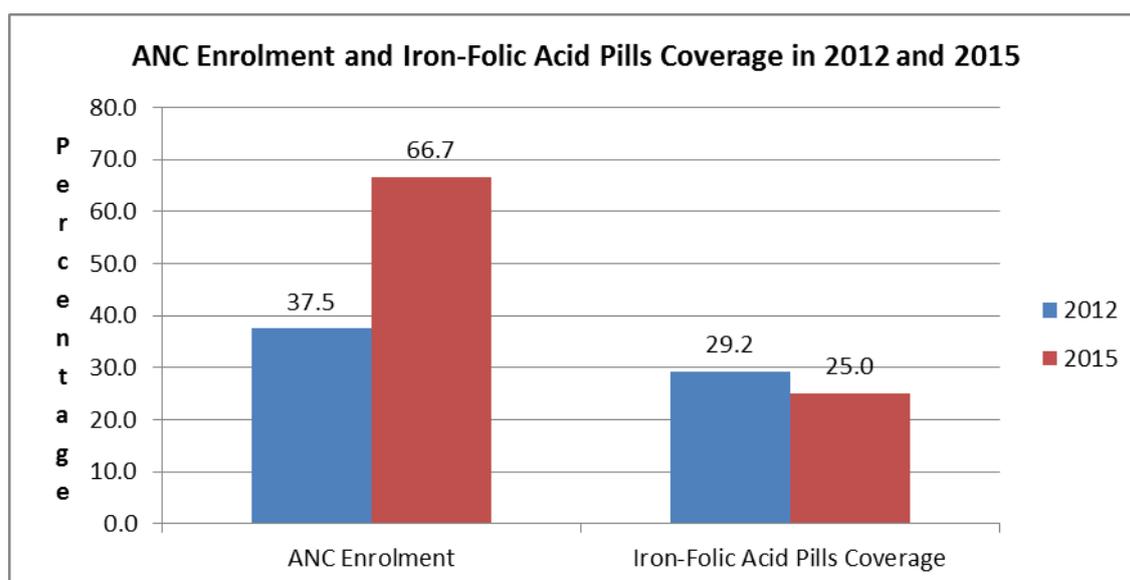
WASH

A total of 87 households were surveyed for WASH. All households in the sample reported using an improved drinking water source, and 89.7% (81.3-95.2, 95% CI) of households were storing water safely (Table 55).

Table 55: Water Quality

	Number/total	**% (95% CI)**
Proportion of households using an improved drinking water source	87/87	100.0 (100.0-100.0)
Proportion of households that use a covered or narrow necked container for storing their drinking water	78/87	89.7 (81.3-95.2)

The proportion of households that store their water safely has statistically significantly increased from 2012 (43.9%, 37.5-50.5, 95% CI) (Figure 27).

Figure 27: Water Quality in 2012 and 2015
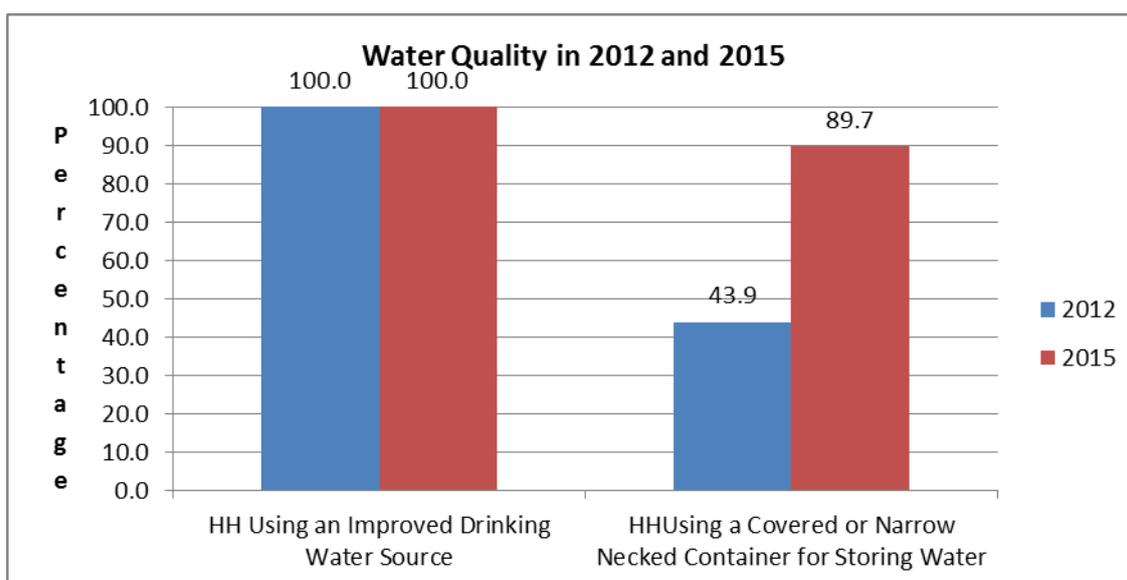
The average amount of water used per person per day was 18.0 litres per person per day (lpppd), with only 36.8% (26.7-47.8, 95% C.I) of households using more than 20 lpppd, which is the UNHCR standard (Table 56). These amounts are comparable and not statistically significantly different from the ones reported in 2012 (Figure 28).

Table 56: Water Quantity, Amount of Litres of Water Used Per Person Per Day

Proportion of households that use:	Number/total	% (95% CI)
≥ 20 lpppd	32/87	36.8 (26.7-47.8)
15 – <20 lpppd	15/87	17.2 (10.0-26.8)
<15 lpppd	40/87	46.0 (35.2-57.0)

Figure 28: Amount of Litres of Water Used Per Person Per Day in 2012 and 2015
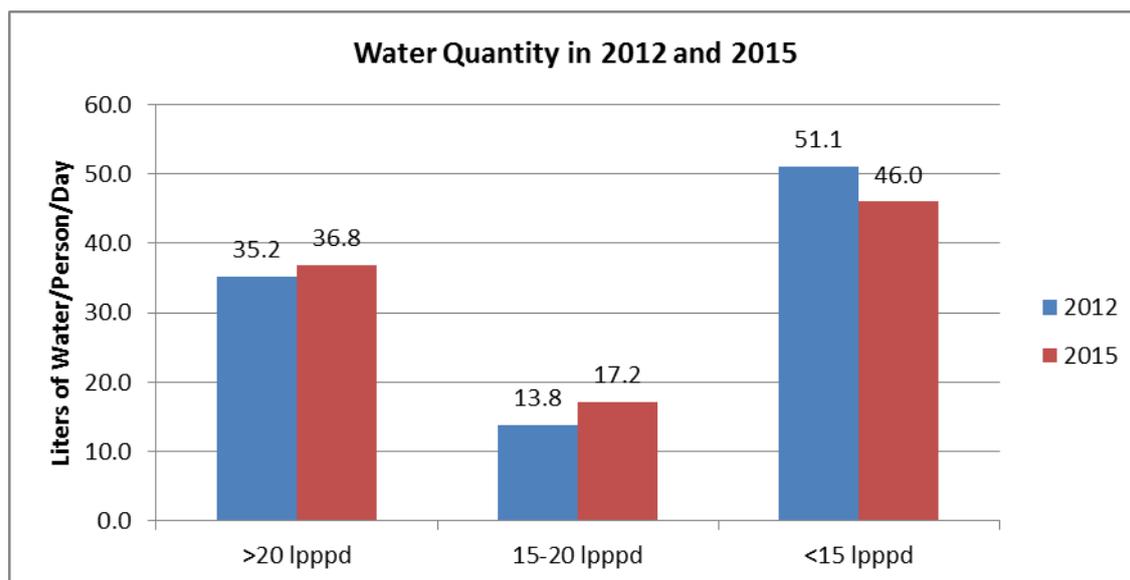
Only 35.6% (25.6-46.6, 95% C.I) of households were satisfied with their drinking water Supply (Table 57).

Table 57: Satisfaction With the Water Supply

	Number/total	% (95% CI)
Proportion of households that say they are satisfied with the drinking water supply	31/87	35.6 (25.6-46.6)

The main reasons of dissatisfaction with the water supply are illustrated in figure 29.

Figure 29: Main Reason for Dissatisfaction with the Water Supply
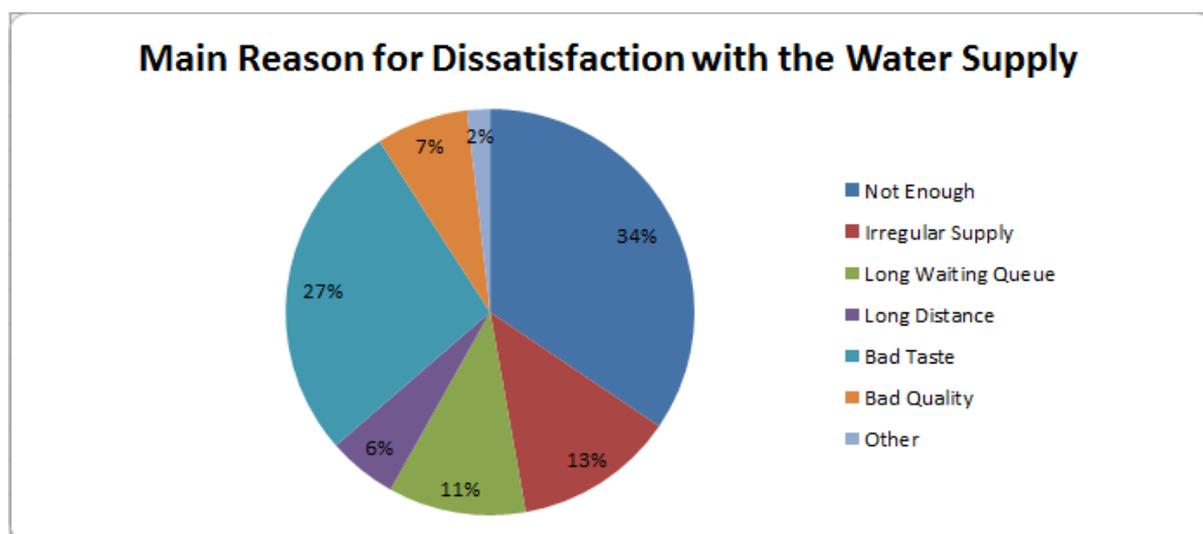
Over half (58.6%, 47.6-69.1, 95% C.I) of households were using an improved excreta disposal facility, and 10.3% (4.8-18.7, 95% C.I) were using unimproved toilets. This is a significant improvement compared to 2012, when 41.8% (35.5-48.4, 95%CI) of households were using unimproved toilets (Figure 30). The proportion of households that use a communal toilet has also statistically significantly increased compared to 2012 (2.5% (0.9-5.4, 95% CI)). Nearly all households were safely disposing of faeces of children (Table 58).

