Standardised Expanded Nutrition Survey (SENS)

FINAL REPORT

(Doro, Gendrassa, Kaya, and Yusuf Batil refugee camps)

Upper Nile State, Maban County, South Sudan

Surveys conducted: 7th – 26th October 2017

Report Finalised in February 2018

UNHCR
The UN Refugee Agency

IN COLLABORATION WITH

WFP, UNICEF, IMC, Samaritan Purse, MEDAIR, MSF-B, Relief International & Maban County Health Department

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ACRONYMS AND ABBREVIATIONS

ACTED	Agency for Technical Cooperation and Development
AWD	Acute Water Diarrhea
BSFP	Blanket Supplementary Feeding Programme
CI	Confidence Interval
CMR	Crude Mortality Rate
CHWs	Community Health Workers
CSB	Corn-Soya Blend
DEFF	Design effect
DPT 3	Diphtheria, Pertussis, Tetanus combined vaccine
ENA	Emergency Nutrition Assessment
ENN	Emergency Nutrition Network
EPI	Expanded Programme on Immunization
Epi Info	CDC software for epidemiological investigations
GAM	Global Acute Malnutrition
GFD	General Food Distribution
HAZ	Height-for-Age z-score
Hb	Haemoglobin
HDDS	Household Dietary Diversity Score
HIS	Health Information System
IMC	International Medical Corps
LLIN	Long lasting insecticide treated mosquito bed nets
IYCF	Infant and Young Child Feeding
LRTI	Low Respiratory Tract Infection
MAM	Moderate Acute Malnutrition
MSF-B	Médecins sans Frontières-Belgium
MUAC	Mid-Upper Arm circumference
NCHS	National Centre for Health Statistics
OTP	Out-patient Therapeutic Programme
PPS	Probability Proportion to Sample Size
PDM	Post Distribution Monitoring
PLW	Pregnant and Lactating Women
ProGress	UNHCR registration database for refugees
SAM	Severe Acute Malnutrition
SC	Stabilization Centre
SD	Standard Deviation
SENS	Standardized Expanded Nutrition Survey (Guidelines)
SFP	Supplementary Feeding Programme
SMART	Standardized Monitoring & Assessment of Relief & Transitions
SP	Samaritan's Purse
TFP	Therapeutic Feeding Programme
TSFP	Therapeutic Supplementary Feeding Programme
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
URTI	Upper Respiratory Tract Infection
WASH	Water, Sanitation and Hygiene promotion
WAZ	Weight-for-Age z-score
WHZ	Weight-for-Height z-score
WFP	World Food Programme
WHO	World Health Organization

EXECUTIVE SUMMARY

Maban County is located in Upper Nile State in the North East of the Republic of South Sudan (RoSS). The refugee caseload is composed of Sudanese fleeing from the conflict in Blue Nile State in Sudan, residing in four refugee camps: Doro, Gendrassa, Kaya (previously Jamam) and Yusuf Batil. The region is a semi-arid desert with sparse vegetation and no surface water. The climate is harsh with extreme temperatures during the dry season and flooding at the rainy season.

The surveys were conducted during the beginning of the dry season from 07th October to October 26th 2017. United Nations High Commissioner for Refugees (UNHCR) coordinanted the surveys in collaboration with the World Food Programme (WFP), The United Nation Children's Fund (UNICEF), International Medical Corps (IMC), Samaritan's Purse (SP), MEDAIR and Relief International (RI). Medecin sans Frontiere –Belgium (MSF-B) provided support in terms of logistics and nutrition supplies.

Objectives:

Primary objectives:

- To measure the prevalence of acute malnutrition in children aged 6-59 months (Module 1).
- To measure the prevalence of stunting in children aged 6-59 months (Module 1).
- To determine the coverage of measles vaccination among children aged 9-59 months (Module 1).
- To determine the coverage of vitamin A supplementation in the last 6 months among children aged 6-59 months (Module 1).
- To assess the two-week period prevalence of diarrhoea among children aged 6- 59 months (Module 1).
- To measure the prevalence of anaemia among children aged 6-59 months and in women of reproductive age between 15-49 years (non-pregnant) (Module 2).
- To investigate IYCF practices among children aged 0-23 months (Module 3).
- To determine the coverage of ration cards and the duration the general food ration lasts for recipient households (Module 4).
- To determine the extent to which negative coping strategies are used by households (Module 4).
- To assess household dietary diversity (Module 4).

- To establish recommendations on actions to be taken to address the nutrition situation in Maban refugee locations.

Secondary objectives:

- To determine the enrolment coverage of therapeutic feeding programme (TFP) and targeted supplementary feeding programme (TSFP) for children aged 6-59 months (Module 1).

- To determine enrolment into Antenatal Care and coverage of iron-folic acid supplementation in pregnant women (Module 2).

Methodology

The survey was conducted according to the UNHCR Standardised Expanded Nutrition Survey (SENS) version 2, 2013 guidelines and the Standardised Monitoring and Assessments of Relief and Transitions (SMART) guidelines. Two stage cluster sampling approach was used. The first stage involved identifying clusters and the second stage was to identify the households to take part in the survey.The Emergency Nutrition Assessment (ENA) software version July 9, 2015 was used to calculate the sample sizes. To identify clusters, the Probability Proportion to Sample Size (PPS) method was used. For sample sizes calculation, the following parameters were used; percentage population under 5, estimated Global Acute Malnutrition (GAM) prevalence from 2016 nutrition survey, desired precision, design effect. As a result, 612 households in Doro, 500 households in Batil, 455 in Gendrassa, 474 households in Kaya were computed to be assessed.

The surveys had a total of four modules out of six modules of SENS, three individual level questionnaires, and one household level questionnaires. The four modules are;

Module 1: Anthropometry and health; targeting all children (6 to 59 months) in all the sampled household;

Module 2: Anaemia; targeting all eligible children 6 to 59 months within all of the sampled households and all non-pregnant women 15 to 49 years in every other sampled household (sub-sample);

Module 3: Infant and Young Child Feeding (IYCF); targeting all children 0 to 23 months in all the sampled household;

Module 4: Food Security; targeting every other sampled households (sub-sample);

The WASH (module 5) and mosquito net coverage (module 6) modules were not taken into account for this survey. The reason is that WASH indicators are being routinely collected and mosquito net distributions have been targeted through NFI distribution and at ANC level.

Data was collected using Open Data Kit (ODK) mobile phone technology by ten teams of four members each. Because of ethnic clashes and subsequent relocation Data collection was carried out at first in Doro camp followed by Yusuf Batil and Gendrassa camps (concurrently) and lastly by Kaya camp .

RESULTS

Table 2: Summary of Key Findings SENS Oct – 2017 Refugee camps in Maban Upper Nile – South Sudan

SURVEYED CAMPS	DORO % (95% C.I)	YUSUF BATIL % (95% C.I)	GENDRASSA % (95% C.I)	KAYA % (95% C.I)	Classification of public health significance or target (where applicable)
CHILDREN 6-59 months % (95% CI)					
Acute Malnutrition (WHO 2006 Growth Standards)					
Global Acute Malnutrition (GAM)	**6.7 (5.0 – 8.9)**	**6.3 (4.2-9.3)**	**5.5 (3.6-8.3)**	**6.3 (4.5 – 8.7)**	Critical if ≥ 15%
Moderate Acute Malnutrition (MAM)	**6.2 (4.5 – 8.5)**	**5.9 (3.9-9.0)**	**4.6 (3.0-7.0)**	**6.3 (4.5 – 8.7)**	
Severe Acute Malnutrition (SAM)	**0.5 (0.2 - 1.3)**	**0.3 (0.1-1.4)**	**0.9 (0.3-2.4)**	**0.0 (0.0 – 0.0)**	
Oedema	**0.1**	**0.0**	**0.2**	**0.0**	
Mid Upper Arm Circumference (MUAC)					
MUAC <125mm and/or oedema	**4.7 (3.3-6.7)**	**2.1 (1.2-3.5)**	**3.7 (2.2-6.1)**	**2.1 (1.0-4.1)**	
MUAC 115-124 mm	**4.1 (2.8-5.8)**	**1.4 (0.8 – 2.5)**	**3.0 (1.8-5.1)**	**1.9 (0.9-4.0)**	
MUAC <115 mm and/or oedema	**0.6 (0.2 – 0.3)**	**0.6 (0.2 – 1.7)**	**0.7 (0.3-1.8)**	**0.2 (0.0 - 1.3)**	
Stunting (WHO 2006 Growth Standards)					
Total Stunting	**47.8 (43.5-52.1)**	**55.5 (50.3-60.6)**	**48.7 (43.5-54.0)**	**55.9 (51.4 – 60.4)**	Critical if ≥ 40%
Severe Stunting	**20.3 (17.4-23.6)**	**21.5 (17.4-26.3)**	**17.6 (14.7-20.9)**	**23.5 (19.8 – 27.8)**	
Programme coverage					

Measles vaccination with card or recall (9-59 months)	**93.9 (90.0-97.8)**	**92.3 (85.4-99.2)**	**92.0 (85.0-98.8)**	**98.5 (97.0-99.8)**	Target of ≥ 95%
Vitamin A supplementation coverage within past 6 months with card or recall (6-59 months)	**80.7 (71.8-89.5)**	**91.7 (84.6-98.9)**	**69.1 (53.3-84.8)**	**64.8 (47.6-81.9)**	Target of ≥ 90%
Programme enrollement coverage TFP (enrolment of SAM) based on all admission criteria (WHZ, oedema and MUAC)	**45.4 (0.0-96.02)**	**12.5 (0.0-42.0)**	**10.0 (0.0-35.8)**	**66.6 (0.0-210.0)**	Target of >90%
Programme enrolment coverage TSFP (enrolment of MAM) based on all admission criteria (WHZ, oedema and MUAC)	**38.0 (23.6-52.4)**	**33.3 (11.6-55.0)**	**39.0 (21.9-56.0)**	**22.0 (5.6-38.2)**	Target of >90%
Diarrhoea					
Diarrhoea in last 2 weeks	**10.3 (7.1-13.4)**	**16.2 (9.1-23.3)**	**19.3 (10.9-27.5)**	**17.2 (9.3-24.9)**	
Anaemia Children 6-59 months					
Total Anaemia (Hb <11 g/dl)	**52.8 (47.8-57.8)**	**44.2 (39.7-49.1)**	**48.0 (42.7-53.2)**	**46.8 (40.6-53.0)**	High if ≥ 40%
Mild (Hb 10-10.9 g/dl)	**30.4 (26.5-34.4)**	**27.7 (24.2-31.2)**	**27.0 (23.8-30.1)**	**28.9 (24.8-33.0)**	
Moderate (Hb 7-9.9 g/dl)	**21.6 (17.4-25.8)**	**16.7 (13.3-20.0)**	**20.4 (16.3-24.5)**	**17.4 (13.2-21.5)**	
Severe (Hb<7 g/dl)	**0.7 (0.1-0.4)**	**0.0 (0.0-0.0)**	**0.5 (0.0-1.0)**	**0.5 (0.0-1.0)**	
CHILDREN 0-23 months					
Anemia children 6-23 months					
Total Anaemia (Hb <11 g/dl)	**71.6 (65.9-77.3)**	**62.4(55.4-69.4)**	**73.7(66.6-80.7)**	**58.6(49.2-68.0)**	
Mild (Hb 10-10.9 g/dl)	**40.3 (34.3-46.3)**	**34.9(26.4-41.4)**	**34.7(27.3-42.0)**	**37.4(31.4-43.4)**	

Moderate (Hb 7-9.9 g/dl)	**30.3 (23.6_37.0)**	**27.5(20.6-34.4)**	**37.9(29.5-46.1)**	**20.2(12.8-27.5)**	
Severe (Hb<7 g/dl)	**0.1 (0.0-2.4)**	**0.0 (0.0-0.0)**	**1.0 (0.0-1.5)**	**1.0 (0.0-1.3)**	
IYCF indicators					
Timely Initiation of Breastfeeding	**88.4 (83.6-93.0)**	**91.1 (87.5-94.6)**	**86.0 (78.3-93.7)**	**92.4 (87.8-97.0)**	
Exclusive Breastfeeding under 6 months	**90.4 (83.3-97.5)**	**88.2 (77.6-98.8)**	**95.0 (87.7-102.2)**	**97.7 (92.8-100)**	
Continued breastfeeding at 1 year	**98.6 (95.6-100)**	**95.1(88.1-100)**	**96.7 (89.8-103.5)**	**96.8 (90.5-103.0)**	
Continued breastfeeding at 2 years	**83.6 (75.0-92.2)**	**86.7 (74.9-98.4)**	**76.7 (63.0-90.4)**	**83.8 (67.4-100.0)**	
Introduction of solid, semi-solid or soft foods	**52.7 (38.5-67.0)**	**50.0 (26.7-73.2)**	**54.5 (32.0-77.0)**	**55.4 (39.3-71.3)**	
Consumption of iron- rich or iron -fortified foods	**81.2 (71.5-90.9)**	**88.1 (78.3-97.7)**	**83.4 (70.4-96.4)**	**79.8 (67.6-91.9)**	
Bottle feeding	**2.3 (0.0-1.2)**	**22.6 (6.6-38.4)**	**18.2 (4.0-32.3)**	**21.0 (6.5-35.4)**	
WOMEN 15-49 years					
Anaemia (non-pregnant)					
Total Anaemia (Hb <12 g/dl)	**25.6 (20.3-30.9)**	**27.9 (20.5-35.2)**	**28.1 (21.4-34.8)**	**28.6 (21.5-35.7)**	High if ≥ 40%
Mild (Hb 11-11.9)	**18.4 (13.5-23.6)**	**20.0 (14.3-25.8)**	**15.6 (9.8-21.4)**	**13.6 (9.2-17.9)**	
Moderate (Hb 8-10.9)	**7.2 (4.0-10.5)**	**7.4 (3.3-11.5)**	**12.0 (7.1-16.8)**	**14.1 (8.9-19.2)**	
Severe (Hb <8)	**0.0 (0.0-0.0)**	**0.4 (0.0-1.3)**	**0.5 (0.0-1.5)**	**0.9 (0.0-2.2)**	
Programme enrolment pregnant women					
Pregnant women currently enrolled in the ANC	**76.8(63.5-90.0)**	**100.0**	**92.9 (84.9-30.7)**	**95.8 (87.5-100)**	
Pregnant women currently receiving Iron-folic acid pills	**76.8(63.5-90.0)**	**100.0**	**92.9 (84.9-30.7)**	**95.8 (87.5-100)**	
Food Security					

Proportion of HH with a ration card	**98.6(97.0-100)**	**100.0**	**100.0**	**100.0**	
Average House Hold Diversity Score(HDDS)	**5.3(4.8-5.9)**	**5.0 (4.0-6.11)**	**5.1(4.1-6.1)**	**4.8 (3.9-5.7)**	
Proportion of households consuming either a plant or animal source of vitamin A	**94.2 (90.8-97.6)**	**76.8 (61.7-91.8)**	**78.4 (65.0-91.7)**	**82.9 (71.2-94.4)**	
Proportion of households consuming organ meat/flesh meat, or fish/seafood (food sources of haem iron)	**47.8 (36.5-59.0)**	**54.1 (37.9-70.3)**	**62.5 (48.9-76.0)**	**48.6 (32.5-64.6)**	
Proportion of households reporting using the following coping strategies over the past month*:					
Borrowed cash, food or other items with or without interest	**52.1 (41.9-62.3)**	**81.4 (73.7-89.0)**	**73.5 (65.0-81.8)**	**77.4 (66.6-88.0)**	
Sold any assets that would not have normally sold	**15.7 (6.7-24.6)**	**35.9 (23.5-48.1)**	**24.8 (17.5-31.9)**	**33.8 (21.8-45.7)**	
Requested increased remittances or gifts as compared to normal	**6.0 (0.0-15.0)**	**24.5 (13.0-35.9)**	**16.4 (5.8-26.8)**	**28.6 (16.1-41.1)**	
Reduced the quantity and/or frequency of meals and snacks	**47.2 (33.8-60.6)**	**72.0 (59.1-84.9)**	**60.4 (44.8-75.8)**	**73.7 (61.7-81.6)**	
Begged	**30.6 (19.2-42.0)**	**44.7 (30.1-59.2)**	**26.9 (15.1-38.5)**	**40.8 (25.5-56.1)**	
Engaged in potentially risky or harmful activities	**5.8(1.9-10.0)**	**13.0(4.2-21.9)**	**10.1(1.3-18.9)**	**11.8(4.4-19.1)**	
Households reporting using none of the listed coping strategies	**26.2(16.5-35.8)**	**3.8(0.3-7.3)**	**11.5 (2.9-20.1)**	**1.9(0.0-4.1)**	

Result Interpretation

The table below shows the public health significance malnutrition classification among children under 5 years old.

Table 1: Classification of Public Health Significance for Children Under 5 Years of Age

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

Source: WHO (1995) Physical Status: The Use and Interpretation of Anthropometry and WHO (2000). The Management of Nutrition in Major Emergencies

- According to the World Health Organisation (WHO) classification, the GAM prevalence in all four Maban refugee camps is poor (WHO, 2000). A comparison of the 2017 results to that in 2016 showed GAM prevalence was lower in all camps. The poor status as well as improvement of the overall nutrition situation in 2017 is confirmed by the weighted GAM and SAM prevalences of 2017 (weighted GAM= 6.4 %, weighted SAM =0.4 %) lower than those of to 2016 (weighted GAM= 11.0 %, weighted SAM=1.6 %). The decrease was significant only in Doro and Kaya ($p<0.05$). This means that the nutrition situation in Yusuf Batil and Gendrassa refugee camps remained the same in 2017. This indicates that the interventions in 2017 were able to curb the deterioration of the nutrition situation in all camps, especially in Doro and Kaya. However more effort is required to gain further improvement especially in Batil and Gendrassa refugee camps.

- The stunting prevalence in all Maban refugee camps is critical as it is above the public health significance threshold of ≥40%. As compared with 2016, there was a significant increase in Doro ($p<0.05$) while Kaya experienced a significant decrease ($p<0.05$). The stunting prevalence increased in Batil and Gendrassa but it was not significant ($p>0.05$). Stunting results should however be interpreted with caution due to the low proportion of children that had credible age determination documents in the camps. Age determination of the rest of the lot relied on age recall via an events calendar.

- Measles coverage was slightly below the required standards in Doro, Yusuf Batil and Gendrassa camps (between 92.0-93.9 %) except in Kaya where the target was met (≥ 95%).

- Vitamin A coverage met the acceptable standard of ≥ 90% only in Batil refugee camp while in other camps it was below standards (65.9% to 77.5 %).

- Diarrhoea among children aged 6-59 months in the last two weeks prior to nutrition survey ranged between 10.3% - 19.3%. In comparision with the results of SENS 2016 where it was reported ranged between 5.3% - 20.1%. An increase has been noticed in Yusuf Batil camp from 5.3% in 2016 to 16.2% in 2017.

- Enrolment in the MAM and SAM treatment programmes was significantly low ranged from 10-67 % for SAM cases in TFP and 22-39% for MAM cases in the TSFP respectively.

- The anaemia prevalence in children 6-59 months old ranged between 44.2%-52.8% remain critical as it is above the 40% level of public health significance in all the refugee camps in Maban. Children aged 6-23 months were the most affected age group where anaemia prevalence ranged between 58.8%-73.6%. The anaemia prevalence in Doro, Yusuf Batil and Gendrassa remained the same in 2017 ($p>0.05$) compared to that in 2016 apart from Kaya camp which experienced a significant decrease ($p<0.05$). Anaemia prevalence among women of reproductive age 15-49 years (non-pregnant) ranged between 25.6%-28.6% remain as medium public health significance.

  Ante Natal Care (ANC) enrolment and iron-folic acid coverage were each **76.8 %** (63.5-90.0 95% CI) in Doro, **100.0 %** (100.0-100.0 95% CI) in Yusuf Batil, **92.9%** (84.9-30.7 95% CI) in Gendrassa and **95.8%** (87.5-104.0% CI) in Kay any mother attending ANC was automatically given iron-folic acid pills.

- Timely initiation of breast feeding, exclusive breastfeeding rates, continued breast feeding at one and two years were in average 89%, 93%, 96.7% and 84% respectively in Maban refugee camps indicating improving breastfeeding practices. Timely introduction of solid, semi solid or soft food practice remain low but improved as compared with 2016. The consumption of iron rich or iron fortified foods improved substantially as compared with 2016, possibily indicating awareness raising in this area including the provision of options that allow for the realisation of it might have had impact. Bottle feeding usage ranged from 2.3% to 22.6 % with Yusuf Batil and Kaya have the higher proportion. Attention to reduce the proportion in the latter camps to be put in place in 2018.

- Nearly all the sampled households (ranged between 98.6%-100%) had access to food assistance. The Household Dietary Diversity Score (HDDS) was 5.3 in Doro, 5.0 in Yusuf Batil, 5.1 in Gendrassa and 4.8 in Kaya out of 12 foods groups. The majority of household reported using one or more of the negative coping strategies.

RECOMMENDATIONS AND PRIORITIES

Nutrition related

- UNHCR and partners to maintain and strengthen the implementation of CMAM program providing both therapeutic and supplementary feeding programs including prevention, active case finding through screening, detection, referral mechanism through the community outreach programme to facilitate the rehabilitation of the identified acute malnourished children (UNHCR, WFP, UNICEF, Partners).

- Timely start and consistent delivery of blanket supplementary feeding programme all year round for children 6-23 months and pregnant and lactating women to continue preventing malnutrition and covering the nutrient gap these vulnerable groups have in light of a predominant grain based general food diet. It is important for UNHCR and WFP to work on early preposition of CSB++ (UNHCR, WFP, Partners).

- Reinforce the consistency the two step MUAC and WHZ scores (for children with MUAC at risk) screening monthly at the BSFP sites in all camps to ensure both high MUAC and WHZ score coverage (Partners).

- Continue to strengthen the capacity of established nutrition facilities and outreach activities in terms of staff and community workers training to facilitate quality provision of both curative and preventative components of nutrition (UNHCR, WFP and UNICEF).

- In line with the updated Infant and Young Child Feeding (IYCF) methods from recent Training of Trainers (ToT) and rollout trainings, and consider the use of UNHCR multi-sectoral IYCF friendly framework to reinforce IYCF and community outreach education aspects to prevent malnutrition from occurring in the first place. In 2018, South Sudan is expected to be one of the countries to benefit from the roll out of the IYCF-friendly framework .IYCF in Maban to prioritise the creation of awareness on appropriate complementary feeding from six months an area that requires significant improvement (UNHCR, UNICEF and Partners).

- Improve the CMAM programming by implementing the updated national CMAM guidelines.

- Reinforce the anaemia prevention and control strategy implementation by improving the early and systematic screening/detection, diagnosis and treatment at key contact points at health facility as well as regular reporting. In addition, particular attention to screening and referral of severe anaemia cases to the health facilities for treatment is recommended.

- Reinforce regular supervision, monitoring, quarterly joint monitoring and yearly program performance evaluations in all camps to assess performance progress and formulate recommendations for any identified gaps (UNHCR, WFP, UNICEF, and Partners).

- Carry out nutrition surveillance through quarterly mass MUAC screening. The screening exercise to also be used to ascertain coverage and to refer any acute malnourished children identified (Partners).

- Undertake annual joint nutrition surveys in all camps to analyse trends, assess program impact and facilitate evidence based recommendations for nutrition programming (UNHCR, WFP, UNICEF and Partners).

Food security related

- Provision of food assistance providing the recommended 2100kcal/person/day to facilitate basic nutrition provision at household level (UNHCR and WFP).

- Continue the routine monthly food basket monitoring on site to ensure that refugees receive their entitlement in addition to ensuring identified gaps are addressed in a timely manner (UNHCR, WFP and Food security partners).

- Improve timeliness data collection, frequency, reporting and feedback to community of post distribution monitoring at the household level in all camps (WFP, UNHCR and partners).
- Expand the coverage of sustainable food security and livelihood solutions (with increased focus on agro-nutrition) in the refugee context in all camps that promote diet diversity and complement the general food ration (UNHCR, WFP and Partners).

