FINAL REPORT

STANDARDISED EXPANDED NUTRITION SURVEY (SENS)

SOUTH SUDANESE REFUGEES IN EL LERI SETTLEMENT:

SOUTH KORDOFAN STATE, SUDAN

Survey conducted: 26th – 31st May 2018
Report finalized: September 2018

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Lists of Acronyms

ANC	Antenatal Care
BSFP	Blanket Supplementary Feeding Program
CDC	Centres for Disease Control and Prevention
CDR	Crude Death Rate
CI	Confidence Interval
CIS	Care International Swiss
COR	Coordination of Refugees
CWW	Concern world Wide
DL	Deci Litre
ENA	Emergency Nutrition Assessment
EPI	Expanded Programme on Immunization
Epi Info	Name of CDC software for epidemiological investigations
GAM	Global Acute Malnutrition
GFD	General Food Distribution
HAC	Humanitarian Aid Coordination
HAZ	Height-for-Age Z-score
HDD	Household Dietary Diversity
HFA	Height-for-Age
IYCF	Infant and young child feeding
Kcal	Kilocalorie
Kg	Kilogram
LLIN	Long Lasting Insecticide treated Nets
MAM	Moderate Acute Malnutrition
MUAC	Mid-Upper Arm Circumference
NCHS	National Centre for Health Statistics
OTP	Outpatient Therapeutic Programme
SAM	Severe Acute Malnutrition
SC	Stabilization Centre
SMART	Standardized Monitoring and Assessment for Relief and Transition
SMOH	Sudan Ministry of Health
SENS	Standardized Expanded Nutrition Survey
TFP	Therapeutic Feeding Program
TSFP	Targeted Supplementary Feeding Program
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children’s Fund
WASH	Water Sanitation and Health
WFA	Weight-for-Age
WFH	Weight-for-Height
WFP	World Food Program
WHO	World Health Organization
WHZ	Weight-for-Height / Length Z-score

Executive Summary

A Standardized Expanded Nutrition Survey (SENS) was conducted in El Leri rural settlement of South Sudanese refugees in South Kordofan State between 26th and 31st of May 2018. The survey followed SMART methodology (https://smartmethodology.org/) and the Standardized Expanded Nutrition Survey (SENS) guidelines for refugee populations (SENS version 2, 2013) sens.unhcr.org.

Objectives of the survey

The main objective of the SENS survey was to assess the general health, nutrition and mortality indices of refugees, in order to make action-oriented recommendations for appropriate nutrition, public health and related interventions.

Primary objectives:

a. To determine the prevalence of acute malnutrition among children 6-59 months.
b. To determine the prevalence of stunting among children 6-59 months.
c. To assess the two-week period prevalence of diarrhoea among children 6-59 months.
d. To assess the prevalence of anaemia among children 6-59 months and women of reproductive age (non-pregnant 15-49 years).
e. To determine the coverage of measles vaccination among children 9-59 months of age.
f. To determine the coverage of vitamin A supplementation in the last six months among children 6-59 months.
g. To investigate IYCF practices among children 0-23 months of age.
h. To assess the proportion of households those use an adequate quantity of water per person per day.
i. To determine the population's access to improved water, sanitation and hygiene facilities.
j. To determine the coverage of ration cards and the duration the GFD ration lasts for recipient households.
k. To determine the extent to which negative coping strategies are used by households.
l. To assess household dietary diversity.
m. To determine the utilisation of mosquito nets (all types and LLINs) by the population (including children 0-59 months and pregnant women).
n. To make recommendations on actions to be taken to address the situation

Secondary objectives:

o. To assess crude and under-five mortality rates in the refugee settlement in the last three months.
p. To determine enrolment into Antenatal Care clinic and coverage of iron-folic acid supplementation in pregnant women.
q. To assess the enrolment status of children 6-59 months in to selective feeding programs (OTP/SC and TSFP).

Systematic random sampling method was used to estimate a representative sample of children and households. The sample size was 335 children and 589 households (HH). All eligible children aged 6-59 months from all selected households were included in the assessment for anthropometry, anaemia, and health, while children between 0-23 months were included in the assessment for Infant and Young Child Feeding practices (IYCF). All

selected households were assessed for demographic data to estimate the mortality rate. Whereas half of the selected households were considered as representative and assessed for Food Security, WASH, Mosquito net coverage, and women (15-49 years) for Haemoglobin (Hb) level measurement (for anaemia determination) and coverage for antenatal care. All the data was transferred to ENA for SMART and Epi-Info software for data analysis. Table 1 contains a summary of the key SENS findings.

Table 1: Summary of key findings, El Leri South Sudanese Refugees settlement in South Kordofan 2018

Indicators	El Leri		Classification of public health significance or target (where applicable)
	Number / total	% (95% C.I.)	
CHILDREN 6-59 months of age			
Acute Malnutrition (WHO 2006 Growth Standards)			
Prevalence of global malnutrition (<-2 z-score and/or Oedema)	91/518	17.6 % (14.5 - 21.1)	Critical if ≥ 15%
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no Oedema)	69/518	13.3 % (10.7 - 16.5)	
Prevalence of severe malnutrition (<-3 z-score and/or Oedema)	22/518	4.2 % (2.8 - 6.3)	UNHCR Target of <2%
Oedema		0.2%	
Stunting (WHO 2006 Growth Standards)			
Prevalence of stunting (<-2 z-score)	45/517	8.7 % (6.6 - 11.4)	Critical if ≥ 40% Target of <20%
Prevalence of severe stunting (<-3 z-score)	9/517	1.7 % (0.9 - 3.3)	
Prevalence of acute malnutrition based on MUAC cut-off measurement			
Prevalence of global malnutrition (< 125 mm and/or Oedema)	45/518	8.7 % (6.6 - 11.4)	
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no Oedema)	33/518	6.4 % (4.6 - 8.8)	
Prevalence of severe malnutrition (< 115 mm and/or Oedema)	12/518	2.3 % (1.3 - 4.0)	
Anaemia (6-59 months)			
Total anaemia (Hb <11 g/dl)	220/508	43.3% (39.0-47.7)	High if ≥ 40% Target of <20%
Mild (Hb 10-10.9)	124/508	24.4% (20.8-28.4)	
Moderate (Hb 7-9.9)	95/508	18.7% (15.5-22.4)	
Severe (Hb <7)	1/508	0.2% (0.0-1.3)	

Indicators	El Leri		Classification of public health significance or target (where applicable)
	Number / total	% (95% C.I.)	
Program enrolment and Coverage			
Therapeutic feeding program (based on all admission criteria WHZ, Oedema and MUAC)	8/27	29.6% (13.8-50.2)	Target of ≥ 90%
Therapeutic feeding program based on Oedema and MUAC only	7/12	58.3% (27.7-84.8	
TSFP (based on all admission criteria WHZ, Oedema and MUAC)	22 /86	25.6% (16.8-36.1)	Target of ≥ 90%
TSFP based on MUAC only	15 /33	45.5% (28.1-63.6)	
Measles vaccination with card (9-59 months)	51/481	10.6% (8.0-13.8)	
Measles vaccination with card or recall (9-59 months)	232/481	48.2% (43.7-52.8)	Target of ≥ 95%
Vitamin A supplementation coverage with card, within past 6 months (6-59 months)	9/517	1.7% (0.9-3.4)	
Vitamin A supplementation within past 6 months with card or recall	105/517	20.3% (17.0-24.1)	Target of ≥ 90%
Morbidity			
Diarrhoea in last 2 weeks	141/517	27.3% (23.5-31.4)	
CHILDREN 0-23 months of age			
Infant and Young children Feeding Indicators			
Timely initiation of breastfeeding (0-23 months)	121/224	54.0% (47.3-60.7)	
Exclusive breastfeeding under 6 months (0-5 months)	10/34	29.4% (15.1-47.5)	
Continued breastfeeding at 1 year (12-15 months)	24/30	80.0% (61.4-92.3)	
Continued breastfeeding at 2 years (20-23 months)	19/47	40.4% (26.4-55.7)	
Introduction of solid, semi-solid or soft foods (6-8months)	12/33	36.4% (20.4-54.9)	
Consumption of iron-rich or iron-fortified foods (6-23 months)	95/184	51.6% (44.2-59.0)	
Bottle feeding (0-23 months)	1 /227	0.4% (0.0-2.4)	
WOMEN 15-49 years of age			

Indicators	El Leri		Classification of public health significance or target (where applicable)
	Number / total	% (95% C.I.)	
Anaemia (non-pregnant)			
Total Anaemia (Hb <12 g/dl)	48/198	24.2% (18.4-30.8)	High if ≥ 40%
Mild (Hb 11-11.9)	22/198	11.1% (7.1-16.3)	
Moderate (Hb 8-10.9)	24/198	12.1% (7.9-17.5)	
Severe (Hb <8)	2 /198	1.0% (0.1-3.6)	
ANC enrolment and iron-folic acid pills coverage among pregnant women (15-49 years)			
Currently enrolled in ANC programme	13/24	54.2% (32.8-74.4)	
Currently receiving iron-folic acid pills	13/24	54.2% (32.8-74.4)	
FOOD SECURITY			
Food distribution			
Proportion of households with a ration card	236/255	92.5% (88.6-95.5)	
Average HDDS	3.8		
coping strategies used by the surveyed population over the past month			
Borrowed cash, food or other items	101 /255	39.6% (33.6-45.9)	
Sold any assets (furniture, seed stocks, tools, other NFI, livestock etc.)	46 /255	18.0% (13.5-86.5)	
Requested increase remittances or gifts as compared to normal	56/255	22.0% (17.0-27.5)	
Reduced the quantity and/or frequency of meals	140/255	54.9% (48.6-61.1)	
Begged	37 /255	14.5% (10.4-19.4)	
Engaged in potentially risky or harmful activities (Cutting live trees, smuggling, etc.)	90/255	35.3% (29.4-41.5)	
Proportion of households reporting using none of the coping strategies over the past month	46/255	18.0% (13.5-23.3)	
Combined results for consumption of food commodities and micronutrient rich foods by households			

Indicators	El Leri		Classification of public health significance or target (where applicable)
	Number / total	% (95% C.I.)	
Households not consuming any vegetables, fruits, meat, eggs, fish/seafood, and milk/milk products	119/254	46.9% (40.6-53.2)	
Households consuming organ meat/flesh meat, or fish/seafood (HAEM FE)	130/255	51.0% (44.7-57.3)	
WASH (Water quantity , Safe excreta disposal)			
Proportion of households using improved drinking water source	236/248	95.2% (91.7-97.5)	
Proportion of households that say they are satisfied with the drinking water supply	29/247	11.7% (8.0-16.4)	
Proportion of households that use:			UNHCR target is ≥20 lpppd
≥ 20 lpppd	85/248	34.3% (28.4-40.5)	
15 - <20 lpppd	35/248	14.1% (10.0-19.1)	
<15 lpppd	128/248	51.6% (45.2-58.0)	
Average consumption: Liters per person per day (LPPPD)	16.8		
An improved excreta disposal facility (improved toilet facility, not shared)	25/243	10.3% (6.8-14.8)	
A shared family toilet (improved toilet facility, 2 households only)	19/243	7.8% (4.8-11.9)	
A communal toilet (improved toilet facility, 3 households or more)	34/243	14.0% (9.9-19.0)	
An unimproved toilet (unimproved toilet facility or public toilet)	165/243	67.9% (61.6-73.7)	
Mosquito net coverage and utilization			
Proportion of households owning at least one LLIN	100/255	39.2% (33.2-45.5)	UNHCR Target of >80%
Household ownership of net of any type	123/255	48.2% (42.0-54.6)	
Proportion of total population (all ages) Slept under net of any type	149/1567	9.5%	
Average number of persons per LLIN (mean)	5.5		2 persons per LLIN
MORTALITY			

Indicators	El Leri		Classification of public health significance or target (where applicable)
	Number / total	% (95% C.I.)	
Crude Mortality Rate (CMR) (total deaths/10,000 people / day)	0.49 (0.21-1.13)		Critical if >1/10,000/day
Under five Mortality Rate (U5MR) (deaths in children under five/10,000 children under five / day)	0.53 (0.09-3.18)		Critical if >2/10,000/day

Summary of Key results

The overall findings of the nutritional status for refugees in El Leri settlement was classified as being critical, with Global Acute Malnutrition (GAM) prevalence 17.6% (14.5-21.1 C.I.), above the 15.0% of emergency threshold (WHO classification). The prevalence of Severe Acute Malnutrition (SAM) was 4.2% (2.8-6.3 C.I.), above 2% of the critical level (UNHCR classification). *The UNHCR intended target for the prevalence of GAM among children 6-59 months of age is < 10% and the target for the prevalence of SAM is <2% in refugee settings*.

The prevalence of anaemia among children 6-59 months of age was 43.3% (39.0-47.7 C.I.). This is categorized as being high (critical if ≥40%). Whereas the anaemia prevalence among non-pregnant women of reproductive age (15-49 years) was 24.3% (18.4-30.8 C.I). This was below the emergency threshold, however, within the category of medium level of anaemia (20-39%).

The majority of key indicators for Infant and Young Children Feeding practices (IYCF) were lower than expected. Timely initiation of breastfeeding among children 0-23 month age was 54.0% (47.3-60.7 C.I.). Exclusive breastfeeding among children 0-5 month of age was only 29.4% (15.1-47.5 C.I), which is low. Continued breast feeding during 12-15 months of age was 80.0% (61.4-92.3 C.I.), which is relatively better than the other indices. Introduction of solid, semi-solid or soft foods for children 6-8 months old was low 36.4% (20.4-54.9 C.I.). The consumption of iron-rich or iron-fortified foods for children 6-8 months old was also found to be low, 51.6% (44.2-59.0 C.I.).

Health related indicators: The rate of morbidity (diarrhea) among children 6-59 month of age in the last two weeks prior to nutrition survey was 27.3% (23.5-31.4 C.I) this was a high prevalence, considering the proportional morbidity pattern for the context. Measles vaccination among children 9-59 months of age was 48.2% (43.7-52.8 C.I.). This is below the target (≥ 95%). Likewise the coverage of Vitamin A supplementation for children 6-59 months of age was only 20.3% (17.0-24.1 C.I.), which is far below the target (≥ 90%).

Enrolment coverage for acutely malnourished children (Severe Acute Malnutrition-SAM and Moderate Acute Malnutrition-MAM) in the nutrition programme (at a point in time), by all criteria of admission was reported at 29.6% (13.8-50.2 C.I.) and 25.6% (16.8-36.1 C.I.) respectively. The overall enrolment status for both SAM and MAM were far below the expected level (target >90%).

Food assistance is the main source of household food security for the majority of persons of concern. According to information obtained from community leaders and partners, food assistance which is ought to be provided on a monthly-basis was interrupted for two months prior to the survey. As such, data for the duration of period which food lasts from the recent food assistance was not collected. Dependency on negative coping strategies

was a common phenomenon. For example: A significant proportion of community members engaged in potentially risky or harmful activities i.e. 35.3% (29.4-41.5 C.I.).

The proportion of households using an improved drinking water source was reported at 95.2% (91.7-97.5 C.I.). The average per capita water use/consumption was acceptable i.e. 16.8 Litres per person per day. However, the proportion of households using < 15 Litres per person per day was high i.e. 51.6% (45.2-58.0 C.I.). This may be interpreted as having disproportionate water availability between the households.

The survey revealed the following with respect to toilet coverage: those using improved toilet facility-not shared 10.3% (6.8-14.8 C.I.), improved toilet facility-2 households or more 7.8% (4.8-11.9 C.I.), and improved toilet facility-3 households or more 14.0% (9.9-19.0 C.I). Communal latrines were widely used i.e. 67.9% (61.6-73.7 C.I.). There is significant room for improvement on this regard.

The proportion of households owning at least one mosquito net of LLIN type was 39.2% (33.2-45.5 C.I.) and the proportion of households owning at least one mosquito net of any type was 48.2% (42.0-54.6 C.I.) and this is below UNHCR's target >80%. These findings are in contradiction with operational realities as mass distribution of LLIN was conducted in December 2017. The most plausible reasons for this could be the likelihood for refugees having sold these LLINs in order to take care of essential needs, expectation to receive an additional mosquito net or simply ignorance as the survey was conducted during low breeding period for mosquitos.

The retrospective mortality rates for the last 90 days (three months) for Crude Mortality Rate (CMR) and under five years old children Mortality Rate (U5MR) were 0.49 and 0.53/10,000/day respectively. This is within acceptable limits for an emergency context i.e. <1.0/10,000/day for CMR and <2/10,000/day for U5MR.