Table 58: Safe Excreta disposal

	Number/total	% (95% CI)
Proportion of households that use:		
An improved excreta disposal facility (improved toilet facility, 1 household)	51/87	58.6 (47.6-69.1)
A shared family toilet (improved toilet facility, 2 households)	16/87	18.4 (10.9-28.1)
A communal toilet (improved toilet facility, 3 households or more)	11/87	12.6 (6.5-21.5)
An unimproved toilet (unimproved toilet facility or public toilet)	9/87	10.3 (4.8-18.7)
Proportion of households with children under three years old that dispose of faeces safely	52/56	92.9 (82.7-98.0)

Figure 30: Safe Excreta Disposal in 2012 and 2015
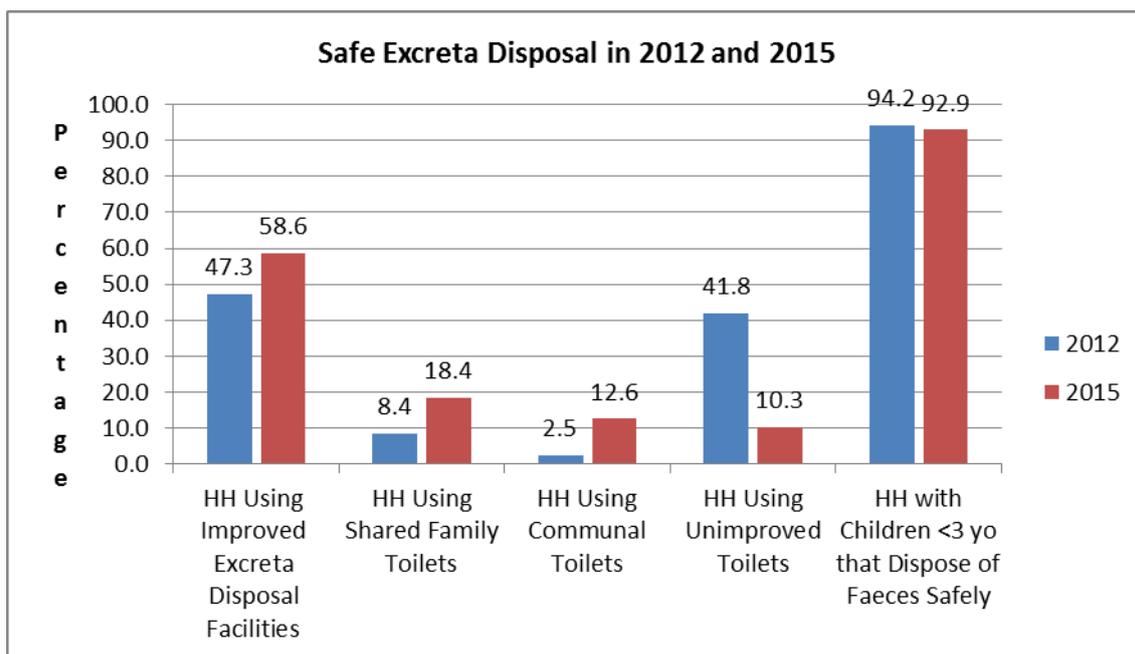
Mosquito Net Coverage

A total of 87 households were surveyed for mosquito net ownership and utilisation. Out of these, 80.5% (70.6-88.2, 95% CI) owned at least one mosquito net, whilst 77.0 (66.8-85.4, 95% CI) owned at least one LLIN (Table 59).

Table 59: Household Mosquito Net Ownership

	Number/total	% (95% CI)
Proportion of households owning at least one mosquito net of any type	70/87	80.5 (70.6-88.2)
Proportion of households owning at least one LLIN	67/87	77.0 (66.8-85.4)

Less households seemed to own mosquito nets in 2015 compared to 2012 but more households seemed to own LLINs (Figure 31).

Figure 31: Household Ownership of Mosquito Nets and LLINs
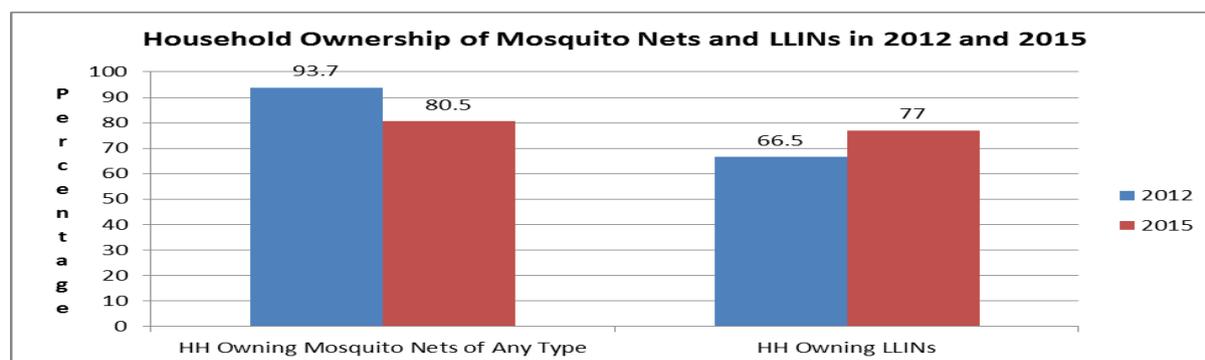
On average, each household had 1.9 LLINs, with an average of 3.7 persons per LLIN, which is almost twice higher than the recommended UNHCR target of no more than 2 persons per LLIN (Table 60). These numbers are worse than those reported in 2012 (Figure 32).

Table 60: Number of Nets

Average number of LLINs per household	Average number of persons per LLIN
1.9	3.7

Figure 32: Number of nets in 2012 and 2015
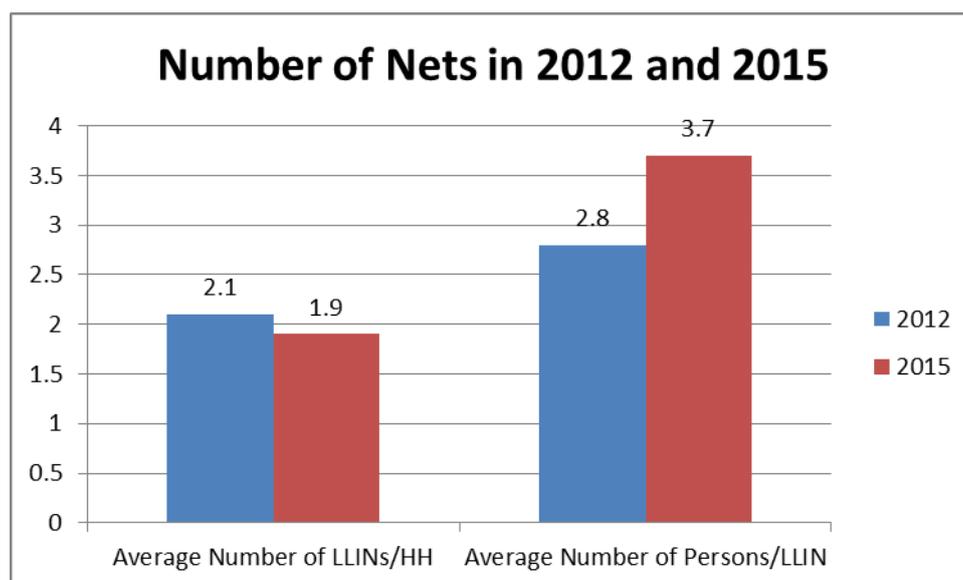
Analysis of mosquito net utilisation (Table 61) revealed that 73.6% of people had slept under a mosquito net (with 68.4% under a LLIN), including 76.4% of children 0-59 months (with 73.6% under a LLIN) and 75.0% of pregnant women (with 66.7% under a LLIN). Mosquito net utilisation is fairly comparable to that reported in 2012, as illustrated in Figure 33.

Table 61: Mosquito Net Utilisation

	Proportion of total population (all ages)		Proportion of 0-59 months		Proportion of pregnant women	
	Total No= 484	%	Total No= 110	%	Total No= 12	%
Slept under net of any type	356	73.6	84	76.4	9	75.0
Slept under LLIN	331	68.4	81	73.6	8	66.7

Figure 33: Mosquito Net Utilisation in 2012 and 2015
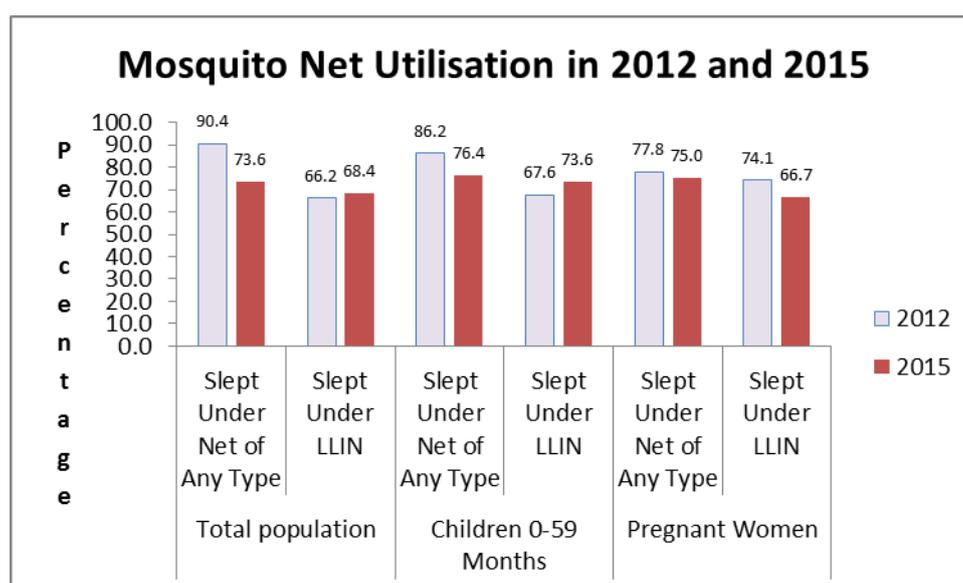
LIMITATIONS

- **High absentee rate**: Due to the high mobility of refugees, there was a high number of absent households in Survey 1 and absent children in Survey 2.
- **No detailed, up-to-date map of the camp and its limits**: The camp's surface area is quite large and the limits of the camp are not clear given that the Mozambican population lives alongside the refugee population of the camp. This made data collection harder and more time consuming.
- **No up-to-date data on which refugees are residing in the camp and on their addresses in the camp**: In Survey 1, a total of 307 households had to be sampled for 206 addresses to be provided. In Survey 2, children of new arrivals had to be called on the community radio to come to a central place, as neither the Nampula office nor the camp administrator could provide their residential addresses.
- **Limited time to conduct the survey**: The survey technical team had three weeks in the field to plan and conduct the two nutrition surveys. The final versions of the Portuguese and the Kiswahili translations could not be tested prior to the survey owing to time constraints and were deemed to contain some inaccuracies. Also, the technical team could have benefited of more time to scan the nutritional products and food commodities available on the market and to adapt the WASH and Mosquito Net Coverage questionnaires.
- **Inability to conduct a nutrition survey in the Mozambican host population, as requested by UNHCR's Mozambique Country Office**: No data on the Mozambican host population or map of the Mozambican community were provided by the camp's administrator despite repeated requests by the survey techinal team and staff from the Nampula office.