Health related

- Maintain and strengthen the provision of comprehensive primary health care programme providing both curative and preventative community outreach services to reduce the disease burden among the refugees in Maban (UNHCR and Partners).

- Ensure Vitamin A supplementation and deworming is maintained in all the refugee camps including the periodic campaigns at least two times in the year. Kaya to pay attention to increasing the coverage to acceptable standards (UNHCR and Partners).

- UNICEF, UNHCR and Partners to ensure the EPI program continues to maintain the acceptable standards (UNHCR, UNICEF and Partners).

- Strengthen reproductive health interventions including healthy timing and spacing of pregnancies to improve birth outcomes, allow for continued breastfeeding until at least 24 months, reduce the risk of iron deficiency anaemia and maternal mortality thus improved nutrition for both the mothers and their children. (UNHCR and Partners).

- Reinforce comprehensive linkages between health nutrition and WASH by maintaining and improving cross cutting sectoral impact activities such as mosquito net distribution, WASH water ponds mitigation/WASH facilities usage for livelihood support, vector control activities (Indoor Residual Spraying, larviciding etc.).

- Reinforce the community engagement strategies to increase ownership and responsibilities from the community.

- Based on 2017 experience in Maban, strengthen the reinforcement of the capacities of the refugee staff to take over health and nutrition activities.

- Update regularly incase of any change of situation the emergency health and nutrition plans.

1. INTRODUCTION

1.1. Background

Maban County is located in Upper Nile State in the North East of the Republic of South Sudan (RSS). The refugee caseload is composed of Sudanese fleeing from the conflict in Blue Nile State in Sudan, residing in four camps: Doro, Yusuf Batil, Gendrassa and Kaya (previously Jamam). The region is semi-arid with sparse vegetation and no surface water. The climate is harsh with extreme temperatures during the dry season and flooding at the rainy season. The surveys were conducted during the beginning of the dry season in October 2017.

The total registered refugee population in the four camps as of October 2017 (UNHCR ProGres data) was 142,215. The refugees have limited access to additional sources of income, the environment is not suitable for agricultural activities, and very few manage to keep livestock. The majority of the refugees is largely dependent on the general food ration from World Food Programme (WFP).

The land surface in Maban is composed of clay soil which is impassable with rain, however significant work has been done between and within camps to upgrade the quality of roads using murram. This ensures that humanitarian work is not hampered. Each camp has a market area which is accessible to all refugees as well as the main Bunj market run by the local host community and business people from Ethiopia.

UNHCR and WFP continue to work together, in partnership, to ensure that food security and related needs of the refugees are adequately addressed. WFP is responsible for the provision of the general food ration while UNHCR and its Partners provide protection, health services, water and sanitation, shelter, and basic non-food items.

Description of the population

During the survey period in October 2017, a total of 142,215 refugees were registered in the four camps .Doro camp was populated by 57,257 refugees, Batil by 43,541 refugees, Gendrassa by 17,659 refugees and Kaya by 23,758 refugees (Source; UNHCR ProGres). The main ethnic groups in the four camps are Ingassana, Uduk, jumjum, Nuba, Dafur, and magaja. Islam and Christianity are the two dominant religions practiced in the camps. At the country of origin, the refugees are agriculturalist and keep some herds of livestock such as; goat, sheep, and cattle. Sorghum, simsim, and maize are some main staple foods grown by the refugees. The year 2017 was marked by ethnic clashes between Uduk-Majority and Ingassana tribes in Doro camp, leading to the relocation of Ingassanas from Doro to the three other camps (Ingassana majority). That event reshaped the ethnic profiles of the camps with Doro configured as an Uduk-majority camps while Batil, Gendrassa and Kaya became Ingassana-oriented camps. Obviously, that new configuration impacted the health and nutrition service delivery in the camps.

Food security situation

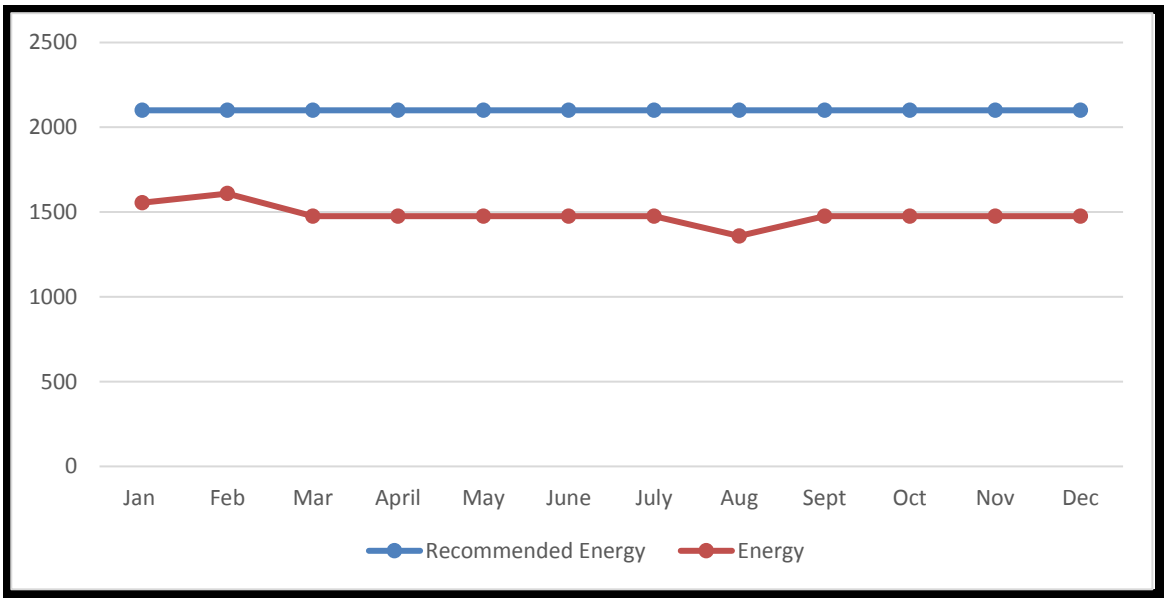
The registered refugees in Maban camps are highly dependent on general food ration provided by WFP through General Food Distribution (GFD) by partners. In Maban, WFP has two partners for the delivery and distribution of general food assistance each serving two camps (Samaritan Purse in Doro and Yusuf Batil camps and ACTED in Kaya and Gendrassa camps). Throughout the year

(2017), all registered refugees in the four camps received general food rations at a 70% scale following the 30% reduction since August 2015 due to funding constraints. An inadequate food basket with only three food items: cereals (350grams/person/day), pulses (35grams/person/day), and cooking oil (21grams/person/day) was provided (table 1). Salt and CSB+ essential commodities in the food basket were missing in the food basket. The average daily energy intake from the ration provided was 1476 Kcal/p/day which is below the recommended daily energy intake of 2100 kcal/p/day (see Table 2 and Figure 1).

Table 2: General Food distribution Rations (factoring the 30 % reduction)

Food Item	Grams/person/day	Kilo Calories	% Energy
Sorghum	350	1173	79.5%
Pulses	35	117	7.9
Vegetable oil	21	186	12.6
Salt	3.5	0	0
Total	409.5	1476	70.2

Figure 1: Monthly average daily energy provision (Kcal/p/day) in Maban Camps (Jan –Dec 2017)



Post Distribution Monitoring (PDM) was conducted twice in 2017 (February/March and October/November) in Maban refugee camps by WFP with support from GFD partners and UNHCR. However, the report are still pending clearance of WFP Juba office. In addition, food basket monitoring (FBM) is conducted every month during GFD in all Maban camps. Outcome of this monitoring (FBM) suggests that refugees use a portion of their GFD food items in exchange of milling services and to meet some basic needs (buying salt, sugar, and other food items). This means that the reduced calories available for consumption are likely to reduce further. The milling vouchers introduced in December 2013 to support food assistance were stopped in March 2015. The vouchers covered milling of 70 % of the cereal in 2014. This reduced to 50 % in January 2015 through to March 2015 when the assistance stopped. Since November 2017, WFP has initiated cash distribution of 120 SSP/person to replace the milling voucher programme who was discontinued in March 2015.

Livelihood activities are likely to contribute to food security in Maban refugee camps included basic agriculture. Some households planted crops at a small scale Kitchen garden level. Main crops grown included sorghum, simsim, cow peas, amaranth, tomatoes, eggplant and Kale.

In Maban camps, all the foods and non-food items (NFI) brought to the persons of concern are sourced from either Juba or Sudan (GFD food items provided by WFP). Transportation of goods by road to Maban has been a challenge which has meant that at times the GFD food components have to be airlifted which is very expensive. In addition, there was pipeline break of some nutrition supplies which included pulses and salt.

A number of markets do exist either within or nearby of the respective camps. Majority of both the persons of concern and host communities rely also on Bunj Market which is the biggest in Maban County. Most of the food items sold are partly from the GFD and others brought by dealers/traders from Sudan, Ethiopia and Blue Nile State in Sudan. Main food items sold are cereals, pulses, and limited varieties of vegetables, cooking oil, seeds, and some non-food items.

Health situation

Health care services providers/partners vary from one camp to the other. There are four main health partners in Maban camps delivering health and nutrition services at either Primary Health Care Centres (PHCC) or health posts. Health care services are delivered by the following organizations: Doro camp is handled by IMC and MSF-B, Batil camp by MEDAIR, Gendrassa and Kaya camps by IMC. Each camp also has also a community outreach structure which provides a linkage between the community and the health facilities. In addition to this, there are two main referral hospitals (Gentile and Bunj) serving both the refugees and the host community and managed by RI and SP respectively. The presence of these hospitals has significantly reduced on the number of referrals to Juba. In the camps, ethnic clashes between refugees disrupted service delivery, especially in Batil, Gendrassa and Kaya where only one health and nutrition partners was operating.

The Crude Mortality Rate (CMR) and Under Five Mortality Rate (U5 MR) remained within the standard thresholds of 0.75/1000/month and 1.5/1000/month respectively in most of the period in 2017.

The year 2017 was characterized by ethnic clashes and subsequent relocations between refugees (May, June, July) as well as staff/strike issues within health and nutrition organizations (October, November, December) which disrupted health and nutrition services in the camps, leading to temporary closure of health posts (block 17 in Gendrassa, block F in Kaya, west clinic in Batil camp, vandalized PHCU of Belila in Doro camp). As a result CMR went beyond the thresholds in Batil camp (June) and Kaya camp (February, August) while the U5 MR was beyond threshold in Gendrassa camp (June, July, December) and Kaya camp (January, March, May, June) (Source; UNHCR HIS Jan to Dec 2017). The mortality trends are illustrated in Figures 2, 3, 4, and 5 below. Note that the situation in Doro was better mitigated as that camp had two partners and one was able to take over extra-responsibilities in such period. Kaya was the most affected camp due to its relative isolation status as compared with other Maban camps. However it worth noting that health, nutrition and WASH partners and UNHCR managed to keep the situation under control by activating emergency/minimum services plans including emergency referrals , support from other

partners (camp management) and sectors , minimum dug stocks in camps, use of refugee trained refugee staff etc. In Doro, a health post was set up at the extension site to treat minor health/nutrition cases.

In 2017, the main morbidities were Upper Respiratory Tract Infection (URTI) Lower Respiratory Tract Infection (LRTI), watery diarrhoea, Malaria (both confirmed and suspected cases) and skin diseases with an average proportion of 30.3 %, 25.02 %, and 16.12 %, 7.6 % and 4.3 % respectively. (Source; UNHCR HIS Jan to Dec 2017). The detailed top five causes of morbidity are illustrated in figures 6, 7, 8 and 9 below:

Figure 2 :Crude and under-5 mortality rates (Jan-Dec 2017) – Doro refugee Camp

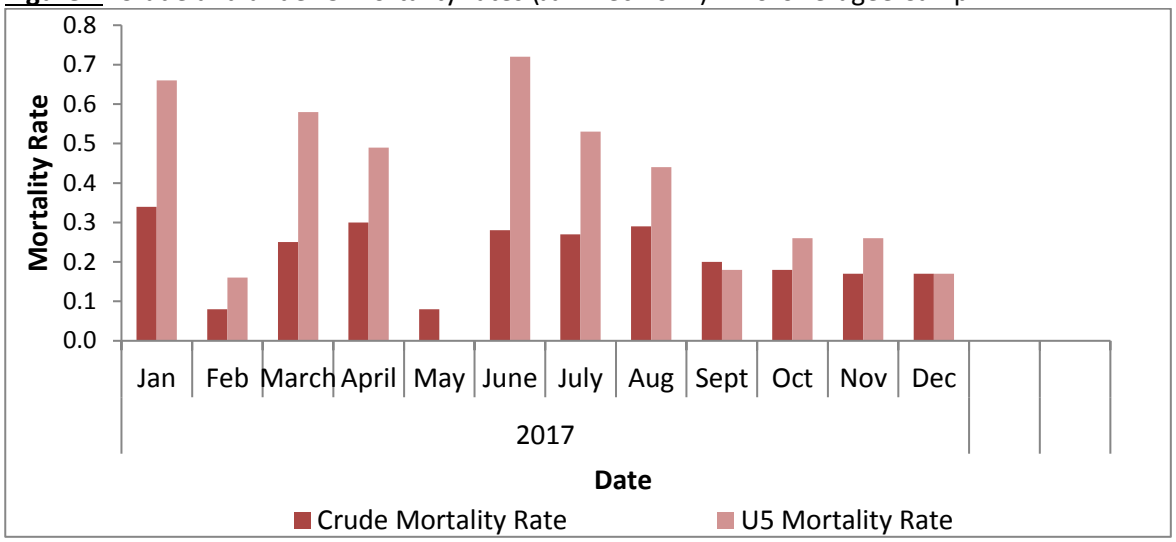


Figure 3:Crude and under-5 mortality rates (Jan-Dec 2017) – Batil refugee camp

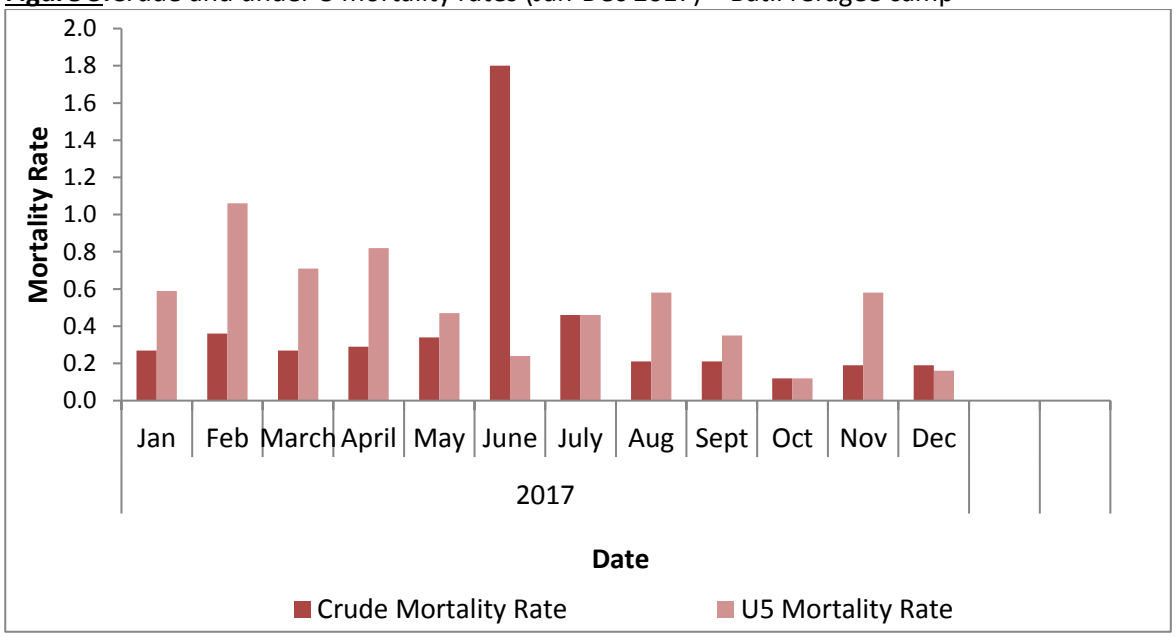


Figure 4: Crude and under-5 mortality rates (Jan-Dec 2017) – Gendrassa refugee camp

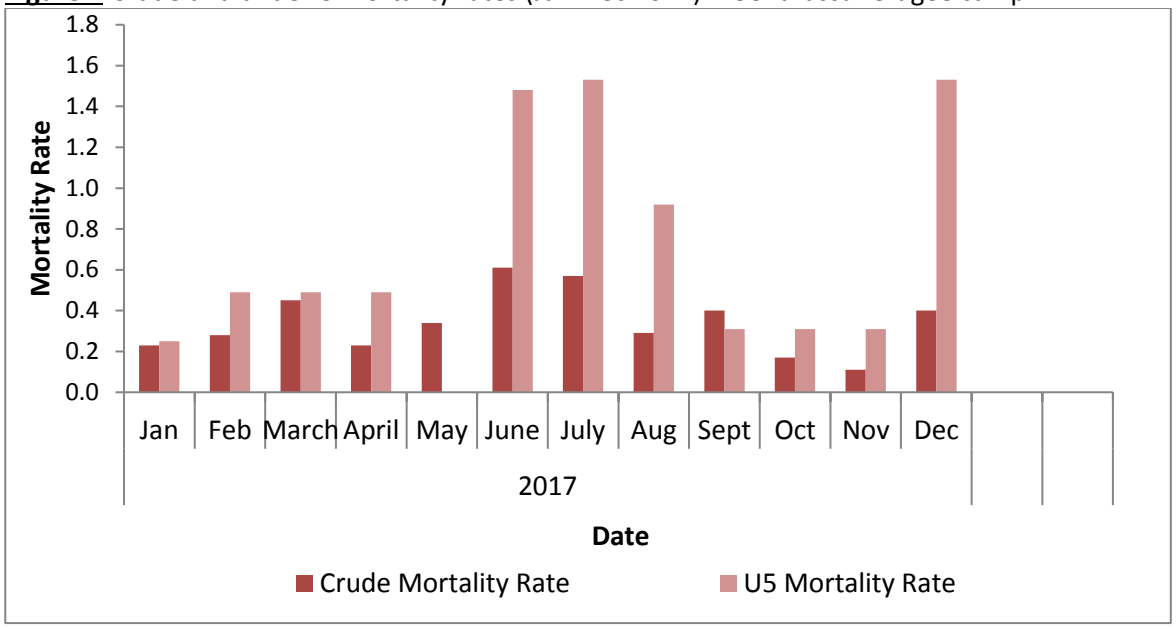


Figure 5: Crude and under-5 mortality rates (Jan-Dec 2017) – Kaya refugee camp

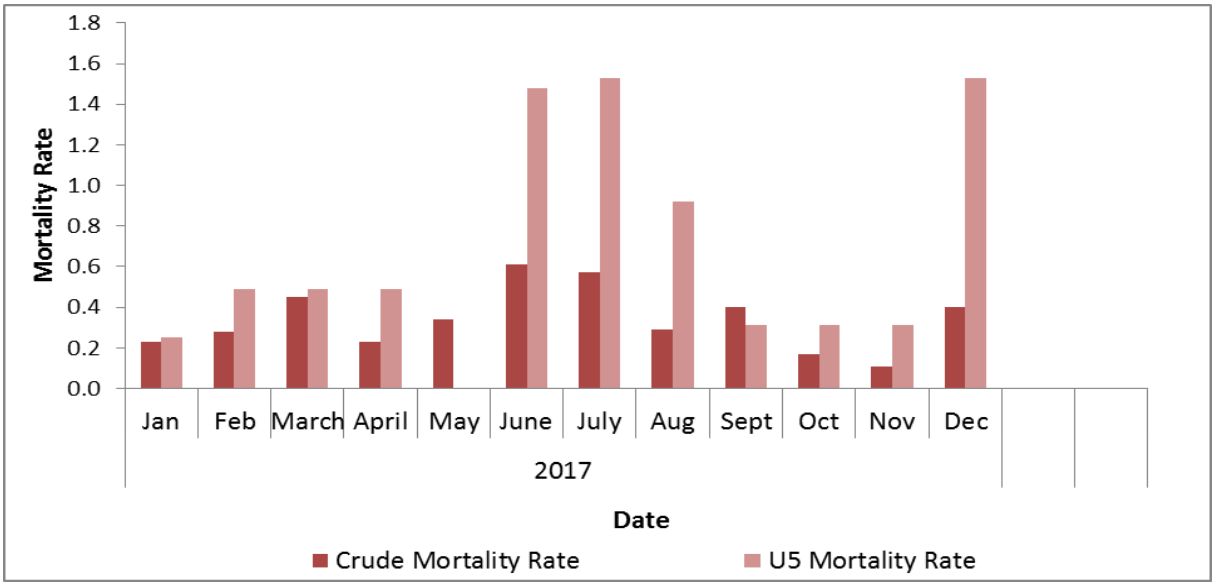


Figure 6: Top five causes of morbidity in children under 5(Jan-Dec 2017) - Doro refugee camp

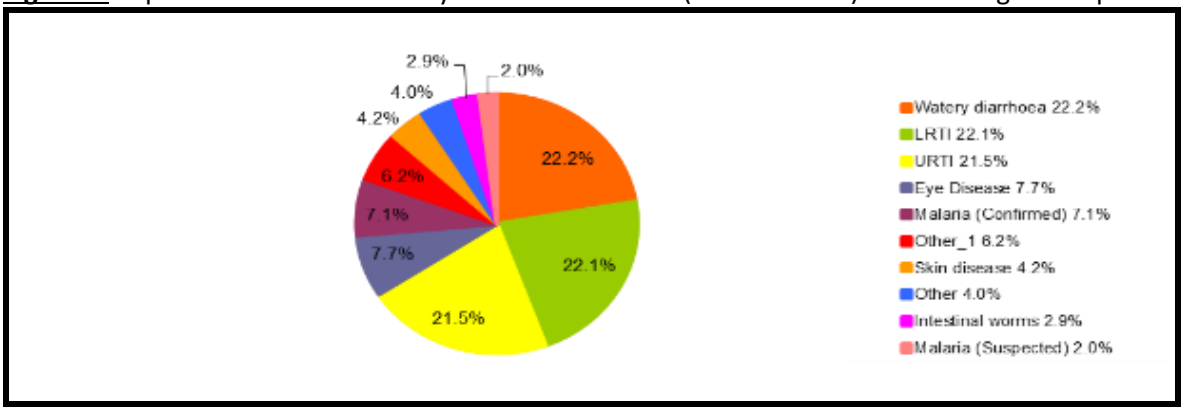


Figure 7: Top five causes of morbidity in children under5 (Jan-Dec 2017) -Yusuf Batil refugee camp

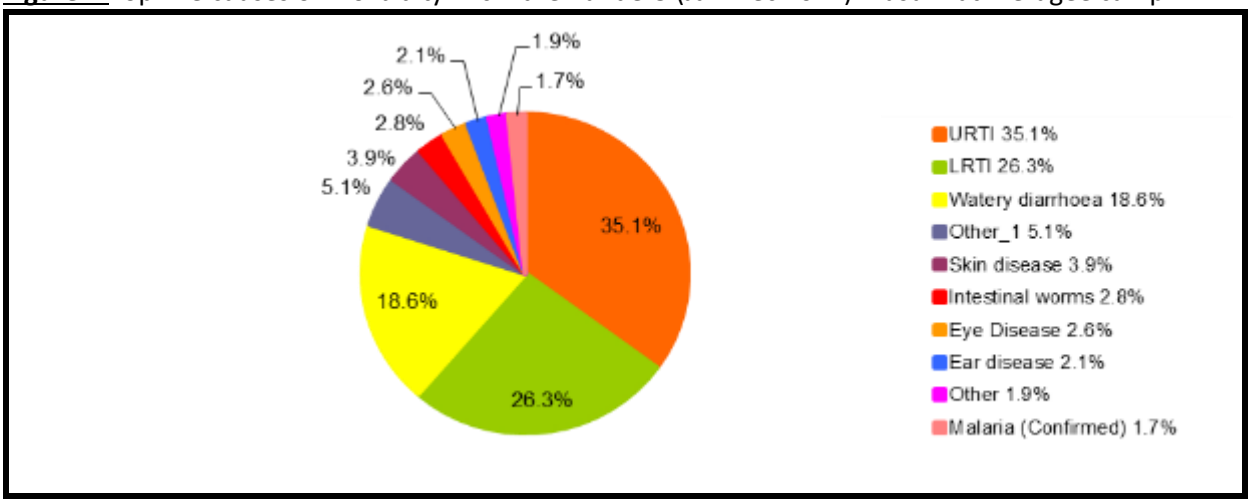


Figure 8: Top five causes of morbidity in children under 5(Jan-Dec 2017) - Gendrassa refugee camp