The overall survey results showed gaps in service delivery to refugees with respect to food security, nutrition, health, WASH and the general community child-caring practices. Interruption of the monthly food distribution, limited options of household income to access the missing commodities from local market and undesirable negative coping strategies remain a key challenge.

Summary of Key Recommendations and Priorities

Health and Nutrition Partners to work on a mechanism to sustain health and nutrition services and minimize/avoid interruption of services, which adversely affect efforts made to improve the nutritional status of persons of concerns. (UNICEF, WFP, WHO and UNHCR to provide supports for project implementing partners)

The nutrition partners (MOH, UNICEF, WFP, CONCERN and CIS) should agree on the use of mixed criteria (MUAC/OEDEMA/ WFH-Z) for identification and enrolment of SAM and MAM cases into nutrition programme to increase the coverage of detecting and enrolment of SAM and MAM cases into the programme, as well ensure both MUAC and Weight-For-Height-Z (WFH-Z) score admits all eligible children into the programme. This approach entails primary screening with MUAC for all children, then secondary screening is undertaken through WFH anthropometric measurement for children ''at risk'' of acute malnutrition (i.e. those measuring MUAC >12.5 cm and <13.5 cm). This will maximize the opportunity to identify acute malnourished children during screening.

WFP to continue providing general food assistance and preventive measures through Blanket Supplementary Feeding Program (BSFP) for children 6-23 months, breast feeding mothers and pregnant women on regular-

basis to avoid further deterioration of nutrition and food security situations of persons of concern, as food insecurity is considered as a primary contributing factor for the high malnutrition rate. Explore a mechanism, such as prepositioning of food, alternative forms of assistance, compensation mechanisms with the available resources etc.

Health partners (MOH, CIS, CONCERN and their partners) to develop strategy to increase vaccination coverage, card retention for all under five children to ensure that immunization and vitamin A supplementation coverage reach the recommended targets i.e. >95% and >90% respectively.

Establish reasons behind what happened to the LLINs that were distributed in all camps during the mass distribution campaign in December 2017, as LLIN coverage is currently lower than UNHCR's target >80%. Additionally, monitor proper usage of these LLINs. (UNHCR, WHO, MOH and CIS).

Establish a clear outreach, and a context specific awareness promotion strategy which includes a wider perspective (i.e. Health, Nutrition, WASH etc.) with a clear monitoring plan to ensure that appropriate messages are delivered and are reflected on behavioral changes. (Health and nutrition technical working group).

UNHCR and partners to strengthen coordination and to ensure a holistic approach (Health, WSH, Education, Food security, Livelihoods etc.) through joint strategies with the active participation of persons of concerns to address the multiple underlying causes of malnutrition.

1. Introduction

South Kordofan State is situated in the southern part of Sudan, sharing an international border with South Sudan's Unity and Upper Nile states in the South and national borders to the East with White Nile State, North and West to the West Kordofan and to the North with the North Kordofan State. The state is uniquely covered with mountains and also known as the Nuba Mountain area in Sudan. It is divided into 17 localities of which 14 localities are accessible and the other three are not accessible. Kadugli town is the capital and is situated in the extreme western part of the State. The economy relies on agricultural and livestock activities, horticultural crops, fruits production, and trading contribute a substantial amount of income in the local economy. Due to its closeness to South Sudan, South Kordofan state has been either a recipient or a transit point for South Sudanese Refugees. Subsequently, the South Sudanese refugees are widely spread throughout the State and these are identified as collective self-settlement in certain locations or dispersed self-settlement in wider locations.

South Sudanese Refugees in Sudan

The conflict in South Sudan coupled with acute food insecurity situation forced hundreds of thousands of civilians, and this outflow continues into neighbouring countries including Sudan. The majority of refugees originate from South Sudan's Upper Nile (83%), followed by Jonglei (9%), and Unity (8%). Refugees in small numbers also arrived from NBeG, WBeG, Eastern, Western, Central Equatorial, Warrap and the Lakes. As of the end of April 2018, over 410,900 South Sudanese refugees had arrived in Sudan since December 2013, out of which about 30,315 are hosted in South Kordofan State, living across various location as out-of-camp settlements. The out-of-camp settlements are either identified as collective self-settlements and scattered/dispersed self- settlements. The largest number of refugee population in South Kordofan lives in the following settlement areas: El Leri 14,805, Sirajiya 5,340, Quaryd 922 and Gedied 762. In total 72.0% of South Sudanese refugees in South Kordofan live in collective self-settlement areas[1].

Table 2: South Sudanese Refugee Population in South Kordofan (UNHCR, ProGres report as of April 2018)

Locality	Settlement site	Settlement type	Total Individuals	Total Household
Abu Jubaiha	Abu Nowara	Dispersed self-settlement	314	78
	Mabrooka	,, ,,	585	55
	Um Hashima	,, ,,	699	173
	Gedied	Collective self-settlement	762	291
	Quaryd	,, ,,	922	279
	Sirajiya	,, ,,	5340	1,376
	Abu Jubaiha Town	Dispersed self-settlement	2,780	683
Al Tadamon	Al Tadamon	,, ,,	650	122
El Leri	El Leri West	Collective self-settlement	14,805	4,068
Kadugli	Kadugli	Dispersed self-settlement	1,512	436
Dilling	Dilling	,, ,,	942	421
Habila	Habila Town	,, ,,	439	172
Al Quoz	Ed Dibebat	,, ,,	160	58
	El Hamadi	,, ,,	89	29

[1] UNHCR, April 30, 2018: monthly South Sudanese population update in Sudan.

	El Hajez	,,	,,	99	44
Rashad	Tegmala	,,	,,	217	48
Total				**30,315**	**8,333**

Coordination

UNHCR in collaboration with the government of Sudan counterpart Commission of Refugees (COR) supports a coordinated response to the refugee situation in Sudan. UNHCR also co-leads the national inter-agency Refugee Consultation Forum (RCF). Under the RCF there are national-level sectoral Technical Advisory Groups (TAGs) which includes health and nutrition TAG and field-level Refugee Working Groups (RWGs), aimed at contributing to an effective coordination mechanism for the refugee response at all levels. UNHCR, WFP, UNICEF, UNFPA and WHO in collaboration with the government of Sudan and partners, international and local agencies, have been providing lifesaving assistance and continue working towards ensuring the continuation of assistance to address health and nutritional needs for refugees on arrival at reception centers, in the camps and settlements.

There are various forms of coordination mechanisms in South Kordofan; such as the monthly humanitarian Sector/Cluster coordination meetings that are supported by OCHA, Sector coordination: WASH- led by UNICEF; Health – led by WHO; Nutrition – led by UNICEF; Food security and livelihoods- led by FAO; NFIs, Protection and Refugee Working Group - led by UNHCR. All forms of coordination structures are co-chaired or facilitated by respective government counterparts.

Nutrition Situation

The nutrition programme in El Leri settlement comprises of a curative component for the treatment of severely and moderately acute malnutrition, as well as protection or nutritional support for children 6 to 59 months of age, pregnant women and lactating mothers for the six months after delivery through blanket supplementary feeding programme. The curative programme is designed to apply Community based Management of Acute Malnutrition (CMAM) model, comprising of treatment of SAM and MAM at a facility level and out of the facility (at home) element through the participation of the community. Community participation is supported by community outreach workers who deliver key messages and conduct active case finding. Targeted Supplementary Feeding Programme (TSFP) for the treatment of Moderately Acute Malnutrition (MAM) is supported by WFP that provides Ready-to-Use Supplementary food (Plumpy-sup). Outpatient Therapeutic feeding programme (OTP) for the treatment of Severely Acute Malnutrition (SAM) without medical complications is supported by UNICEF that procures and distributes Ready-to-Use Therapeutic food (Plumpy-nut). The Stabilization Center (SC) for the treatment of Severely Acute Malnutrition with medical complications is supported by UNICEF and WHO that ensure availability of therapeutic milk and inpatient medical care. Implementation of CMAM components is supported by international and national/local NGOs. During the time of survey, the nutrition programme in El Leri was supported by CWW and Almanar. Periodic mass MUAC screening of children 6-59 months is undertaken every month with the admission cut off point of <12.5 cm.

Figure 1: Trends of MUAC screening in El Leri camp

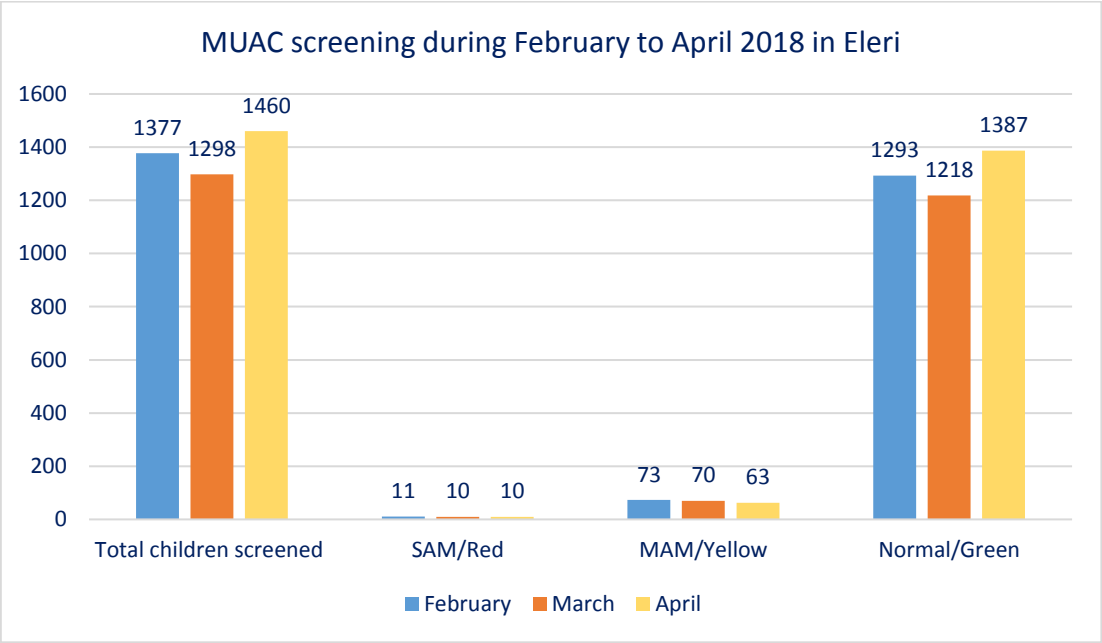
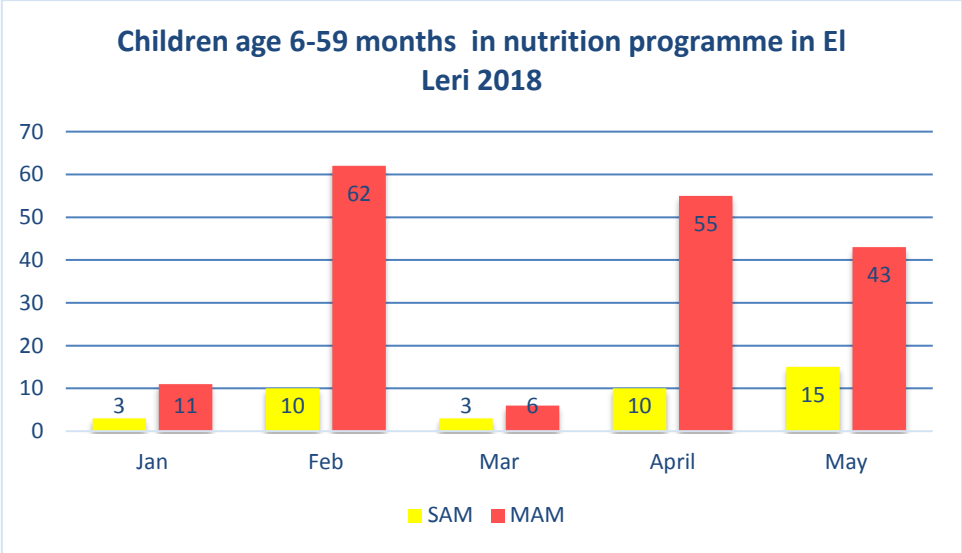


Figure 2: Number of children in nutrition programme in El Leri 2018



According to figure one and two, the number of children in the nutrition programme was less than children identified as malnourished by monthly MUAC screening.

Food Security

Refugees in El Leri settlement are dependent on the general food ration assistance which is provided by WFP and its partner on a monthly-basis. At the time of the survey, the planned General Food Distribution (GFD) was not undertaken for the previous two months due to prolonged administrative processes for establishing a new partnership agreement between WFP and the partner. As per the information obtained from local key informants, the distribution was expected to resume in June and continue as usual. Besides, a supply pipeline break was encountered since the beginning of the year. Distribution of pulses, oil and salt were irregular and

missing from the expected food basket. Refugees exercised various forms of coping strategies to earn an income and to support household access to food. Due to limited livelihood opportunities and weak/poor support from partners, refugees are engaged in stress and risky coping strategies. Consequently many refugees work in the informal market/ sectors such as alcohol production which is prohibited under the Sudan laws, some parents send their young children to the nearby towns for manual and casual labour, young girls work in gold mining areas, others engage in early marriages etc.

Health situation

Primary healthcare services are provided in El Leri at the health facility which is run by the SMoH and supported by WHO and partner NGOs. Care International Swiss (CIS) is providing health assistance and Concern World Wide (CWW) runs the nutrition program and the health facility serves as an OTP center. Though local and international NGOs are assisting the health facility, refugees were complaining about the quality and quantity of medicaments and services which are not adequate to combat chronic and acute illnesses. Health services are unable to bear the high burden of communicable and chronic diseases. The common diseases in El Leri are malaria, ARI, diarrheal diseases and skin infections. The recently concluded multi-agency assessment team identified certain gaps to improve primary health care delivery in El Leri.

Water and sanitation situation

Water supply in El Leri settlement is supported by UNHCR and UNICEF together in partnership with CIS. The current water capacity in the settlement is not adequate for the increasing number of refugees. According to information obtained from community leaders the daily water supply is below their needs. As a result families with financial capacity depend on purchased water from private vendors which is mostly sold at a higher price. Families that do not have financial capacity normally send their wives and children to distant places in order to fetch water from unprotected sources.

Hygiene and sanitation activities are supported by CIS. Improved latrines (VIP) are available in the settlement area. As the settlement was established through self-group settlement, the distribution of latrines in the area is erratic and rather close to the houses. Uncontrolled garbage disposal and open defecation was observed during the time of survey.

2. Survey Objectives

The aim of the survey was to assess the general health, nutrition and mortality indices of refugees in order to establish baseline data and formulate action-oriented recommendations for appropriate nutrition, public health and related interventions.

Objectives:

The main objective of the SENS assessment was to assess the general health, nutrition and mortality indices of refugees, in order to make action-oriented recommendations for appropriate nutrition, public health and related interventions.

Primary objectives:

a. To determine the prevalence of acute malnutrition among children 6-59 months

b. To determine the prevalence of stunting among children 6-59 months

c. To assess the two-week period prevalence of Diarrhoea among children 6-59 months

d. To assess the prevalence of anaemia among children 6-59 months and women of reproductive age (non-pregnant, 15-49 years)

e. To determine the coverage of measles vaccination among children 9-59 months

f. To determine the coverage of vitamin A supplementation in the last six months among children 6-59 months

g. To investigate IYCF practices among children 0-23 months

h. To assess the proportion of households that use an adequate quantity of water per person per day

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

j. To determine the coverage of ration cards and the duration the General Food Distribution (GFD) ration lasts for recipient households

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

l. To assess household dietary diversity

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

n. To make recommendations on actions to be undertaken to address the situation

Secondary objectives:

o. To assess crude and under-five mortality rates in the refugee settlements in the last three months.

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

q. To assess the enrollment status of children 6-59 months into selective feeding programme (OTP/SC and TSFP).

3. Methodology

The survey followed UNHCR's Standardized Expanded Nutrition Survey (SENS) guidelines for refugee populations combined with SMART methodology.

3.1. Sampling procedures and sample size calculations

The total households in the settlement was considered as the sampling frame. A Household is considered as sampling unit and the total number of households to be studied were calculated by using ENA simple random sampling method. The data range for the sampling frame was taken from the total number of households which were labelled during the time of the survey. Empty houses were excluded from sampling.