DISCUSSION

• Maratane's refugee camp continues to have stable levels of acute malnutrition and persistent levels of chronic malnutrition and anaemia since 2010. The severity of the stunting prevalence in children remains medium to high and anemia levels remain critical in both children and women..

• Children seem to be arriving to the camp with critical levels of chronic malnutrition and anaemia, although the small sample size makes it hard to generalize the findings.

• The programme coverage of both vitamin A supplementation and measles vaccination (assessed by card or recall) is low in both the camp refugee population and the newly arrived refugees and has decreased significantly compared to 2010 and 2012.

• Around 71% of children were breastfed within an hour of birth and only two-thirds of children under 6 months were exclusively breastfed. All children 12-15 months were still breastfeeding, whilst two-thirds of children 20-23 months were still breastfeeding. Only two out of five of children 6-8 months had been introduced to solid foods and only one out of five consumed iron-rich or iron-fortified foods. Bottle feeding and formula feeding were fairly uncommon. These below-par practices were comparable to those observed in 2012 and fairly comparable to the ones observed in the newly arrived refugees, despite the small sample size.

• All households reported access to an improved drinking water source. However, only a third was satisfied with the drinking water supply and several water taps were non-functional at the time of the survey. Still 10.3% of households used an unimproved toilet facility.

• More than three quarters of the households owned at least one LLIN, but there was an average of 3.7 people per LLIN, which is almost twice higher than the recommended UNHCR target of no more than two persons per LLIN and higher than the average reported in 2012.

RECOMMENDATIONS AND PRIORITIES

Immediate

1. Blanket provision of Micronutrient Powder (MNP) for children 6-59 months or 6-23 months, or blanket provision of CSB++ in children aged 6-24 months of age depending on resource availability, to address the high prevalence of anaemia among children.
2. Blanket provision of iron and folate supplements or maternal micronutrient supplements including iron to pregnant women.
3. Distribution of LLINs to reduce the risk of malaria infection, which exacerbates anemia levels.
4. Organisation of a measles vaccination and vitamin A supplementation campaign.
5. Repair of non-funtioning water taps.

Medium-Term

6. Explore the possibility of providing cash instead of the actual food ration, as this would give refugees more options to consume a varied and nutritious diet.
7. Awareness and sensitization around IYCF best practices including regarding timely introduction of solid foods and feeding children iron-rich or iron-fortified foods.
8. Health education, especially for anaemia prevention, including nutrition education on dietary diversity and sensitization on the importance of ANC and iron and folate supplementation during pregnancy.
9. Support the production of iron-rich crops, such as green leafy vegetables, legumes and iron-rich cereals, potentially through small scale nutrition gardening projects financed by agencies involved in food security.
10. Regular checks of water quality and supply in the camp and support to upgrade non-improved toilet facilities or to build toilets, where needed.

Longer term

11. Foster intersectoral linkages and explore innovative solutions to further reduce anaemia and stunting levels in the camp.
12. Further investigate possible causes of anaemia in children and women and monitor trends in malaria infections.

REFERENCES

■ WHO. Indicators for Assessing Infant and Young Child Feeding Practices: Part I Definitions, Washington DC, USA, 2008.

■ WHO. Physical Status: The Use and Interpretation of Anthropometry, 1995.

■ UNHCR. Maratane Nutrition and Mortality Survey. A survey jointly conducted by UNHCR and the Ministry of Health, Nampula, in Maratane refugee camp and surroundings. 2010.

■ UNHCR. UNHCR Operational Guidance on the Use of Special Nutritional Products to Reduce Micronutrient Deficiencies and Malnutrition in Refugee Population, 2011.

■ UNHCR. UNHCR SENS Nutrition Survey in Maratane Refugee Camp Mozambique, 2012.

■ UNHCR. Standardised Expanded Nutrition Survey (SENS) Guidelines for Refugee Populations: Version 1.3, 2012.

APPENDICES

Appendix 1 List of Individuals Involved in the Survey

Technical Team	Caroline Wilkinson (UNHCR)
	Joëlle Zeitouny (UNHCR)
	Maeve de France (CartONG)
Supervision Team	Joëlle Zeitouny (UNHCR)
	KOMBA, Papson
Enumeration Teams	**TEAM 1**
Team Leader	BUKOMBE JOSPIN, Mushamalirwa
Anthropometric Measurements	BIN RAMAZANI, Mastak
Anthropometric Measurements	KONGE MURONDA, Béatrice
Hb Measurements	BYAMASA, Mwanvua
WASH and Mosquito Net Questionnaires	DIAMA BAHENEKA, Justin
	TEAM 2
Team Leader	KAMANGO KIZA, David Selemani
Anthropometric Measurements	BANYUZURIYEKO, Dursila
Anthropometric Measurements	MANUEL, Fernando
Hb Measurements	BITOMWA, Roger
WASH and Mosquito Net Questionnaires	VENERANDO, Kisubi Juma
	TEAM 3
Team Leader	ODETTE, Nshimirimana
Anthropometric Measurements	ABILIO, Laura
Anthropometric Measurements	HENRY MWESSA, Ngumba
Hb Measurements	BIMPA, Célestin Bikenge
WASH and Mosquito Net Questionnaires	ABRAHAM, Ismael Luc
	TEAM 4
Team Leader	ÉGIDE, Manzi
Anthropometric Measurements	CONSOLATTE, Nditije
Anthropometric Measurements	VIANE, Munyaneza Jean Marie
Hb Measurements	BULAMBU, Mananga
WASH and Mosquito Net Questionnaires	LUSEMBE, Isaac

Appendix 2 Plausibility Reports

Standard/Reference used for z-score calculation: WHO standards 2006
(If it is not mentioned, flagged data is included in the evaluation. Some parts of this plausibility report are more for advanced users and can be skipped for a standard evaluation)

- ▪ **Maratane All Refugees**

Overall data quality

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

Flagged data          Incl   %     0-2.5 >2.5-5.0 >5.0-7.5   >7.5
(% of in-range subjects)            0     5        10         20       0 (1.6 %)

Overall Sex ratio     Incl   p     >0.1  >0.05    >0.001  <=0.001
(Significant chi square)            0     2        4          10       0 (p=0.768)

Overall Age distrib   Incl   p     >0.1  >0.05    >0.001  <=0.001
(Significant chi square)            0     2        4          10       0 (p=0.410)

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

Dig pref score - height Incl  #     0-7   8-12     13-20   > 20
                                    0     2        4          10       2 (11)

Dig pref score - MUAC  Incl   #     0-7   8-12     13-20   > 20
                                    0     2        4          10       0 (5)

Standard Dev WHZ      Excl   SD    <1.1  <1.15    <1.20   >=1.20
.                                  and   and      and        or
.                     Excl   SD    >0.9  >0.85    >0.80   <=0.80
                                    0     5        10         20       0 (1.04)

Skewness  WHZ         Excl   #     <±0.2 <±0.4    <±0.6   >=±0.6
                                    0     1        3          5        0 (0.03)

Kurtosis  WHZ         Excl   #     <±0.2 <±0.4    <±0.6   >=±0.6
                                    0     1        3          5        0 (0.11)

Poisson dist WHZ-2    Excl   p     >0.05 >0.01    >0.001  <=0.001
                                    0     1        3          5        0 (p=)

OVERALL SCORE WHZ =                0-9   10-14    15-24   >25          4 %
```

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

There were no duplicate entries detected.

Percentage of children with no exact birthday: 37 %

- ▪ **Maratane New Arrivals**

Overall data quality

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

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

Overall Sex ratio     Incl   p     >0.1  >0.05    >0.001  <=0.001
```

```
(Significant chi square)                      0      2      4      10       0 (p=0.876)

Overall Age distrib    Incl  p   >0.1  >0.05  >0.001  <=0.001
(Significant chi square)                      0      2      4      10       0 (p=0.688)

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

Dig pref score - height  Incl  #  0-7   8-12   13-20   > 20
                                             0      2      4      10       4 (18)

Dig pref score - MUAC    Incl  #  0-7   8-12   13-20   > 20
                                             0      2      4      10       2 (11)

Standard Dev WHZ        Excl  SD  <1.1  <1.15  <1.20   >=1.20
.                                 and   and    and     or
.                       Excl  SD  >0.9  >0.85  >0.80   <=0.80
                                             0      5      10     20       5 (0.88)

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

Kurtosis  WHZ           Excl  #   <±0.2 <±0.4  <±0.6   >=±0.6
                                             0      1      3       5       3 (0.50)

Poisson dist WHZ-2      Excl  p   >0.05 >0.01  >0.001  <=0.001
                                             0      1      3       5       0 (p=)

OVERALL SCORE WHZ =               0-9   10-14  15-24   >25      18 %
```

The overall score of this survey is 18 %, this is acceptable.

There were no duplicate entries detected.