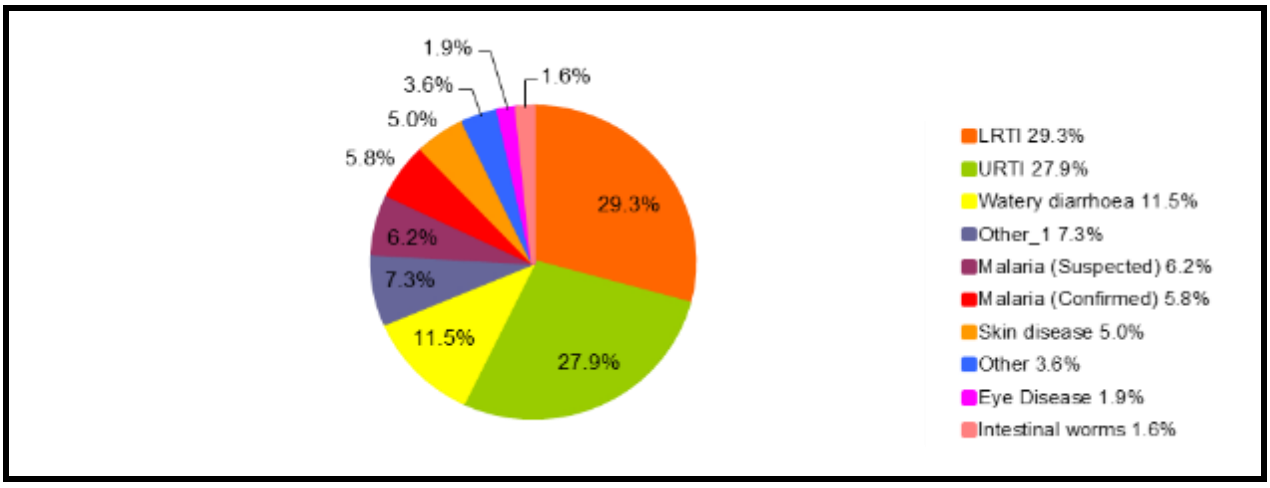
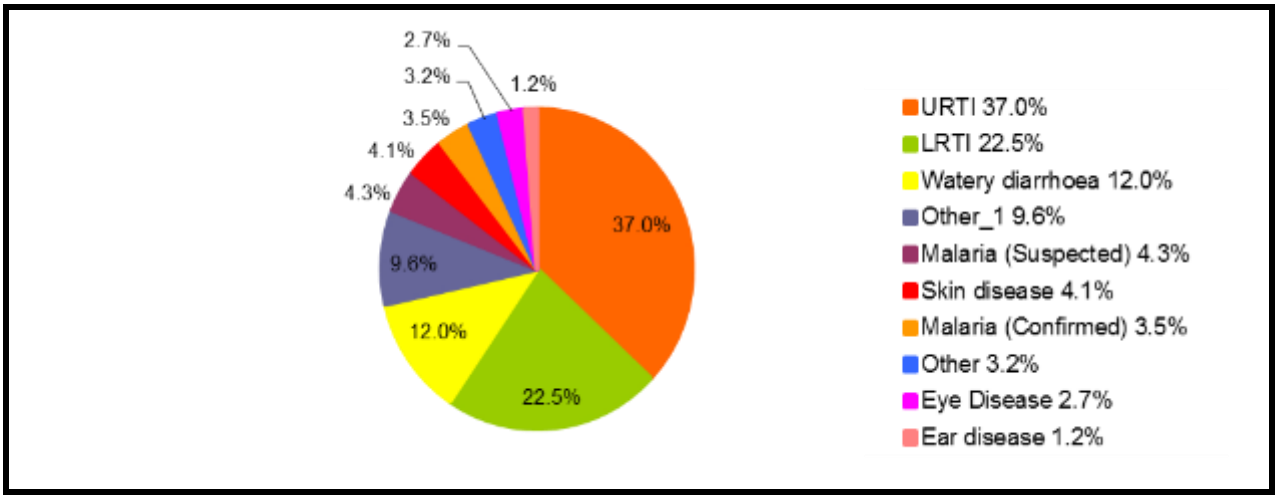


Figure 9: Top five causes of morbidity in children under5 (Jan-Dec 2017)-Kaya refugee camp



Nutrition situation

Curative Services

Prior to 2017 nutrition survey and considering 2016 survey results, the overall nutrition situation was serious in Doro and Kaya camps and poor in Yusuf Batil and Gendrassa camps. Curative nutrition interventions were provided in all the respective camps even though disrupted by ethnic clashes and staff strikes as already mentioned above when some health posts where temporarily closed. Curative services included Stabilisation Centres (SC) for severely acute malnourished children with major medical complications, Outpatient Therapeutic Feeding Program (OTP) for severely acute malnourished children without medical complications, Targeted Supplementary Feeding Program (TSFP) for moderately acute malnourished children 6 to 59 months and pregnant and lactating women.

These interventions were offered in eight OTP centres (two in Batil by Medair, three in Doro, two in Kaya, and one in Gendrassa by IMC), eight TSFP centres (two in Batil by Medair, two in Doro, two in Kaya, and two in Gendrassa by IMC) and three SCs managed by SP in Bunj hospital, RI in Gentile hospital, and MSF-B in Doro clinic. Note that as a matter of fact, some OTP and TSFP centres located in health facilities affected by the ethnic clashes and staff strike could not function. All interventions follow the South Sudan guidelines for management of acute malnutrition and the UNHCR Nutrition and Food Security strategy.

In the four camps in 2017, a total of 3910 children 6 to 59 months were admitted into Targeted Supplementary Feeding Programs (TSFP). SAM new admissions (both SC and OTP) where 3875 children 6 to 59 months. As shown on the graphs, there were higher admissions in the camps from May-June to August. This could be linked also to the peaks of watery diarrhoea and malaria at that period, which in turns were exacerbated by the instability in the camps. High numbers of SAM without complications in OTP were detected particularly during instability periods in the camps and particularly in Doro. During the relocations triggered by the clashes, populations were temporarily hosted in schools with limited facilities (toilets etc.). As a result that promiscuity and bad hygienic conditions were rooms for increased water-borne diseases. See below under figures 10, 11, 12 and 13 the admission trends of children under five years.

In 2017, UNHCR in collaboration with UNICEF facilitated a CMAM training at Maban Level for all health and nutrition partners to update them on the South Sudan CMAM guidelines (November 2017).

Figure 10: Number of Admissions to Treatment Programmes for MAM and SAM in Children 6-59 Months – Doro refugee camp

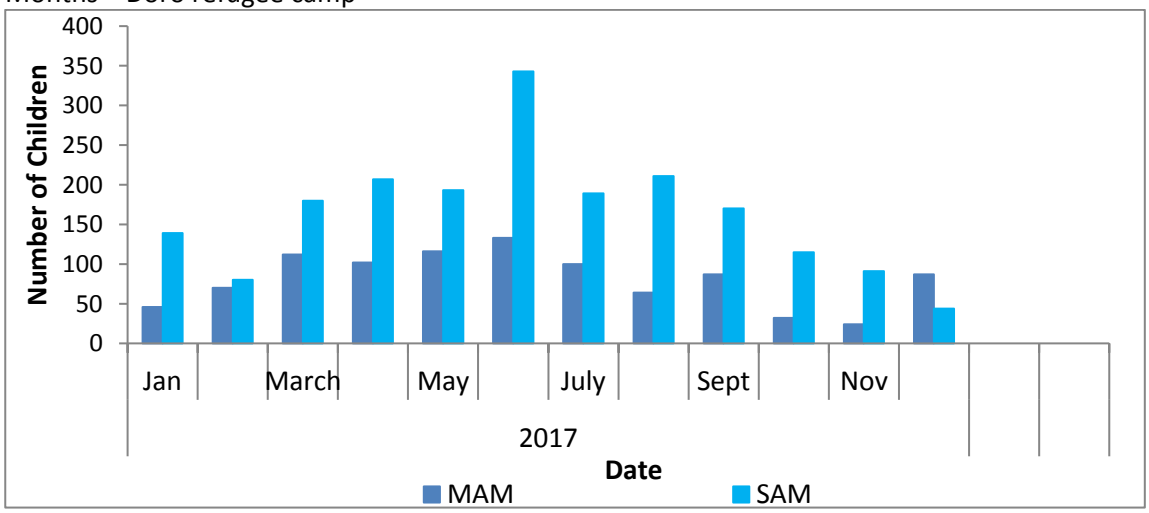


Figure 11: Number of Admissions to Treatment Programmes for MAM and SAM in Children 6-59 Months – Yusuf Batil refugee camp

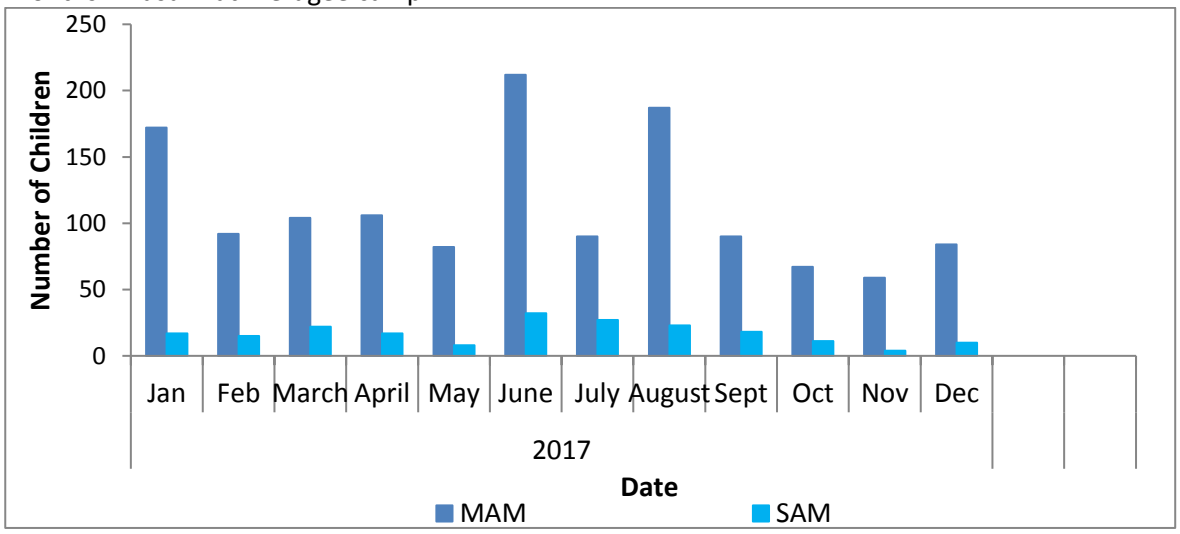


Figure 12: Number of Admissions to Treatment Programmes for MAM and SAM in Children 6-59 Months – Gendrassa refugee camp

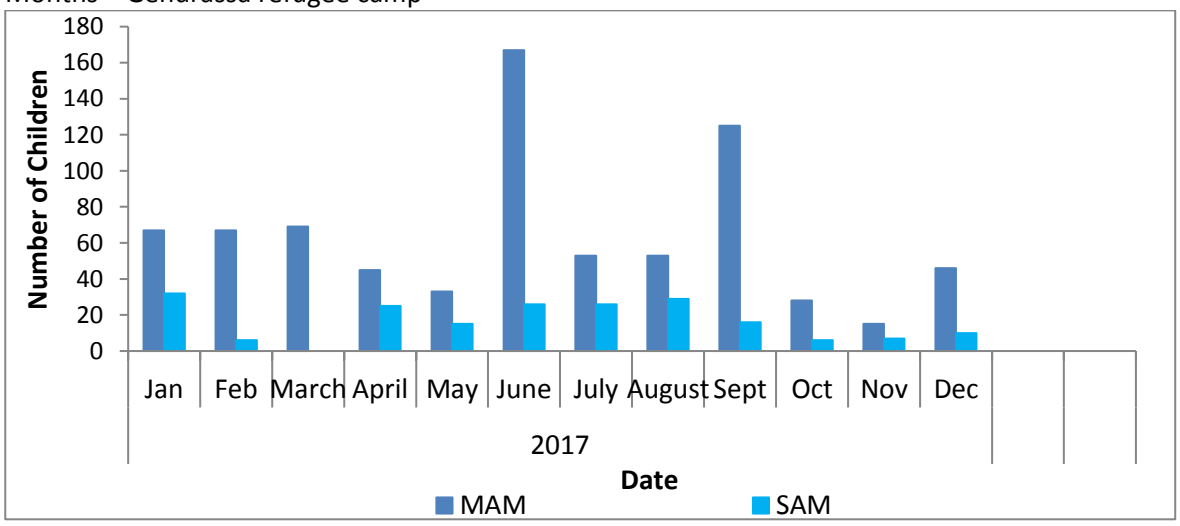
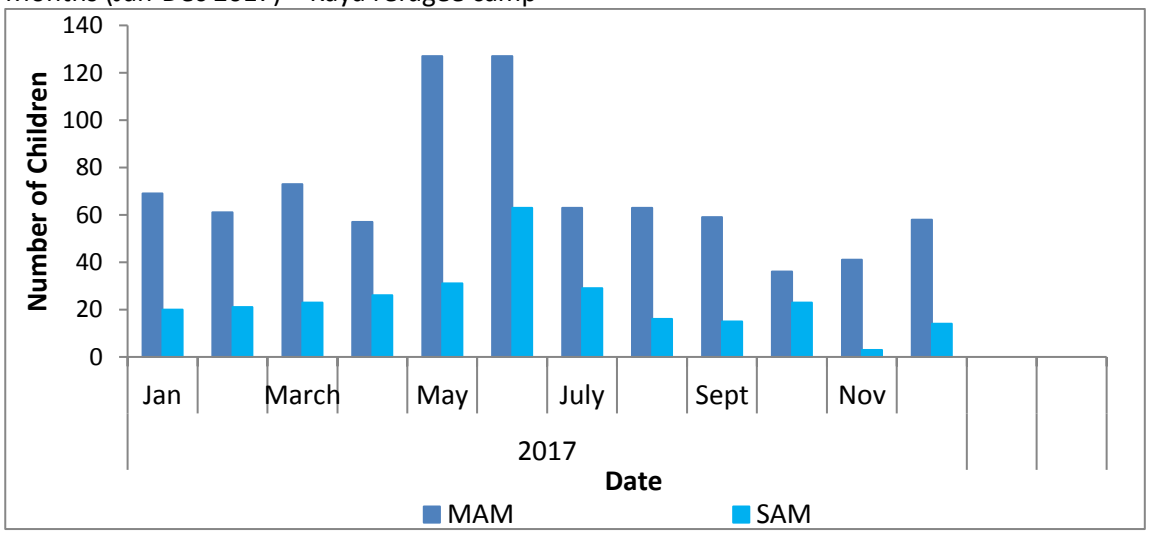
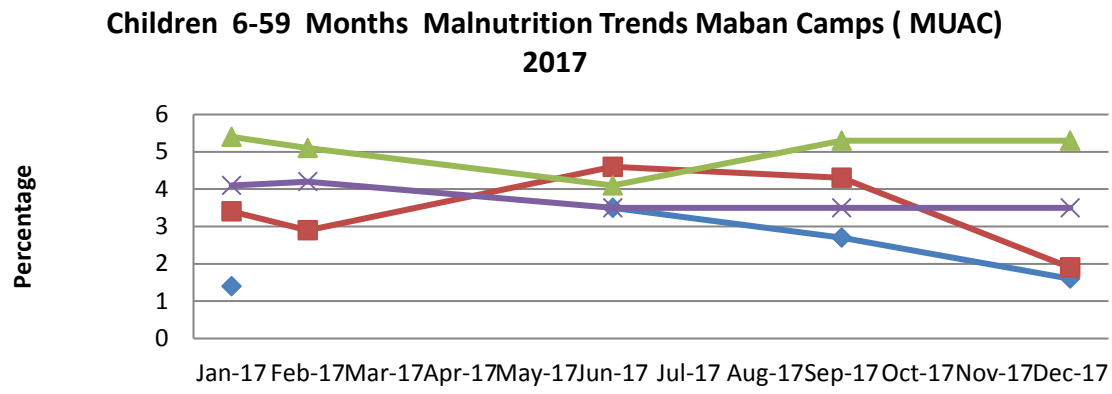


Figure 13: Number of Admissions to Treatment Programmes for MAM and SAM in Children 6-59 Months (Jan-Dec 2017) – Kaya refugee camp



In all Maban camps, nutrition monitoring using Mid Upper Arm Circumference (MUAC) screening frequency shifted from monthly to quarterly. In all camps, the average MUAC malnutrition prevalence is <5% (Figure 14).

Figure 14: Mass MUAC screening trends Maban Jan-Dec 2017



	Jan-17	Feb-17	Jun-17	Sep-17	Dec-17
Batil	1.4		3.5	2.7	1.6
Doro	3.4	2.9	4.6	4.3	1.9
Gendrassa	5.4	5.1	4.1	5.3	5.3
Kaya	4.1	4.2	3.5	3.5	3.5

Preventive Services

Routine and quarterly mass MUAC screening of children 6 to 59 months and PLWs were conducted in all camps. In addition to this, active case finding by community health promoters and care groups (Yusuf Batil) continued on a daily basis.

Following the 2016 survey recommendations for BSFP to be continued, all children 6 to 23 months in all Camps were enrolled into the BSFP program as of April 2017. BSFP for Pregnant and Lactating Women (PLW) kicked off also from May 2017. This was to cater not only for GAM prevalence but also for stunting and micronutrient deficiencies. However, BSFP was missed out for 2 to 3 months in some of the camps due to the security and internal partners human resources issues already raised above. In 2017, average BSFP coverage for children 6-59 months was 78.7 % and that of PLW was 78.02%. The commodity used for the BSFP implementation for both children 6-23 months and PLWs was CSB++. Premix had been replaced by CSB++ for BSFP PLW since 2016.

Infant and Young Child Feeding (IYCF) support and promotion program continued to be implemented in all camps. Each camp had IYCF counsellors trained to roll out the IYCF program. IYCF programming continued to be implemented according to the updated community-based IYCF programming guidelines rolled out in Maban in 2016 with the support of UNICEF and Ministry of Health in coordination with UNHCR. At camp level, the number of Mother Support Groups (MSGs) was maintained. In Doro there are 50 MSGs, 100 MSGs in Gendrassa, 100 MSGs in Kaya and 402 care groups in Yusuf Batil. Community health workers in all camps aid in the implementation of IYCF. Antenatal Care (ANC) and Post Natal Care (PNC) services have IYCF care practices promotion services integrated.

The anaemia prevention and control strategy document was finalized and subsequent measures put in place with the support of UNHCR nutrition and food security officer based in Juba. Improvement of screening particularly was practically emphasized. Existing interventions (BSFP, awareness, promotion of IYCF etc.). Joint activities were held with Food Security and livelihood partners (vegetable seeds distribution, agro/nutrition trainings, Kitchen gardening/improved technics, food demonstrations) for mother support groups were reinforced.

Wash situation

UNHCR provides technical leadership and coordination through the UNHCR WASH unit responsible for coordination of WASH implementations. In all camps for the provision of water the UNHCR daily water consumption target of >20 liters per person per day was met[1]. Water supply demand has been rising during dry season and dropping during rainy season. Rainy water is being collected and used for purposes other than drinking and cooking. Installation of solar panels continued in 2017. A solar hybrid plant of 44 KW and solar installation at 7 boreholes were effective in 2017. To date 60% of pumping installation were covered by solar energy. More would be done depending on funding availability.
In terms of sanitation, the big achievement is the increased number of latrine and the community participation on constructing them. Family latrines particularly were decommissioned and replaced by household latrines. In schools, 14 households were constructed in 2017. In terms of WASH facilities, there are 3851 latrines and 17 boreholes hand pumps and 14 motorized boreholes in Doro, 3106 latrines , 7 hand pump boreholes and 9 motorized boreholes in Yusuf Batil, 2361 latrines 19 had pump boreholes and 7 motorized boreholes in Gendrassa and 3221 latrines and 5 motorized boreholes in Kaya.

1.2. Survey Objectives

Primary objectives:

Objectives:

Primary objectives:

- To measure the prevalence of acute malnutrition in children aged 6-59 months (Module 1).
- To measure the prevalence of stunting in children aged 6-59 months (Module 1).
- To determine the coverage of measles vaccination among children aged 9-59 months (Module 1).
- To determine the coverage of vitamin A supplementation in the last 6 months among children aged 6-59 months (Module 1).
- To assess the two-week period prevalence of diarrhoea among children aged 6- 59 months (Module 1).

[1] UNHCR Maban End of Year Report ;February 2018

- To measure the prevalence of anaemia among children aged 6-59 months and in women of reproductive age between 15-49 years (non-pregnant) (Module 2).
- To investigate IYCF practices among children aged 0-23 months (Module 3).
- To determine the coverage of ration cards and the duration the general food ration lasts for recipient households (Module 4).
- To determine the extent to which negative coping strategies are used by households (Module 4).
- To assess household dietary diversity (Module 4).
- To establish recommendations on actions to be taken to address the nutrition situation in Maban refugee locations.

Secondary objectives:

- To determine the coverage of therapeutic feeding and targeted supplementary feeding programmes for children 6-59 months.
- To determine enrolment into Antenatal Care clinic and coverage of iron-folic acid supplementation in pregnant women.

2. METHODOLOGY

2.1. Sample size

The sample sizes for anthropometry and health were calculated using the parameters illustrated in table 3 below. The ENA for SMART software version July 9th, 2015 was used to calculate the sample sizes.

Table 3: Anthropometry and Health Sample Size Calculation

Location	% population under 5	Estimated GAM prevalence	Desired Precision	Design Effect	Non response rate	Average household size	Number of Children (ENA)	Number of Households
CLUSTER SURVEYS								
Kaya	**20.6**	**12.5 %**	**3.5**	**1.3**	**5%**	**4.5**	**485**	**612**
Doro	**20.8**	**9.6 %**	**3.0**	**1.3**	**5%**	**5.9**	**524**	**500**
Gendrassa	**23.4**	**7.5 %**	**3.0**	**1.3**	**5%**	**4.6**	**419**	**455**
Yusuf Batil	**23.5**	**12.5 %**	**3.5**	**1.3**	**5%**	**5.1**	**485**	**474**

The sample sizes for anthropometry and health were used for the IYCF, child anaemia half of the sample sizes of anthropometry (every other household) was used as the sample size for women anaemia and food security.

For the purpose of this survey, household was defined as the number of people who regularly stay together and eat from the same pot. The household size used in the survey was obtained from community health worker reports. The refugee total population and the proportion of children under the age of 5 years were obtained from the UNHCR ProGres database. The estimated GAM prevalence was obtained from the previous 2016 survey in Maban camps. The upper level of GAM confidence interval was not used since it was leading to very high numbers of households to be surveyed. At the period of data collection, time limitation constrains due to instability and ethnic dynamics in the camps had to be factored.
Cluster sampling was used in the survey. This was due to the unavailability of complete household lists and also the unorganised nature of the camps especially in Doro, Batil and Gendrassa. To determine the number of clusters to be included in the survey, consideration on the number of teams, time taken per household as well the available time was put into consideration.