Systematic/Interval random sampling method was used to estimate a representative sample of households and children, based on the expected prevalence of global acute malnutrition. There was no reference/data for the

GAM prevalence rate in El Leri, as a result, the prevalence of global acute malnutrition (GAM) rate was estimated 50% (the highest prevalence rate was used as this survey was baseline) in order to maximize the sample size. The estimated desired precision (±5), the proportion of children below 5 years 19.5%, and the average household size 3.6 with a 10% allowance for non-response was used. Finally, El Leri under five population was smaller, therefore a correction was made as per the ENA for SMART guideline. Population data were obtained from the UNHCR ProGres database (Population update as of 30th April 2018), which has the demographic breakdown of the population through biometrics (secondary) level registration of all refugees in the camps. Finally, a correction was made as per the SMART for ENA recommendation for a smaller population. Table 4 contains a summary of the sample size calculation.

Table 3 : Sample size calculation for cross sectional anthropometric survey in El Leri settlement 2018

Sampling procedure	Sampling
Estimated prevalence (%)	50
± Desired precision (%)	5
Average household size (ProGres)	3.6
<5 population (%)(ProGres)	19.5
Non response households (NRR) (%)	10
Total Population	14,805
Children to be included	335
Households to be included	589

All eligible children aged 6-59 months from all selected households were included in the assessment of anthropometry, Anaemia and health, while children aged 0-23 months were included for assessment infant and young child feeding practices. All selected households were assessed for demographic data to estimate the mortality rate. Whereas half of the selected households were considered as representative and assessed for Food Security, WASH, Mosquito net coverage, and women (15-49 years) for HB level measurement (for anaemia determination) and coverage for antenatal care.

3.2. Questionnaire and measurement methods

The questionnaires were prepared in English language and were administered in Arabic and local language *Shuluk* via translators. Following the SENS guideline, the six modules of SENS were used (anthropometry and health, Anaemia, IYCF, WASH, mosquito net coverage, and food security). In addition, the mortality module was included to collect demographic data. Following these modules questionnaires were designed to provide information on the relevant indicators for the different target groups as indicated in the survey objectives. The six modules of questionnaires covered the following areas and measurements:

Module 1 (anthropometry and health)*: Children 6-59 months*- This included information on questions and measurements on children aged 6-59 months. Information was collected on anthropometric status, Oedema, enrolment in selective feeding programme, immunization (measles), vitamin A supplementation in the last six months, morbidity from Diarrhoea in past two weeks.

Module 2 (Anaemia): Hemoglobin assessment among children aged 6 – 59 months and non-pregnant women*: Women 15-49 years*- This included questions and measurements on women aged 15 – 49 years. Information was collected on women's pregnancy status, enrolment in ANC, coverage of iron-folic acid pills.

Module 3 (IYCF): Children 0-23 months- This included questions on infant and young child feeding (IYCF) practices among children aged 0-23 months.

Module 4: *Water, Sanitation and Hygiene (WASH)* this included questions on the quantity of water used per household and the satisfaction with the drinking water supply, hygiene and sanitation.

Module 5: *Food Security:* - This included questions on access and use of the GFD ration, negative coping mechanisms and household dietary diversity.

Module 6: *Mosquito net:*-This included questions on proportion of households owning at least one mosquito net and utilization.

Additional Module from SMART: Mortality- This included questions related to mortality in the last three months among the households.

3.3. Measurement methods

a) Household-level indicators

WASH, Food Security and Mosquito Net: The questionnaire that was used under this section was adopted from the UNHCR's Standardized Expanded Nutrition Survey Guidelines for Refugee Populations.

Mortality: Individual-level mortality data collection was used from the SMART methodology.

b) Individual-level indicators

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

Birth date or age in months for children 0-59 months: the exact date of birth (day, month, and year) was recorded from birth certificates and checked on an EPI card or child health card. If no reliable proof of age was available, age was estimated in months using multiple approaches, by using a local seasonal and events calendar or by probing, checking if sibling age is known and length/height measurement was used for inclusion; the child had to measure between 65 cm and 110 cm. The age in mortality data was recorded in years.

Age of women 15-49 years: unlike small children, the exact date of birth of women was difficult to explore. Reported age was recorded in years.

Weight of children 6-59 months: measurements were taken to the closest 100 grams using an electronic scale (SECA scale). All children were weighed without clothes. Female children were measured by female survey team inside the selected house, or keeping light clothes to address cultural sensitivity.

Height/Length of children 6-59 months: children's height or length was taken to the closest millimeter using a wooden height board (*Shorr Product*). Height/age was used to decide on whether a child should be measured lying down (length) or standing up (height). Children less than 87cm (< 2 years) were measured lying down, while those greater than or equal to 87cm were measured standing up.

Oedema in children 6-59 months: bilateral Oedema was assessed by applying gentle thumb pressure on top of both feet of the child for a period of three seconds (counting 1001 to 1003) and thereafter observing for the presence or absence of an indent.

MUAC of children 6-59 months: MUAC was measured at the mid-point of the left upper arm between the elbow and the shoulder and taken to the closest millimeter using a standard tape. MUAC was recorded in centimeters.

Child enrolment in selective feeding programme for children 6-59 months: Selective feeding programme enrolment status was assessed for the outpatient therapeutic programme and for the supplementary feeding programme. This was verified by presence of a card or showing the mother or care-giver the sample products (Plumpynut and Plumpy Sup) given in the different programme.

Measles vaccination in children 6-59 months: Measles vaccination was assessed by checking for the measles vaccine on the EPI card if available or by asking the care-giver to recall if no EPI card was available. For ease of data collection, results were recorded on all children but were only analyzed for children aged 9-59 months.

Vitamin A supplementation in last 6 months in children 6-59 months: Whether the child received a vitamin A capsule over the past six months was recorded from the EPI card or health card if available or by asking the caregiver to recall if no card is available. A vitamin A capsule was shown to the caregiver when asked to recall.

Haemoglobin 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 deciliter by using the portable HemoCue Hb 301^{+} Analyzers (HemoCue, Sweden). If severe anaemia was detected, the child or the woman was referred to health facility for treatment immediately.

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

ANC enrolment and iron/folic acid pills coverage: if the surveyed woman was pregnant, it was assessed by card or recall whether she was enrolled in the ANC programme and was receiving iron-folic acid pills.

Infant and young child feeding practices in children 0-23 months: infant and young child feeding practices were assessed based on the UNHCR's Standardized Expanded Nutrition Survey Guidelines for Refugee Populations.

Referrals: Children aged 6-59 months were referred to health centre/post for treatment when MUAC was < 12.5 cm, when Oedema was present, or when haemoglobin was < 7.0 g/dL. Women of reproductive age were referred to the hospital for treatment when haemoglobin was < 8.0 g/dL.

3.4. Case definitions, inclusion criteria and calculations

Mortality: The Crude Mortality Rate (CMR) was expressed as the number of deaths per 10,000 persons per day. The formula below was applied:

Crude Death Rate (CMR) = 10,000/a*f/ (b+f/2-e/2+d/2-c/2)

Where:
a = Number of recall days
b = Number of current household residents
c = Number of people who joined household during recall period
d = Number of people who left household during recall period
e = Number of births during recall period
f = Number of deaths during recall period

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

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

Categories of acute malnutrition	Percentage of median (NCHS Growth Reference 1977 only)	Z-scores (NCHS Growth Reference 1977 and WHO Growth Standards 2006)	Bilateral Oedema
Global acute malnutrition	<80%	< -2 z-scores	Yes/No
Moderate acute malnutrition	<80% to ≥70%	< -2 z-scores and ≥ -3 z-scores	No
Severe acute malnutrition	>70%	> -3 z-scores	Yes
	<70%	< -3 z-scores	Yes/No

Stunting, also known as chronic malnutrition was defined using height-for-age index values and was classified as severe or moderate based on the cut-off points shown below. Main results are reported according to the WHO Growth Standards 2006.

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

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

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

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

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

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

Table 7 : Low MUAC values cut-offs in children 6-59 months

Categories of acute malnutrition	Categories of low MUAC values
Global acute malnutrition	<12.5 cm
Moderate acute malnutrition	≥ 11.5 cm and <12.5 cm
Severe acute malnutrition	< 11.5 cm:

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

Coverage of SFP programme (%) = 100 x *No. of surveyed children with MAM according to SFP admission criteria who reported being registered in SFP* *No. of surveyed children with MAM according to SFP admission criteria*
Coverage of TFP programme (%) = 100 x *No. of surveyed children with SAM according to OTP admission criteria who reported being registered in OTP* *No. of surveyed children with SAM according to OTP admission criteria*

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

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

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

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

Exclusive breastfeeding under 6 months*:*
Proportion of infants 0–5 months of age who are fed exclusively with breast milk: (including expressed breast milk or from a wet nurse, ORS, drops or syrups (vitamins, breastfeeding minerals, medicines)
Infants 0–5 months of age who received only breast milk during the previous day
Infants 0–5 months of age

Continued breastfeeding at 1 year:
Proportion of children 12–15 months of age who are fed breast milk
Children 12–15 months of age who received breast milk during the previous day
Children 12–15 months of age

Introduction of solid, semi-solid or soft foods*:*
Proportion of infants 6–8 months of age who receive solid, semi-solid or soft foods
Infants 6–8 months of age who received solid, semi-solid or soft foods during the previous day
Infants 6–8 months of age

Children ever breastfed*:*
Proportion of children born in the last 24 months who were ever breastfed
Children born in the last 24 months who were ever breastfed
Children born in the last 24 months

Continued breastfeeding at 2 years:
Proportion of children 20–23 months of age who are fed breast milk
Children 20–23 months of age who received breast milk during the previous day
Children 20–23 months of age

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

Bottle feeding:
Proportion of children 0-23 months of age who are fed with a bottle
Children 0–23 months of age who were fed with a bottle during the previous day
Children 0–23 months of age

Anaemia in children 6-59 months and women of reproductive age non pregnant (15-49 years): Anaemia was classified according to the following cut-off points in children 6-59 months and non-pregnant women of reproductive age. Pregnant women were not included in this survey for the assessment of Anaemia as recommended by UNHCR {pregnant women are not to be included in routine nutrition surveys for the assessment of Anaemia due sample size issues, (usually a small number of pregnant women are found) as well as the difficulties in assessing gestational age in pregnant women)}.

Table 8 : Definition of Anaemia (WHO 2000)

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

Classification of public health problems and targets

Mortality: The following thresholds are used for mortality.

Table 9 : Mortality benchmarks for defining crisis situations (NICS, 2010)

Emergency threshold
CDR > 1/10,000 / day: 'very serious'
CDR > 2 /10,000 /day: 'out of control'

CDR > 5 /10,000 /day: 'major catastrophe' (double for U5MR thresholds)

Anthropometric data: The target for the prevalence of global acute malnutrition (GAM) for children 6-59 months of age by camp, country and region should be < 10% and the target for the prevalence of severe acute malnutrition (SAM) should be <2%. The table below shows the classification of public health significance of the anthropometric results for children under-5 years of age according to WHO:

Table 10: Classification of public health significance for children under 5 years of age

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

Selective feeding programme:

Table 11 : Performance indicators for selective feeding programme *

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

* UNHCR and WFP selective feeding guideline 2011 and SPHERE standards for performance

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

Vitamin A supplementation coverage: UNHCR performance indicator; target for vitamin A supplementation coverage for children aged 6-59 months by camp, country and region should be >90%.

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

Table 12 : Classification of public health significance (WHO 2000)

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

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

Table 13: UNHCR WASH Programme Standards

UNHCR Standard	Indicator
Average quantity of water available per person/day	> or = 20 litres (post-emergency standard)
Latrine provision	≤20 people/latrine (post-emergency standard)

Mosquito Net: Malaria is related to anaemia levels and acute malnutrition is often associated with increased mortality from malaria, especially among young children.

Table 14 : UNHCR Mosquito net coverage Standards

Indicator Name	Unit	Denominator	Classification of public health significance or target
Proportion of total households owning at least one LLIN	%	Total number of households	Target of >80%
Average number of persons per LLIN	Number	Sum of the number of LLINs in all households	2 persons per LLIN

1.1 Training, coordination and supervision

A total of six survey teams each consisting of six team members (anthropometry measurer, anthropometric assistant, interviewer, Hb data collector, demography and team leader) were organized from SMOH, COR, HAC, CIS, CWW and *ALMANAR*. The team members were 36 in number and some were experienced in S3M surveys, period MUAC screening and had health/nutrition background by training and profession. The teams were trained for five days in Abu Jubeiha town, followed by an additional field exercise for standardization and pilot testing. The training topics covered the following: purpose and objectives of the survey, roles and responsibilities of each team member, familiarization with the SENS questionnaires by reviewing the purpose of each question; interviewing skills, use of SMART phone and recording of data; interpretation of local/seasonal calendar of events and age determination; how to take anthropometric measurements and haemoglobin measurements and common errors usually made in the field, team work etc. The training included participatory approach including practical session for anthropometric, HB measurement and role plays for household data collection. The practical session on anthropometric measurement involved volunteer children for practice. The practical session on haemoglobin measurement involved trainees measuring each other's Hb as well as undertaking a standardization test.

The survey was coordinated and supervised by experienced technical experts from UNHCR, WHO, MOH, HAC, CIS, CWW, COR and ALMANAR. Each survey team was given explanation on the purpose of the survey and issues of confidentiality ensuring that verbal consent was obtained before proceeding with the survey in the selected households.

1.2 Data collection, entry and analysis

Each survey team was provided with a list of households to be surveyed on a daily basis, and was advised to follow the precautionary measures below:

- If an individual or an entire household was absent the teams were instructed to return to the household or revisit the absent individual up to two times on the same survey day. If they were unsuccessful after this, the individual or the household was recorded as an absence and they were not replaced with another household or individual.
- If the individual or an entire household refused to participate then it was considered as a refusal and the individual or the household were not replaced with another.
- If a selected child was disabled with a physical deformity preventing certain anthropometric measurem ents, the child was still included in the assessment of the other indicators
- If it was determined that a selected household did not have any eligible children, the relevant questionnaires were administered to the household.
- *If a selected child was found to be admitted in the nutrition or health center the team visited the center to take the measurements and the child's information. If it was impossible to visit the center, the child was given an ID number and considered as absent and not replaced. A note was made that the child was in a nutrition/health center at the time of the survey.

*This recommendation differs from the standard SMART recommendation which considers nutrition surveys that are usually conducted in large geographic areas and where it is often not possible to go to the nutrition or health center for measurement of the admitted children.

Data collection was carried out over five days period and data collection was administered using android Tablet. The data from the Tablet was synchronized with the server daily. After this the various records were downloaded from the server as (csv) files to serve as a back-up thus minimizing the risk of data loss from the server and check the data quality. All the (csv) data were converted into Excel and data for children 6-59 months was transferred to ENA for SMART software for data analysis while that of the other indicators was transferred and analyzed by Epi-Info software.

At the end of the data collection, a complete set of data was ready. All data files were cleaned before analysis. Duplicate entries and incomplete data were identified in Excel and excluded from analysis. Analysis was performed using ENA for SMART and Epi Info software. The SMART Plausibility Report was generated for each complete set of survey data in order to check the quality of the anthropometric data and a summary of the key quality criteria is shown in Appendix 1.

The nutritional indices were cleaned using flexible cleaning criteria from the observed mean (also known as SMART flags in the ENA for SMART software), rather than the reference mean (also known as WHO flags in the ENA for SMART software). This flexible cleaning approach is recommended in the UNHCR SENS Guidelines in accordance with SMART recommendations. For the weight-for-height index, a cleaning window of +/- 3 SD value contained in the SMART for ENA software was used (Version: July 9th, 2015).

Quality control

Quality was maintained by comprehensive training and an intensive support supervision approach during the data collection period. The ENA-SMART plausibility check for anthropometric measurement was generated on a daily-basis and feedback was provided to the teams. The use of pre-programmed Android Tablets for data collection was used. Quality of data was ensured through: crosschecking of filled questionnaires on daily basis and daily review of performance of the data collection teams in addressing any difficulties encountered. The measurement tools were calibrated every morning before the start of the data collections; HemoCue machines

were checked on a daily-basis. Daily reminders were made on proper use of the micro-cuvettes, digital weight scale and height measuring board. Additionally, all survey tools were duly maintained.

1.3 Ethical consideration and consent of study population

During the protocol development relevant partners, MOH, UNICEF and WFP were consulted and their respective input/feedback was duly incorporated. Each step of the survey was shared with relevant partners in order to ensure active participation and also keeping them updated on the progress. Local authorities, the refugee settlement management, from COR and HAC were also informed at all levels. Refugee working group forum and health and nutrition technical meetings were used as an opportunity to share information with respect to the survey. Prior to the actual field work, community leaders and community members were informed about the survey. Household labeling was also used as an opportunity to pass messages to all community members.