Percentage of children with no exact birthday: 83 %

Appendix 3 Questionnaires

CHILD QUESTIONNAIRE

name	label::Portuguese	label::Swahili	label::Français
DeviceID			
TimeStartRecorded			
TimeEndRecorded			
XCHILD	ESTE QUESTIONÁRIO É PARA MÃE OU PESSOA QUE CUIDA DA CRIANÇA COM IDADE DE 0-59 MESES	MASWALI HAYA NI KWA MAMA AO MTU AMBAYE ALISHA LISHA MTOTO KUANZIA MIEZI 0-59	CE QUESTIONNAIRE DOIT ÊTRE ADMINISTRÉ À LA MÈRE OU À LA PERSONNE PRINCIPALEMENT EN CHARGE DE NOURRIR L'ENFANT ET L'ÂGE DE L'ENFANT DOIT SE SITUER ENTRE 0 ET 59 MOIS
CAMP			
ZONE	Zone number	Zone yako/namba	Code zone
BLOCK	Bloco numero	Bloke yako	Code bloc
SURVDATE_c	Date da entrevista	Tarehe ya kuojiwa	Date d'entretien
TEAM	Numero da equipa	Idadi ya timu	Numéro d'équipe
HHN	Numero da casa	Namba ya nyumba	Numéro ménage
I_gps	Por favor leva ponto no GPS	Tafadhali chukua pwenti kwenye GPS:	Veuillez prendre un point GPS:
C	Questionario da crianças	Maswali kwa Watoto	Questionnaire enfants
WCAMP			
SURVDATE			
Team			
ID	Crianca ID	Kadi ya mtoto	ID de l'enfant
NAME	Nome de crianca	Jina la mtoto	Nom de l'enfant
HH			
CHCONST	Consentimento dado?	Makubaliano?	Le ménage a t-il donné son consentement à la prise de mesures sur ${NAME}?

SEX	Sexo?	Jinsia?	Sexe de l'enfant?
XDOBK	Voce sabe a data de nascimento do ${NAME}?	Je wewe unafaamu tarehe ya kuzaliwa ${NAME}?	Connaissez-vous la date de naissance de ${NAME} ?
XBIRTHDATE	Data de Nascimento	Tarehe ya kuzaliwa	Précisez donc la date de naissance
XAgeCalc			
XAgeCalcCheck	Verifica que a idade de criança é ${XAgeCalc} meses? Lembra que se tiver idade superior a 59 meses, ela nao é viavel para inclusao no estudo.	Hakikisha umri wa mtoto ni miaka ${XAgeCalc} na miezi mingapi? Kumbuka kama Je yeye ana zaidi ya mieze 59, hawezi kuwa kwenye ukaguzi.	Vérifiez que l'enfant est bien âgé de ${XAgeCalc} mois. Rappelez-vous que s'ils ont plus de 59 mois, ils ne peuvent être inclus dans l'enquête.
BIRTHDAT			
MONTHS	Por favor, coloca a idade (em meses)?	Tafadhali weka umri wa mtoto (kwa miezi).	Veuillez entrer l'âge approximatif (en mois)
WEIGHT	Peso (kg)	Uzito (kg)	Poids (kg)
HEIGHT	Altura ou comprimento (cm)	Kimo ao urefu(cm)	Taille (cm)
EDEMA	Exame clinico: presenca de edema bilateral?	Kipimo cha cliniki (kitapia mlo)	Oedème bilatéral
PicEdema	Tire uma foto bem focada do edema	Piga picha nzuri kwa ajili ya vipimo	Prenez une photo de l'oedème ; attention à la mise au point.
MUAC	Perimetro Braquial (mm)	Kipimo cha msuli wa mkono(mm)	Périmètre brachial (PB) (cm)
MEASLES	Sarampo?	Pepo Punda?	Rougeole?
VITA	Vit. A nos passados 6 meses ?	Vitamini A kwa miezi 6 ilio pita?	Vit. A dans les 6 derniers mois?
DIAR	Diarreia nas passadas duas semanas?	Kuharisha kwa wiki 2 zilizopita?	Diarrhée dans les 2 dernières semaines?
CHHB	Hemoglobina (g/dL)	Damu(g/dL)	Hb (g/dL)
EVERBF	O ${NAME} é amamentado com leite materno?	Je ${NAME} alishaka wai kunyonya?	Est-ce que ${NAME} a déjà été allaité(e) ?
INITBF	Depois de nascer, quanto tempo passou para ${NAME} começar a mamar?	Alinyoya kwa mda gani baada ya kuzaliwa ${NAME} ?	Combien de temps après la naissance avez-vous mis ${NAME} au sein pour la première fois ?
YESTBF	Será que o ${NAME} amamentou dia e noite?	Je ${NAME} ali nyonya usiku na mchana?	Est-ce que ${NAME} a été allaité(e) durant la journée ou la nuit d'hier ?

XLiquid	Agora gostaria de lhe perguntar sobre os líquidos que o ${NAME} pode ter tomado ontem durante todo o dia. Estou interessado/a em saber se o seu filho tem consumido esse liquido, ou se tem sido combinado com outros . Ontem, durante o dia ou à noite, o ${NAME} consumiu algumas desses líquidos?	Napendelea kukuuliza maswali kuhusu majimaji ambayo ${NAME} ulipata jana mchana ao usiku. Napendelea kujua kama mtoto wako naye kuna maji ambayo ana changa pamoja na chakula. Mchana kama Usiku jana, je ${NAME} vyakula hivyo vya majimaji?	Maintenant je voudrais vous poser des questions sur les liquides que ${NAME} a peut-être reçus hier durant la journée ou la nuit. Je voudrais savoir si ${NAME} a reçu un des liquides suivants même s'il a été mélangé à une autre nourriture. Durant la journée ou la nuit d'hier, est-ce que ${NAME} a reçu un des liquides suivants ?
WATER	Água potável?	Maji poa?	Eau potable?
INFORM	Fórmula infantil (Nan,Lactogene...)?	Chakula cha mtoto: kama maziwa (Nan,Lactogene...)?	Lait infantile (NAN, Lactogen...)?
MILK	Leite em lata, em pó, ou fresco (NIDO, ZAMZAM, PROMEX, MILGRO...)?	Maziwa ya kopo,ya unga au ya maji ambayo yametoka kwa wa nyama (NIDO, ZAMZAM, PROMEX, MILGRO...)?	Lait en boîte, en poudre, ou lait frais d'origine animale (NIDO, ZAMZAM, PROMEX, MILGRO...)?
JUICE	Sumos (CERES, SANTAL, SUPER 7...)?	Juisi (CERES, SANTAL, SUPER 7...)?	Jus ou boissons à base de jus (CERES, SANTAL, SUPER 7...)?
BROTH	Sopas ?	Supu (mchuzi...)?	Bouillon clair (potage, mchuzi...)?
YOGURT	Leite fermentado ou iogurte?	Maziwa aina ya kuganda, yoghurt?	Lait caillé ou yaourt?
THINPOR	Papas ligeiras (maheo,banana)?	Maheu (uji wa Mahindi, Uji wa Mutama, Uji wa Ndizi...)?	Bouillie légère (bouillie de mais, de sorgho, de banane...)?
WHTEACOF	Chá ou café com leite ?	Chai au kahawa na maziwa?	Thé avec du lait ou café au lait?
WATLQD	Outros (JOLLY JUS, refrigerantes, outras bebidas doces, infusão de ervas, água, chá claro, gripe water, café preto…)?	Vyakula vyote vya majimaji vinavyo patikana hapa kama vile soda, chai bila maziwa, kahawa bila maziwa, pia vyakula vingine vya majimaji vya asili, JOLLY JUS...?	Tout autre liquide à base d'eau (JOLLY JUS, sodas, autres boissons sucrées, tisanes, boisson anti-coliques, thé sans lait, café sans lait, liquides traditionnels...)?
FOOD	Ontem, durante o dia ou à noite, o ${NAME} comeu alimento sólido ou semi-sólido (macio, mole)?	Jana, mchana au usiku ${NAME} alikula chakula kigumu au chepesi?	Durant la journée ou la nuit d'hier, est-ce que ${NAME} a mangé des aliments solides ou semi-solides ?

BOTTLE	Será que ${NAME} bebeu algo no biberao, ontem, durante o dia ou à noite?	Je ${NAME} alinyonya kupitia biberon jana?	Est-ce que ${NAME} a bu quelque chose au biberon durant la journée ou la nuit d'hier ?
XFood	Agora eu gostaria de lhe perguntar sobre alguns alimento em particular que ${NAME} pode comer. Estou interessado em saber se o seu filho tem comido esse alimento, ou se o mesmo tem sido combinado com outros alimentos. Ontem, durante o dia ou à noite, ${NAME} consumiu qualquer um desses alimentos?	Nataka nikuulize kuhusu vyakula fulani ambavyo umesha kula, naomba nijuwe mtoto wako pia amesha wahi kuvikula jana mchana ao usiku kuvichanga na vyakula vingine kwenye mlo wake?	Maintenant je voudrais vous poser des questions sur les aliments que ${NAME} a pu manger. Je voudrais savoir si votre enfant a reçu un des aliments suivants même s'il a été mélangé à une autre nourriture. Durant la journée ou la nuit d'hier, est-ce que ${NAME} a reçu un des aliments suivants ?
FLESHFD	Carnes [carne de vaca, cabra, ovelha, carneiro, porco, coelho, galinha, pato, fígado, rim, coração]?	Nyama (ya Ng'ombe, kondoo, sungura, nguruwe, kuku, bata, maini, moyo)	Viande (boeuf, lapin, mouton, poulet, porc, canard, foie, rein, coeur...)
FBF	FBF (CSB…Papas para crianças)?	ACE (unga wa uji wa watoto)?	ACE (farine pour la bouillie des enfants…)?
INFORMFE			
RATION	Qual e o tipo dos alimentos que voces recebem?	Aina gani ya vyakula mnapokea?	Quel type de ration recevez-vous?
VINT	Pesquisador: confirmo que o meu questionario esta completo.	Muojiaji: nahakikisha maswali yangu yameenea.	Enquêteur : Je confirme que le questionnaire est complet.
VSUPCON	Supervisor: confirmo que o meu questionario esta completo.	Msimamizi: nahakikisha maswali yangu yameenea.	Superviseur : Je confirme que le questionnaire est complet.