2.2. Sampling Procedure

Sampling procedure: selecting clusters

The UNHCR ProGres database was used to obtain camp population statistics. The data used was as of September 31st 2017. To assign clusters, the probability proportion to sample size (PPS) was employed using the ENA software Version July 9th, 2015. As a result, 32 clusters of 18 households each in Doro, 27 clusters of 17 households each in Batil, 25 clusters of 17 households each in Gendrassa and 27 clusters of 17 households each in Kaya were surveyed.

Sampling procedure: selecting households and individuals

Once clusters were identified, the next stage was the selection of households to participate in the survey. In each camp, community health workers were assigned to identify clusters where they were asked to number the households. Once the households were numbered, systematic random sampling was employed in second stage sampling. The sampling interval varied depending on the number of households in the cluster. The first household was randomly selected.

All the eligible household members were included in the survey. That is all children 0 to 59 months and women 15 to 49 years in a sample were included in the survey as appropriate. Interviews were conducted in most cases with the mother in the household or in her absence with an adult member of the household who was knowledgeable with the everyday running of the household.

In the event of an absent household or individual, the team members returned to the household twice during the course of the day. If the household or individual was not found after returning, the household or individual was counted as an absentee and was not replaced. If an individual or household refused to participate, it was considered a refusal and the individual or household was not replaced with another. If a selected household was abandoned, the household was replaced by another. If a selected child was disabled with a physical deformity preventing certain anthropometric measurements, the child was still included in the assessment of the other indicators.

2.3. Questionnaire and measurement methods

Questionnaire

Mobile phone technology and questionnaires were used. The English language was set for the questionnaires. During the training, the hard copies had both English and Arabic translations. The

questionnaires were set with ranges for age, height, haemoglobin as a way of minimising mistakes when collecting data. In addition skip options were provided as necessary. Piloting was conducted before the survey.

Measurement methods

Household level indicators

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

Individual-level indicators

- **Sex of children:** Gender 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 either a child health card or birth notification if available. If no reliable proof of age was available, as was with most children age was estimated in months using a local event calendar (annex 3) or by comparing the selected child with a sibling whose age was known, and was recorded in months on the questionnaire. If the child's age could absolutely not be determined by using a local events calendar or by probing, the child's length/height was measured and a cut off between 65.0 and 110.0 cm was used for inclusion. The UNHCR Manifest was not used for recording age.

- **Age of women 15-49 years**: Reported age was recorded in years.

- **Weight of children 6-59 months:** Measurements were taken to the nearest 100 grams using an electronic scale (SECA scale). The scale was placed on firm flat ground before measurements were taken. The double-weighing technique was used to weigh young children unable to stand on their own or unable to understand instructions not to move while on the scale. Clothes were removed during weighing although where necessary, light undergarments were allowed.

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

- **Oedema in children 6-59 months:** The presence of bilateral oedema was assessed by applying gentle thumb pressure on to the tops of both feet of the child for three seconds. If a shallow indent remained in both feet, oedema was recorded as present. The survey coordinators verified all oedema cases reported by the survey teams. There was no oedema cases recorded in the survey.

- **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 millimetre using standard tapes.

- **Child enrolment in selective feeding programme for children 6-59 months:** This was assessed for the outpatient therapeutic programme and for the supplementary feeding programme using card or recall. The programme products were shown when recall was used, Plumpy'Nut for the OTP and Plumpy'Sup for the TSFP.

- **Measles vaccination in children 9-59 months:** Measles vaccination was assessed by checking for the measles vaccine on the Expanded Programme on Immunisation (EPI) card or by carers recall if no EPI card was available. For ease of data collection, all children aged 6-59 months were assessed for measles but analysis was only done on 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 an EPI card or health card if available, or by asking the caregiver to recall if no card was available. A vitamin A capsule was shown to the caregiver when asked to recall.

- **Haemoglobin (Hb) concentration in children 6-59 months and women 15-49 years (non-pregnant):** Hb concentration was taken from a capillary blood sample from the fingertip and recorded to the closest gram per decilitre by using the portable HemoCue Hb 301 Analyser. The third drop was collected after wiping the first two drops.

- **Diarrhoea in last 2 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 episodes of diarrhoea in the past two weeks.

- **ANC enrolment and iron and folic acid pills coverage in pregnant women:** Whether the woman was enrolled in the ANC programme and was receiving iron-folic acid pills was assessed by use of the ANC card or by recall. An iron-folic acid pill was shown to the pregnant woman when asked to recall.

- **Infant and young child feeding practices in children 0-23 months**: Infant and young child feeding practices were assessed based on standard WHO recommendations (WHO 2010). Infant formula feeding and bottle use was also assessed.

- **Referrals:** Children aged 6-59 months were referred to the health post for treatment when MUAC was <11.5cm, when W/H was <-2 z-score, when oedema was present or when haemoglobin was <7.0g/dL. Women of reproductive age were referred to the hospital for treatment if haemoglobin was < 8.0 g/dL.

2.4. Case definitions, inclusion criteria and calculations

In this survey, a household was defined as a group of people who cook and eat together from the same pot.

Table 4 shows the definition and classification of the nutritional indicators used. Main results are reported according the WHO Growth Standards 2006.

Table 4: Nutritional Status and Anaemia indicators and cut-offs used

Indicator		Children 6-59 months	Women 15-49 years Non-Pregnant
Acute Malnutrition[1]	Global acute malnutrition	WHZ <-2 and/or oedema	--
	Moderate acute malnutrition	WHZ <-2 and ≥-3	--
	Severe acute malnutrition	WHZ <-3 and/or oedema	--
Stunting[1]	Total stunting	HAZ <-2	--
	Moderate stunting	HAZ <-2 and ≥-3	--
	Severe stunting	HAZ <-3	--
Underweight[1]	Total underweight	WAZ <-2	--
	Moderate underweight	WAZ <-2 and ≥-3	--
	Severe underweight	WAZ <-3	--
Malnutrition (MUAC)	--	<12.5cm and/or oedema	--
	--	≥11.5cm and <12.5cm	--
	--	<11.5cm and/or oedema	--
Anaemia	Total anaemia	Hb <11.0 g/dL	Hb <12.0 g/dL
	Mild anaemia	Hb 10.0 - 10.9 g/dL	Hb 11.0 - 11.9 g/dL
	Moderate anaemia	Hb 7.0 - 9.9 g/dL	Hb 8.0 - 10.9 g/dL
	Severe anaemia	Hb <7.0 g/dL	Hb <8.0 g/dL

[1] Calculated using WHO Growth Standards 2006

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

Selective Feeding Programme Coverage (children 6-59 months)

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

Targeted supplementary feeding programme

Coverage of TSFP programme (%) =

$$100x \quad \frac{\text{No. of surveyed children with MAM according to SFP admission criteria who reported being registered in SFP}}{\text{No. of surveyed children with MAM according to SFP admission criteria}}$$

Therapeutic feeding programme

Coverage of OTP programme (%) =

100x 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 (IYCF) Indicators (children 0-23 months)

Infant and young child feeding practices were assessed based on standard WHO recommendations (WHO, 2010) as follows:

- **Timely initiation of breastfeeding: WHO core indicator 1 -** Proportion of children 0-23 months of age who were put to the breast within one hour of birth.

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

- **Exclusive breastfeeding under 6 months: WHO core indicator 2 -** Proportion of infants 0–5 months of age who are fed exclusively with breast milk: (including milk expressed or from a wet nurse, ORS, drops or syrups (vitamins, minerals, medicines).

Infants 0–5 months of age who received only breast milk during the previous day
Infants 0–5 months of age

- **Continued breastfeeding at 1 year: WHO core indicator 3 -** Proportion of children 12–15 months of age who are fed breast milk.

Children 12–15 months of age who received breast milk during the previous day
Children 12–15 months of age

- **Introduction of solid, semi-solid or soft foods: WHO core indicator 4 -** Proportion of infants 6–8 months of age who receive solid, semi-solid or soft foods.

Infants 6–8 months of age who received solid, semi-solid or soft foods during the previous day
Infants 6–8 months of age

- **Consumption of iron-rich or iron-fortified foods: WHO core indicator 8 -** Proportion of children 6–23 months of age who receive an iron-rich or iron-fortified food that is specially designed for infants and young children, or that is fortified in the home.

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

- **Continued breastfeeding at 2 years: WHO optional indicator 10 -** Proportion of children 20–23 months of age who are fed breast milk.

Children 20–23 months of age who received breast milk during the previous day
Children 20–23 months of age

- **Bottle feeding: WHO optional indicator 14 -** Proportion of children 0-23 months of age who are fed with a bottle.

Children 0–23 months of age who were fed with a bottle during the previous day
Children 0–23 months of age

- **Infant formula intake** – Proportion of children 0-23 months consuming infant formula

Children 0-23 months of age consuming infant formula
Children 0-23 months of age

- **Consumption of FBF+** - Proportion of children 6-59 months consuming CSB+

Children 6-59 months of age consuming CSB+
Children 6-59 months of age

- **Consumption of FBF super** – Proportion of children 6 to 59 months consuming CSB++

Children 6-59 months of age consuming CSB++
Children 6 to 59 months

2.5. Classification of public health problems and targets

Anthropometric data: UNHCR states that 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%. (UNHCR Nutrition and Food Security strategy and WHO, 2000).
Table 5 below shows the classification of public health significance of the anthropometric results for children under-5 years of age.

Table 5: Classification of public health significance for children under 5 years of age (WHO 1995)

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

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

Table 6: Performance indicators for selective feeding programmes (UNHCR Strategic Plan for Nutrition and Food Security 2008-2012)*

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

* Also meet SPHERE standards for performance

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

Table 7: Recommended targets for measles vaccination and vitamin A supplementation in last 6 months (UNHCR SENS Guidelines)

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

Anaemia data: The 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 for the prevalence of anaemia should be classified according to WHO criteria as shown in the Table below.

Table 8: Classification of public health significance (WHO, 2000)

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

2.6. Training, coordination and supervision

Survey teams and supervision

The surveys in Maban were conducted by 5 teams in each camp. In 2017, because of the ethnic clashes and subsequent relocation, the data collection was conducted in three steps: Doro camp was surveyed first by a team composed mainly of enumerators from the main ethnicity and Mabanese. The same criteria applied with Yusuf Batil and Gendrassa camps which were surveyed concurrently in second, followed by Kaya camp. Each team had 4 to 5 members: 2 anthropometric measurers, 1 responsible for anaemia measurements, a fourth member responsible for conducting the interview and filling the responses on the mobile phone and the team leader. A total of 42 enumerators (which including reserve ones in case of some drop out) participated in data collection. Originally it was planned to provide phones to two team members (individual interview and household interview) but this proved a challenge in terms of the enumerators' mastery of the use of the mobile phones. One enumerator thus filled both the individual and household interview.

Team leaders were national or refugee staff from SP, MEDAIR, IMC, and RI. The rest of the team members were a mix of partner staff. The minimum requirements to participate in the survey were

the ability speak, read and write in both English and Arabic. There were twelve survey supervisors (including the survey coordinator) who supervised the teams during data collection on a permanent basis. The survey coordinator roved between the teams on a daily basis. The supervision team included UNHCR Senior Nutrition Associate, and Health and Nutrition programme managers from IMC, SP and MEDAIR. The Survey Coordinator was the UNHCR Nutrition and Food Security Officer based Maban.

Training

Due to the ethnicity sensitivity issues triggered by the conflicts between Uduk (Doro camps) and Ingassana (Batil, Gendrassa and Kaya) Two separate trainings were held: one for Doro camp and the second included enumerators for Batil, Gendrassa and Kaya together. The first training for Doro lasted for five days from 02nd to 6th October 2017 followed by Data collection in that camp and the second training was held from 10 to 18 October for Batil, Gendrassa and Kaya followed by subsequent data collection. Overall, a total of 61 participants attended both trainings. Training topics were provided to the survey supervisors by the survey coordinator. The topics covered were general survey objectives, overview of survey design, household selection procedures, anthropometric measurements, signs and symptoms of malnutrition, data collection and interview skills, mortality interview, IYCF interview, anaemia assessment skills and food security interviews. The training had to be given extra-day to allow for more training on the mobile phone use and language interpretation.

To ensure high quality data was collected, two standardisation and field tests for each training were carried. Each team had 2 households for this exercise and all eligible women and children in those households were included in the standardisation. The standardisation was conducted in the camps areas not sampled to participate in the survey. A feedback session was conducted after the teams returned from the exercise to address challenges encountered.

2.7. Data collection

Data collection

Data collection was conducted from 7 to 26 October 2017 in all camps. Sundays were excluded, taken as break to allow enumerators to rest. Data collection was conducted in Doro from 07 to 09 October, Gendrassa and Kaya from 19 to 24 October and Kaya from 24 to 26 October 2017. On visiting each household the team leader introduced the team and the survey to the households and asked for consent. The standard introduction and consent message was attached to every questionnaire, (see Appendix 5).

2.8. Data analysis

At the end of each day's data collection, the Survey Coordinator and the Survey Supervisors checked each and every questionnaire on the phones for completeness and then finalised the questionnaires. Once the questionnaires were finalised, they were sent to the server for synchronisation and exporting. After exporting the data, the anthropometric data plausibility check was conducted to identify areas and teams that need more supervision or to be strengthened. Teams that required more supervision were given more attention the following day.

The ODK exports data in csv format was saved in Microsoft Excel 1997 to 2003. Anthropometric data was cleaned using flexible cleaning criterion (+/- 3 SD from the observed mean; also known as SMART flags in the ENA for SMART software). SMART flags were excluded in the analysis. Anthropometry indices were analysed using the ENA for SMART July 9th 2015 version. Epi Info version 7 was used to analyse all the other data.

3. RESULTS

DORO CAMP

The demographic characteristics are illustrated in table 12 below.

Table 9: Target and Actual Number Captured-Doro Camp

	Target (No.)	Total surveyed (No.)	% of the target
Children 6-59 months	612	808	132 %
Clusters (where applicable)	32	32	100%

3.1. Anthropometric results (based on WHO standards 2006)

Table 10: Distribution of age and sex of sample-Doro Camp

	Boys		Girls		Total		Ratio
AGE (mo)	**no.**	**%**	**no.**	**%**	**no.**	**%**	**Boy: girl**
6-17	108	52.2	99	47.8	207	25.6	1.1
18-29	121	53.1	107	46.9	228	28.2	1.1
30-41	79	50.6	77	49.4	156	19.3	1.0
42-53	88	46.1	103	53.9	191	23.6	0.9
54-59	13	50.0	13	50.0	26	3.2	1.0
Total	409	50.6	399	49.4	808	100.0	1.0

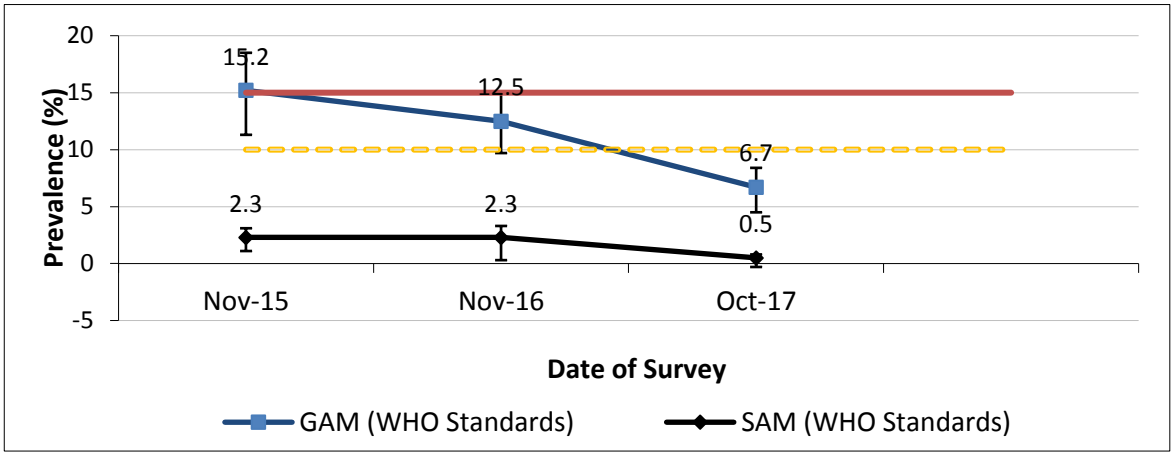
The overall ration of boys: girls is equally represented

Table 11: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex-Doro Camp

	All n = 791	**Boys** n = 399	**Girls** n = 392
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(53) 6.7 % (5.0 - 8.9 95% C.I.)	(33) 8.3 % (5.5 - 12.4 95% C.I.)	(20) 5.1 % (3.1 - 8.3 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(49) 6.2 % (4.5 - 8.5 95% C.I.)	(32) 8.0 % (5.2 - 12.2 95% C.I.)	(17) 4.3 % (2.7 - 7.0 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(4) 0.5 % (0.2 - 1.3 95% C.I.)	(1) 0.3 % (0.0 - 1.9 95% C.I.)	(3) 0.8 % (0.2 - 2.3 95% C.I.)

The prevalence of oedema is 0.1 %

Figure 15: Trends in the Prevalence of Global and Severe Acute Malnutrition Based On WHO Growth Standards In Children 6-59 Months From 2015 to 2017-Doro Camp

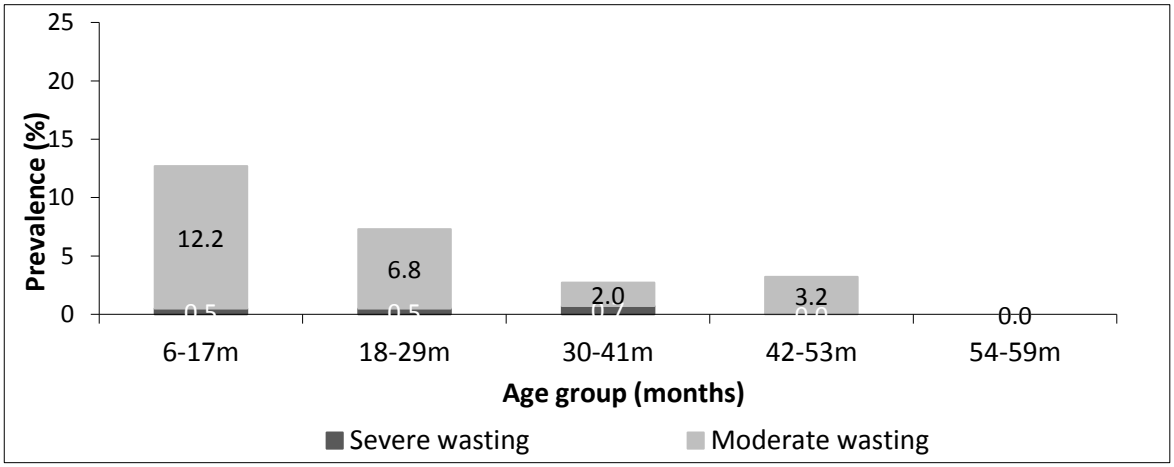


The nutrition situation improved significantly in 2017 compared to 2016 in Doro ($p < 0.05$).

Table 13: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema-Doro Camp

		Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	205	1	0.5	25	12.2	179	87.3	0	0.0
18-29	219	1	0.5	15	6.8	202	92.2	1	0.5
30-41	153	1	0.7	3	2.0	149	97.4	0	0.0
42-53	189	0	0.0	6	3.2	183	96.8	0	0.0
54-59	25	0	0.0	0	0.0	25	100.0	0	0.0
Total	791	3	0.4	49	6.2	738	93.3	1	0.1

Figure 16: Trend in the Prevalence of Wasting By Age in Children 6-59 Months



The 6-17 months age group was the most affected by wasting indicating higher vulnerability at this age.

Table 14: Distribution of acute malnutrition and oedema based on weight-for-height z-scores-Doro camp

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 1 (0.1 %)
Oedema absent	Marasmic No. 13 (1.6 %)	Not severely malnourished No. 788 (98.3 %)

Figure 17: Distribution of Weight-For-Height Z-Scores-Doro Camp (Based On WHO Growth Standards)

The reference population is shown in green and the surveyed population is shown in red. The figure below shows that the distribution for weight-for-height z-scores for the survey sample is shifted to the left, illustrating a poorer status than the international WHO Standard population of children aged 6-59 months.

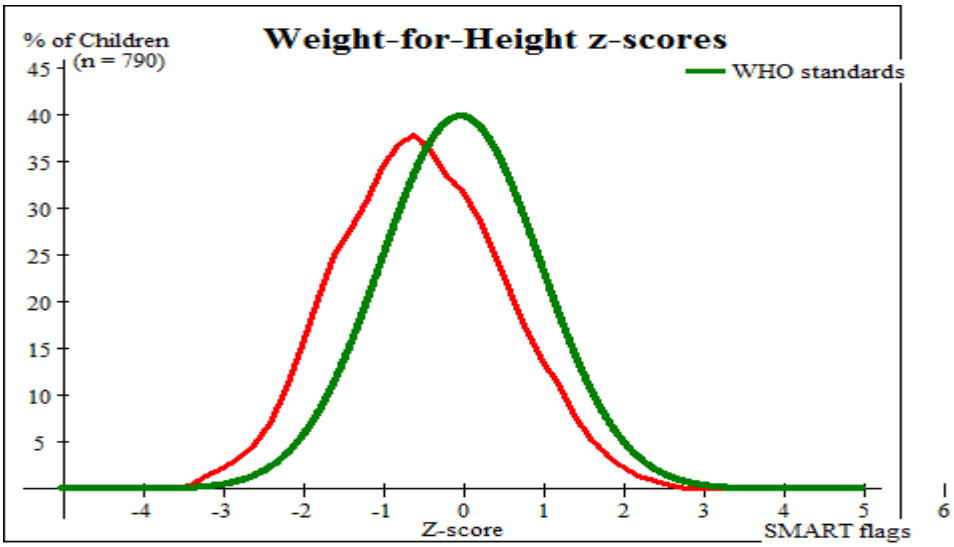


Table 15: Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex-Doro Camp

	All n = 807	**Boys** n = 408	**Girls** n = 399
Prevalence of global malnutrition (< 125 mm and/or oedema)	(38) 4.7 % (3.3 - 6.7 95% C.I.)	(14) 3.4 % (2.1 - 5.6 95% C.I.)	(24) 6.0 % (3.6 - 9.8 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(33) 4.1 % (2.8 - 5.8 95% C.I.)	(12) 2.9 % (1.7 - 5.2 95% C.I.)	(21) 5.3 % (3.2 - 8.6 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(5) 0.6 % (0.2 - 2.3 95% C.I.)	(2) 0.5 % (0.1 - 2.0 95% C.I.)	(3) 0.8 % (0.2 - 3.2 95% C.I.)

Table 16: Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema-Doro Camp

		Severe wasting (< 115 mm)		Moderate wasting (>= 115 mm and < 125 mm)		Normal (> = 125 mm)		Oedema	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	207	2	1.0	25	12.1	180	87.0	0	0.0
18-29	228	2	0.9	4	1.8	222	97.4	1	0.4
30-41	156	0	0.0	1	0.6	155	99.4	0	0.0
42-53	191	0	0.0	3	1.6	188	98.4	0	0.0
54-59	25	0	0.0	0	0.0	25	100.0	0	0.0
Total	807	4	0.5	33	4.1	770	95.4	1	0.1

Table 17: Prevalence of underweight based on weight-for-age z-scores by sex-Doro Camp

	All n = 795	**Boys** n = 403	**Girls** n = 392
Prevalence of underweight (<-2 z-score)	(241) 30.3 % (25.7 - 35.3 95% C.I.)	(124) 30.8 % (25.1 - 37.1 95% C.I.)	(117) 29.8 % (24.8 - 35.5 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(185) 23.3 % (19.3 - 27.7 95% C.I.)	(97) 24.1 % (18.9 - 30.1 95% C.I.)	(88) 22.4 % (18.5 - 27.0 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(56) 7.0 % (5.3 - 9.4 95% C.I.)	(27) 6.7 % (4.5 - 9.9 95% C.I.)	(29) 7.4 % (5.2 - 10.5 95% C.I.)