Main ethical considerations including keeping privacy, cultural sensitivities and any issues associated with rights and dignity of the study populations were considered and respected. Given the comprehensive nature of the survey and taking of peripheral blood, verbal consent was obtained from individuals or/and households before the interviews, anthropometric measurements and haemoglobin test. Children and women with serious health and nutrition problems (either sick or malnourished) were referred to the health center for further assessment and treatment.

4. Results

4.1. Anthropometric results (based on WHO standards 2006):

Table 4. 1. Distribution of age and sex of sample

AGE (mo)	Boys		Girls		Total		Ratio
	no.	%	no.	%	no.	%	Boy:girl
6-17	59	49.6	60	50.4	119	23.0	1.0
18-29	76	50.3	75	49.7	151	29.2	1.0
30-41	45	59.2	31	40.8	76	14.7	1.5
42-53	56	52.3	51	47.7	107	20.7	1.1
54-59	31	47.7	34	52.3	65	12.5	0.9
Total	267	51.5	251	48.5	518	100.0	1.1

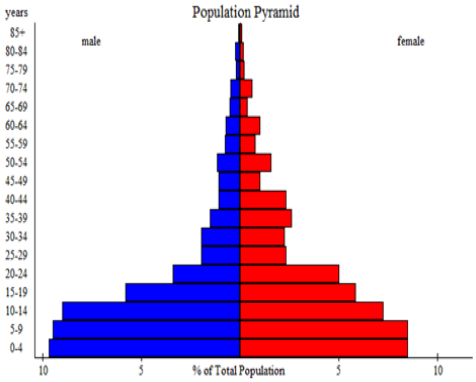


Figure 3: Population age and sex pyramid

Table 4. 2: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or Oedema) and by sex

	All n = 518	**Boys** n = 267	**Girls** n = 251
Prevalence of global malnutrition (<-2 z-score and/or Oedema)	(91) 17.6 % (14.5 - 21.1 95% C.I.)	(53) 19.9 % (15.5 - 25.0 95% C.I.)	(38) 15.1 % (11.2 - 20.1 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no Oedema)	(69) 13.3 % (10.7 - 16.5 95% C.I.)	(38) 14.2 % (10.5 - 18.9 95% C.I.)	(31) 12.4 % (8.8 - 17.0 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or Oedema)	(22) 4.2 % (2.8 - 6.3 95% C.I.)	(15) 5.6 % (3.4 - 9.1 95% C.I.)	(7) 2.8 % (1.4 - 5.6 95% C.I.)

The prevalence of Oedema is 0.2 %

The overall weight-for-height Z-score (and/or Oedema) in El Leri showed a critical nutrition situation, with high prevalence of Global Acute Malnutrition (GAM) 17.6% (14.5-21.1 C.I) and SAM 4.2% (2.8-6.3 C.I), above the emergency threshold as per the WHO classification (GAM prevalence >15% and SAM >2%). In terms of category by sex (compared boys and girls), the GAM rate was highest among boys i.e. 19.9 % (15.5-25.0 C.I) and SAM rate was 5.6%, whereas GAM rate among girls was lower at 15.1% (11.2-20.1 C.I) and SAM rate was 2.8% (1.4-5.6 C.I). This could be attributed to cultural orientation with respect to child caring practices, as young girls are given closer attention than boys and are commonly at home with mother or caregiver.

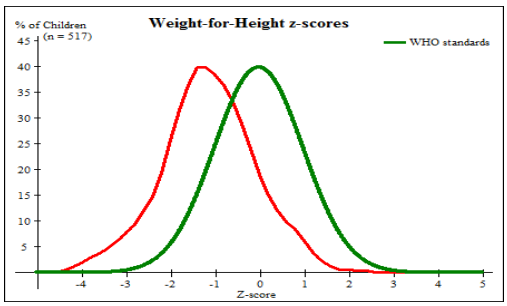


Figure 4: Distribution of weight-for-height z-scores (based on WHO Growth Standards) in El Leri settlement.

The figure shows that the weight-for-height z-score distribution is shifted to the left, which indicates a poorer nutritional status in comparison to the international WHO Standard population of children aged 6-59 months.

Table 4. 3: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or Oedema

Age (mo)	Total no.	Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-17	119	12	10.1	25	21.0	81	68.1	1	0.8
18-29	151	6	4.0	17	11.3	128	84.8	0	0.0
30-41	76	0	0.0	5	6.6	71	93.4	0	0.0
42-53	107	0	0.0	15	14.0	92	86.0	0	0.0
54-59	65	3	4.6	7	10.8	55	84.6	0	0.0
Total	518	21	4.1	69	13.3	427	82.4	1	0.2

The overall prevalence of severe wasting was 4.1%. In terms of age category, the prevalence of severe wasting is highest among children of 6-17 months of age i.e. 10.1%, the 54-59 months age category i.e. 4.6%, those between 18-29 months of age at 4.0%. Therefore, the result showed that infant and young children were the most affected.

Table 4. 4: Distribution of acute malnutrition and Oedema based on weight-for-height z-scores

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 1 (0.2 %)
Oedema absent	Marasmic No. 21 (4.1 %)	Not severely malnourished No. 496 (95.8 %)

Table 4. 5: Prevalence of acute malnutrition based on MUAC cut off's (and/or Oedema) and by sex

	All n = 518	**Boys** n = 267	**Girls** n = 251
Prevalence of global malnutrition (< 125 mm and/or Oedema)	(45) 8.7 % (6.6 - 11.4 95% C.I.)	(22) 8.2 % (5.5 - 12.2 95% C.I.)	(23) 9.2 % (6.2 - 13.4 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no Oedema)	(33) 6.4 % (4.6 - 8.8 95% C.I.)	(16) 6.0 % (3.7 - 9.5 95% C.I.)	(17) 6.8 % (4.3 - 10.6 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or Oedema)	(12) 2.3 % (1.3 - 4.0 95% C.I.)	(6) 2.2 % (1.0 - 4.8 95% C.I.)	(6) 2.4 % (1.1 - 5.1 95% C.I.)

Table 4. 6: Prevalence of acute malnutrition by age, based on MUAC cut off's and/or Oedema

Age (mo)	Total no.	Severe wasting (< 115 mm)		Moderate wasting (>= 115 mm and < 125 mm)		Normal (> = 125 mm)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-17	119	12	10.1	20	16.8	87	73.1	1	0.8
18-29	151	0	0.0	9	6.0	142	94.0	0	0.0
30-41	76	0	0.0	1	1.3	75	98.7	0	0.0
42-53	107	0	0.0	0	0.0	107	100.0	0	0.0
54-59	65	0	0.0	3	4.6	62	95.4	0	0.0
Total	518	12	2.3	33	6.4	473	91.3	1	0.2

Table 4. 7: Prevalence of underweight based on weight-for-age z-scores by sex

	All n = 517	**Boys** n = 267	**Girls** n = 250
Prevalence of underweight (<-2 z-score)	(79) 15.3 % (12.4 - 18.6 95% C.I.)	(52) 19.5 % (15.2 - 24.6 95% C.I.)	(27) 10.8 % (7.5 - 15.3 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(66) 12.8 % (10.2 - 15.9 95% C.I.)	(42) 15.7 % (11.9 - 20.6 95% C.I.)	(24) 9.6 % (6.5 - 13.9 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(13) 2.5 % (1.5 - 4.3 95% C.I.)	(10) 3.7 % (2.0 - 6.8 95% C.I.)	(3) 1.2 % (0.4 - 3.5 95% C.I.)

Table 4. 8: Prevalence of underweight by age, based on weight-for-age z-scores

Age (mo)	Total no.	Severe underweight (<-3 z-score)		Moderate underweight (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-17	118	8	6.8	20	16.9	90	76.3	1	0.8
18-29	151	3	2.0	23	15.2	125	82.8	0	0.0
30-41	76	0	0.0	6	7.9	70	92.1	0	0.0
42-53	107	1	0.9	14	13.1	92	86.0	0	0.0
54-59	65	1	1.5	3	4.6	61	93.8	0	0.0
Total	517	13	2.5	66	12.8	438	84.7	1	0.2

Table 4. 9: Prevalence of stunting based on height-for-age z-scores and by sex

	All n = 517	**Boys** n = 267	**Girls** n = 250
Prevalence of stunting (<-2 z-score)	(45) 8.7 % (6.6 - 11.4 95% C.I.)	(30) 11.2 % (8.0 - 15.6 95% C.I.)	(15) 6.0 % (3.7 - 9.7 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(36) 7.0 % (5.1 - 9.5 95% C.I.)	(23) 8.6 % (5.8 - 12.6 95% C.I.)	(13) 5.2 % (3.1 - 8.7 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(9) 1.7 % (0.9 - 3.3 95% C.I.)	(7) 2.6 % (1.3 - 5.3 95% C.I.)	(2) 0.8 % (0.2 - 2.9 95% C.I.)

Prevalence of total stunting among children 6-59 months age is 8.7% (6.6-11.4 C.I) which is within acceptable limits.

Table 4. 10: Prevalence of stunting by age based on height-for-age z-scores

Age (mo)	**Total no.**	**Severe stunting (<-3 z-score)**		**Moderate stunting (>= -3 and <-2 z-score)**		**Normal (> = -2 z score)**	
		No.	**%**	**No.**	**%**	**No.**	**%**
6-17	118	1	0.8	10	8.5	107	90.7
18-29	151	6	4.0	10	6.6	135	89.4
30-41	76	0	0.0	5	6.6	71	93.4
42-53	107	2	1.9	11	10.3	94	87.9
54-59	65	0	0.0	0	0.0	65	100.0
Total	517	9	1.7	36	7.0	472	91.3

Table 4. 11: 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	517	-1.13±1.05	1.00	1	0
Weight-for-Age	517	-1.16±0.86	1.00	1	0
Height-for-Age	517	-0.70±0.96	1.00	1	0

* contains for WHZ and WAZ the children with Oedema.

4.2. Mortality results (retrospective over the last three months/90 days prior to interview)

Table 4. 12: Mortality rates

CMR (total deaths/10,000 people / day): 0.49 (0.21-1.13, 95% CI)
U5MR (deaths in children under five/10,000 children under five / day): 0.53 (0.09-3.18, 95% CI)

The result of crude/total mortality rate and children below five years of age mortality rate shows 0.49 (0.21-1.13 C.I) and 0.53 (0.09-3.18 C.I) respectively. The results are within acceptable threshold.

4.3. Programme Coverage and health indicators

4.3.1. Nutrition Feeding programme Enrolment Results

Table 4. 13: Programme coverage for acutely malnourished children based on admission criteria (MUAC, WHZ and/or Oedema) in El Leri

	Number/total	% (95% CI)
Supplementary feeding programme coverage (based on all admission criteria WHZ* and MUAC)	8/27	29.6% (13.8-50.2)
Supplementary feeding programme eligibility based on MUAC only	7/12	58.3% (27.7-84.8)
Therapeutic programme (based on all admission criteria WHZ*, Oedema and MUAC)	22 /86	25.6% (16.8-36.1)
Therapeutic feeding programme eligibility based on MUAC and/or Oedema only	15 /33	45.5% (28.1-63.6)

*WHZ flags excluded from analysis

Enrolment status of children identified as malnutrition during the time of survey as being classified SAM and MAM cases in the nutrition programme in El Leri settlement revealed a lower than expected standard. Coverage of SAM in the OTP programme was 45.5 % (28.1-63.6 C.I) by using only MUAC and Oedema admission criteria. Likewise, coverage of MAM in the SFP programme by using MUAC admission criteria was 58.3% (27.7-84.8 C.I).

4.3.2. Measles vaccination coverage results

Table 4. 14: Measles vaccination coverage for children aged 9-59 months (n=481) in El Leri 2018

	Measles (with card) n=51	**Measles (with card or confirmation from mother) n=232**
YES	10.6% (8.0-13.8)	48.2% (43.7-52.8)

The coverage for measles vaccination among children between 9 to 59 months of age revealed a poor result for the information collected by card 10.6% (8.0-13.8 C.I) and recall from the mother or caregivers 48.2% (43.7-52.8 C.I).

4.3.3. Vitamin A supplementation coverage results

Table 4. 15: Vitamin A supplementation for children aged 6-59 months within past 6 (n= 517) in El Leri 2018

	Vitamin A capsule (with card) n=9	**Vitamin A capsule (with card or confirmation from mother) n=107**
YES	1.7% (0.9-3.4)	20.3% (17.0-24.1)

The coverage for Vitamin A supplementation among children age 6 to 59 months in the previous six months showed a poor result for the information collected by card 1.7% (0.9-3.4 C.I) and recall from the mother or caregivers 20.3% (17.0-24.1 C.I).

4.4. Diarrhoea results among children age 6-59 months

Table 4. 16: Two weeks Period prevalence of diarrhoea in El Leri

	Number/total	**Prevalence in %(95% CI)**
Diarrhoea in the last two weeks	141/517	27.3% (23.5-31.4)

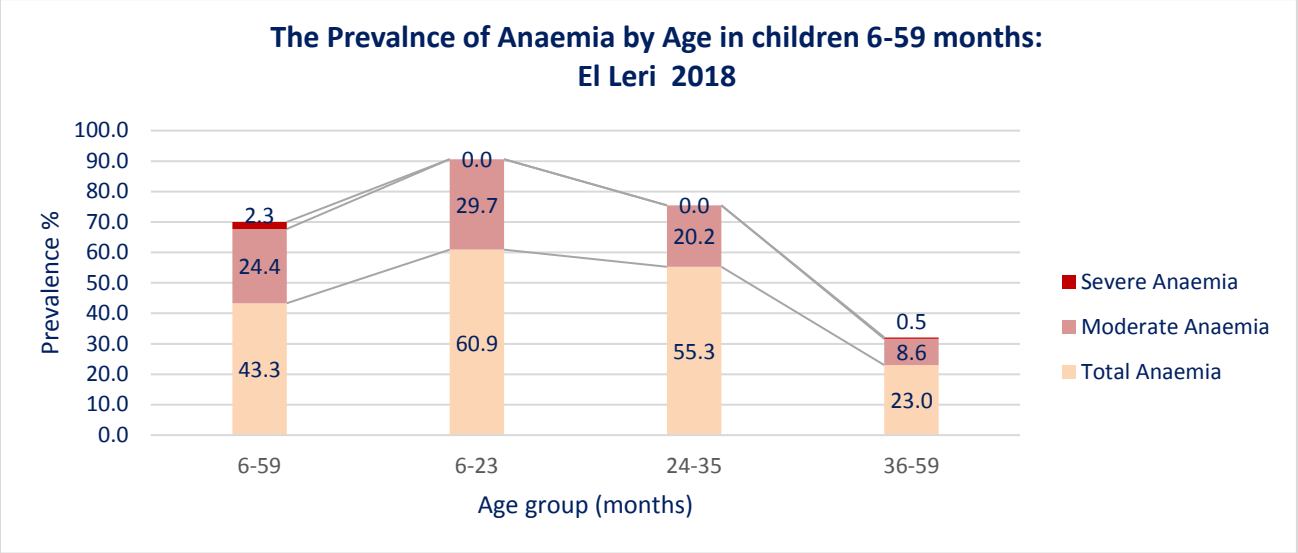
Children 6-59 months of age who had diarrhoea in the preceding two weeks prior to the survey date was high in El Leri settlement, 27.3% (23.5-31.4)

4.5. Anaemia results among children age 6 to 59 months

Table 4. 17: Prevalence of total anaemia, anaemia categories, and mean haemoglobin concentration in children 6-59 months of age and by age group in El Leri 2018 (Total Children N=508)

	6-23 months N=192	**24-35 months** N=94	**36-59 Months** N=222	**6-59 months** N = 508
Total Anaemia (Hb<11.0 g/dL)	(117) 60.9% (53.7-67.9)	(52) 55.3% (44.7-65.6)	(51) 23.0% (17.6-29.1)	(220) 43.3% (39.0-47.7)
Mild Anaemia (Hb 10.0-10.9 g/dL)	(60) 31.3% (24.8-38.3)	(33) 35.1% (25.5-45.6)	(31) 14.0% (9.7-19.2)	(124) 24.4% (20.8-28.4)
Moderate Anaemia (7.0-9.9 g/dL)	(57) 29.7% (23.3-36.7)	(19) 20.2% (12.6-29.8)	(19) 8.6% (5.2-13.0)	(95) 18.7% (15.5-22.4)
Severe Anaemia (<7.0 g/dL)	(0) 0.0%	(0) 0.0%	(1) 0.5% (0.0-2.5)	(1) 0.2% (0.0-1.3)
Mean Hb (g/dL) (SD / 95% CI) [range]	10.5 g/dL 1.6 SD [7.1 Min, 13.3 Max]	10.7 g/dL 1.7 SD [7.3 Min, 13.7 Max]	11.7 g/dL 1.6 SD [6.8 Min, 15.2 Max]	11.0 g/dL 1.9 SD [6.8Min, 15.2 Max.]