WOMAN QUESTIONNAIRE

name	label::Portuguese	label::Swahili	label::Français
DeviceID			
TimeStartRecorded			
TimeEndRecorded			

XWOMEN	ESTE QUESTIONARIO E ADMINISTRADO PARA AS MAMAS SELECIONADAS DE 15-49 ANOS.	HAYA MA SWALI YANA HULIZWA KWA WA MAMA WENYE UMRI WA MIAKA KUANZIA MIAKA 15 -49 AMBAYE WAMECHAGULIWA.	CE QUESTIONNAIRE DOIT ÊTRE ADMINISTRÉ À TOUTES LES FEMMES ÂGÉES DE 15 À 49 ANS DANS LE MÉNAGE SÉLECTIONNÉ
CAMP			
ZONE	Zona numero	Zone yako	Code zone
BLOCK	Bloco numero	Bloke yako	Code bloc
SURVDATE_c	Date da entrevista	Tarehe ya kuojiwa	Date d'entretien
TEAM	Numero da equipa	Idadi ya timu	Numéro d'équipe
HHN	Numero do casa	Namba ya nyumba	Numéro ménage
I_gps	Por favor leva ponto no GPS	Tafadhali chukua pwenti kwenye GPS:	Veuillez prendre un point GPS:
W	QUESTIONARIO DA ANEMIA DAS MULHERES	MASWALI YA UPUNGUFU WA DAMU KWA WANA WAKE	QUESTIONNAIRE ANÉMIE FEMMES
SURVDATE			
WCAMP			
Team			
WMID			
XWMID	Bilhete	Kitambulisho	ID
HH			
WMCONST	Consentimento dado?	Makubaliano?	Consentement donné?
WMAGE	Idade anos	Umri kwa miaka	Age (années)
PREGNANT	Tu estas de gravida?	Je una mimba?	Êtes-vous enceinte ?
ANC	Está atualmente inscrita no programa de consulta Pré-Natal?	Je ume andikwa kwenye kitengo cha cliniki kabla ya uzazi?	Êtes-vous actuellement inscrite au programme de soins prénataux ?
FEREC	Está actualmente a receber Acido Folico/Sal ferroso?	Unapata kwa sasa acid folik na sal ferreso?	Recevez-vous des comprimés de fer-folate ?
WMHB	Hb (g/L or g/dL)	Hemoglobina	Hémoglobine (g/dL)

name	label::Portuguese	label::Swahili	label::Français
VINT	Pesquisador: confirmo que o meu questionario esta completo.	Muojiaji: nahakikisha maswali yangu yameenea.	Enquêteur : Je confirme que le questionnaire est complet.
VSUPCON	Supervisor: confirmo que o meu questionario esta completo.	Msimamizi: nahakikisha maswali yangu yameenea.	Superviseur : Je confirme que le questionnaire est complet.

WASH QUESTIONNAIRE

name	label::Portuguese	label::Swahili	label::Français
DeviceID			
TimeStartRecorded			
TimeEndRecorded			
XWASH	Água e Higiene: Questionário por agregado familiar	MAJI NA USAFI:1 MASWALI KATIKA NYUMBA	WASH : 1 questionnaire par ménage
CAMP			
ZONE	Número da zona	Zone yako/namba	Code zone
BLOCK	Número do bloco	Bloke yako	Code bloc
SURVDATE_c	Data da entrevista	Tarehe ya kuojiwa	Date d'entretien
TEAM	Número da equipa	Idadi ya timu	Numéro d'équipe
HHN	Número do casa	Namba ya nyumba	Numéro ménage
I_gps	Por favor, clica no ponto no GPS	tafadhali chukua pwenti kwenye GPS:	Veuillez prendre un point GPS:
WSCONST	O agregado familiar deu consentimento para responder ao questionário?	Hali ana rizisha kwa kujibu ma swali?	Le ménage a t-il donné son consentement pour répondre au questionnaire ?
HHSIZE	Quantas pessoas vivem nesta casa e dormiram aqui ontem à noite?	Je, niwatu wangapi wanaoishi katika nyumba hii na ambao wame lala humo usiku ulio pita?	Combien de personnes vivent dans ce ménage et ont dormi ici la nuit dernière ?
SOURCE	Qual é a principal fonte de água potável para os membros do seu agregado familiar?	Ni watu wangapi wanakaa katika nyumba hii?	Quelle est la source principale d'eau de boisson pour les membres de votre ménage?
SOUROTH	Se existe outros,podes especificar	Kama kuna wengine, wataje	Si autre, veuillez spécifier:

SATISFY	Você está satisfeito com o abastecimento de água?	Je unarizika na huduma ya maji?	Êtes-vous satisfait de l'approvisionnement en eau ?
REASON	Qual é a razão de não estar satisfeito com aprovisionamento de água?	Sababu gani ahurizishwi na huduma ya maji?	Quelle raison principale fait que vous n'êtes pas satisfait de l'approvisionnement en eau ?
REASONOTH	Se existe outros, podes especificar	Kama kuna ingine,itaje.	Si autre, veuillez spécifier
TOILET	Que tipo de instalações sanitárias a familia usa?	Nyumba hii inatumikisha choo ya aina gani?	Quel type de toilettes votre ménage utilise-t-il ?
TOILSHR	Quantas famílias compartilham esta latrina?	Ni nyumba ngapi ambazo zina changiya choo hii?	Combien de ménages partagent ces toilettes ? (CE NOMBRE COMPREND LE MENAGE ENQUÊTÉ)
TOILSHR_c			
CHILD	Você tem crianças com menos de três anos de idade?	J,Uko na watoto wa chini ya miaka tatu?	Avez-vous des enfants de moins de trois ans ?
STOOL	A última vez [NOME DA CRIANÇA MAIS NOVA] fez fezes, o que foi feito com as fezes?	Mara ya mwisho (taja jina ya mtoto wa mwisho) alihenda kwenye choo kubwa,mulifanya nini ili mupate kuitoa?	La dernière fois que [NOM DE L'ENFANT LE PLUS JEUNE] a fait ses besoins, qu'est-ce qui a été fait pour les éliminer ?
STOOLOTH	Si existe outros,podes especificar	Kama kuna wengine,wataje	Si autre, veuillez spécifier
CONTAINER	Quantos recipientes que usastes para tirar aqua ontem?	Vyombo vingapi ulivyo tumia jana kwa kuteka maji?	Combien de récipients avez-vous utilisé pour collecter de l'eau hier?
HHWLOOP	Por favor, mostre os recipientes que você usou ontem para a recolha de água	Tafadhali, onyesha vyombo ulivyo vitumia kwa kuchota maji jana, orodhesha moja baada ya kingune	S'il vous plaît, montrez-moi les récipients que vous avez utilisé hier pour collecter l'eau (enregistrer les récipients un à un).
LITRE	Capacidade em litros	Uwezo kwa ma lita kwa kila chombo	Capacité en litres du récipient
JOURNEY	Numero de viajens feitas com cada recipiente	Umbali wa kila safari ya kuleta maji	Nombre de trajets effectués avec le récipient
XSUMLIT			
HHWLOOP			
XTotLitDay			

name	label::Portuguese	label::Swahili	label::Français
XXTotLitDay	Total de litros utilizados pelo agregado familiar: 10LT	Idadi kamili ya maji kwa siku ni: XX kwa lita.	La quantité totale d'eau par jour est de : ${XTotLitDay} litres.
XPerLitDay			
XXPerLitDay	Quantidade em Litro cada pessoa por dia:10	idadi ya lita za maji kwa kila mtu kwa siku ni :10	Le nombre de litres par personne par jour est : ${XPerLitDay}.
STORE	Por favor, mostre-me onde armazena sua água potável.	Tafadhali nionyeshe kwenye mnahifadhi maji ya kunywa.	S'il vous plaît, montrez-moi où vous stockez votre eau potable.
VINT	Pesquisador: confirmo que o meu questionario esta completo.	Muojiaji: nahakikisha maswali yangu yameenea.	Enquêteur : Je confirme que le questionnaire est complet.
VSUPCON	Supervisor: confirmo que o meu questionario esta completo.	Msimamizi: nahakikisha maswali yangu yameenea.	Superviseur : Je confirme que le questionnaire est complet.

MOSQUITO NET COVERAGE

name	label::Portuguese	label::Swahili	label::Français
DeviceID			
TimeStartRecorded			
TimeEndRecorded			
XMOSQUITO	Malaria: perguntas no dono da casa	Malaria : maswali kwa mwenye nyumba	Malaria : Questionnaire par ménage
CAMP			
ZONE	Numero da zona	Zone yako/namba	Code zone
BLOCK	numero do bloco	bloke yako	Code bloc
SURVDATE_c	Date da entrevista	Tarehe ya kuojiwa	Date d'entretien
TEAM	Numero da equipa	Idadi ya timu	Numéro d'équipe
HHN	Numero da casa	Namba ya nyumba	Numéro ménage
I_gps	Tenta usar o GPS	Jaribu kutumia GPS.	Veuillez prendre un point GPS:
TNCONST	O dono dá consentimento para responder às questões?	Je mwenye nyumba ailiwakubalia ili apate kuhojiwa?	Le ménage at-il donné son consentement pour répondre au questionnaire ?

TOTHH	Quantas pessoas vivem nesta casa e dormiram aqui ontem à noite?	Watu ngapi wanakao hapa na wa melala myamba hiyi jana usiku?	Combien de personnes vivent dans ce ménage et ont dormi ici la nuit dernière ?
TOTCH	Quantas crianças 0-59 meses viver nesta casa e dormiram aqui ontem à noite?	Watoto ngopi wa muzi 0 mpaka 59 wenye waonaishi na wmelala katika nyumba hiyi jana usiku?	Combien d'enfants de 0 à 59 mois vivent dans ce ménage et ont dormi ici la nuit dernière ?
TOTPW	Quantas mulheres grávidas vivem nesta casa e dormiram aqui ontem à noite??	Waja wazito (wa mimba) ngopi wa ishi ndani ya nyumba hiji na wamelala jana usiku hapa?	Combien de femmes enceintes vivent dans ce ménage et ont dormi ici la nuit dernière ?
MOSNETS	Você tem atualmente redes mosquiteiras nesta casa que podem ser usadas quando se deita?	Je muko na chandaniwa ambayo munayo tumia usiku saa muna po lala?	Avez-vous dans votre ménage des moustiquaires qui peuvent être utilisées pendant le sommeil ?
NUMNETS	Quantas destas redes mosquiteiras são usadas quando dorme a familia?	Uko nazo ngopi mabazo munazo tumikisha mnapo lala usiku?	Combien de ces moustiquaires peuvent être utilisées pendant le sommeil dans votre ménage ?
Nets	Observa as redes mosqueteiras nas camas	Chunguza vyandarua vya kitanda.	Verifier les moustiquaires des lits.
LNTID	O número de redes mosquiteiras	Namba ya chandaruwa	NUMÉRO DE LA MOUSTIQUAIRE
NETSOBS	Posso ver quantas redes mosquiteiras têm?	Unaweza ku chunguza hicho chandaruwa?	POUVEZ-VOUS OBSERVER CETTE MOUSTIQUAIRE ?
XReview	Tenta voltar para atraz e observa se a casa tem quantos mosquiteiros.para poder saber se o seu mosquiteiro e necessario na sua observacao	Jaribu kurudi nyuma na uchunguze kama mwenye nyumba ana vyandaruwa vingapi.ila ujuwe kwamba ni chandaruwa chako ndicho kitakacho tumiwa katika uchunguzi.	VEUILLEZ REVENIR EN ARRIÈRE ET CORRIGER LE NOMBRE DE MOUSTIQUAIRES DONT LE MÉNAGE DISPOSE. RAPPELEZ-VOUS QUE SEULES LES MOUSTIQUAIRES QUE VOUS AVEZ PU VOIR DOIVENT ÊTRE PRISES EN COMPTE POUR L'ENQUÊTE.
LNTBRAND	OBSERVE A REDE E REGISTRE A MARCA DA REDE QUE ESTA NA ETIQUETA.	Chunguza Chandaruwa na unakili jina la ahina hiyo kwenye (Etiquette)Lebo	OBSERVER LA MOUSTIQUAIRE ET NOTER LE NOM DE LA MARQUE SUR L'ÉTIQUETTE.
LNTBRANDOTH	Se for outra, especifique	Kama ni ingine,unajaribu kuitaja	Si autre, veuillez spécifier
LNTYPE			
Nets			
TOTLN			