Table 18: Prevalence of underweight by age, based on weight-for-age z-scores-Doro Camp

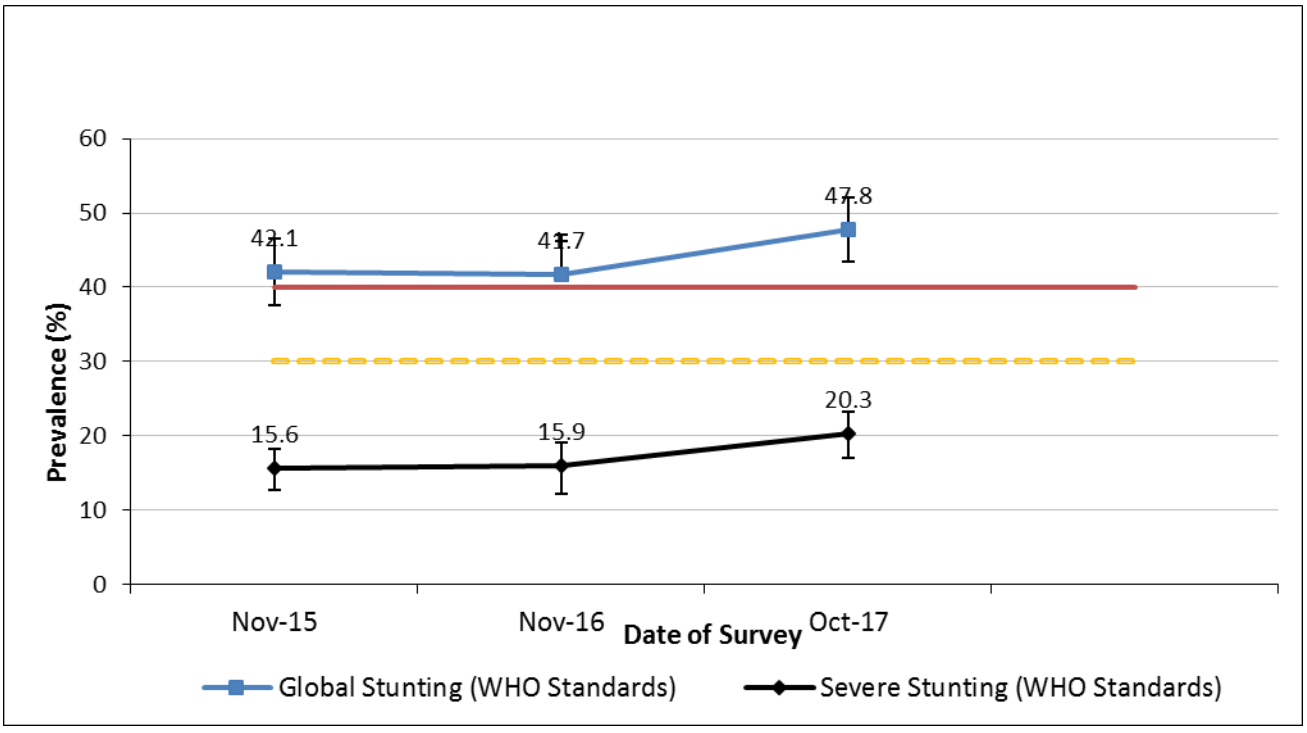
		Severe underweight (<-3 z-score)		Moderate underweight (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	203	11	5.4	45	22.2	147	72.4	0	0.0
18-29	222	15	6.8	61	27.5	146	65.8	1	0.5
30-41	155	10	6.5	37	23.9	108	69.7	0	0.0
42-53	190	19	10.0	35	18.4	136	71.6	0	0.0
54-59	25	1	4.0	7	28.0	17	68.0	0	0.0
Total	795	56	7.0	185	23.3	554	69.7	1	0.1

Table 19: Prevalence of stunting based on height-for-age z-scores and by sex-Doro Camp

	All n = 768	Boys n = 388	Girls n = 380
Prevalence of stunting (<-2 z-score)	(367) 47.8 % (43.5 - 52.1 95% C.I.)	(192) 49.5 % (43.6 - 55.4 95% C.I.)	(175) 46.1 % (41.0 - 51.2 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(211) 27.5 % (24.4 - 30.7 95% C.I.)	(113) 29.1 % (24.2 - 34.6 95% C.I.)	(98) 25.8 % (21.9 - 30.1 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(156) 20.3 % (17.4 - 23.6 95% C.I.)	(79) 20.4 % (15.9 - 25.7 95% C.I.)	(77) 20.3 % (16.8 - 24.2 95% C.I.)

Stunting prevalence is of high public health significance.

Figure 18: Trends in the Prevalence of Global and Severe Stunting Based On WHO Growth Standards In Children 6-59 Months From 2015 to 2017-Doro Camp

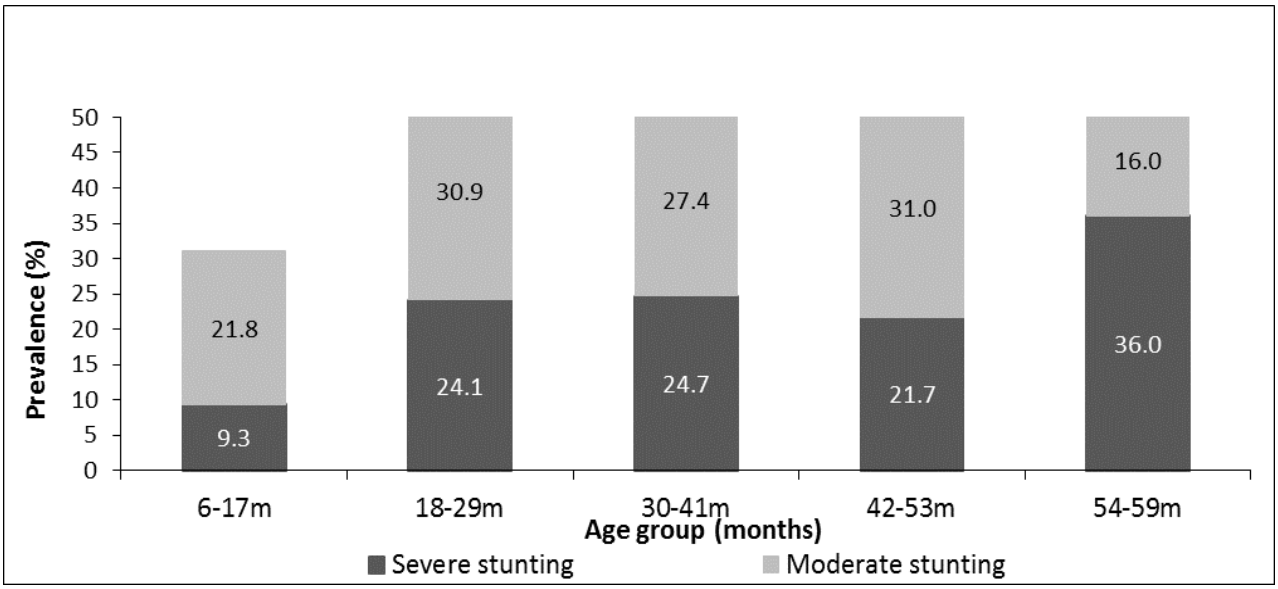


Stunting prevalence increased as compared to 2016 but the increase was not significant (p>0.05).

Table 20: Prevalence of stunting by age based on height-for-age z-scores-Doro Camp

		Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	193	18	9.3	42	21.8	133	68.9
18-29	220	53	24.1	68	30.9	99	45.0
30-41	146	36	24.7	40	27.4	70	47.9
42-53	184	40	21.7	57	31.0	87	47.3
54-59	25	9	36.0	4	16.0	12	48.0
Total	768	156	20.3	211	27.5	401	52.2

Figure 19: Trends in the Prevalence of Stunting By Age in Children 6-59 Months



Stunting in Doro affected mostly the age group of 18-29 months children

Table 21: Mean z-scores, Design Effects and excluded subjects-Doro Camp

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	790	-0.52±1.02	1.19	7	11
Weight-for-Age	795	-1.46±1.07	2.11	2	11
Height-for-Age	768	-1.94±1.17	1.35	6	34

* contains for WHZ and WAZ the children with oedema.

3.2. Health/Feeding Programme Coverage

Feeding Programme Coverage Results

Table 22: Programme Coverage for Acutely Malnourished Children Based On MUAC, Oedema and WHZ-Doro Camp

	Number/total	% (95% CI)
Supplementary feeding programme coverage	27/71	38.0 (23.6-52.4)
Therapeutic feeding programme coverage	5/11	45.4 (0.0-96.02)

Table 23: Programme coverage for acutely malnourished children based on MUAC and oedema-Doro Camp

	Number/total	% (95% CI)
Supplementary feeding programme coverage	13/33	39.3 (22.5-56.3)
Therapeutic feeding programme coverage	0/1	0.0(0-0)

Feeding program coverage very low. This to be interpreted with caution due to the low sample

Measles vaccination coverage results

Table 24: Measles Vaccination Coverage for Children Aged 9-59 Months (N=754)-Doro Camp

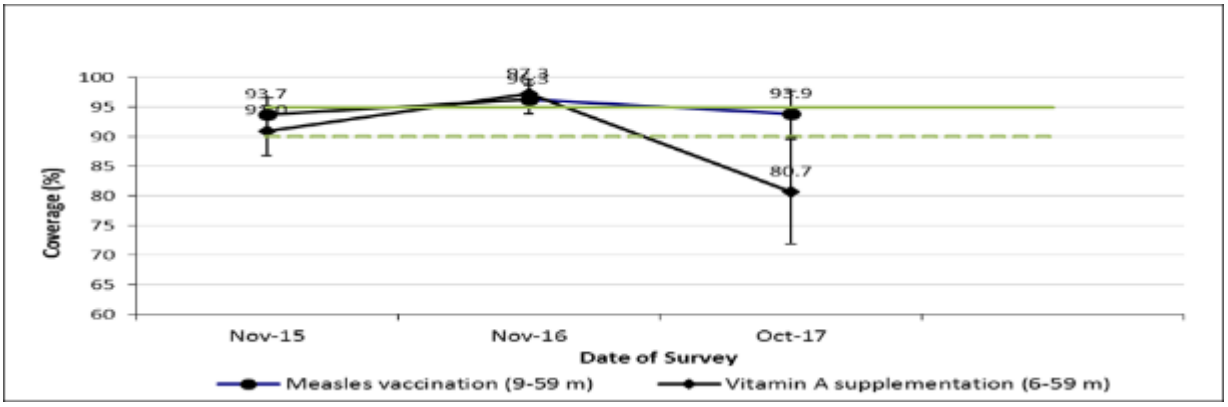
	Measles (with card) n= 497	Measles (with card or confirmation from mother) n= 708
YES	65.9% (58.3 -73.5 % CI)	93.9 % (90.0 -97.8. 95 % CI)

Vitamin A supplementation coverage results

Table 25: Vitamin A Supplementation for Children Aged 6-59 Months within Past 6 Months (N= 808)-Doro Camp

	Vitamin A capsule (with card) n=338	Vitamin A capsule (with card or confirmation from mother) n=652
YES	41.8% (29.9-53.8 95% CI)	80.7% (71.8-89.5 95% CI)

Figure 20: Trends in the Coverage of Measles Vaccination and Vitamin a Supplementation in Last 6 Months in Children 6-59 Months from 2015 to 2017-Doro Camp



Diarrhoea Results

Table 26: Period Prevalence of Diarrhea-Doro Camp

	Number/total	% (95% CI)
Diarrhoea in the last two weeks	83/808	10.3 (7.1-13.4)

3.3. Anaemia Children 6 – 59 months

The total anaemia prevalence among children 6 to 59 months is 52.8 % (47.8-57.8, 95% CI) and is of high public health significance. Prevalence of anaemia among children 6 to 23 months is of high public health significance at 71.6 % (75.9-77.3 , 95% CI). This agegroup is more affected by anaemia compared to the 30-59 months agegroup.

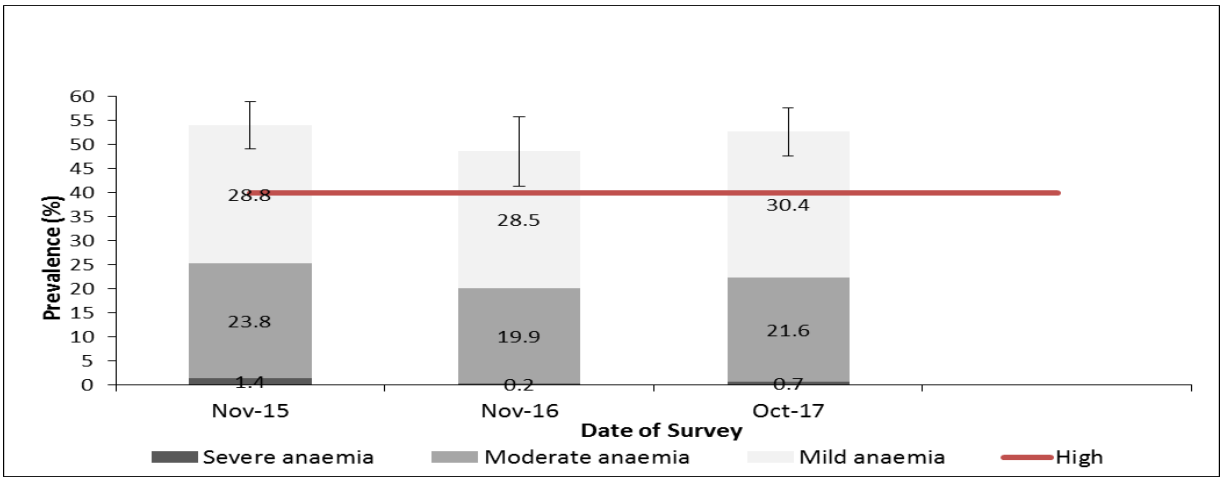
Table 27: Prevalence of Total Anaemia, Anaemia Categories, and Mean Haemoglobin

	6-59 months n = 805	**6-23 months** n=310	**24-59 months** n=495
Total Anaemia (Hb<11.0 g/dL)	(425) 52.8 % (47.8-57.8 , 95% CI)	(222) 71.6% (65.9-77.3 , 95% CI)	(203) 41.0% (35.4-19.0 , 95% CI)
Mild Anaemia (Hb 10.0-10.9 g/dL)	(245) 30.4 % (26.5 -34.4, 95% CI)	(125) 40.3% (34.3-46.3, 95% CI)	120) 24.2% (19.4-29.0, 95% CI)
Moderate Anaemia (7.0-9.9 g/dL)	(174) 21.6% (17.4-25.8, 95% CI)	(94) 30.3% (23.6-37.0 , 95% CI)	(80) 16.2% (11.5-20.9, 95% CI)
Severe Anaemia (<7.0 g/dL)	(6) 0.7% (0.1-0.4, 95% CI)	(3) 0.1% (0.0-2.4 , 95% CI)	(3) 0.6 (0.0-0.3 , 95% CI)
Mean Hb (g/dL) (SD / 95% CI) [range]	10.8 g/dL (10.7-11.0 , 95% CI) [3.8-15.0]	10.3 g/dL (10.1-10.5 ,95% CI) [3.8-14.6]	11.1 g/dL (11.0-11.3 , 95% CI) [4.6-15.0]

Table 28: Prevalence of Moderate and Severe Anaemia in Children 6-59 Months of Age and By Age Group-Doro Camp

	6-59 months n = 805	**6-23 months** n= 310	**24-59 months** n= 495
Moderate and Severe Anaemia (Hb<10.0 g/dL)	(180) 22.4% (17.9-26.8 , 95% CI)	(97) 31.3. % (24.0-38.6 , 95% CI)	(83) 16.8% (12.1-21.4 , 95% CI)

Figure21: Trends in Anaemia Categories in Children 6-59 Months from 2015 to 2017-Doro Camp



The anaemia prevalence increased in 2017 but not significantly.

Figure 22: Trend in Total Anaemia (<11 G/Dl), and Moderate and Severe Anaemia (<10 G/Dl) With 95% CI in Children 6-59 Months from 2015 to 2017-Doro Camp

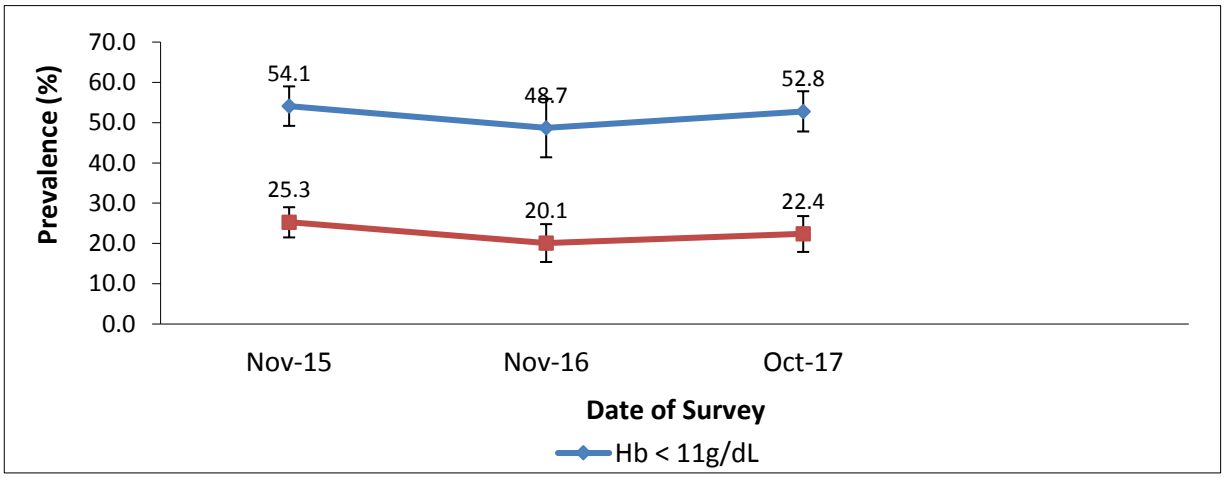
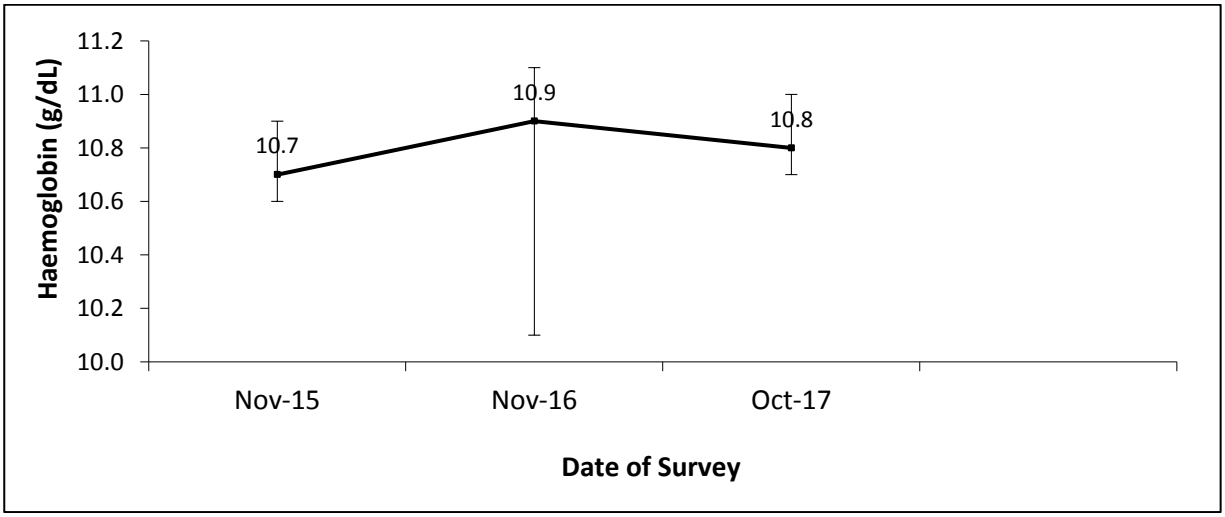


Figure 23: Trend in Mean Haemoglobin Concentration With 95% CI in Children 6-59 Months from 2014 to 2016-Doro Camp

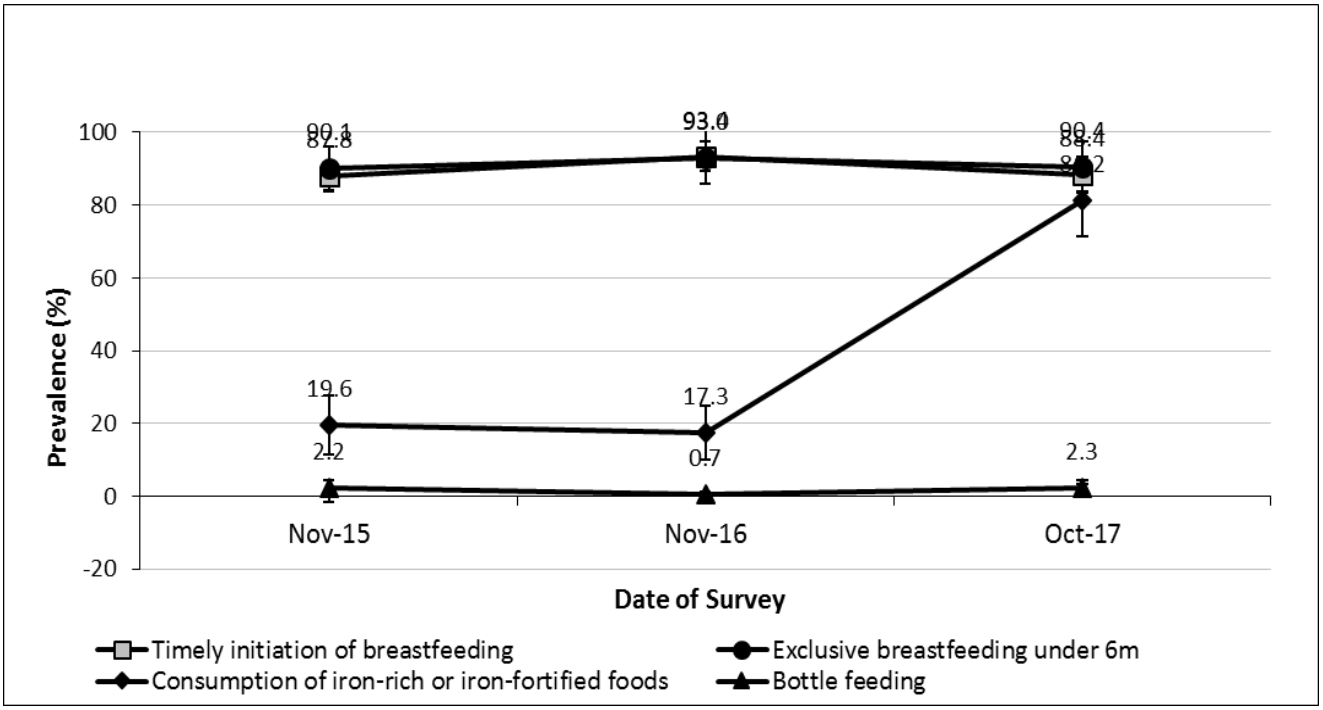


3.4. IYCF Children 0-23 Months

Table 29: Prevalence of Infant and Young Child Feeding Practices Indicators-Doro Camp

Indicator	Age range	Number/ total	Prevalence (%)	95% CI
Timely initiation of breastfeeding	**0-23 months**	334/378	88.4	83.6-93.0
Exclusive breastfeeding under 6 months	**0-5 months**	66/73	90.4	83.3-97.5
Continued breastfeeding at 1 year	**12-15 months**	68/69	98.6	95.6-101.5
Continued breastfeeding at 2 years	**20-23 months**	56/67	83.6	75.0-92.2
Introduction of solid, semi-solid or soft foods	**6-8 months**	29/55	52.7	38.5-67.0
Consumption of iron-rich or iron-fortified foods	**6-23 months**	250/308	81.2	71.5-90.9
Bottle feeding	**0-23 months**	9/386	2.3	0.0-1.2

Figure 24: Key IYCF Indicators from 2015 to 2017-Doro Camp



The IYCF indicators remained the same in 2017 compared to 2016.