Figure 5: Prevalence of anaemia among children 6-59 months classified by age category



Prevalence of total anaemia amongst all children 6-59 months age was high, 43.3% (39.0-47.7 C.I). According to WHO cut-off point anaemia level ≥40%, categorized as critical. In terms of age group classification, the highest level was found in 6-23 months age group at 60.9% (53.7-67.9 C.I) and this was followed by 55.3% (44.7-65.6 C.I) in the 24-35 months age group. However, total anaemia was lower among the older children in the 36-59 months age group at 23.0% (17.6-29.1 C.I). This could be associated with the fact that older children have a better chance to access diversified food which contains micronutrients (such as Iron, Vitamin C, etc.)

4.6. Infant and Young Child Feeding (IYCF) Children 0-23 months

Table 4. 18: Prevalence of Infant and Young Child Feeding Practices Indicators in El Leri

Indicator	Age range	Number/ total	Prevalence 95% CI
Timely initiation of breastfeeding	0-23 months	121/224	54.0% (47.3-60.7)
Exclusive breastfeeding under 6 months	0-5 months	10/34	29.4% (15.1-47.5)
Continued breastfeeding at 1 year	12-15 months	24/30	80.0% (61.4-92.3)
Continued breastfeeding at 2 years	20-23 months	19/47	40.4% (26.4-55.7)
Introduction of solid, semi-solid or soft foods	6-8 months	12/33	36.4% (20.4-54.9)
Consumption of iron-rich or iron-fortified foods	6-23 months	95/184	51.6% (44.2-59.0)
Bottle feeding	0-23 months	1 /227	0.4% (0.0-2.4)

Results for key IYCF indicator was lowest for exclusive breastfeeding in the 0-5 months age group i.e. 29.4% (15.1-47.5 C.I). Likewise, the introduction of solid, semi-solid or soft foods in the 6-8 months age group was low

at 36.4% (20.4-54.9 C.I). However, continued breast feeding revealed relatively better results at 80.0% (61.4-92.3 C.I) at the age of one year.

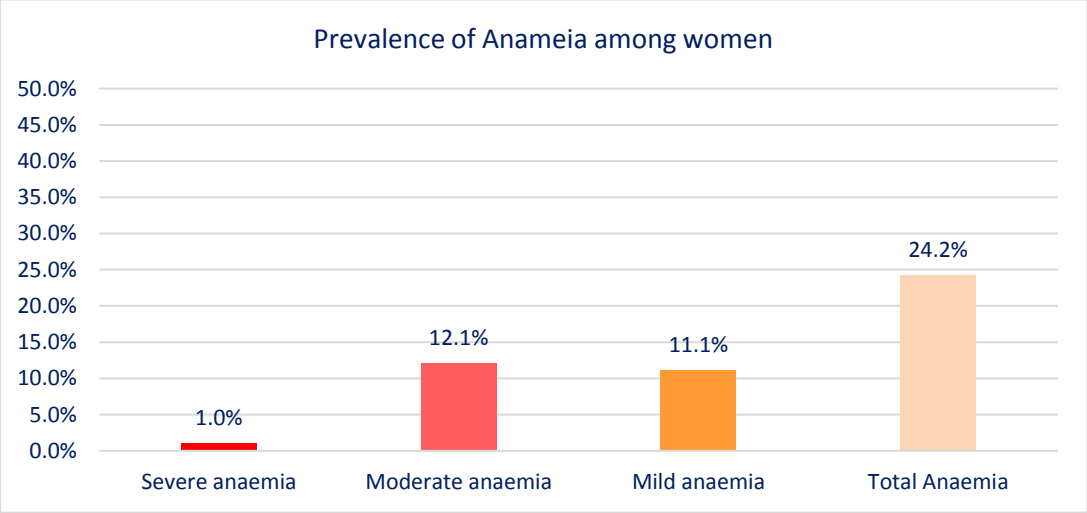
4.7. Women age 15-49 years in El Leri

Physiological status	Number/total
Non-pregnant	200
Pregnant	24
Mean age (range)	26.2 15 Min, 47 Max.

Table 4. 19: Prevalence of Anaemia and haemoglobin concentration in non-pregnant women of reproductive age (15-49 years) in El Leri

Anaemia rate	Number/total	Prevalence(95% CI)
Total Anaemia (<12.0 g/dL)	48/198	24.2% (18.4-30.8)
Mild Anaemia (11.0-11.9 g/dL)	22/198	11.1% (7.1-16.3)
Moderate Anaemia (8.0-10.9 g/dL)	24/198	12.1% (7.9-17.5)
Severe Anaemia (<8.0 g/dL)	2 /198	1.0% (0.1-3.6)
Mean Hb (g/dL) (SD / 95% CI) [range]	12.8 g/dL 3.4 S.D. [5.4 min, 14.0 Max]	

Figure 6: Prevalence of Anaemia among women of reproductive age (15-49 years old, non-pregnant)



Total anaemia among women of reproductive age and non-pregnant was 24. 2% (18.4-30.8 C.I), which is below the critical threshold (Critical when ≥ 40%).

Table 4. 20: ANC enrolment and iron-folic acid pills coverage among pregnant women (15-49 years) in El Leri

	Number /total	Prevalence(95% CI)
Currently enrolled in ANC programme	13/24	54.2% (32.8-74.4)
Currently receiving iron-folic acid pills	13/24	54.2% (32.8-74.4)

Pregnant women attending antenatal care at the health facility in El Leri was low i.e. 54.2% (32.8-74.4 C.I). Similarly, those women attending ANC and receiving iron-folic acid pills were recorded at 54.2% (32.8-74.4 C.I). Women in the camp or group settlement are expected to achieve 100% enrollment in the ANC programme.

4.8. Food security in El Leri Settlement 2018

Table 4. 21: Ration card coverage in El Leri

	Number/total	Prevalence(95% CI)
Proportion of households with a ration card	236/255	92.5% (88.6-95.5)

Note: Refugees didn't receive the monthly GFD during the previous two months prior to the survey. As a result, the question about households reporting the length of period the food ration lasted the principal duration of ration in the expected days of the cycle was not collected in order to avoid inconvenience and undesirable expectations.

Table 4. 22: Coping strategies used by the surveyed population over the past month in El Leri

	Number/total	Prevalence(95% CI)
Proportion of households reporting using the following coping strategies over the past month*:		
Borrowed cash, food or other items *with or without interest*	101 /255	39.6% (33.6-45.9)
Sold any assets that would not have normally sold (furniture, seed stocks, tools, other NFI, livestock etc.)	46 /255	18.0% (13.5-86.5)
Requested increased remittances or gifts as compared to normal	56/255	22.0% (17.0-27.5)
Reduced the quantity and/or frequency of meals	140/255	54.9% (48.6-61.1)
Begged	37 /255	14.5% (10.4-19.4)
Engaged in potentially risky or harmful activities (Cutting live trees and sell, local alcohol making, sending young girls and boys for labour work)]	90/255	35.3% (29.4-41.5)
Proportion of households reporting using none of the coping strategies over the past month	46/255	18.0% (13.5-23.3)

Over 80 % of refugees exercised various forms of negative coping mechanisms. More than half of the households exercised reduced quantity and/or frequency of meals i.e. 54.9% (48.9-61.1 C.I). Poor or inadequate dietary intake is considered as an immediate cause of malnutrition among children.

Table 4. 23: Consumption of micronutrient rich foods by households in El Leri

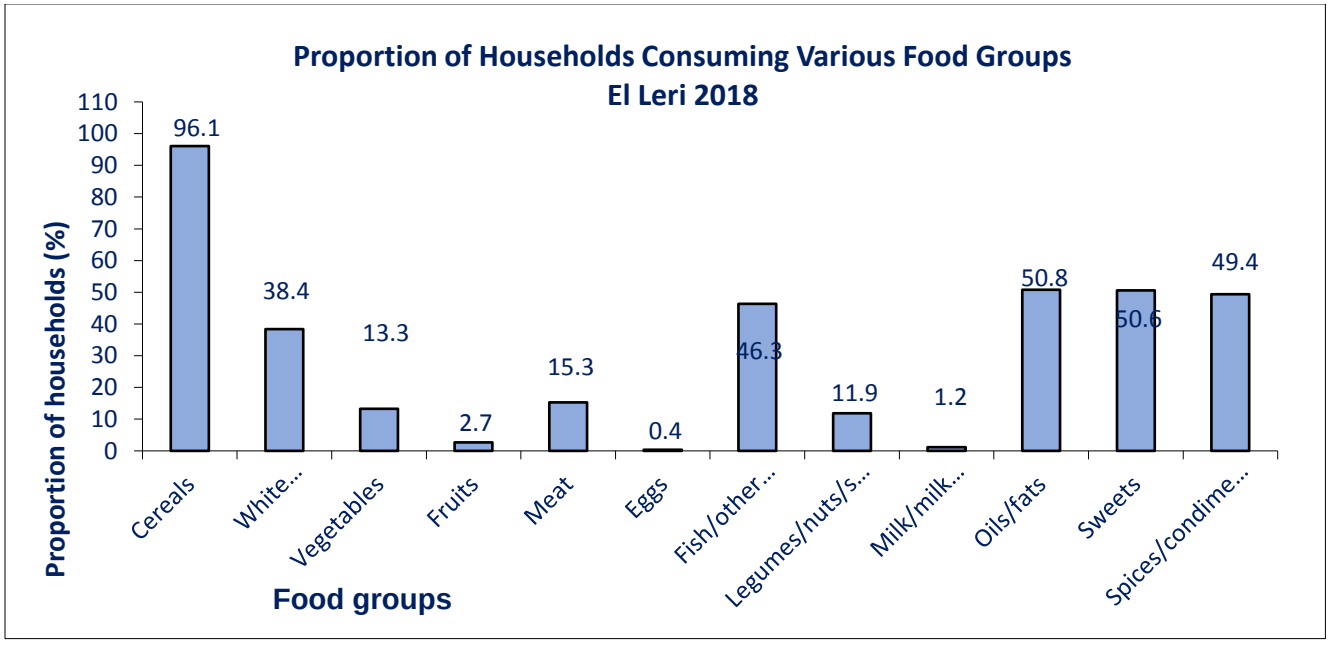
	Number/total	Prevalence(95% CI)
Proportion of households *not consuming any* vegetables, fruits, meat, eggs, fish/seafood, and milk/milk products	119/254	46.9% (40.6-53.2)
Proportion of households consuming organ meat/flesh meat, or fish/seafood (food sources of haem iron)	130/255	51.0% (44.7-57.3)

Table 4. 24: Average HDDS in El Leri

	Mean (Standard deviation or 95% CI)
Average HDDS	3.8 2.4 SD (1.0 Min, 10.0 Max)

The mean Household Dietary Diversity (HDD) for the 24 hours recall period was 3.8 with the standard deviation (SD) of 2.4, this shows poor dietary practices. However, the proportion of household consuming animal source food was 51.0% (44.7-57.3 C.I), this was relatively better compared to other locations in Sudan. Animal products including fish regularly was available in the refugee market. The proximity of El Leri settlement to the South Sudan boarder enabled traders to establish cross boarder market, mainly for fish.

Figure 7: Proportion of households consuming various food groups in El Leri 2018



4.9. WASH in El Leri Settlement 2018

Table 4. 25 : WASH indicators water source and storage of drinking water

	Number/total	Prevalence(95% CI)
Proportion of households using an improved drinking water source	236/248	95.2% (91.7-97.5)
Proportion of households that use a covered or narrow necked container for storing their drinking water	132/247	53.4% (47.0-59.8)

Table 4. 26: Water Quantity: Amount of litters of water used per person per day in El Leri

Proportion of households that use:	Number/total	Prevalence(95% CI)
≥ 20 lpppd	85/248	34.3% (28.4-40.5)
15 - <20 lpppd	35/248	14.1% (10.0-19.1)
<15 lpppd	128/248	51.6% (45.2-58.0)
Average amount of litters of water used per person per day	16.8	

Note: average amount of litres of water used per person per day was 16.8. This result was obtained at a point in time for the 24 hours recall period. It is worth noting that this figure doesn't reflect the overall supply of water from protected source, as communities are collecting water from various sources.

Table 4. 27: Satisfaction with water supply in El Leri

	Number/total	Prevalence(95% CI)
Proportion of households that say they are satisfied with the drinking water supply	29/247	11.7% (8.0-16.4)

The majority of refugees were not satisfied with the drinking water supply, as only 11.7 % (8.0-16.4 C.I) mentioned that they were satisfied with the available service.

Figure 8: Proportion of households that say they are satisfied with the drinking water supply

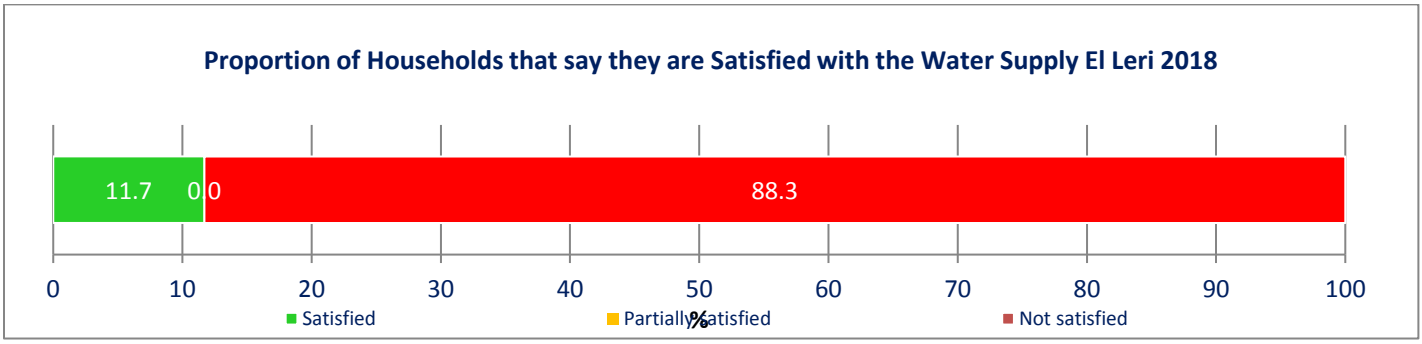


Figure 9: Reasons provided for dissatisfaction of water supply.