| Members	Questionário sobre os membros da família	Uchunguzi juu ya mwenye nyumba	ENQUÊTE SUR LES MEMBRES DU MÉNAGE
MID	O número do agregado familiar	Namba ya mwenye nyumba	NUMÉRO DU MEMBRE DU MÉNAGE
SEX	O membro da familia entrevistado é do género feminino ou masculino	Je mwenye nyumba huyo ni wa jinsia ya Kiume ao wa Kike	Ce membre du ménage est-il de sexe masculin ou féminin ?
AGE	Quantos anos tem?	Ana miaka mingapi?	Quel âge a ce membre ?
PREGSTAT	Está grávida actualmente?	Je, huyo mwenyenyumba nimjamzito wakati huu?	Est-ce que ce membre est enceinte actuellement ?
SLEPTNET	Dormiu na rede na noite passada?	Je,jana huyo mwenye nyumba ali lala ndani ya chandaruwa?	Est-ce que ce membre a dormi sous une moustiquaire la nuit dernière ?
SLEPTIDNET	FAÇA UM CIRCULO NO NUMERO CORRESPONDENTE DE REDES MOSQUITEIRAS USADAS.	Andika namba ambayo inaambatana na chandaruwa ambacho ametumikisha.	ÉCRIRE LE NUMÉRO CORRESPONDANT À LA MOUSTIQUAIRE QU'IL/ELLE A UTILISÉE.
SLEPTBRAND	Que tipo de rede mosquiteira usava antes?	Ni haina gani ya chandaruwa ambayo ulinakili kabla.	QUELLE MARQUE DE MOUSTIQUAIRE AVEZ-VOUS NOTÉ AUPARAVANT ?
SLEPTTYPE			
XAgeAux			
XPregAux			
XAuxC			
XAuxPW			
Members			
TOTSLPNT			
TOTSLPLN			
TOTCHNT			
TOTCHLN			
TOTPWNT			
TOTPWLN			
VINT	Pesquisador: confirmo que o meu questionario esta completo.	Muojiaji: nahakikisha maswali yangu yameenea.	Enquêteur : Je confirme que le questionnaire est complet.
VSUPCON	Supervisor: confirmo que o meu questionario esta completo.	Msimamizi: nahakikisha maswali yangu yameenea.	Superviseur : Je confirme que le questionnaire est complet.

Appendix 4 Local Events Calendar

| Religious Holidays	Other Events	Local Events	Month-Year	Age (in months)
Local Events Calendar Used During the Survey to Estimate the Age of Young Children
	International Women's Day 8	Floods Peanut Season Rainy Season	March 2015	1
		Rainy Season	February 2015	2
	New Year's Day	Floods Mango Season Rainy Season School Break	January 2015	3
Christmas 25	16 Days of Activism (25 Nov-10 Dec) World AIDS Day 1 Human Rights Day 10 SGBV Campaign 16	Emmuali Mango Season Rainy Season School Break	December 2014	4
	16 Days of Activism (25 Nov-10 Dec)	Mango Season	November 2014	5
			October 2014	6
		Cashew Season Dry Season (Hot)	September 2014	7
		Nampula Day 22 Cashew Season Dry Season (Hot)	August 2014	8
Ramadan 28 Jun-27 Jul			July 2014	9
Pentecost 8 Ramadan 28 Jun-27 Jul	International Child's Day 1 Day of the African Child 16 World Refugee Day 20 Independence Day (MOZ) 25	Dry Season (Cool)	June 2014	10
	Labour Day 1	Dry Season (Cool)	May 2014	11
Easter 20	Day of the Mozambican Woman 7	Dry Season (Cool) Peanut Season	April 2014	12
	International Women's Day 8	Famine Peanut Season Rainy Season	March 2014	13
		Famine Rainy Season	February 2014	14
	New Year's Day	Famine Mango Season Rainy Season School Break	January 2014	15
Christmas 25	16 Days of Activism (25 Nov-10 Dec) World AIDS Day 1 Human Rights Day 10 SGBV Campaign 16	Emmuali Famine Mango Season Rainy Season School Break	December 2013	16

	16 Days of Activism (25 Nov-10 Dec)	Mango Season	November 2013	17
			October 2013	18
		Cashew Season Dry Season (Hot)	September 2013	19
Ramadan 9 Jul-7 Aug		Nampula Day 22 Cashew Season Dry Season (Hot)	August 2013	20
Ramadan 9 Jul-7 Aug			July 2013	21
	International Child's Day 1 Day of the African Child 16 World Refugee Day 20 Independence Day (MOZ) 25	Dry Season (Cool)	June 2013	22
Pentecost 20	Labour Day 1	Dry Season (Cool)	May 2013	23
	Day of the Mozambican Woman 7	Dry Season (Cool) Peanut Season	April 2013	24
Easter 31	International Women's Day 8	Peanut Season Rainy Season	March 2013	25
		Rainy Season	February 2013	26
	New Year's Day	Mango Season Rainy Season School Break	January 2013	27
Christmas 25	16 Days of Activism (25 Nov-10 Dec) World AIDS Day 1 Human Rights Day 10 SGBV Campaign 16	Emmuali Mango Season Rainy Season School Break	December 2012	28
	16 Days of Activism (25 Nov-10 Dec)	Mango Season	November 2012	29
			October 2012	30
		Cashew Season Dry Season (Hot)	September 2012	31
Ramadan 20 Jul-18 Aug		Nampula Day 22 Cashew Season Dry Season (Hot)	August 2012	32
Ramadan 20 Jul-18 Aug			July 2012	33
	International Child's Day 1 Day of the African Child 16 World Refugee Day 20 Independence Day (MOZ) 25	Dry Season (Cool)	June 2012	34
Pentecost 28	Labour Day 1	Dry Season (Cool)	May 2012	35
Easter 8	Day of the Mozambican Woman 7	Dry Season (Cool) Peanut Season	April 2012	36
	International Women's Day 8	Peanut Season Rainy Season	March 2012	37
		Rainy Season	February 2012	38
	New Year's Day	Mango Season Rainy Season School Break	January 2012	39
Christmas 25	16 Days of Activism (25 Nov-10 Dec)	Emmuali	December 2011	40

	World AIDS Day 1 Human Rights Day 10 SGBV Campaign 16	Mango Season Rainy Season School Break		
	16 Days of Activism (25 Nov-10 Dec)	Mango Season	November 2011	41
			October 2011	42
		Cashew Season Dry Season (Hot)	September 2011	43
Ramadan 1-30		Nampula Day 22 Cashew Season Dry Season (Hot)	August 2011	44
			July 2011	45
Pentecost 13	International Child's Day 1 Day of the African Child 16 World Refugee Day 20 Independence Day (MOZ) 25	Dry Season (Cool)	June 2011	46
	Labour Day 1	Dry Season (Cool)	May 2011	47
Easter 24	Day of the Mozambican Woman 7	Dry Season (Cool) Peanut Season	April 2011	48
	International Women's Day 8	Peanut Season Rainy Season	March 2011	49
		Rainy Season	February 2011	50
	New Year's Day	Mango Season Rainy Season School Break	January 2011	51
Christmas 25	16 Days of Activism (25 Nov-10 Dec) World AIDS Day 1 Human Rights Day 10 SGBV Campaign 16	Emmuali Mango Season Rainy Season School Break	December 2010	52
	16 Days of Activism (25 Nov-10 Dec)	Mango Season	November 2010	53
			October 2010	54
Ramadan 11 Aug-9 Sep		Cashew Season Dry Season (Hot)	September 2010	55
Ramadan 11 Aug-9 Sep		Nampula Day 22 Cashew Season Dry Season (Hot)	August 2010	56
			July 2010	57
	International Child's Day 1 Day of the African Child 16 World Refugee Day 20 Independence Day (MOZ) 25	Dry Season (Cool)	June 2010	58
Pentecost 23	Labour Day 1	Dry Season (Cool)	May 2010	59
Easter 14	Day of the Mozambican Woman 7	Dry Season (Cool) Peanut Season	April 2010	60

Appendix 5 Maps

Maratane Refugee Camp: Extent and services

Camp Services
- W Food warehouse
- Hospital
- School
- Creche
- Police
- Refugee committee
- Administration
- Transit center
- Borehole
- Functional water point
- Partially functional water point
- Unfunctional water point
- Recreation area

Extent
- Camp extent
- Mozambican area

Zone A
Zone B
Zone C
Zone D

Camp Entrance

0   0,5 Km

Design: CartONG (April 2015)
Note:The boundaries of the Mozambican areas are based on a 2013 satellite imagery and are therefore uncertain.