Prevalence of Intake

Infant Formula

Table 30 : Infant Formula Intake in Children Aged 0-23 Months-Doro Camp

	Number/total	% (95% CI)
Proportion of children aged 0-23 months who receive infant formula (fortified or non-fortified)	4/387	1.0 (0.0-2.0)

Fortified Blended Foods

Table 31: CSB++ Intake in Children Aged 6-23 Months-Doro Camp

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive FBF++	241/313	77.0(12.7-33.5)

3.5. Anaemia Women 15-49 Years Results

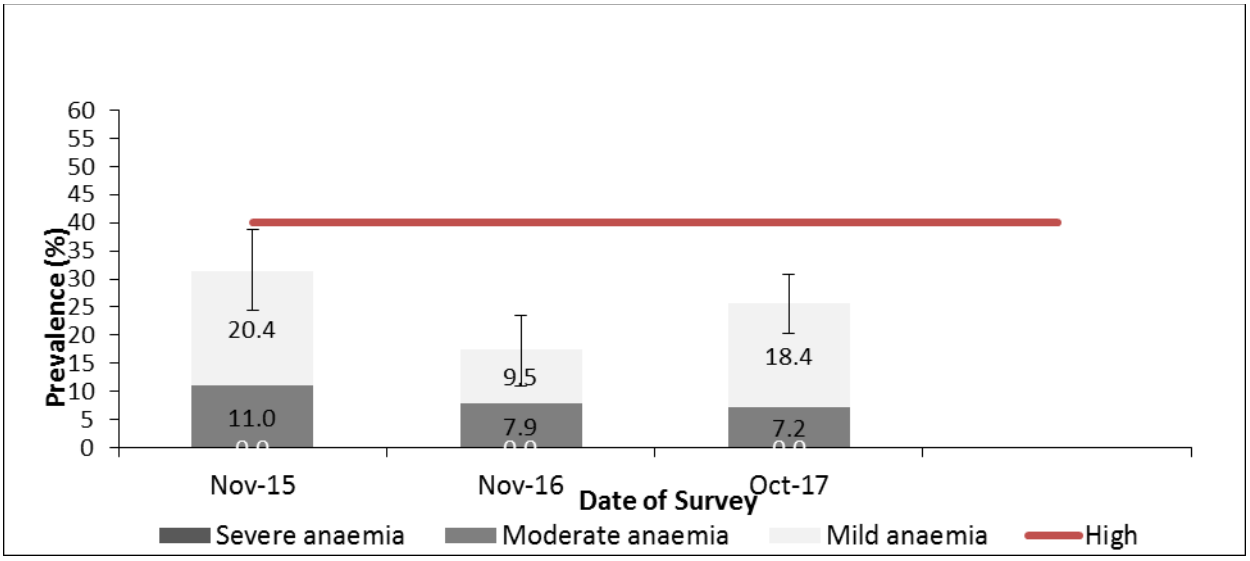
Table 32: Women Physiological Status and Age-Doro Camp

Physiological status	Number/total	% of sample
Non-pregnant	277/333	83.2
Pregnant	56/333	16.8
Mean age (range)	25.7(15-49)	

Table 33: Prevalence of Anaemia and Haemoglobin Concentration in Non-Pregnant Women of Reproductive Age (15-49 Years)-Doro Camp

Anaemia in non-pregnant women of reproductive age (15-49 years)	**All n = 277**
Total Anaemia (<12.0 g/dL)	(71) 25.6 % (20.3-30.9 , 95% CI)
Mild Anaemia (11.0-11.9 g/dL)	(51) 18.4% (13.5-23.6 , 95% CI)
Moderate Anaemia (8.0-10.9 g/dL)	(20) 7.2 % (4.0-10.5 , 95% CI)
Severe Anaemia (<8.0 g/dL)	(0) 0.0 (0.0-0.0, 95% CI)
Mean Hb (g/dL) (SD / 95% CI) [range]	12.7 g/dL (12.5-12.8, 95% CI) [8.5-15.5]

Figure 25: Trends in Anaemia Categories in Women of Reproductive Age (Non-Pregnant) From 2014 to 2016-Doro Camp



Anaemia prevalence among women of reproductive age increased in 2017 compared to 2016 but not significantly.

Table 34: ANC Enrolment and Iron-Folic Acid Pills Coverage among Pregnant Women (15-49 Years)-Doro Camp

	Number /total	% (95% CI)
Currently enrolled in ANC programme	43/56	76.8 (63.5-90.0)
Currently receiving iron-folic acid pills	43/56	76.8 (63.5-90.0)

3.6. Food Security

Table 35: Sampling characteristics Food Security -Doro Camp

	Target (No.)	Total surveyed (No.)	% of the target
Households	306	298	97.4 %
Clusters (where applicable)	32	32	100%

Access to food assistance

Table 36: Ration card coverage

	Number/total	% (95% CI)
Proportion of households with a ration card	289/293	98.6(97.0-100.2)

The majority (98.7 %) of the surveyed households had a ration card

Negative household coping strategies

The refugees in Doro refugee camps receive a reduced food ration at a 70% scale.

Table 37: Coping strategies used by the surveyed population over the past month - Doro Camp

	Number/total	% (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	148/284	52.1 (41.9-62.3)
Sold any assets that would not have normally sold (furniture, seed stocks, tools, other NFI, livestock etc.)	44/281	15.7 (6.7-24.6)
Requested increased remittances or gifts as compared to normal	17/282	6.0 (0.0-15.0)
Reduced the quantity and/or frequency of meals and snacks	133/282	47.2 (33.8-60.6)
Begged	87/284	30.6 (19.2-42.0)
Engaged in potentially risky or harmful activities	16/274	5.8(1.9-10.0)
Proportion of households reporting using none of the coping strategies over the past month	71/271	26.2(16.5-35.8)

***** The total was over 100% as households used several negative coping strategies.

Only 26.2 % of households were not under significant stress to meet their needs as indicated by the proportion of household using none of the negative coping strategies over the past month prior to the survey.

Household dietary diversity

The last general food distribution ended 15+ days prior to the start of the survey data collection. The survey was carried out during the end of the harvest season.

Table 38: Average HDDS*- Doro refugee camp, south Sudan (2017)

	Mean (Standard deviation or 95% CI)
Average HDDS	5.34 (4.8-5.9)

Figure 26: Proportion of households consuming different food groups within last 24 hours – Doro camp

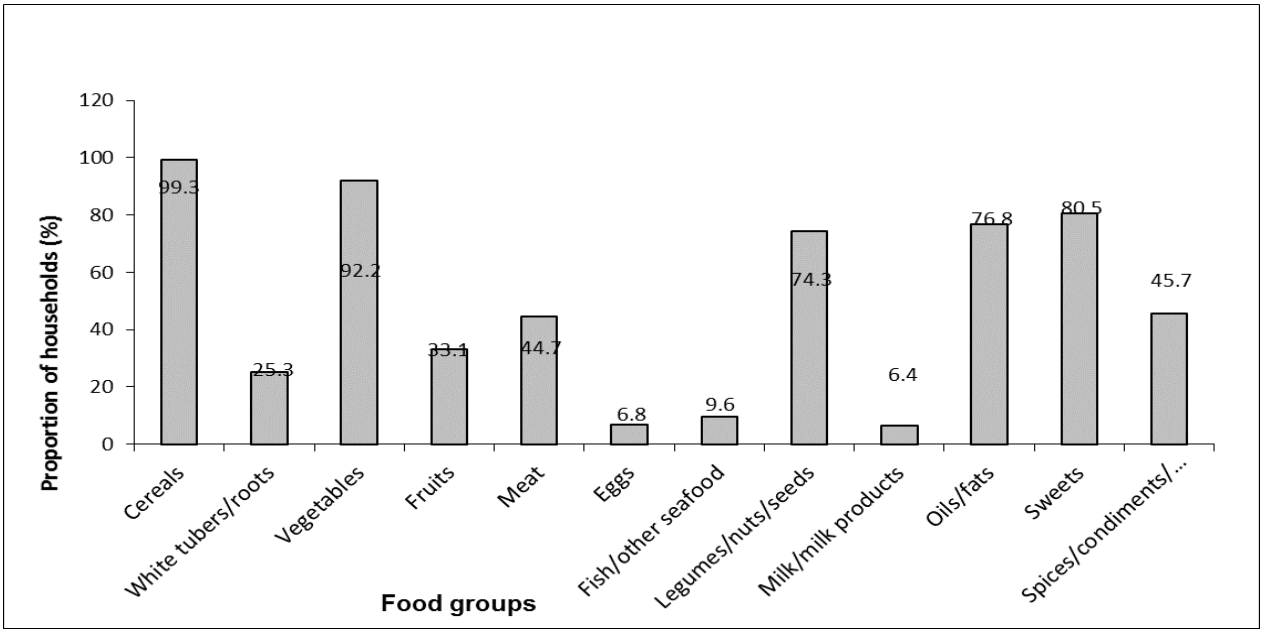


Table 39: Consumption of micronutrient rich foods by households- Doro camp

	Number/total	% (95% CI)
Proportion of households *not consuming any* vegetables, fruits, meat, eggs, fish/seafood, and milk/milk products	11/293	3.8 (1.5-6.0)
Proportion of households consuming either a plant or animal source of vitamin A	275/292	94.2 (90.8-97.6)
Proportion of households consuming organ meat/flesh meat, or fish/seafood (food sources of haem iron)	140/293	47.8 (36.5-59.0)

As majority of households reported having consumed having consumed source of iron. Bioavailability might be the issue.

YUSUF BATIL CAMP

The demographic characteristics are illustrated in table 12 below.

Table 40: Target and Actual Number Captured- Yusuf Batil Camp

	Target (No.)	Total surveyed (No.)	% of the target
Children 6-59 months	524	629	120 %
Clusters (where applicable)	27	27	100%

3.7. Anthropometric results (based on WHO standards 2006)

Table 41: Distribution of age and sex of sample-Yusuf Batil Camp

	Boys		Girls		Total		Ratio
AGE (mo)	**no.**	**%**	**no.**	**%**	**no.**	**%**	**Boy: girl**
6-17	78	54.2	66	45.8	144	22.9	1.2
18-29	74	51.4	70	48.6	144	22.9	1.1
30-41	84	57.1	63	42.9	147	23.4	1.3
42-53	92	52.3	84	47.7	176	28.0	1.1
54-59	8	44.4	10	55.6	18	2.9	0.8
Total	336	53.4	293	46.6	629	100.0	1.1

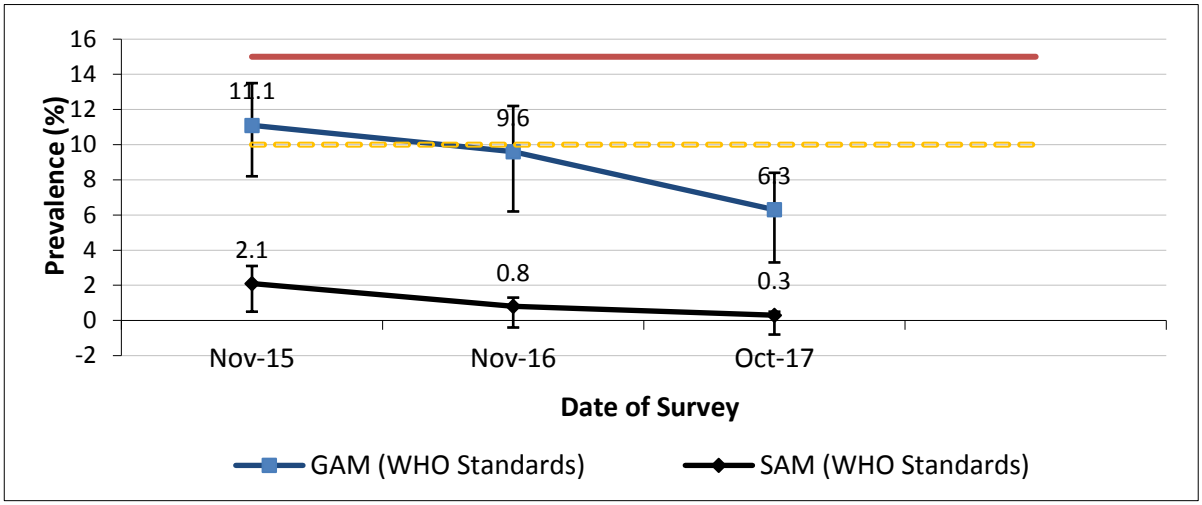
The overall ration of boys: girls is equally represented

Table 42: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex-Yusuf Batil Camp

	All n = 622	**Boys** n = 333	**Girls** n = 289
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(39) 6.3 % (4.2 - 9.3 95% C.I.)	(21) 6.3 % (3.6 - 10.9 95% C.I.)	(18) 6.2 % (4.2 - 9.2 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(37) 5.9 % (3.9 - 9.0 95% C.I.)	(19) 5.7 % (3.0 - 10.5 95% C.I.)	(18) 6.2 % (4.2 - 9.2 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(2) 0.3 % (0.1 - 1.4 95% C.I.)	(2) 0.6 % (0.1 - 2.5 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)

The prevalence of oedema is 0.2 %

Figure 27: Trends in the Prevalence of Global and Severe Acute Malnutrition Based On WHO Growth Standards In Children 6-59 Months From 2015 to 2017 –Yusuf Batil Camp



The nutrition situation remained the same in 2017 compared to 2016 as the decrease was not significant (p=>0.05).

Table 43: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema-Yusuf Batil Camp

		Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	141	0	0.0	9	6.4	132	93.6	0	0.0
18-29	143	0	0.0	10	7.0	133	93.0	0	0.0
30-41	145	2	1.4	5	3.4	138	95.2	0	0.0
42-53	175	0	0.0	11	6.3	164	93.7	0	0.0
54-59	18	0	0.0	2	11.1	16	88.9	0	0.0
Total	622	2	0.3	37	5.9	583	93.7	0	0.0

The 30-41 month age group was more severely wasted compared to the other age groups

Figure 28: Trend in the Prevalence of Wasting By Age in Children 6-59 Months

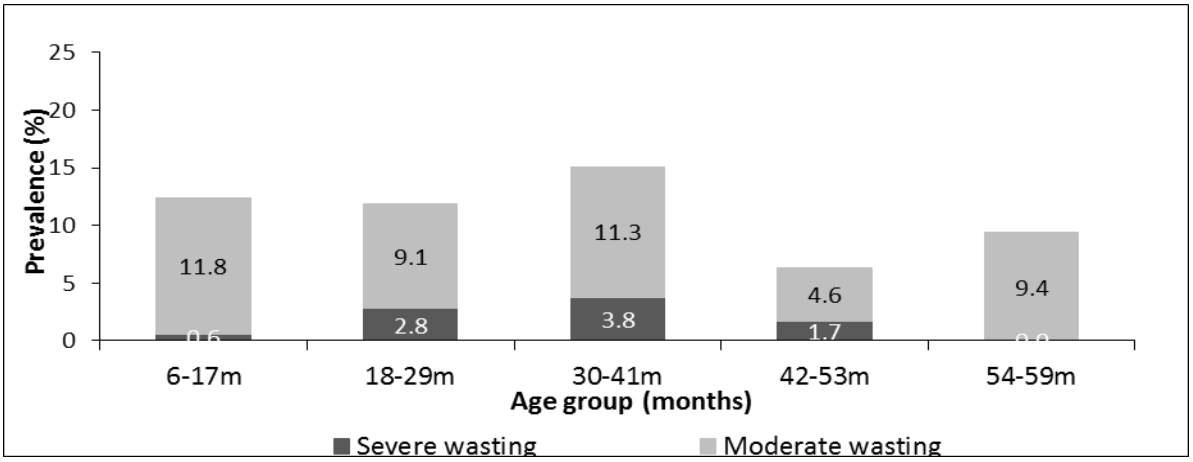


Table 44: Distribution of acute malnutrition and oedema based on weight-for-height z-scores- Yusuf Batil Camp

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 8 (1.3 %)	Not severely malnourished No. 620 (98.7 %)

Figure 29: Distribution of Weight-For-Height Z-Scores (Based On WHO Growth Standards The Reference Population Is Shown In Green and the Surveyed Population Is Shown In Red). The Figure below shows that the distribution for weight-for-height z-scores for the survey sample is shifted to the left, illustrating a poorer status than the international WHO Standard population of children aged 6-59 months.

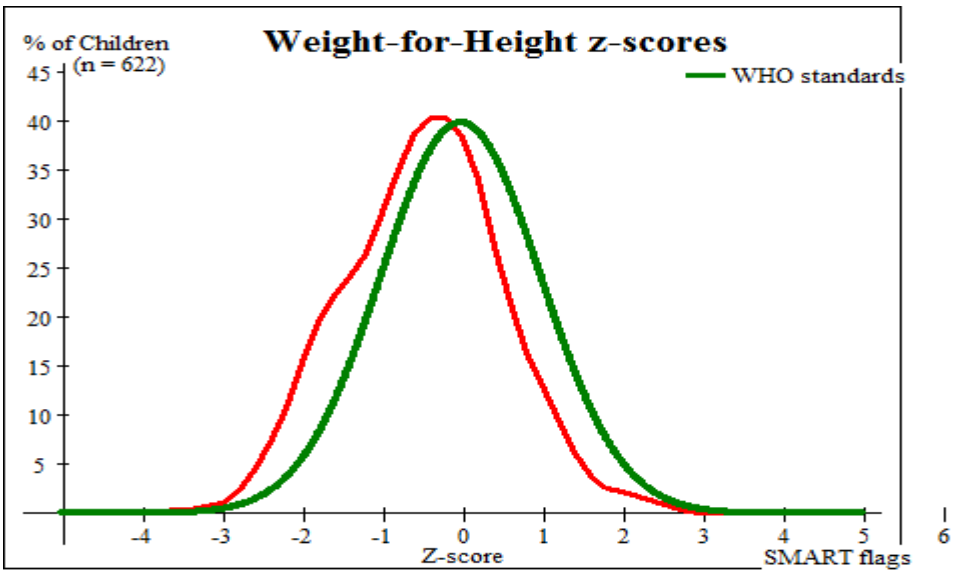


Table 45: Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex- Yusuf Batil Camp

	All n = 629	**Boys** n = 336	**Girls** n = 293
Prevalence of global malnutrition (< 125 mm and/or oedema)	(13) 2.1 % (1.2 - 3.5 95% C.I.)	(4) 1.2 % (0.4 - 3.8 95% C.I.)	(9) 3.1 % (1.7 - 5.5 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(9) 1.4 % (0.8 - 2.5 95% C.I.)	(2) 0.6 % (0.1 - 2.4 95% C.I.)	(7) 2.4 % (1.2 - 4.8 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(4) 0.6 % (0.2 - 1.7 95% C.I.)	(2) 0.6 % (0.1 - 2.4 95% C.I.)	(2) 0.7 % (0.2 - 2.8 95% C.I.)

Table 46 : Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema-Yusuf Batil Camp

		Severe wasting (< 115 mm)		Moderate wasting (>= 115 mm and < 125 mm)		Normal (> = 125 mm)		Oedema	
Age (mo)	Total no.	No.	%	No.	%	No.	%	No.	%
6-17	144	2	1.4	7	4.9	135	93.8	0	0.0
18-29	144	1	0.7	1	0.7	142	98.6	0	0.0
30-41	147	1	0.7	1	0.7	145	98.6	0	0.0
42-53	176	0	0.0	0	0.0	176	100.0	0	0.0
54-59	18	0	0.0	0	0.0	18	100.0	0	0.0
Total	629	4	0.6	9	1.4	616	97.9	0	0.0

Table 47: Prevalence of underweight based on weight-for-age z-scores by sex-Yusuf Batil Camp

	All n = 625	Boys n = 333	Girls n = 292
Prevalence of underweight (<-2 z-score)	(192) 30.7 % (25.6 - 36.3 95% C.I.)	(99) 29.7 % (23.4 - 37.0 95% C.I.)	(93) 31.8 % (26.1 - 38.3 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(136) 21.8 % (18.2 - 25.8 95% C.I.)	(68) 20.4 % (16.1 - 25.6 95% C.I.)	(68) 23.3 % (18.7 - 28.7 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(56) 9.0 % (6.7 - 11.9 95% C.I.)	(31) 9.3 % (5.8 - 14.6 95% C.I.)	(25) 8.6 % (6.0 - 12.0 95% C.I.)

Table 48: Prevalence of underweight by age, based on weight-for-age z-scores-Yusuf Batil Camp

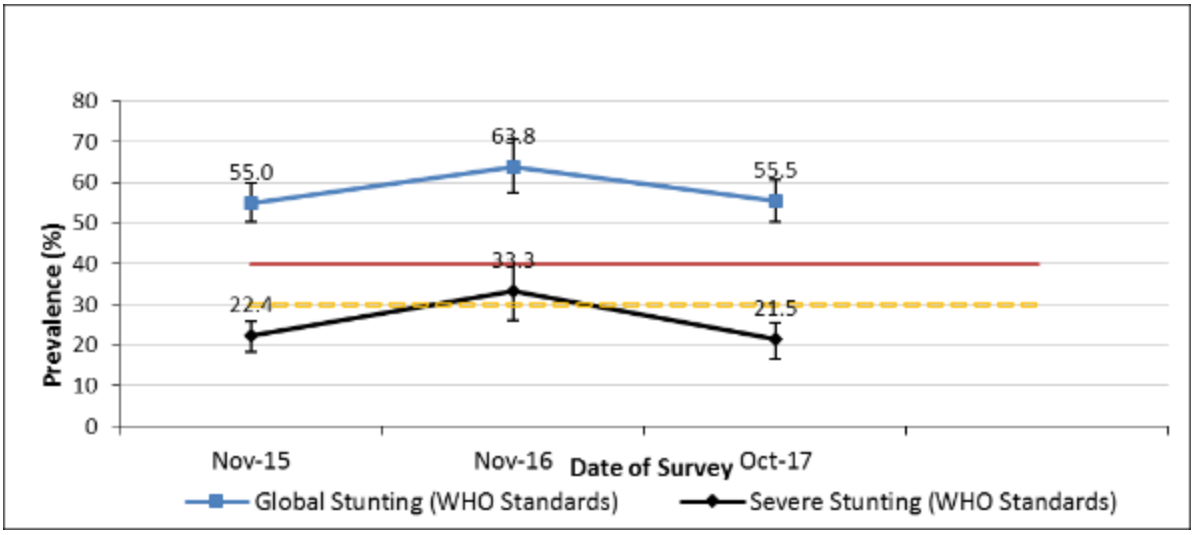
		Severe underweight (<-3 z-score)		Moderate underweight (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mo)	Total no.	No.	%	No.	%	No.	%	No.	%
6-17	144	5	3.5	29	20.1	110	76.4	0	0.0
18-29	142	16	11.3	26	18.3	100	70.4	0	0.0
30-41	145	13	9.0	35	24.1	97	66.9	0	0.0
42-53	176	18	10.2	41	23.3	117	66.5	0	0.0
54-59	18	4	22.2	5	27.8	9	50.0	0	0.0
Total	625	56	9.0	136	21.8	433	69.3	0	0.0

Table 49: Prevalence of stunting based on height-for-age z-scores and by sex-Yusuf Batil Camp

	All n = 609	Boys n = 324	Girls n = 285
Prevalence of stunting (<-2 z-score)	(338) 55.5 % (50.3 - 60.6 95% C.I.)	(181) 55.9 % (50.2 - 61.4 95% C.I.)	(157) 55.1 % (48.7 - 61.3 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(207) 34.0 % (30.2 - 38.0 95% C.I.)	(112) 34.6 % (29.9 - 39.5 95% C.I.)	(95) 33.3 % (26.8 - 40.5 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(131) 21.5 % (17.4 - 26.3 95% C.I.)	(69) 21.3 % (16.0 - 27.8 95% C.I.)	(62) 21.8 % (16.5 - 28.1 95% C.I.)