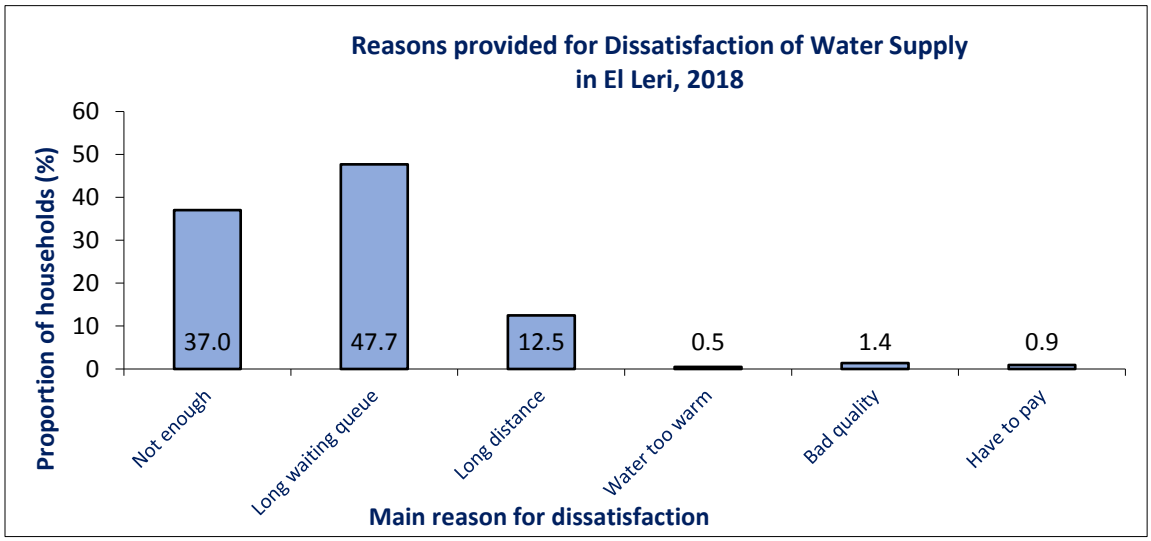
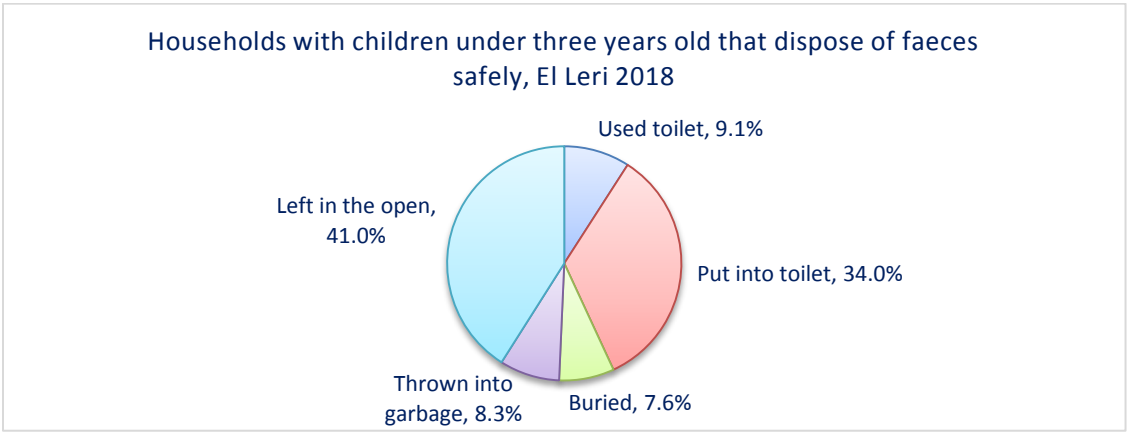


Table 4. 28: Safe Excreta disposal in El Leri

	Number/total	Prevalence(95% CI)
Proportion of households that use:		
An improved excreta disposal facility (improved toilet facility, 1 household)	25/243	10.3% (6.8-14.8)
A shared family toilet (improved toilet facility, 2 households)	19/243	7.8% (4.8-11.9)
A communal toilet (improved toilet facility, 3 households or more)	34/243	14.0% (9.9-19.0)
An unimproved toilet (unimproved toilet facility or public toilet)	165/243	67.9% (61.6-73.7)
Proportion of households with children under three years old that dispose of faeces safely	73/145	50.3% (41.9-58.7)

67.9% ((61.6-73.7 C.I) of households in El Leri utilized unimproved toilet facility or public toilet.

Figure 10: Proportion of households with children under three years old that dispose of faeces safely



Proportion of households with children under three years old that did not safely dispose of faeces (left in the open area) was 41.0% (32.9-49.5 C.I).

4.10. Mosquito Net Coverage in El Leri settlement 2018

Table 4. 29: Household Mosquito net ownership in El Leri

	Number/total	Prevalence(95% CI)
Proportion of total households owning at least one mosquito net of any type	123/255	48.2% (42.0-54.6)
Proportion of total households owning at least one LLIN	100/255	39.2% (33.2-45.5)

Figure 11: Proportion of total households owning at least one LLIN

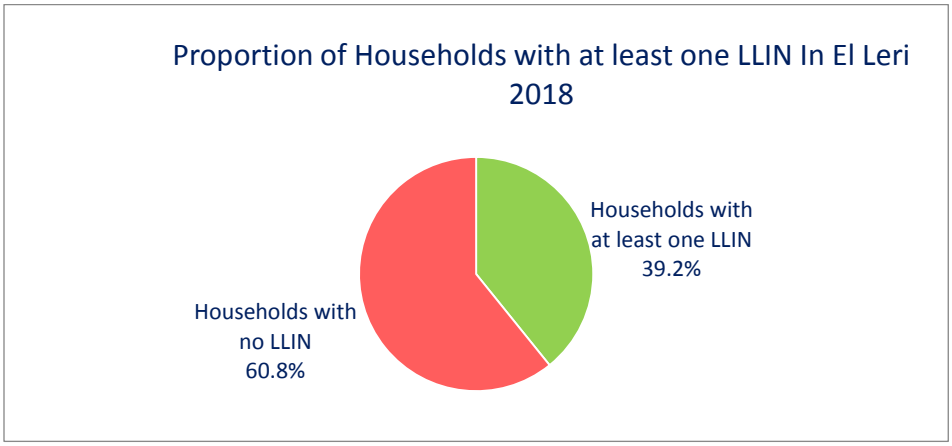


Table 4. 30: Number of nets in El Leri

Average number of LLINs per household	Average number of persons per LLIN
2.2	5.5

Average number of person per LLIN higher 5.5, which is above the UNHCR standard 2 person per LLIN.

Table 4. 31: Mosquito net Utilisation by category in El Leri

	Proportion of total population (all ages)		Proportion of 0-59 months		Proportion of pregnant women	
	Total No=1567	%	Total No=323	%	Total No=36	%
Slept under net of any type	149	9.5%	46	14.2%	6	17.1%
Slept under LLIN	123	7.8%	33	10.2%	5	14.2%

5. Discussion

4.1 Nutritional status of young children

The overall findings of the nutritional status for refugees in El Leri settlement was classified as being critical, with Global Acute Malnutrition (GAM) prevalence 17.6% (14.5-21.1 C.I.), above the 15.0% of emergency threshold (WHO classification). The prevalence of Severe Acute Malnutrition (SAM) was 4.2% (2.8-6.3 C.I.), above 2% of critical (UNHCR classification). *The UNHCR intended target for the prevalence of GAM among children 6-59 months of age is < 10% and the target for the prevalence of SAM is <2% in refugee settings*.

4.2 Morbidity

Health-related indicators: The rate of morbidity (diarrhea) among children 6-59 month of age in the previous two weeks prior to the nutrition survey was 27.3% (23.5-31.4 C.I). This was a high prevalence level, considering the proportional morbidity pattern for the context.

4.3 Programme coverage

Enrolment coverage for acutely malnourished children (Severe Acute Malnutrition-SAM and Moderate Acute Malnutrition-MAM) in the nutrition programme (at a point in time), by all criteria of admission was reported at 29.6% (13.8-50.2 C.I.) and 25.6% (16.8-36.1 C.I.) respectively. The overall enrolment status for both SAM and MAM were far below the expected level (target >90%).

Measles vaccination among children 9-59 months of age was 48.2% (43.7-52.8 C.I.). This was below the target (≥ 95%). Likewise the coverage of Vitamin A supplementation for children 6-59 months of age was only 20.3% (17.0-24.1 C.I.), which is far below the target (≥ 90%).

Pregnant women attending antenatal care at health facility of El Leri was low at 54.2% (32.8-74.4 C.I). Similarly, those women attending ANC and receiving iron-folic acid pills was 54.2% (32.8-74.4 C.I). Women in the camp or group settlement is expected to register 100% enrollment in the ANC programme.

4.4 Anaemia in young children and women

The prevalence of anaemia among children 6-59 months of age was 43.3% (39.0-47.7 C.I.). This is categorized as being high (critical if ≥40%). Whereas the anaemia prevalence among non-pregnant women of reproductive age (15-49 years) was 24.3% (18.4-30.8 C.I). This was below the emergency threshold, however, within the category of medium level of anaemia (20-39%).

4.5 IYCF indicators

The majority of key indicators for Infant and Young Children Feeding practices (IYCF) were lower than expected. Timely initiation of breastfeeding among children 0-23 month age was 54.0% (47.3-60.7 C.I.). Exclusive breastfeeding among children 0-5 month of age was only 29.4% (15.1-47.5 C.I), which is low. Continued breast feeding during 12-15 months of age was 80.0% (61.4-92.3 C.I.), which is relatively better than the other indices. Introduction of solid, semi-solid or soft foods for children 6-8 months old was low 36.4% (20.4-54.9 C.I.). The

consumption of iron-rich or iron-fortified foods for children 6-8 months old was also low i.e. 51.6% (44.2-59.0 C.I.).

4.6 Food security

Food assistance is the main source of household food security for the majority of persons of concern. However, 7.5% of refugees does not have ration cards to access food assistance. Access to diversified food source (HDDS) is very low. According to information obtained from community leaders and partners, food assistance which is ought to be provided on a monthly-basis was interrupted for two months prior to the survey. As such, data for the duration of period which food lasted from the recent food assistance was not collected. Dependency on negative coping strategies was a common phenomenon. For example: A significant proportion of community members engaged in potentially risky or harmful activities i.e. 35.3% (29.4-41.5 C.I.).

4.7 WASH

The proportion of households using an improved drinking water source was reported at 95.2% (91.7-97.5 C.I.). The average per capita water use/consumption was i.e. 16.8 Liters per person per day. However, the proportion of households using < 15 Liters per person per day was high i.e. 51.6% (45.2-58.0 C.I.). This may be interpreted as having disproportionate water availability between the households.

The survey revealed the following on toilet coverage: those using improved toilet facility-not shared 10.3% (6.8-14.8 C.I.), improved toilet facility-2 households or more 7.8% (4.8-11.9 C.I.), and improved toilet facility-3 households or more 14.0% (9.9-19.0 C.I). Communal latrines were widely used i.e. 67.9% (61.6-73.7 C.I.). There is significant room for improvement on this regard.

4.8 Mosquito net coverage

The proportion of households owning at least one mosquito net of LLIN type was 39.2% (33.2-45.5 C.I.) and the proportion of households owning at least one mosquito net of any type was 48.2% (42.0-54.6 C.I.) and this is below UNHCR's target >80%. These findings are in contradiction with operational realities as mass distribution of LLIN was conducted in December 2017. The most plausible reasons for this could be the likelihood for refugees having sold these LLINs in order to take care of essential needs, expectation to receive an additional mosquito net or simply ignorance as the survey was conducted during low breeding period for mosquitos.

4.9 Mortality rate for the previous three months

The retrospective mortality rates for the last 90 days (three months) for Crude Mortality Rate (CMR) and under five years old children Mortality Rate (U5MR) were 0.49 and 0.53/10,000/day respectively. This is within acceptable limits for an emergency context i.e. <1.0/10,000/day for CMR and <2/10,000/day for U5MR.

6. Conclusions

The overall survey results indicate gaps in service delivery to refugees with respect to food security, nutrition, health, WASH and the general community child-caring practices. Interruption of the monthly food distribution,

limited options of household income to access the missing commodities from the local market and undesirable negative coping strategies remain a key challenge. As multiple factors are contributing for high malnutrition rate in El Leri, comprehensive programming approach is needed to avert the undesirable situation.

7. Recommendations

Health and Nutrition Partners to work out a mechanism to sustain health and nutrition services and minimize/avoid interruption of services, which adversely affect efforts made to improve the nutritional status of persons of concerns. (UNICEF, WFP, WHO and UNHCR to provide supports for project implementing partners)

The nutrition partners (MOH, UNICEF, WFP, CONCERN and CIS) should agree on the use of mixed criteria (MUAC/OEDEMA/ WFH-Z) for enrolment of SAM and MAM cases into nutrition programme to increase the coverage of detecting and enrolment of SAM and MAM cases into the programme, as well ensure both MUAC and Weight-For-Height-Z (WFH-Z) score admits all eligible children into the programme. This approach entails primary screening with MUAC for all children, then secondary screening is undertaken through WFH anthropometric measurement for children ''at risk'' of acute malnutrition (i.e. those measuring MUAC >12.5 cm and <13.5 cm). This will maximize the opportunity to identify malnourished children during screening.

WFP to continue providing general food assistance and preventive measures through Blanket Supplementary Feeding Program (BSFP) for children 6-23 months, breast feeding mothers and pregnant women on regular-basis to avoid further deterioration of nutrition and food security situations of persons of concern, as food insecurity is a primary contributing factor for the high malnutrition rate. Explore a mechanism, such as prepositioning of food, alternative forms of assistance, compensation mechanisms with the available resources etc.

Health partners (MOH, CIS, CONCERN and their partners) to develop strategy on increasing vaccination coverage, card retention for all under five children to ensure that immunization and vitamin A supplementation coverage reach the recommended targets i.e. 95% and >90% respectively.

Establish reasons behind what happened to the LLINs that were distributed in all camps during the mass distribution campaign in December 2017, as LLIN coverage is currently lower than UNHCR's target >80%. Additionally, monitor proper usage of these LLINs. (UNHCR, WHO, MOH and CIS).

Establish a clear outreach and context specific awareness promotion strategy which includes a wider perspective (i.e. Health, Nutrition, WASH etc.) with a clear monitoring plan to ensure that appropriate messages are delivered and are reflected on behavioral changes. (Health and nutrition technical working group).

UNHCR and partners to strengthen coordination and to ensure a holistic approach (Health, WSH, Education, Food security, Livelihoods etc.) through joint strategies with the active participation of persons of concerns to address the multiple underlying causes of malnutrition.

Plausibility check for: SUDDAN_SENS_052018_South Kordofan Eleri camp.as

Standard/Reference used for z-score calculation: WHO standards 2006

Overall data quality

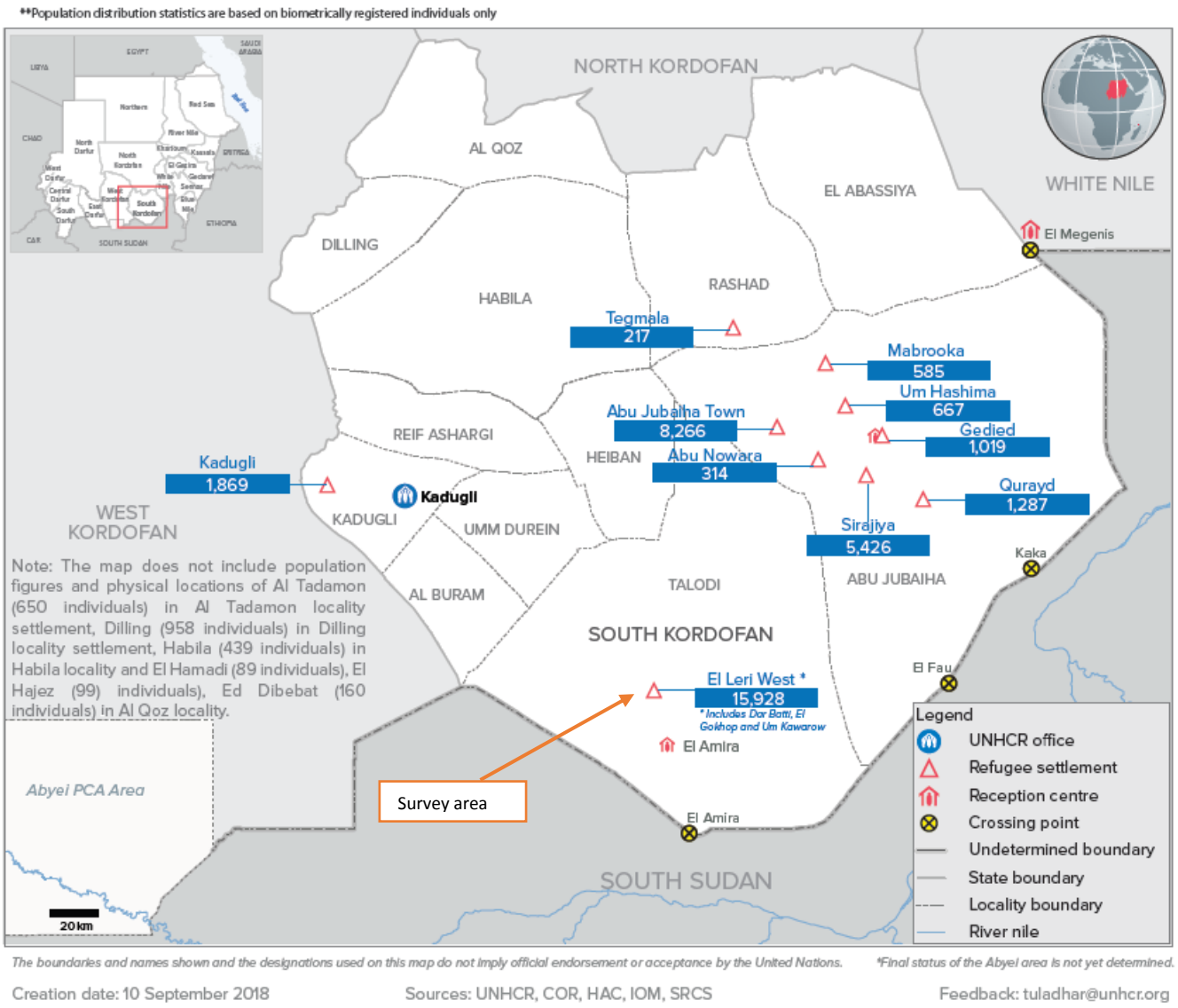
Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	**Score**
Flagged data	Incl	%	0-2.5	>2.5-5.0	>5.0-7.5	>7.5	
(% of out of range subjects)			0	5	10	20	**0** (0.4 %)
Overall Sex ratio	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**0** (p=0.482)
Age ratio(6-29 vs 30-59)	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**4** (p=0.005)
Dig pref score - weight	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**0** (5)
Dig pref score - height	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**2** (10)
Dig pref score - MUAC	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**0** (7)
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** (1.03)
Skewness WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**0** (-0.13)
Kurtosis WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**0** (0.05)
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	**6** %