Maratane Refugee Camp UNHCR SENS Survey 2015:
CHILD: Acute Malnutrition Linked to the Household's Ration Type

Zone A

Zone B

Zone C

Zone D

Acutely Malnourished Children by Household Ration Type

○ Full ration
◐ Mixed ration
▲ Half ration

■ No child malnutrition
■ Child malnutrition

○ Excluded children
◆ Don't know

0   0,25 Km

Design: CartONG (May 2015)
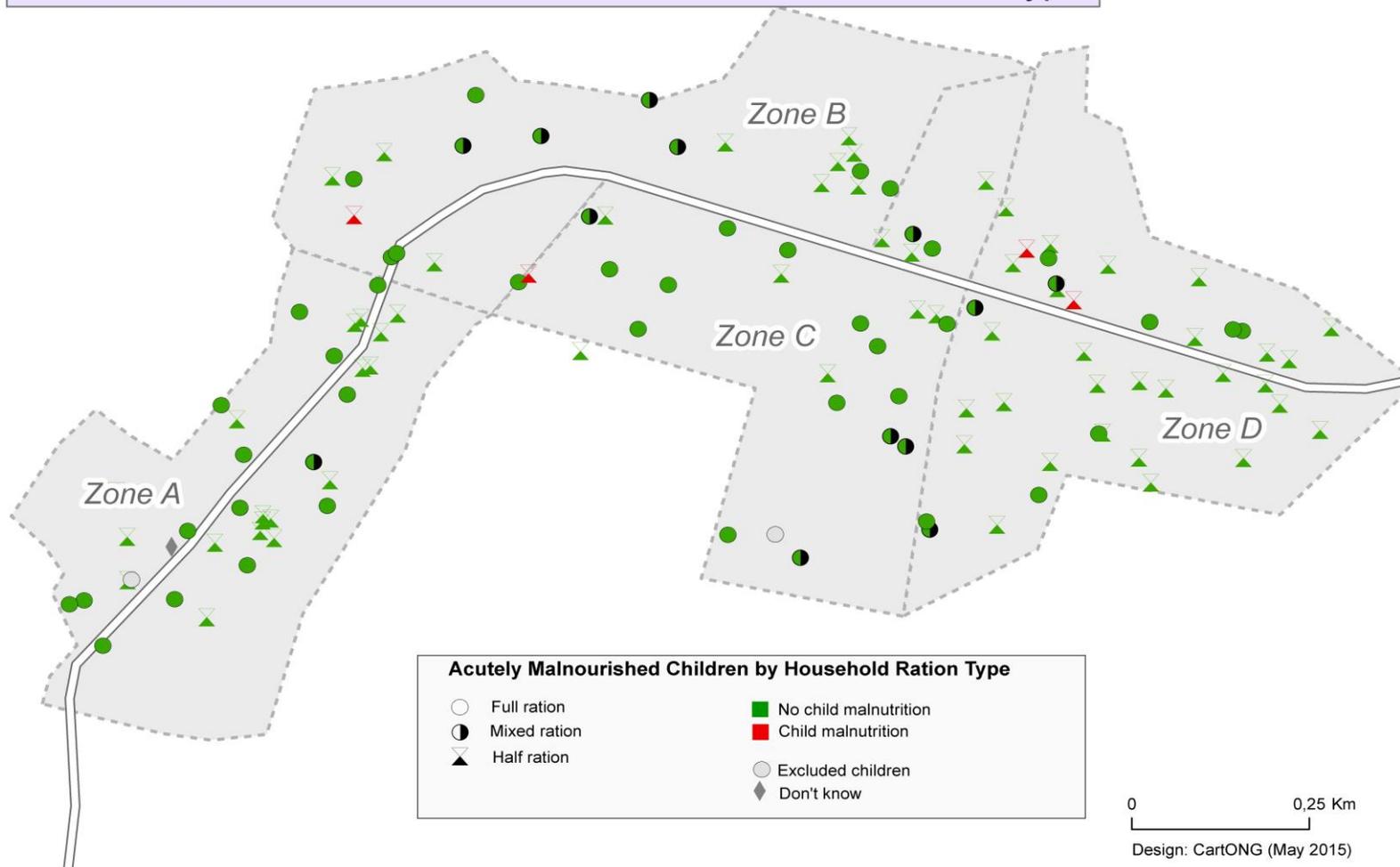
Maratane Refugee Camp UNHCR SENS Survey 2015:
CHILD: Stunting linked to the household's ration type

Zone B

Zone C

Zone D

Zone A

Nb of stunted children by type of household:

Full ration

Mixed ration

Half ration

No child stunting

Child stunting

Excluded children

Don't know

0   0,25 Km

Design: CartONG (May 2015)
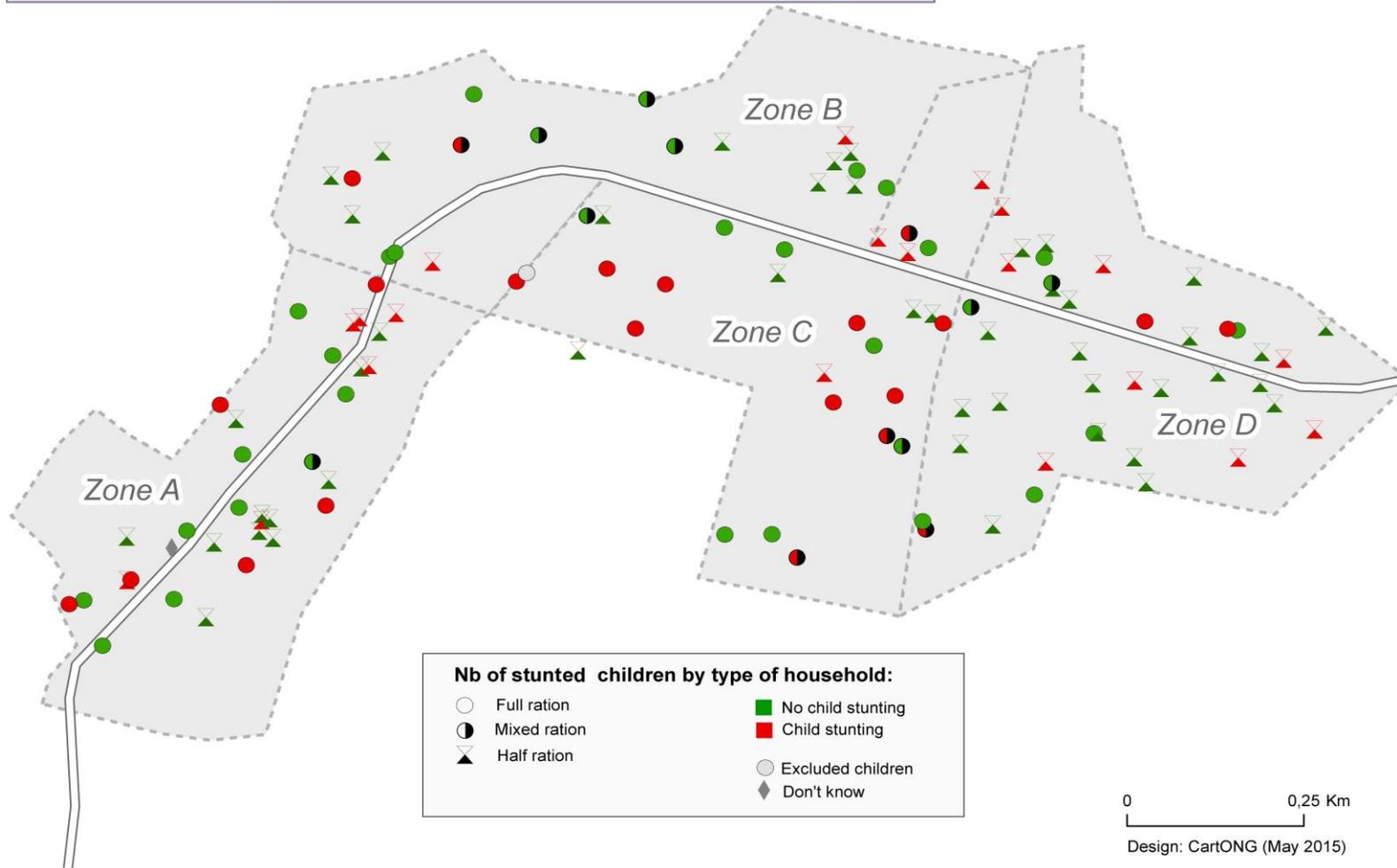
Maratane Refugee Camp UNHCR SENS Survey 2015:
CHILD: Anaemic Children by Household Ration Type

Zone B

Zone C

Zone A

Zone D

Nb of anaemic children by type of household:

○ Full ration
◑ Mixed ration
▼ Half ration

■ No anaemic children
■ Anaemic children

◆ Don't know

0   0,25 Km

Design: CartONG (May 2015)
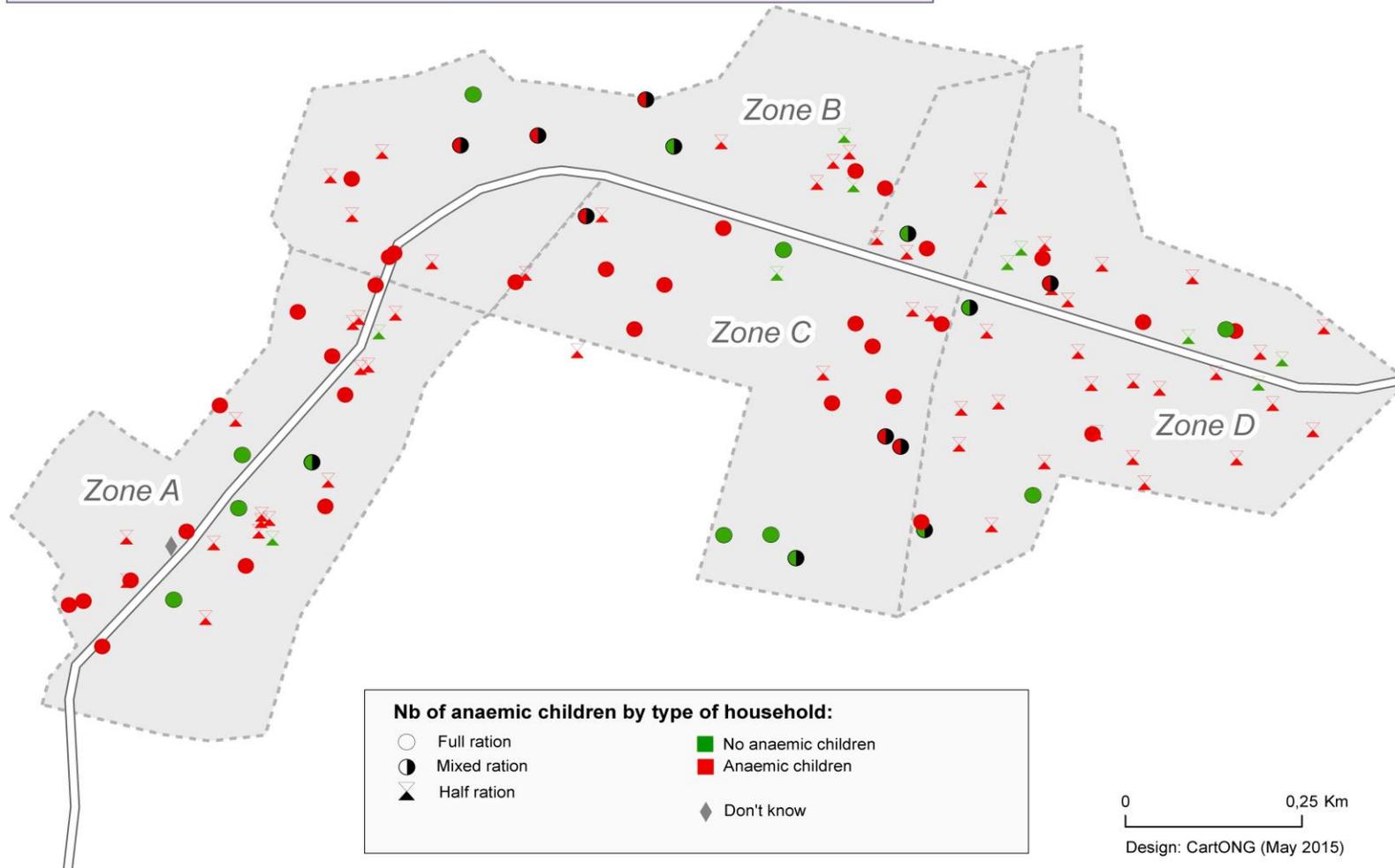
Maratane Refugee Camp UNHCR SENS Survey 2015:
WOMEN: Anaemia Amongst Non-Pregnant Women Aged 15-49 y.o.