Stunting prevalence is of high public health significance

Figure 30: Trends in the Prevalence of Global and Severe Stunting Based On WHO Growth Standards In Children 6-59 Months From 2015 to 2017-Yusuf Batil Camp

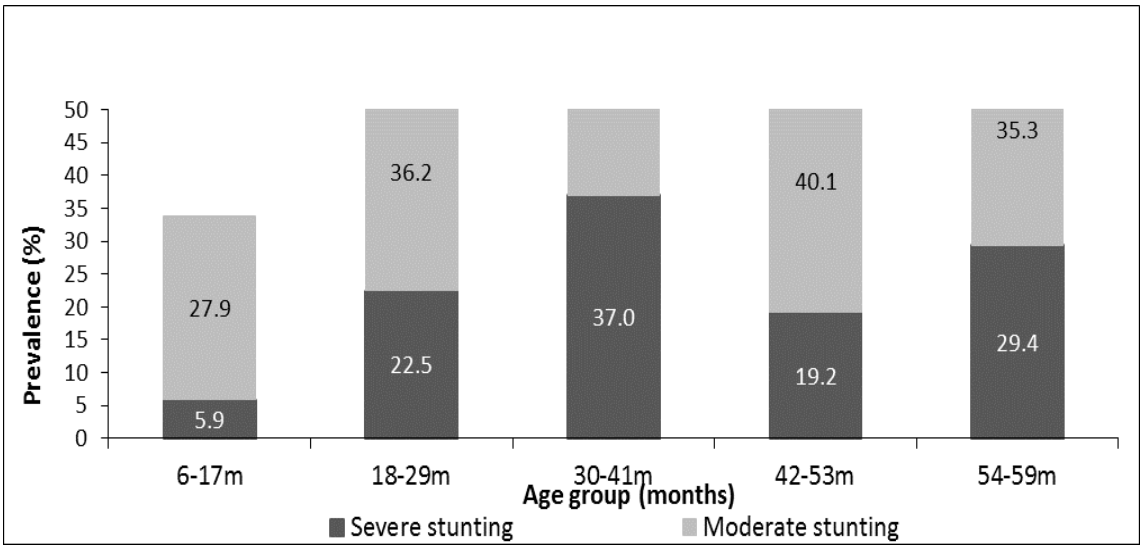


The stunting prevalence decreased significantly from 2016 to 2017 (P<0.05). However, stunting remains of public health significance (>=40%)

Table 50: Prevalence of stunting by age based on height-for-age z-scores-Yusuf Batil Camp

		Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	136	8	5.9	38	27.9	90	66.2
18-29	138	31	22.5	50	36.2	57	41.3
30-41	146	54	37.0	44	30.1	48	32.9
42-53	172	33	19.2	69	40.1	70	40.7
54-59	17	5	29.4	6	35.3	6	35.3
Total	609	131	21.5	207	34.0	271	44.5

Figure 31 : Trends in the Prevalence of Stunting By Age in Children 6-59 Months



The Age group of 30-41 months is the most affected by stunting in Yusuf Batil camp

Table 51: Mean z-scores, Design Effects and excluded subjects-Yusuf Batil Camp

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	622	-0.48±0.98	1.55	1	6
Weight-for-Age	625	-1.57±0.99	1.99	0	4
Height-for-Age	609	-2.17±1.11	1.54	1	19

* contains for WHZ and WAZ the children with edema.

3.8. Health/Feeding Programme Coverage

Feeding Programme Coverage Results

Table 52: Programme Coverage for Acutely Malnourished Children Based On MUAC, Oedema and WHZ-Yusuf Batil Camp

	Number/total	**% (95% CI)**
Supplementary feeding programme coverage	15/45	33.3(11.6-55.0)
Therapeutic feeding programme coverage	1/8	12.5(0.0-42.0)

Table 53: Programme coverage for acutely malnourished children based on MUAC and oedema-Yusuf Batil Camp

	Number/total	**% (95% CI)**
Supplementary feeding programme coverage	6/9	66.7(28.2-105.1)
Therapeutic feeding programme coverage	1/4	25.0(0.6-104.5)

Measles vaccination coverage results

Table 54: Measles Vaccination Coverage for Children Aged 9-59 Months (N=586)-Yusuf Batil Camp

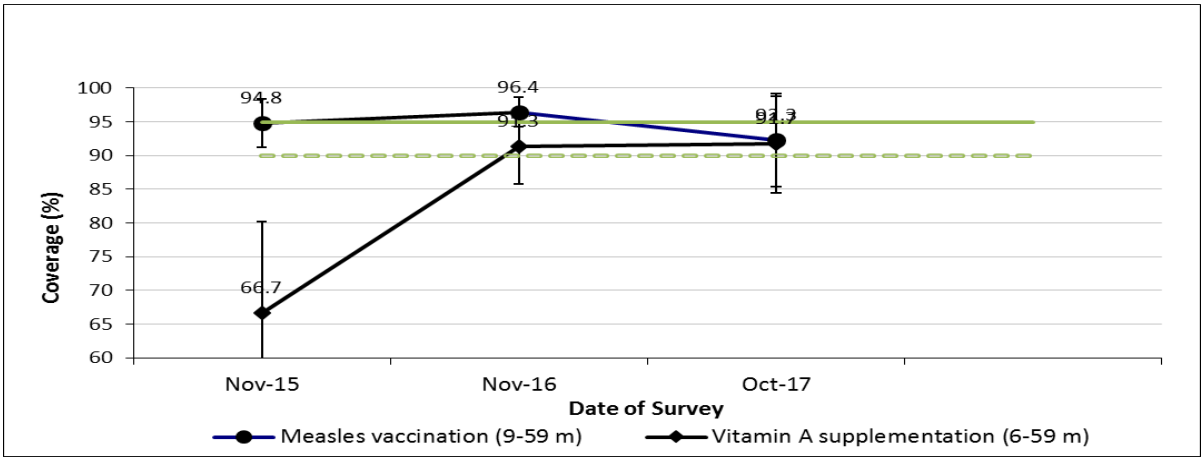
	Measles (with card) n= 454	Measles (with card or confirmation from mother) n= 541
YES	77.5% (67.0-87.9; 95% CI)	92.3 % (85.4-99.2; 95% CI)

Vitamin A supplementation coverage results

Table 55: Vitamin A Supplementation for Children Aged 6-59 Months within Past 6 Months (N= 628)-Yusuf Batil Camp

	Vitamin A capsule (with card) n=357	Vitamin A capsule (with card or confirmation from mother) n=576
YES	56.8% (41.4-72.3; 95% CI)	91.7 % (84.6-98.9 95% CI)

Figure 32: Trends In the Coverage of Measles Vaccination and Vitamin A Supplementation in Last 6 Months in Children 6-59 Months from 2015 to 2017-Yusuf Batil Camp



Diarrhoea Results

Table 56: Period Prevalence of Diarrhea-Yusuf Batil Camp

	Number/total	% (95% CI)
Diarrhoea in the last two weeks	102/628	16.2 (9.1-23.3)

3.9. Anaemia Results Children 6 – 59 months

The total anaemia prevalence among children 6 to 59 months is of high health significance at 44.2% (39.7-49.1; 95% CI). Prevalence of anaemia among children 6 to 23 months is also of high public health significance at 62.54% (55.4-69.4 95% CI).

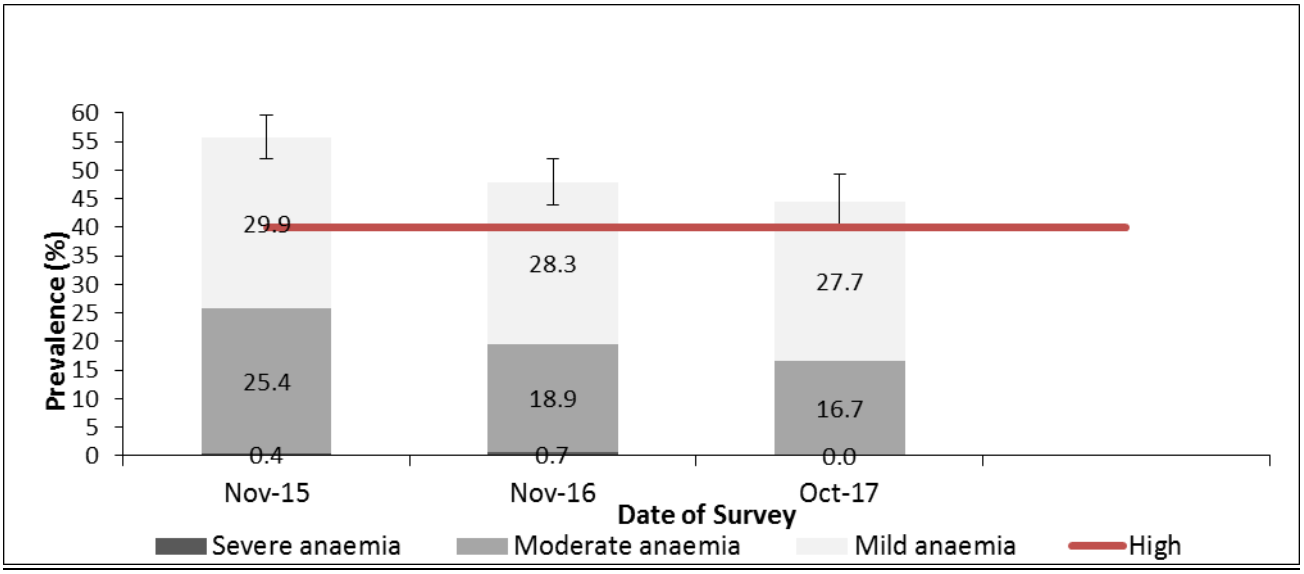
Table 57: Prevalence of Total Anaemia, Anaemia Categories, and Mean Haemoglobin Concentration in Children 6-59 Months of Age and By Age Group-Yusuf Batil Camp

	6-59 months n = 628	**6-23 months** n=218	**24-59 months** n=410
Total Anaemia (Hb<11.0 g/dL)	(279) 44.2% (39.7-49.1 ; 95% CI)	(136) 62.4 % (55.4-69.4 95% CI)	(143) 34.9 % (29.2-40.5 ; 95% CI)
Mild Anaemia (Hb 10.0-10.9 g/dL)	(174) 27.7 % (24.2-31.2 ; 95% CI)	(76) 34.9% (26.4-41.4 ; 95% CI)	(98) 23.9 % (19.3-28.4 ; 95% CI)
Moderate Anaemia (7.0-9.9 g/dL)	(105) 16.7 % (13.3-20.0 ; 95% CI)	(60) 27.5% (20.6-34.4 ; 95% CI)	(45) 11.0% (7.9-14.0 ; 95% CI)
Severe Anaemia (<7.0 g/dL)	(0) 0.0 % (0.0-0.0 ; 95% CI)	(0) 0.0 % (0.0-0.0 ; 95% CI)	(0) 0.0 % (0.0-0.0 ; 95% CI)
Mean Hb (g/dL) (SD / 95% CI) [range]	11.0 g/dL (10.9-11.2 ; 95% CI [7.2-14.7]	10.6 g/dL (10.3-10.7 ; 95% CI) [7.2-14.7]	11.3 g/dL (11.1-11.4 ; 95% CI) [7.2-14.1]

Table 58: Prevalence of Total Anaemia, Anaemia Categories, and Mean Haemoglobin Concentration in Children 6-59 Months of Age and By Age Group-Yusuf Batil Camp

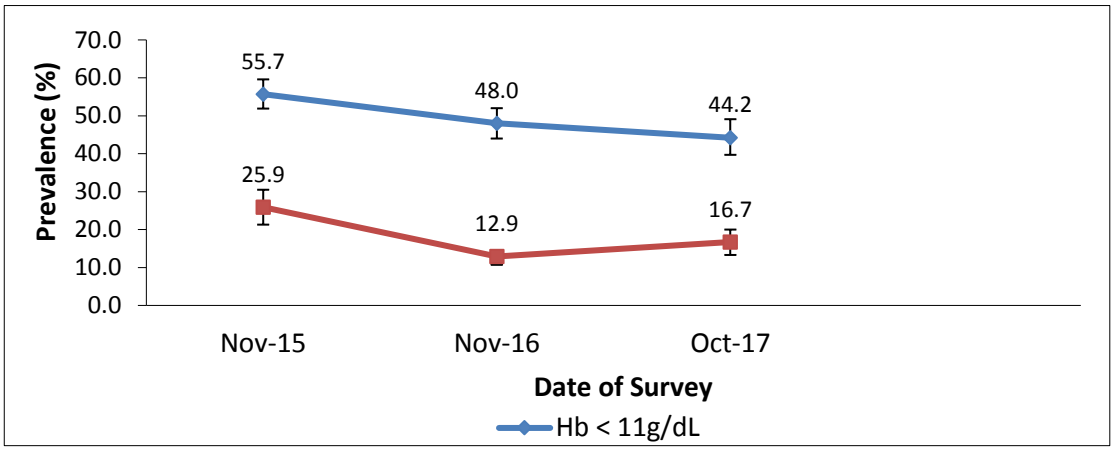
	6-59 months n = 628	**6-23 months** n= 218	**24-59 months** n= 410
Moderate and Severe Anaemia (Hb<10.0 g/dL)	(105) 16.7 % (13.3-20.0 ; 95% CI)	(60) 27.5 % (20.6-34.4; 95% CI)	(45) 11.0 % (7.9-14.0 ; 95% CI)

Figure 33: Trends in Anaemia Categories in Children 6-59 Months from 2014 to 2016-Yusuf Batil Camp



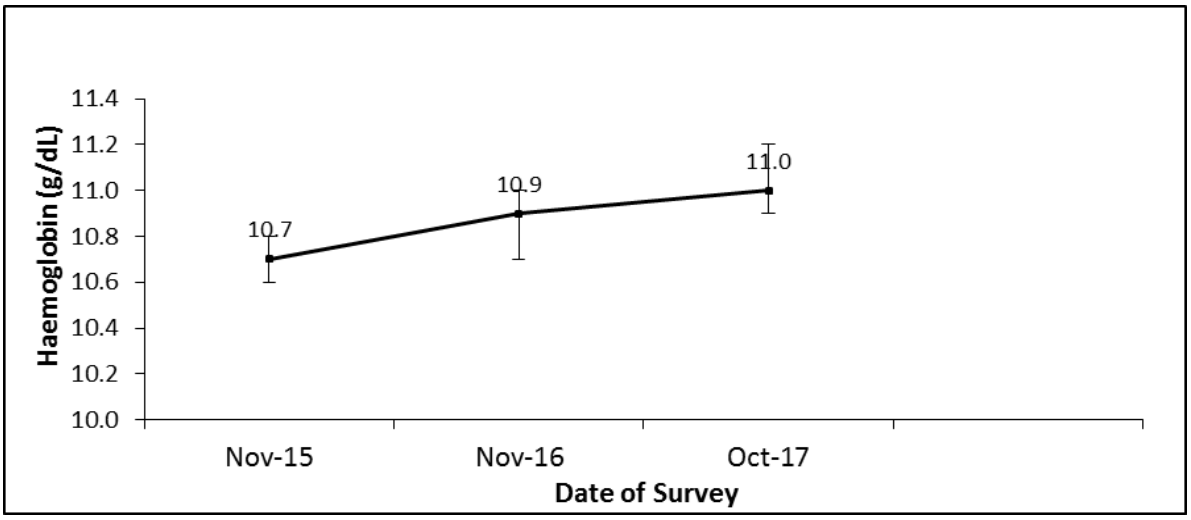
There is a non significant decrease (p>0.05) in anaemia prevalence in 2017 as compared with 2016 in Yusuf Batil camp.

Figure 34: Trend in Total Anaemia (<11 G/Dl), and Moderate and Severe Anaemia (<10 G/Dl) With 95% CI in Children 6-59 Months from 2015 to 2017- Yusuf Batil Camp



There is a non significant decrease (p>0.05) in prevalence of anaemia in 2017 as compared with 2016 in Yusuf Batil camp

Figure 35 : Trend in Mean Haemoglobin Concentration With 95% CI in Children 6-59 Months from 2015 to 2017-Yusuf Batil Camp

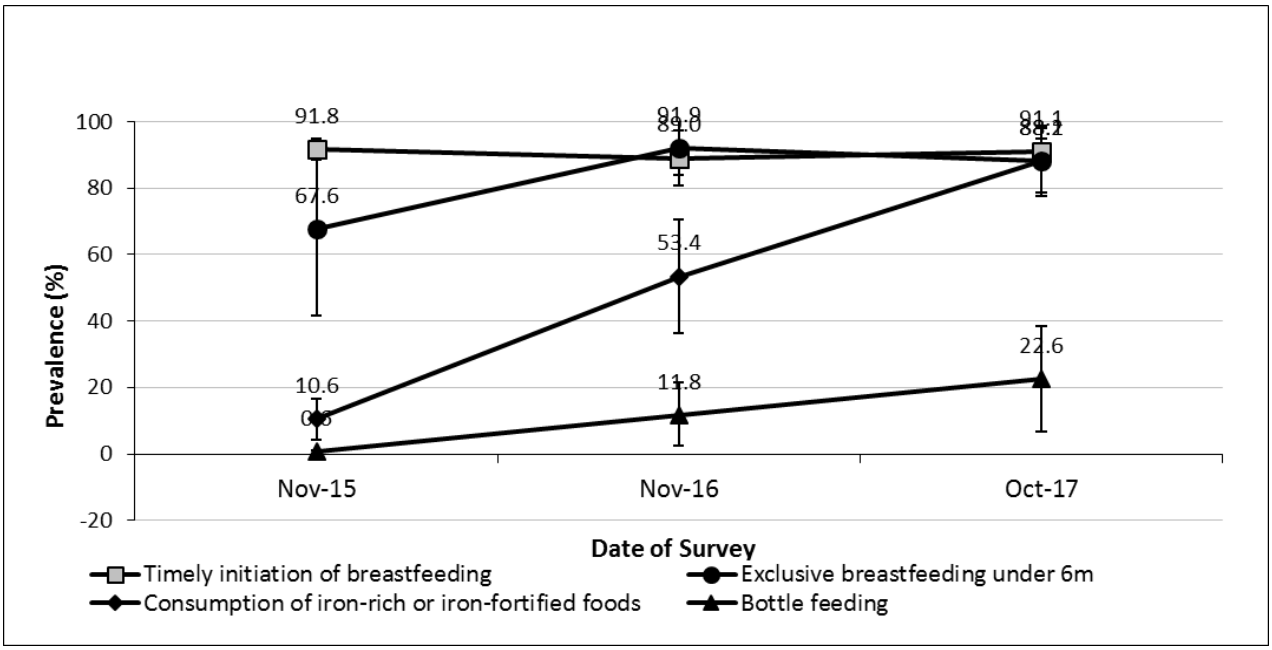


3.10. IYCF Children 0-23 months

Table 59: Prevalence of Infant and Young Child Feeding Practices Indicators-Yusuf Batil Camp

Indicator	Age range	Number/ total	Prevalence (%)	95% CI
Timely initiation of breastfeeding	**0-23 months**	246/270	91.1	87.5-94.6
Exclusive breastfeeding under 6 months	**0-5 months**	45/51	88.2	77.6-98.8
Continued breastfeeding at 1 year	**12-15 months**	39/41	95.1	88.1-102.0
Continued breastfeeding at 2 years	**20-23 months**	39/45	86.7	74.9-98.4
Introduction of solid, semi-solid or soft foods	**6-8 months**	21/42	50.0	26.7-73.2
Consumption of iron-rich or iron-fortified foods	**6-23 months**	192/218	88.1	78.3-97.7
Bottle feeding	**0-23 months**	61/270	22.6	6.6-38.4

Figure 36: Key IYCF Indicators from 2014 to 2016-Yusuf Batil Camp



Prevalence of intake

Infant formula

Table 60: Infant Formula Intake in Children Aged 0-23 Months-Yusuf Batil Camp

	Number/total	% (95% CI)
Proportion of children aged 0-23 months who receive infant formula (fortified or non-fortified)	63/270	23.3(6.8-39.8)

Fortified blended foods

Table 61: FSB++ Intake in Children Aged 6-23 Months-Yusuf Batil Camp

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive FBF++	186/219	84.9(73.9-95.9)

3.11. Anaemia Women 15-49 years

Table 62: Women Physiological Status and Age-Yusuf Batil Camp

Physiological status	Number/total	% of sample
Non-pregnant	230/259	88.8
Pregnant	29/259	11.2
Mean age (range)	27.4 (15-49)	

Table 63: Prevalence of Anaemia and Haemoglobin Concentration in Non-Pregnant Women of Reproductive Age (15-49 Years)-Yusuf Batil Camp

Anaemia in non-pregnant women of reproductive age (15-49 years)	**All n = 229**
Total Anaemia (<12.0 g/dL)	(64) 27.9% (20.5-35.2 ; 95% CI)
Mild Anaemia (11.0-11.9 g/dL)	(46) 20.0 % (14.3-25.8 ; 95% CI)
Moderate Anaemia (8.0-10.9 g/dL)	(17) 7.4 % (3.3-11.5; 95% CI)
Severe Anaemia (<8.0 g/dL)	(1) 0.4 (0.0-1.3 ; 95% CI)
Mean Hb (g/dL) (SD / 95% CI) [range]	12.6 g/dL (12.4-12.7 95% CI) [7.5-15.5]

Figure 37: Trends in Anaemia Categories in Women of Reproductive Age (Non-Pregnant) From 2015 to 2017-Yusuf Batil Camp

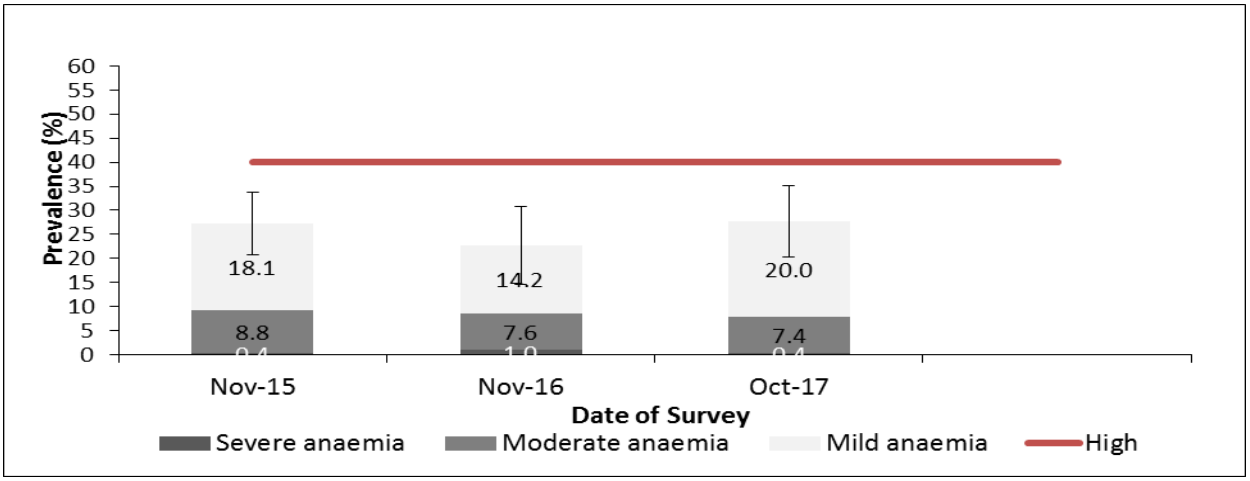


Table 64: ANC Enrolment and Iron-Folic Acid Pills Coverage among Pregnant Women (15-49 Years)-Yusuf Batil Camp

	Number /total	**% (95% CI)**
Currently enrolled in ANC programme	29/29	100.0 (100.0-100.0)
Currently receiving iron-folic acid pills	29/29	100.0 (100.0-100.0)

3.12. Food Security

Table 65: Sampling Characteristics Food Security –Yusuf Batil Camp

	Target (No.)	**Total surveyed (No.)**	**% of the target**
Households	250	244	97.6 %
Clusters (where applicable)	27	27	100%

Access to food assistance

Table 66: Ration card coverage

	Number/total	% (95% CI)
Proportion of households with a ration card	242/242	100.0 (100.0-100.0)

All the surveyed households had a ration card

Negative household coping strategies

The refugees in Batil refugee camp receive a reduced food ration at a 70% scale.