The overall score of this survey is 6 %, this is excellent.
There were no duplicate entries detected.
Percentage of children with no exact birthday: 64 %

Appendix 2: Lists of survey participants

SN	Name	Agency	24.	Hajja Osman Ibrahim	MOH
1.	Samuel Tadesse	UNHCR	25	Hussien Khamis Zayed Albadin	MOH
2.	Khalid Abdulrahim	UNHCR	26	Allam Adam Abdulrahman	COR
3.	Dr.Jouda Salih Hamid	WHO	27	Alradi Mohamed Ali	MOH
4.	Sufyian Hammad Abdallah	MOH	28	Essa Hassan Mohamed	CONCERN
5.	Saeed Abdellah Morsal	MOH	29	Amira Aldai Ali Ibrahim	MOH
6.	Ibrahim Mohamad Ibrahim	MOH	30	Fatima Mohammed Adam	MOH
7.	Khalifa Mohammed Adam	MOH	31	Salama Mohieldin Abdgalil	MOH
8.	Mohammed Omer Mohamed	MOH	32	Awatif Tia Albasha Elshafi	MOH
9.	Hajer Ismail Fadlallah	MOH	33	Arwa Ibrahim Adam Irahim	MOH
10.	Sara Elyass Abdallah	MOH	34	Saari Abdallah Ahmed	MOH
11.	Mohammed Elshaeikh Sakot	MOH	35	Imam Mohammed Ahmed	MOH
12.	Mortada Elhadi Gasmalla	CIS	36	Khadmalla Alfaki Ali	MOH
13.	El Hussain abderhaman Ibrahim	MOH	37	Hashim Abulgasim Hamad Mussa	MOH
14.	Dafallah Mohamed Nasir	MOH	38	Angelina Younis Tibo	Almanar
15.	Marwa Yousef Osman grad	MOH	39	Ahmed Mohammed Ahmed	MOH
16.	Safaa Hamid Al Regiag	MOH	40	Altigani Mohammed Ahmed	MOH
17.	Ibrahim Zakeria Taha	MOH	41	Alsdig Mahadi	MOH
18.	Abdallah Adam Mohammed	MOH	42	Nasireldeen Ibrahim	MOH
19.	Rehab Abdellah Koko	MOH	43	Abdelgadir Adam Madani	MOH
20.	Manahel Fdul Mulah	MOH	44	Gibril Mustafa Hemadan	HAC
21.	Nadia Fadulallah Koko	MOH			
22.	Alhama Elshami Hamad Elnil	MOH			
23.	Aaisha Ahmed Abdellah Abakar	MOH			

Appendix 3: Map of survey area as of March 2018



Appendix 4: Local calendar

Seasons: الفصول	Religious Holidays الاعياد الدينية	Local Event (in camp of surrounding villages): الاحداث المحلية في المعسكر	Month / year شهر \ السنة	Age (m) العمر بالشهر	Height Range المدي الطولي
Middle of Hot: وسط الصيف			May-18: مايو	0	
Middle of Hot: وسط الصيف			Apr-18 : ابريل	1	
Beginning of Hot: بداية الصيف			Mar-18 : مارس	2	
End of Cold: نهاية الشتاء			Feb-18: فبراير	3	
Middle of cold : وسط الخر الشتاء	New yearالسنة الجديدة		Jan-18: يناير	4	
Middle of cold : وسط الخر الشتاء	Christmas عيد كريسماس		Dec-17: ديسمبر	5	
Beginning of Cold: بداية الشتاء			Nov-17: نوفمبر	6	سم 65-70
End of Rain: نهاية الخريف			Oct-17: اكتوبر	7	
Middle of Rain: وسط الخريف			Sept-17: سبتمبر	8	سم 71-76
Middle of Rain: وسط الخريف			Aug-17: أغسطس	9	
Middle of Rain: وسط الخريف		South Sudan Independent day انفصال جنوب السودان	Jul-17: يوليو	10	
Beginning of Rain: بداية الخريف		June 20 Refugee day: 20 يونيو يوم اللاجئ العالمي	Jun-17: يونيو	11	
End of Hot: نهاية الصيف			May-17: مايو	12	
Middle of Hot: وسط الصيف			Apr-17 : ابريل	13	سم 77-80
Beginning of Hot: بداية الصيف			Mar-17 : مارس	14	
End of Cold: نهاية الشتاء			Feb-17: فبراير	15	
Middle of cold : وسط الخر الشتاء	New yearالسنة الجديدة		Jan-17: يناير	14	
Middle of cold : وسط الخر الشتاء	Christmas عيد كريسماس		Dec-16 : ديسمبر	16	
Beginning of Cold: بداية الشتاء			Nov-16: نوفمبر	17	
End of Rain: نهاية الخريف			Oct-16 : أكتوبر	18	
Middle of Rain: وسط الخريف			Sept-16 : سبتمبر	19	
Middle of Rain: وسط الخريف			Aug-16: أغسطس	20	سم 81-86
Middle of Rain: وسط الخريف		South Sudan Independent day انفصال جنوب السودان	Jul-16 : يوليو	21	
Beginning of Rain: بداية الخريف		June 20 Refugee day: 20 يونيو يوم اللاجئ العالمي	Jun-16 : يونيو	22	
End of Hot: نهاية الصيف			May-16: مايو	23	
Middle of Hot:وسط الصيف			Apri-16 : أبريل	24	
Beginning of Hot: بداية الصيف			Mar-16 : مارس	25	سم 87-90
End of Cold: نهاية الشتاء			Feb-16 : فبراير	26	
Middle of cold : وسط الخر الشتاء	New yearالسنة الجديدة		Jan-16 : ينائر	27	
Middle of cold : وسط الخر الشتاء	Christmas عيد كريسماس		Dec-15: ديسمب	28	
Beginning of Cold: بداية الشتاء			Nov-15 : نوفمبر	29	
End of Rain: نهاية الخريف			Oct- 15: أكتوبر	30	
Middle of Rain: وسط الخريف			Sep- 15 : سبتمبر	31	
Middle of Rain: وسط الخريف			Aug- 15:أغسطس	32	
Middle of Rain: وسط الخريف		South Sudan Independent dayانفصال جنوب السودان	Jul-15: يوليو	33	
Beginning of Rain: بداية الخريف		June 20 Refugee day : 20 يونيو يوم اللاجئ العالمي	June-15: يونيو	34	
End of Hot: نهاية الصيف	Refugee dayيوم اللاجئ		May-15:مايو	35	
Middle of Hot: وسط الصيف			April-15: أبريل	36	
Beginning of Hot: بداية الصيف			Mar-15: مارس	37	سم 91-99
End of Cold: نهاية الشتاء			Feb-15: فبراير	38	
Middle of cold : وسط الخر الشتاء	New yearالسنة الجديدة		Jan-15: يناير	39	
Middle of cold : وسط الخر الشتاء	Christmas كريسماس عيد		Dec-14: ديسمبر	40	
Beginning of Cold: بداية الشتاء			Nov-14: نوفمبر	41	
End of Rain: نهاية الخريف			Oct-14: أكتوبر	42	
Middle of Rain: وسط الخريف			Sept-14: سبتمبر	43	
Middle of Rain: وسط الخريف			Aug-14:أغسطس	44	
Middle of Rain: وسط الخريف		South Sudan Independent day انفصال جنوب السودان	July-14: يوليو	45	
Beginning of Rain: بداية الخريف		June 20 Refugee day: 20 يونيو يوم اللاجئ العالمي	June-14: يونيو	46	
End of Hot: نهاية الصيف			May-14: مايو	47	
Middle of Hot: وسط الصيف			Apr-14:أبريل	48	
Beginning of Hot: بداية الصيف			Mar-14: مارس	49	سم 100-110
End of Cold: نهاية الشتاء			Feb-14: فبراير	50	
Middle of cold : وسط الخر الشتاء	New year السنة الجديدة		Jan-14: يناير	51	
Middle of cold : وسط الخر الشتاء	Christmas عيد كريسماس		Dec-13: ديسمبر	52	
Beginning of Cold: بداية الشتاء			Nov-13 : نوفمبر	53	
End of Rain: نهاية الخريف			Oct-13: أكتوبر	54	
Middle of Rain: وسط الخريف			Sept-13: سبتمبر	55	
Middle of Rain: وسط الخريف			Aug-13:أغسطس	56	
Middle of Rain:وسط الخريف		South Sudan Independent day: انفصال جنوب السودان	July-13: يوليو	57	
Beginning of Rain:بداية الخريف		June 20 Refugee day 20 يونيو يوم اللاجئ العالمي	June-13: يونيو	58	
End of Hot: نهاية الصيف			May-13: مايو	59	

Appendix 5: SENS questionnaires

UNHCR Standardised Expanded Nutrition Survey (SENS) Questionnaire

Verbal Conscent taking guide

Greeting and reading of rights:

This statement is to be read to the head of the household or, if they are absent, another adult member of the house before the interview. Define head of household as member of the family who manages the family resources and is the final decision maker in the house.

Hello, my name is _____ and I work with *[organisation/institution*]. We would like to invite your household to participate in a survey that is looking at the nutrition and health status of people living in this camp.

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

Note that in some camps, the words ‘block’ and ‘section’ may not be used and other words may be used for these. Adapt the wording accordingly.

CAPITAL LETTERS refer to instructions for the surveyors and should not be read to the respondent.

CHILDREN 6-59 MONTHS ANTHROPOMETRY, HEALTH AND ANAEMIA: 1 questionnaire per cluster / zones / sections *(*This questionnaire is to be administered to all childREN between 6 and 59 months of age*)*

Section code / number:_____**Block code / number**: _____

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

CH1	**CH2**	**CH3**	**CH4**	**CH5**	**CH6**	**CH7**	**CH8**	**CH9**	**CH10**	**CH11**	**CH12**	**CH13**	**CH14**	**CH15**
ID	**HH**	**Consent given** 1=Yes 2=No 3=Absent	**Sex** (m/f)	**Birthdate*** dd/mm/yyyy	**Age**** (months)	**Weight** (kg) ±100g	**Height** (cm) ±0.1cm	**Oedema** (y/n)	**MUAC** (mm)	**Child enrolled** 1=SFP 2=TFP 3=None	**Measles** 1=Yes card 2=Yes recall 3=No or don't know	**Vit. A in past 6 months** (SHOW CAPSULE) 1=Yes card 2=Yes recall 3=No or don't know	**Diarrhoea in past 2 weeks** 1=Yes 2=No 3=Don't know	**Hb** *(g/L or g/dL)*
01				/ /										
02				/ /										
03				/ /										
04				/ /										
05				/ /										
06				/ /										
07				/ /										
08				/ /										
…				/ /										

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

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

WOMEN ANAEMIA: 1 questionnaire per cluster / zones / sections (This questionnaire is to be administered to all women aged between 15 and 49 years IN THE SELECTED HOUSEHOLD)

Section code / number:_____**Block code / number**: _____

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

WM1	**WM2**	**WM3**	**WM4**	**WM5**	**WM6**	**WM7**	**WM8**
ID	**HH**	**Consent given** 1=Yes 2=No 3=Absent	**Age** (years)	**Are you pregnant?** 1=Yes 2=No (GO TO HB) 8=Don't know (GO TO HB)	**Are you currently <u>enrolled</u> in the ANC programme?** 1=Yes 2=No 8=Don't know	**Are you currently <u>receiving</u> iron-folate pills (*SHOW PILL*)?** 1=Yes (STOP NOW) 2=No (STOP NOW) 8=Don't know (STOP NOW)	**Hb** (g/L or g/dL)
01							
02							
03							
04							
05							
08							
09							
10							

IYCF: 1 questionnaire per child 0-23 months *(*This questionnaire is to be administered to the MOTHER OR THE Main CareGIVER WHO IS RESPONSIBLE FOR FEEDING THE CHILD AND THE CHILD SHOULD BE BETWEEN 0 AND 23 MONTHS OF AGE)

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

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

No	**QUESTION**	**ANSWER CODES**	
SECTION IF1			
IF1	Sex	Male 1 Female 2	|___|
IF2	Birthdate RECORD FROM AGE DOCUMENTATION. LEAVE BLANK IF NO VALID AGE DOCUMENTATION.	Day/Month/Year…..|___|___| /|___|___| / |___|___||___|___|	
IF3	Child's age in months	IF AGE DOCUMENTATION NOT AVAILABLE, ESTIMATE USING EVENT CALENDAR. IF AGE DOCUMENTATION AVAILABLE, RECORD THE AGE IN MONTHS FROM THE DATE OF BIRTH.	|___|___|
IF4	Has [NAME] ever been breastfed?	Yes 1 No 2 Don't know 8	|___| **IF ANSWER IS 2 or 8 GO TO IF7**
IF5	How long after birth did you first put [NAME] to the breast?	Less than one hour 1 Between 1 and 23 hours 2 More than 24 hours 3 Don't know 8	|___|
IF6	Was [NAME] breastfed yesterday during the day or at night?	Yes 1 No 2 Don't know 8	|___|
SECTION IF2			
IF7	Now I would like to ask you about liquids that [NAME] may have had yesterday during the day and at night. I am interested in whether your child had the item even if it was combined with other foods. Yesterday, during the day or at night, did [NAME] receive any of the following? ASK ABOUT EVERY LIQUID. IF ITEM WAS GIVEN, CIRCLE '1'. IF ITEM WAS NOT GIVEN, CIRCLE '2'. IF CAREGIVER DOES NOT KNOW, CIRCLE '8'. EVERY LINE MUST HAVE A CODE. Replace and adapt the TEXT HIGHLIGHTED IN GREY TO THE CONTEXT. The text IN *ITALICS* NEEDS TO BE DELETED FROM THE FINAL SURVEY QUESTIONNAIRE – THE LIST THAT IS PROVIDED BELOW IS AN EXAMPLE.		
			Yes No DK
	7A. Plain water		7A……1 2 8

	7B. Infant formula, for example [INSERT locally available brand names of infant formula, *ALL TYPES*]	7B……1 2 8	
	7C. Milk such as tinned, powdered, or fresh animal milk, for example [INSERT locally available brand names of tinned and powdered milk]	7C……1 2 8	
	7D. Juice or juice drinks, for example [insert locally available brand names of juice drinks]	7D……1 2 8	
	7E. Clear broth	7E……1 2 8	
	7F. Sour milk or yogurt, for example [insert local names]	7F……1 2 8	
	7G. Thin porridge, for example [insert local names]	7G……1 2 8	
	7H. Tea or coffee with milk	7H……1 2 8	
	7I. Any other water-based liquids, for example [insert other water-based liquids available in the local setting AND USE LOCAL NAMES] (e.g. *sodas, other sweet drinks, herbal infusion, gripe water, clear tea with no milk, black coffee, ritual fluids)*	7I……..1 2 8	
IF8	Yesterday, during the day or at night, did [NAME] eat solid or semi-solid (soft, mushy) food?	Yes……..1 No……..2 Don't know……..8	|___|
SECTION IF3			
IF9	Did [NAME] drink anything from a bottle with a nipple yesterday during the day or at night?	Yes……..1 No……..2 Don't know……..8	|___|
SECTION IF4			
IF10	IS CHILD AGED 6-23 MONTHS? REFER TO IF2 / IF3	Yes……1 No……..2	|___| **IF ANSWER IS 2 STOP NOW**
IF11	Now I would like to ask you about some particular foods [NAME] may eat. I am interested in whether your child had the item even if it was combined with other foods. Yesterday, during the day or at night, did [NAME] consume any of the following? ASK ABOUT EVERY ITEM. IF ITEM WAS GIVEN, CIRCLE '1'. IF ITEM WAS NOT GIVEN, CIRCLE '2'. IF CAREGIVER DOES NOT KNOW, CIRCLE '8'. EVERY LINE MUST HAVE A CODE. Replace and adapt the TEXT HIGHLIGHTED IN GREY TO THE CONTEXT. The text IN *ITALICS* NEEDS TO BE DELETED FROM THE FINAL SURVEY QUESTIONNAIRE – THE LIST THAT IS PROVIDED BELOW IS AN EXAMPLE. If a category of IRON-RICH food (11A-11H) is not available in the setting, delete it from the questionnaire BUT KEEP THE original QUESTION NUMBERS and do not change. Yes No DK		
	11A. [insert common meat, fish, poultry and liver/organ flesh foods used the local setting] *(e.g. beef, goat, lamb, mutton, pork, rabbit, chicken, duck, liver, kidney, heart)*	11A……..1 2 8	
	11B. [INSERT FBF available in the local setting and USE LOCAL NAMES] (e.g. CSB+, WSB+)	11B……1 2 8	