Zone B

Zone C

Zone A

Zone D

Presence of Anaemic Non-Pregnant
15-49 y.o. Women in HH

No

Yes

0   0,25 Km

Design: CartONG (May 2015)
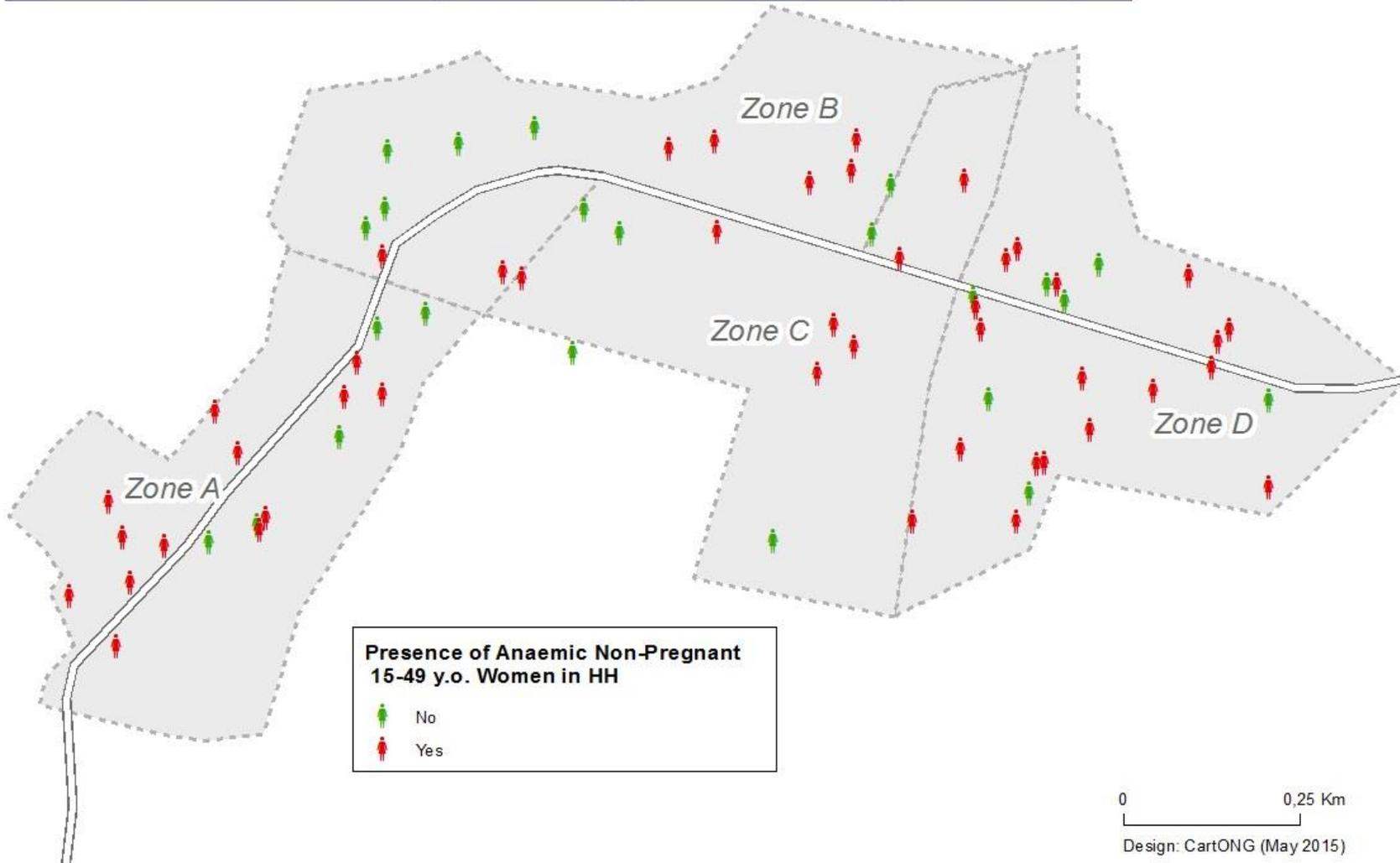
Maratane Refugee Camp UNHCR SENS Survey 2015: Water satisfaction

Zone B

Zone D

Zone C

Zone A

HH satisfied with water access
YES (36%)

For others, reason :
Not enough/irregular supply (52%)
Long waiting queue (12%)
Bad taste (30%)
Long distance (6%)
Other (2%)

Water points
Borehole
Functional water point
Partially functional water point
Unfunctional water point

0   0,25 Km

Design: CartONG (May 2015)

74
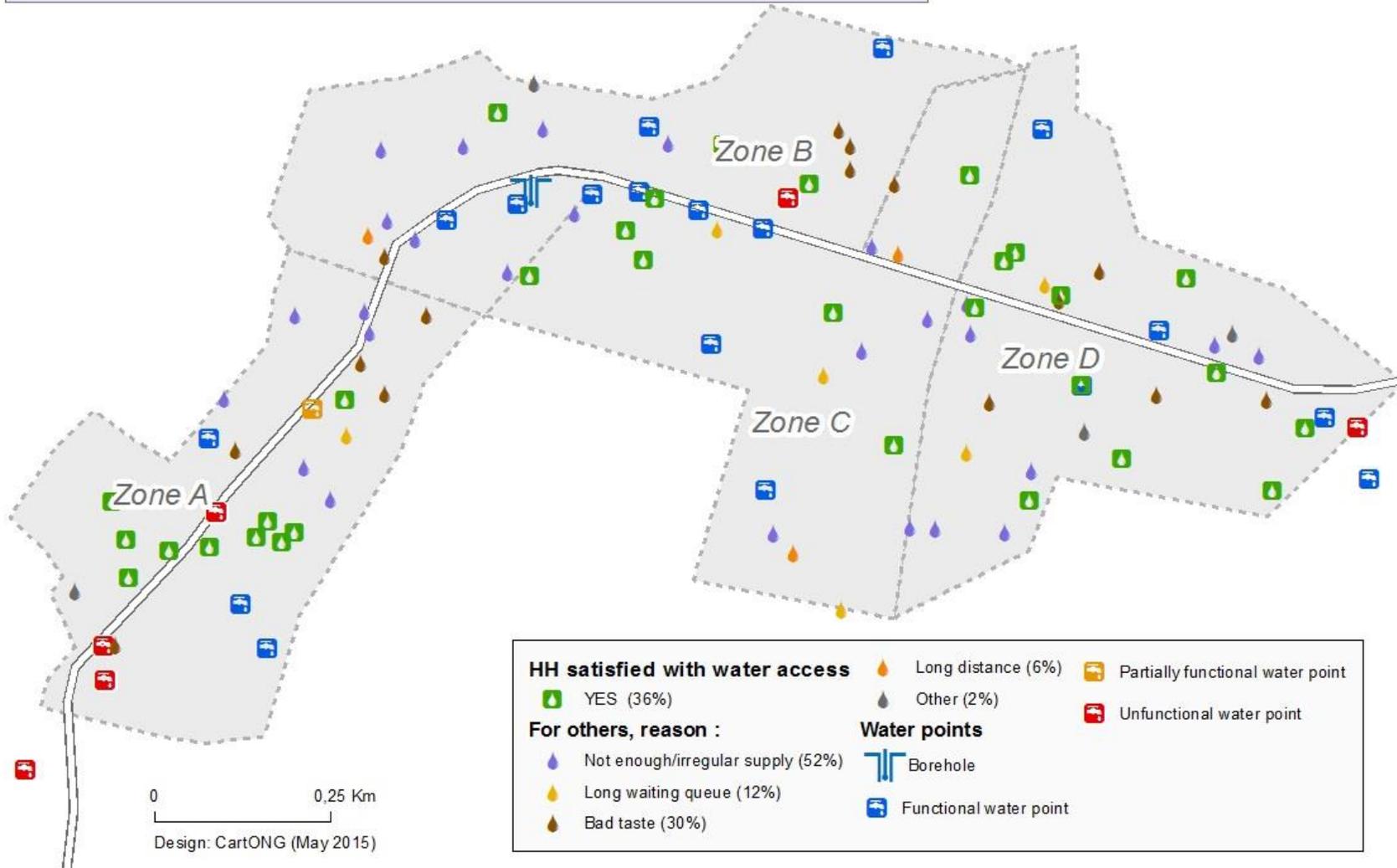
Maratane Refugee Camp UNHCR SENS Survey 2015:
MOSQUITO NETS: Household typology

Zone B

Zone C

Zone A

Zone D

Presence of nets by type

At least one LLIN net

At least one net but no LLIN

No net

0   0,25 Km

Design: CartONG (May 2015)

75