	11C. [INSERT FBF++ available in the local setting AND USE LOCAL NAMES] *(e.g. CSB++, WSB++)*	11C……1 2 8	
	11D. [INSERT RUTF products available in the local setting AND USE LOCAL NAMES] *(e.g. Plumpy'Nut®, eeZeePaste™)* (SHOW SACHET)	11D……1 2 8	
	11E. [INSERT RUSF products available in the local setting AND USE LOCAL NAMES] *(e.g. Plumpy'Sup®)* (SHOW SACHET)	11E……1 2 8	
	11F. [INSERT LNS products available in the local setting AND USE LOCAL NAMES] *(e.g. Nutributter®, Plumpy'doz®)* (SHOW SACHET / POT)	11F……1 2 8	
	11G. [INSERT locally available brand names of *iron fortified* infant formula *ONLY*] *(e.g. Nan, S26 infant formula)*	11G……1 2 8	
	11H. [iNSERTst any *iron fortified* solid, semi-solid or soft foods designed specifically for infants and young children available in the local setting that are different than distributed commodities AND USE LOCALLY AVAILABLE BRAND NAMES] *(e.g. Cerelac, Weetabix)*	11H……1 2 8	
IF12	**In a setting where micronutrient powders are used:** Yesterday, during the day or at night, did [NAME] consume any food to which you added a [INSERT LOCAL NAME FOR Micronutrient powder or sprinkles] like this? (SHOW MICRONUTRIENT POWDER SACHET)	Yes……1 No……2 Don't know……8	|___|

WASH: 1 questionnaire per household *(*This questionnaire is to be administered to the Main Caretaker or, if they are absent, another adult member of the household)

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

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

No	**QUESTION**	**ANSWER CODES**
SECTION WS1		
WS1	How many people live in this household and slept here last night?	|___|___|

WS2	What is the ***main*** source of drinking water for members of your household? Adapt list to local setting before survey. When adapting the list, keep the original answer codes and do not change. DO NOT READ THE ANSWERS SELECT ONE ONLY	Piped water 01 Public tap/standpipe 02 Tubewell/borehole (& pump) 03 Protected dug well 04 Protected spring 05 Rain water collection 06 UNHCR Tanker 07 Unprotected spring 08 Unprotected dug well 09 Small water vendor 10 Tanker truck 11 Bottled water 12 Surface water (e.g. river, pond) 13 Other 96 Don't know 98	|___|___|
WS3	Are you satisfied with the water supply? THIS RELATES TO THE DRINKING WATER SUPPLY	Yes 1 No 2 Partially 3 Don't know 8	|___| **IF ANSWER IS 1, 3 OR 8 GO TO WS5**
WS4	What is the ***main*** reason you are not satisfied with the water supply? Adapt list to local setting before survey**.** DO NOT READ THE ANSWERS SELECT ONE ONLY	Not enough 01 Long waiting queue 02 Long distance 03 Irregular supply 04 Bad taste 05 Water too warm 06 Bad quality 07 Have to pay 08 Other 96 Don't know 98	|___|___|
WS5	What kind of toilet facility does this household use? Adapt list to local setting before survey. When adapting the list, keep the original answer codes and do not change. DO NOT READ THE ANSWERS SELECT ONE ONLY	Flush to piped sewer system 01 Flush to septic system 02 Pour-flush to pit 03 VIP/simple pit latrine with floor/slab 04 Composting/dry latrine 05 Flush or pour-flush elsewhere 06 Pit latrine without floor/slab 07 Service or bucket latrine 08 Hanging toilet/latrine 09 No facility, field, bush, plastic bag 10	|___|___| **IF ANSWER IS 10 GO TO WS7**
WS6	How many ***households*** share this toilet? THIS INCLUDES THE SURVEYED HOUSEHOLD	RECORD NUMBER OF HOUSEHOLDS IF KNOWN (RECORD 96 IF PUBLIC TOILET OR 98 IF UNKNOWN)	|___|___| Households
		SUPERVISOR SELECT ONE ONLY Not shared (**1 HH**) 1 Shared family (**2 HH**) 2 Communal toilet (**3 HH or more**) 3 Public toilet (**in market or clinic etc**.) 4 Don't know 8	|___|
WS7	Do you have children under three years old?	Yes 1 No 2	|___| **IF ANSWER IS 2 GO TO WS9**
WS8	The last time [NAME OF YOUNGEST CHILD] passed stools, what was done to dispose of the stools?	Child used toilet/latrine 01 Put/rinsed into toilet or latrine 02	

	DO NOT READ THE ANSWERS SELECT ONE ONLY	Buried 03 Thrown into garbage 04 Put/rinsed into drain or ditch 05 Left in the open 06 Other 96 Don't know 98	|___|___|

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

No	OBSERVATION / QUESTION	ANSWER			
WS9	CALCULATE THE TOTAL AMOUNT OF WATER USED BY THE HOUSEHOLD PER DAY THIS RELATES TO ALL SOURCES OF WATER (DRINKING WATER AND NON-DRINKING WATER SOURCES)	Please show me the containers you used yesterday for collecting water ASSIGN A NUMBER TO EACH CONTAINER	Capacity in litres	Number of journeys made with each container	Total litres **SUPERVISOR TO COMPLETE HAND CALCULATION**
		1 E.g. jerry can	25 L	1 x	25
		2 E.g. jerry can	10 L	2 x	20
		3 E.g. jerry can	5 L	2 x	10
		4 E.g. jerry can	5 L	1 x	5
		5 E.g. bucket	50 L	1 x	50
		6			
		7			
		8			
		9			
		10			
		Total litres used by household			110
WS10	Please show me where you store your drinking water. ARE THE DRINKING WATER CONTAINERS COVERED OR NARROW NECKED?	All are 1 Some are 2 None are 3			|___|

FOOD SECURITY: 1 questionnaire per household *(*This questionnaire is to be administered to the Main Caretaker WHO IS RESPONSIBLE FOR COOKING THE MEALS)

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

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

No	QUESTION	ANSWER CODES	
SECTION FS1			
FS1	Does your household have a ration card?	Yes 1 No 2	|___| **IF ANSWER IS 1 GO TO FS3**
FS2	Why do you not have a ration card?	Not given one at registration 1 Lost card 2 Traded/sold card 3 Not registered but eligible 4 Not eligible (not in targeting criteria) 5 Other 6	|___| **GO TO FS5**
FS3	Does your household receive full or reduced ration? (OPTIONAL)	Full……1 Half……2 Other……6	|___| **IF ANSWER IS 2 OR 6 GO TO FS5**
FS4	How many days did the food from the general food aid ration from the [INSERT] cycle of [INSERT MONTH] last?	RECORD THE NUMBER OF DAYS IF KNOWN (RECORD 98 IF UNKNOWN)	|___|___|
FS5	In the last month, have you or anyone in your household borrowed cash, food or other items with or without interest?	Yes 1 No 2 Don't know 8	|___|
FS6	In the last month, have you or anyone in your household sold any assets that you would not have normally sold (furniture, seed stocks, tools, other NFI, livestock etc.)?	Yes 1 No 2 Don't know 8	|___|
FS7	In the last month, have you or anyone in your household requested increased remittances or gifts as compared to normal?	Yes 1 No 2 Don't know 8	|___|
FS8	In the last month, have you or anyone in your household reduced the quantity and / or frequency of meals and snacks?	Yes 1 No 2 Don't know 8	|___|
FS9	In the last month, have you or anyone in your household begged?	Yes 1 No 2 Don't know 8	|___|
FS10	In the last month, have you or anyone in your household engaged in: [Add list of potentially risky or harmful activities such as local illegal activities] or any other risky or harmful activities?	Yes 1 No 2 Don't know 8	|___|
SECTION FS2			
FS11	Now I would like to ask you about the types of foods that you or anyone else in your household ate yesterday during the day and at night. I am interested in whether you or anyone else in your household had the item even if it was combined with other foods. I am interested in knowing about meals, beverages and snacks eaten or drank inside or outside the home. READ THE LIST OF FOODS AND DO NOT PROBE. PLACE A *ONE* IN THE BOX IF ANYONE IN THE HOUSEHOLD ATE THE FOOD IN QUESTION, PLACE A *ZERO* IN THE BOX IF NO ONE IN THE HOUSEHOLD ATE THE FOOD. Replace and adapt the TEXT HIGHLIGHTED IN GREY TO THE CONTEXT. The text IN *ITALICS* NEEDS TO BE DELETED FROM THE final survey questionnaire – thE LIST THAT IS PROVIDED BELOW IS AN EXAMPLE.		

	1. Any [INSERT CEREALS LOCALLY AVAILABLE] (*e.g. wheat, corn/maize, corn soy blend, barley, buckwheat, millet, oats, rice, rye, sorghum, teff*) or any foods made from these such as [INSERT LOCAL FOODS] (*e.g. bread, porridge, noodles, ugali, nshima, paste*)	1……|___|
	2. Any [INSERT WHITE ROOTS AND TUBERS LOCALLY AVAILABLE] *(e.g. green bananas, lotus root, parsnip, taro, plantains, white potatoes, white yam, white cassava, white sweet potato)* or any foods made from roots such as [INSERT LOCAL FOODS]	2……|___|
	3A. Any [INSERT vitamin A rich vegetables and tubers locally available] *(e.g. carrot, pumpkin, squash, or sweet potato that are orange inside, red sweet pepper)*	3A……|___|
	3B. Any [INSERT DARK GREEN LEAFY VEGETABLES locally available INLCUDING WILD FORMS AND VITAMIN A RICH LEAVES] (*e.g. amaranth, arugula, cassava leaves, kale, spinach*)	3B……|___|
	3C. Any [INSERT ANY OTHER VEGETABLES locally available] *(e.g. bamboo shoots, cabbage, green pepper, tomato, onion, eggplant, zucchini)*	3C……|___|
	4A. Any [INSERT VITAMIN A RICH FRUITS locally available], and 100% fruit juice made from these *(e.g. mango (ripe, fresh and dried), cantaloupe melon (ripe), apricot (fresh or dried), ripe papaya, passion fruit (ripe), dried peach)*	4A……|___|
	4B. Any [INSERT any other fruits locally available INCLUDING WILD FRUITS], and 100% fruit juice made from these *(e.g. apple, avocados, banana, coconut flesh, lemon, orange)*	4B……|___|
	5A. Any [INSERT ORGAN MEAT or blood-based foods Locally available] *(e.g. liver, kidney, heart)*	5A……|___|
	5B. Any [INSERT FLESH MEAT LOCALLY AVAILABLE] *(e.g. beef, goat, lamb, mutton, pork, rabbit, chicken, duck, cane rat, guinea pig, rat, agouti frogs, snakes, insects)*	5B……|___|
	6. Any eggs from [INSERT EGGS LOCALLY AVAILABLE] *(e.g. eggs from chicken, duck, guinea fowl)*	6……|___|
	7. Any [INSERT FRESH, DRIED OR CANNED FISH OR SHELLFISH LOCALLY AVAILABLE] *(e.g. anchovies, tuna, sardines, shark, whale, roe/fish eggs, clam, crab, lobster, crayfish, mussels, shrimp, octopus, squid, sea snails)*	7……|___|
	8. Any [INSERT LEGUMES, NUTS AND SEEDS LOCALLY AVAILABLE] *(e.g. dried peas, dried beans, lentils, nuts, seeds)* or any foods made from these such as [INSERT LOCAL FOODS] *(e.g. hummus, peanut butter)*	8……|___|
	9. Any [INSERT MILK AND MILK PRODUCTS LOCALLY AVAILABLE] *(e.g. milk, infant formula, cheese, kiefer, yogurt)*	9……|___|
	10. Any [INSERT OILS AND FATS LOCALLY AVAILABLE] added to food or used for cooking *(e.g. vegetable oil, ghee or butter)*	10……|___|
	11. Any [INSERT SWEETS, SWEETENED SODA OR JUICE DRINKS AND SUGARY FOODS LOCALLY AVAILABLE] *(e.g. sugar, honey, soda drinks, chocolates, candies, cookies, sweet biscuits and cakes)*	11……|___|
	12. Any [INSERT SPICES, CONDIMENTS AND BEVERAGES LOCALLY AVAILABLE] *(e.g. black pepper, salt, chillies, soy sauce, hot sauce, fish powder, fish sauce, ginger, herbs, magi cubes, ketchup, mustard, coffee, tea, beer, alcoholic beverages like wine, hard spirits)*	12……|___|

MOSQUITO NET COVERAGE: 1 questionnaire per household (This questionnaire is to be administered to the head of the household or, if they are absent, and ANOTHER adult member of the household).

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

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

No	**QUESTION**		**ANSWER CODES**		
SECTION TN1					
TN1	How many people live in this household and slept here last night? INSERT NUMBER				|___|___|
TN2	How many children 0-59 months live in this household and slept here last night? INSERT NUMBER				|___|___|
TN3	How many pregnant women live in this household and slept here last night? INSERT NUMBER				|___|___|
TN4	Did you have your house sprayed with insecticide in an indoor residual spray campaign in the past I___I months? (OPTIONAL)		Yes 1 No 2		|___|
TN5	Do you have mosquito nets in this household that can be used while sleeping?		Yes 1 No 2		|___| **IF ANSWER IS 2 STOP NOW**
TN6	How many of these mosquito nets that can be used while sleeping does your household have? INSERT NUMBER		IF MORE THAN 4 Nets, enter the number and use ADDITIONAL NET questionnaire sheets entering the number of the nets sequentially at the top.		|___| Nets
TN7	ASK RESPONDENT TO SHOW YOU THE NET(S) IN THE HOUSEHOLD. IF NETS ARE NOT OBSERVED → CORRECT TN6 ANSWER	NET #|___|	NET #|___|	NET #|___|	NET #|___|
TN8	OBSERVE NET AND RECORD THE BRANDNAME OF NET ON THE TAG. IF NO TAG EXISTS OR IS UNREADABLE RECORD 'DK' FOR DON'T KNOW.				
TN9	**For surveyor/supervisor only (not to be done during interview)**: WHAT TYPE OF NET IS THIS? BASED ON THE TAG INDICATE IF THIS IS A LLIN OR OTHER TYPE OF NET OR DK.	1=LLIN 2=Other/DK |___|	1=LLIN 2=Other/DK |___|	1=LLIN 2=Other/DK |___|	1=LLIN 2=Other/DK |___|
TN10	**For surveyor/supervisor only (not to be done during interview)**: RECORD THE TOTAL NUMBER OF LLINs IN HOUSEHOLD BY COUNTING THE NUMBER OF '1' IN TN9.				|___| LLINs

SECTION TN2							
Line no	**Household members**	**Sex**	**Age**	**Pregnancy status**	**Slept under net**	**Which net**	**Type of net**
#	**COL1**	**COL2**	**COL3**	**COL4**	**COL5**	**COL6**	**COL7**
	Please give me the names of the household members who live here and who slept here last night	Sex m/f	Age years	FOR WOMEN 15-49 YEARS, ASK: Is (NAME) currently pregnant? (CIRCLE NOT APPLICABLE OR N/A'99' IF FEMALE <15->49 YEARS OR MALE) Yes No/DK N/A	Did (NAME) sleep under a net last night? Yes No/DK	Ask the respondent to physically identify which of the observed nets they slept under. WRITE THE NUMBER CORRESPONDING TO THE NET THEY USED.	**For surveyor/ supervisor only:** Based on the observed net brandname recorded (TN8), indicate if it is an LliN or other / don't know (DK). LLIN OTHER/DK
01		m f	<5 ≥5	1 0 99	1 0	|___|	1 2
02		m f	<5 ≥5	1 0 99	1 0	|___|	1 2
03		m f	<5 ≥5	1 0 99	1 0	|___|	1 2
04		m f	<5 ≥5	1 0 99	1 0	|___|	1 2
05		m f	<5 ≥5	1 0 99	1 0	|___|	1 2
06		m f	<5 ≥5	1 0 99	1 0	|___|	1 2

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