Table 67: Coping strategies used by the surveyed population over the past month – Yusuf Batil Camp

	Number/total	% (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	193/237	81.4 (73.7-89.0)
Sold any assets that would not have normally sold (furniture, seed stocks, tools, other NFI, livestock etc.)	85/237	35.9 (23.5-48.1)
Requested increased remittances or gifts as compared to normal	58/237	24.5 (13.0-35.9)
Reduced the quantity and/or frequency of meals and snacks	170/236	72.0 (59.1-84.9)
Begged	106/237	44.7 (30.1-59.2)
Engaged in potentially risky or harmful activities	31/237	13.0(4.2-21.9)
Proportion of households reporting using none of the coping strategies over the past month	9/236	3.8(0.3-7.3)

***** The total was over 100% as households used several negative coping strategies.

Only 3.8 % of households were not under significant stress to meet their needs as indicated by the proportion of household using none of the negative coping strategies over the past month prior to the survey.

Household dietary diversity

The last general food distribution ended 21+ days prior to the start of the survey data collection. The survey was carried out during the end of the harvest season.

Table 68: Average HDDS*- Yusuf Batil camp, south Sudan

	Mean (Standard deviation or 95% CI)
Average HDDS	5.0 (4.0-6.11)

Figure 38: Proportion of households consuming different food groups within last 24 hours – Yusuf Batil Camp

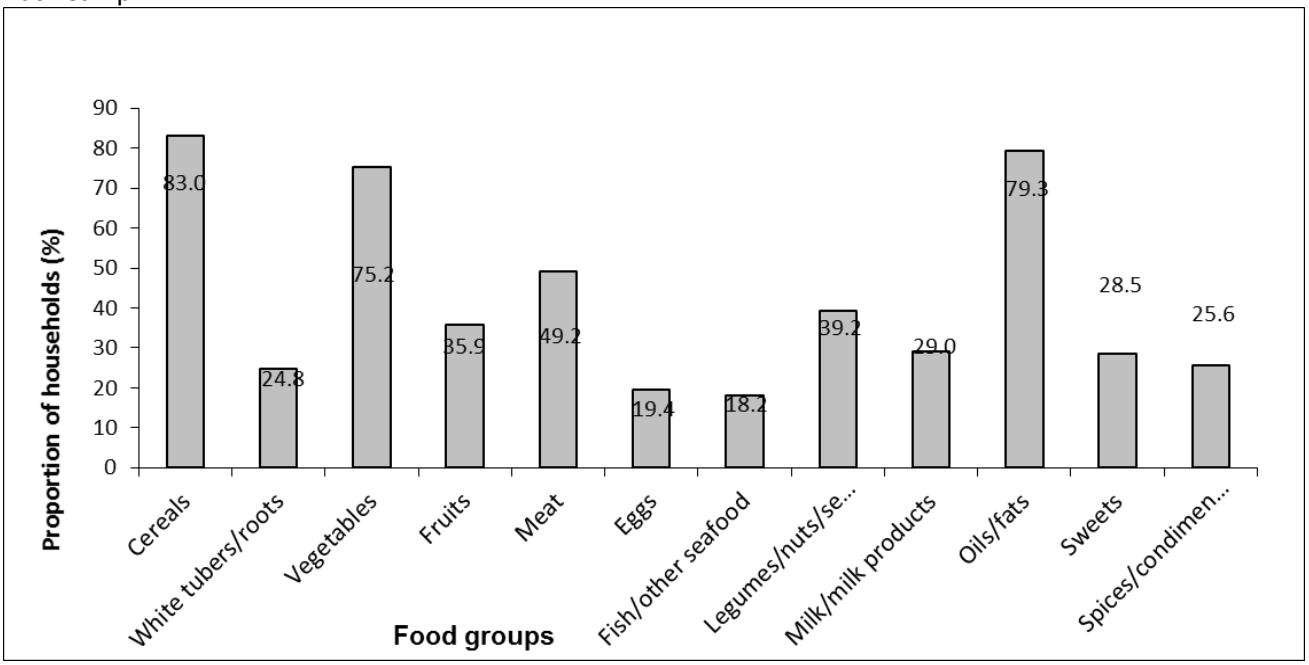


Table 69: Consumption of micronutrient rich foods by households- Yusuf Batil camp

	Number/total	% (95% CI)
Proportion of households *not consuming any* vegetables, fruits, meat, eggs, fish/seafood, and milk/milk products	47/241	19.5 (5.4-33.5)
Proportion of households consuming either a plant or animal source of vitamin A	185/241	76.8 (61.7-91.8)
Proportion of households consuming organ meat/flesh meat, or fish/seafood (food sources of haem iron)	131/242	54.1 (37.9-70.3)

More than half of the household responded had consumed food groups rich in vitamin A and iron.

GENDRASSA CAMP

The demographic characteristics are illustrated in table 88 below.

Table 70: Target and actual number captured-Gendrassa camp South Sudan

	Target (No.)	Total surveyed (No.)	% of the target
Children 6-59 months	419	593	141.5 %
Clusters (where applicable)	25	25	100 %

3.13. Anthropometric results (based on WHO standards 2006)

Table 71: Distribution of age and sex of sample- Gendrassa Camp

	Boys		Girls		Total		Ratio
AGE (mo)	**no.**	**%**	**no.**	**%**	**no.**	**%**	**Boy: girl**
6-17	61	49.2	63	50.8	124	20.9	1.0
18-29	68	48.9	71	51.1	139	23.4	1.0
30-41	68	50.0	68	50.0	136	22.9	1.0
42-53	86	52.1	79	47.9	165	27.8	1.1
54-59	13	44.8	16	55.2	29	4.9	0.8
Total	296	49.9	297	50.1	593	100.0	1.0

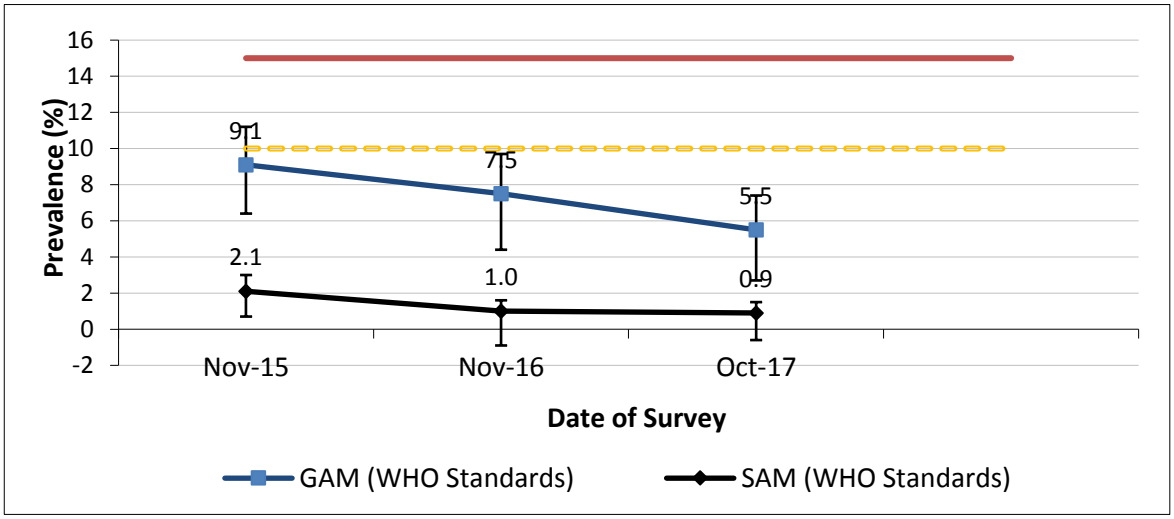
The overall ration of boys: girls is equally represented

Table 72: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex-Gendrassa Camp

	All n = 585	**Boys** n = 291	**Girls** n = 294
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(32) 5.5 % (3.6 - 8.3 95% C.I.)	(19) 6.5 % (3.9 - 10.6 95% C.I.)	(13) 4.4 % (2.5 - 7.6 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(27) 4.6 % (3.0 - 7.0 95% C.I.)	(16) 5.5 % (3.2 - 9.4 95% C.I.)	(11) 3.7 % (2.1 - 6.7 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(5) 0.9 % (0.3 - 2.4 95% C.I.)	(3) 1.0 % (0.3 - 3.2 95% C.I.)	(2) 0.7 % (0.2 - 2.9 95% C.I.)

The prevalence of oedema is 0.2

Figure 39: Trends in the Prevalence of Global and Severe Acute Malnutrition Based On WHO Growth Standards in Children 6-59 Months from 2015 to 2017 – Gendrassa Camp



The decrease noticed in Gendrassa camp was not significant (p>0.05)

Table 73: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema-Gendrassa Camp

		Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mo)	Total no.	No.	%	No.	%	No.	%	No.	%
6-17	118	0	0.0	10	8.5	108	91.5	0	0.0
18-29	139	2	1.4	9	6.5	127	91.4	1	0.7
30-41	135	2	1.5	4	3.0	129	95.6	0	0.0
42-53	165	0	0.0	4	2.4	161	97.6	0	0.0
54-59	28	0	0.0	0	0.0	28	100.0	0	0.0
Total	585	4	0.7	27	4.6	553	94.5	1	0.2

The 18-29 and the 34-41 age group was more severely wasted compared to the other age groups

Figure 40 Trend in the Prevalence of Wasting By Age in Children 6-59 Months

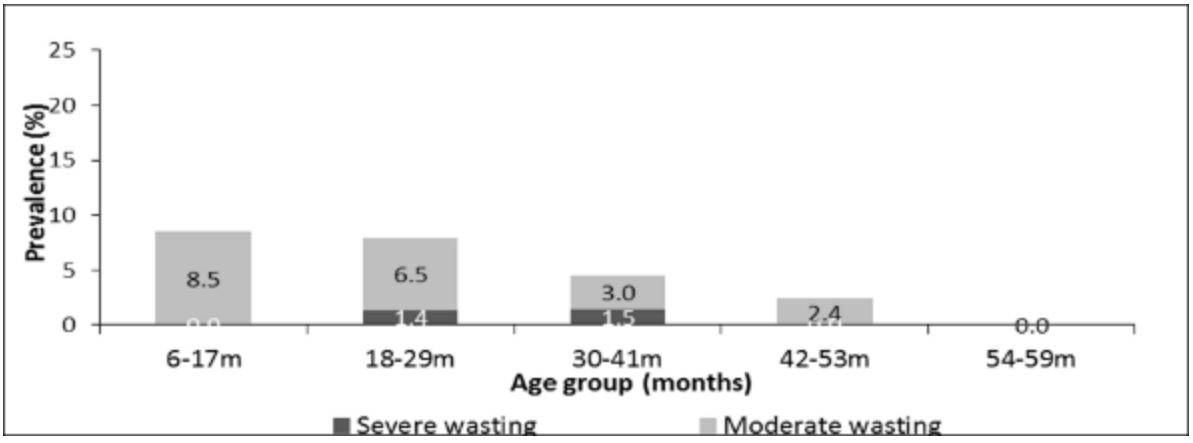


Table 74: Distribution of acute malnutrition and oedema based on weight-for-height z-scores- Gendrassa Camp

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 1 (0.2 %)
Oedema absent	Marasmic No. 10 (1.7 %)	Not severely malnourished No. 581 (98.1 %)

Figure 41: Distribution of Weight-For-Height Z-Scores (Based On WHO Growth Standards)
The Reference Population Is Shown In Green and the Surveyed Population Is Shown In Red). The Figure below shows that the distribution for weight-for-height z-scores for the survey sample is shifted to the left, illustrating a poorer status than the international WHO Standard population of children aged 6-59 months.

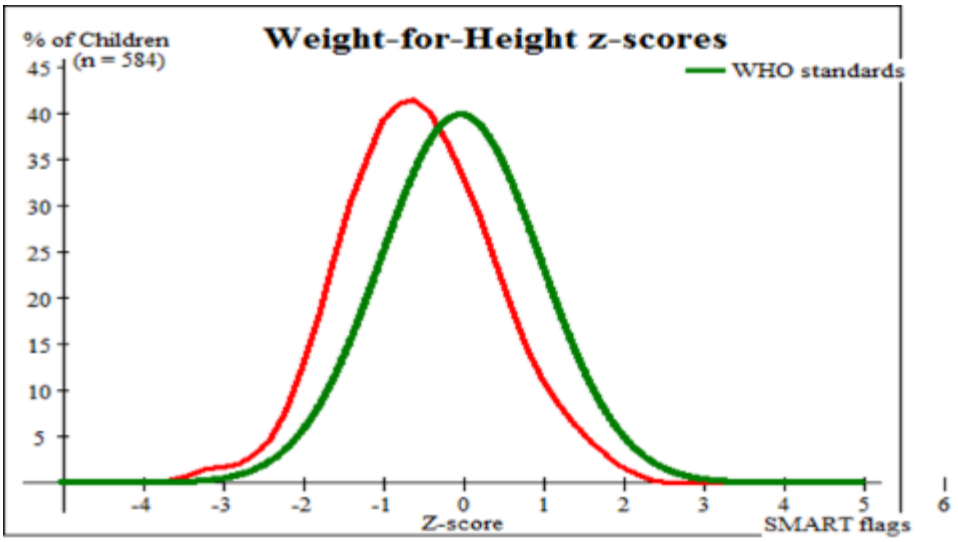


Table 75: Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex- Gendrassa Camp

	All n = 593	**Boys** n = 296	**Girls** n = 297
Prevalence of global malnutrition (< 125 mm and/or oedema)	(22) 3.7 % (2.2 - 6.1 95% C.I.)	(8) 2.7 % (1.2 - 6.1 95% C.I.)	(14) 4.7 % (2.7 - 8.1 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(18) 3.0 % (1.8 - 5.1 95% C.I.)	(6) 2.0 % (0.8 - 5.0 95% C.I.)	(12) 4.0 % (2.3 - 7.0 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(4) 0.7 % (0.3 - 1.8 95% C.I.)	(2) 0.7 % (0.2 - 2.8 95% C.I.)	(2) 0.7 % (0.2 - 2.7 95% C.I.)

Table 76: Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by age-Gendrassa Camp

		Severe wasting (< 115 mm)		Moderate wasting (>= 115 mm and < 125 mm)		Normal (> = 125 mm)		Oedema	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**Age (mo)**	**Total no.**	**No.**	**%**
6-17	124	1	0.8	10	8.1	**6-17**	124	1	0.8
18-29	139	2	1.4	6	4.3	**18-29**	139	2	1.4
30-41	136	0	0.0	1	0.7	**30-41**	136	0	0.0
42-53	165	0	0.0	1	0.6	**42-53**	165	0	0.0
54-59	29	0	0.0	0	0.0	**54-59**	29	0	0.0
Total	593	3	0.5	18	3.0	**Total**	593	3	0.5

Table 77: Prevalence of underweight based on weight-for-age z-scores by sex-Gendrassa Camp

	All n = 587	**Boys** n = 293	**Girls** n = 294
Prevalence of underweight (<-2 z-score)	(161) 27.4 % (23.4 - 31.9 95% C.I.)	(93) 31.7 % (25.2 - 39.1 95% C.I.)	(68) 23.1 % (18.4 - 28.7 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(134) 22.8 % (19.6 - 26.4 95% C.I.)	(74) 25.3 % (20.5 - 30.6 95% C.I.)	(60) 20.4 % (15.4 - 26.6 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(27) 4.6 % (3.1 - 6.8 95% C.I.)	(19) 6.5 % (3.8 - 10.7 95% C.I.)	(8) 2.7 % (1.4 - 5.1 95% C.I.)

Table 78: Prevalence of underweight by age, based on weight-for-age z-scores-Gendrassa Camp

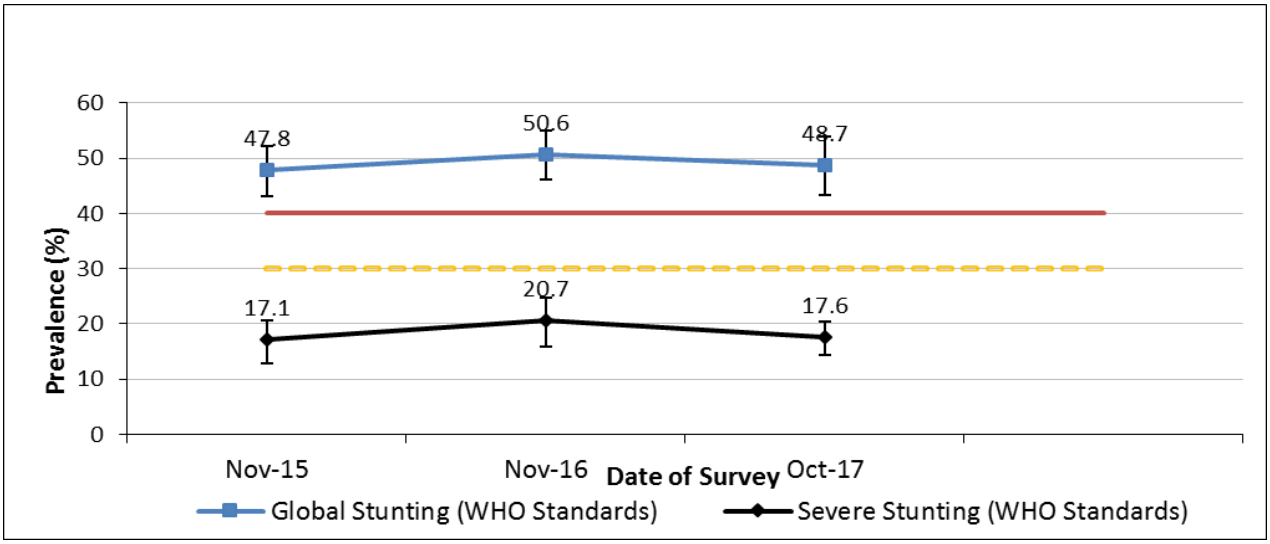
		Severe underweight (<-3 z-score)		Moderate underweight (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**Age (mo)**	**Total no.**	**No.**	**%**
6-17	122	7	5.7	16	13.1	**6-17**	122	7	5.7
18-29	138	9	6.5	41	29.7	**18-29**	138	9	6.5
30-41	135	5	3.7	40	29.6	**30-41**	135	5	3.7
42-53	164	5	3.0	34	20.7	**42-53**	164	5	3.0
54-59	28	1	3.6	3	10.7	**54-59**	28	1	3.6
Total	587	27	4.6	134	22.8	**Total**	587	27	4.6

Table 79: Prevalence of stunting based on height-for-age z-scores and by sex-Gendrassa Camp

	All n = 575	Boys n = 285	Girls n = 290
Prevalence of stunting (<-2 z-score)	(280) 48.7 % (43.5 - 54.0 95% C.I.)	(148) 51.9 % (44.9 - 58.9 95% C.I.)	(132) 45.5 % (38.2 - 53.1 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(179) 31.1 % (26.3 - 36.4 95% C.I.)	(88) 30.9 % (25.7 - 36.6 95% C.I.)	(91) 31.4 % (24.4 - 39.3 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(101) 17.6 % (14.7 - 20.9 95% C.I.)	(60) 21.1 % (16.0 - 27.2 95% C.I.)	(41) 14.1 % (10.6 - 18.6 95% C.I.)

Stunting prevalence is of high public health significance

Figure 42 Trends in the Prevalence of Global and Severe Stunting Based On WHO Growth Standards in Children 6-59 Months from 2013 to 2015-Gendrassa Camp

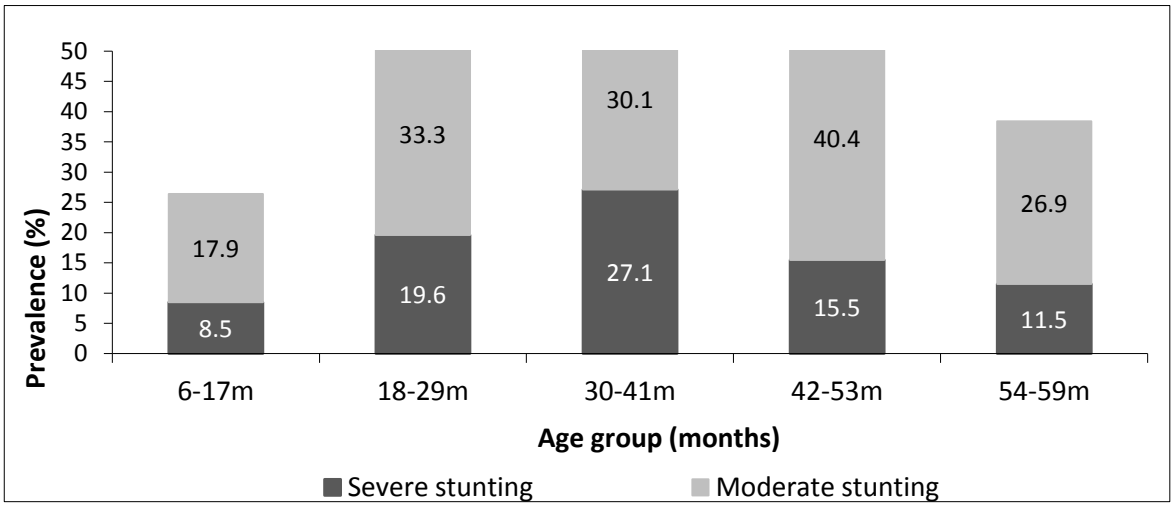


There is a non-significant decrease in stunting in Gendrassa camp (P>0.05)

Table 80: Prevalence of stunting by age based on height-for-age z-scores-Gendrassa Camp

		Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	117	10	8.5	21	17.9	86	73.5
18-29	138	27	19.6	46	33.3	65	47.1
30-41	133	36	27.1	40	30.1	57	42.9
42-53	161	25	15.5	65	40.4	71	44.1
54-59	26	3	11.5	7	26.9	16	61.5
Total	575	101	17.6	179	31.1	295	51.3

Figure 43: Trends in the Prevalence of Stunting By Age in Children 6-59 Months



The age group of 30-41 month is the most affected by stunting in Gendrassa

Table 81: Mean z-scores, Design Effects and excluded subjects-Gendrassa Camp

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	584	-0.54±0.94	1.25	2	7
Weight-for-Age	587	-1.49±0.89	1.26	1	5
Height-for-Age	575	-1.94±1.13	1.50	1	17

* contains for WHZ and WAZ the children with edema.

3.14. Health/Feeding programme coverage

Table 82: Programme Coverage for Acutely Malnourished Children Based on MUAC, Oedema and WHZ-Gendrassa camp

	Number/total	**% (95% CI)**
Supplementary feeding programme coverage	16/41	39.0(21.9-56.0)
Therapeutic feeding programme coverage	1/10	10.0(0.0-35.8)

Table 83: Programme coverage for acutely malnourished children based on MUAC and oedema-Gendrassa Camp

	Number/total	**% (95% CI)**
Supplementary feeding programme coverage	10/18	55.6 (31.3-79.8)
Therapeutic feeding programme coverage	1/4	25.0 (0.0-104.5)

Measles vaccination coverage results

Table 84: Measles Vaccination Coverage for Children Aged 9-59 Months (N=560)-Gendrassa Camp

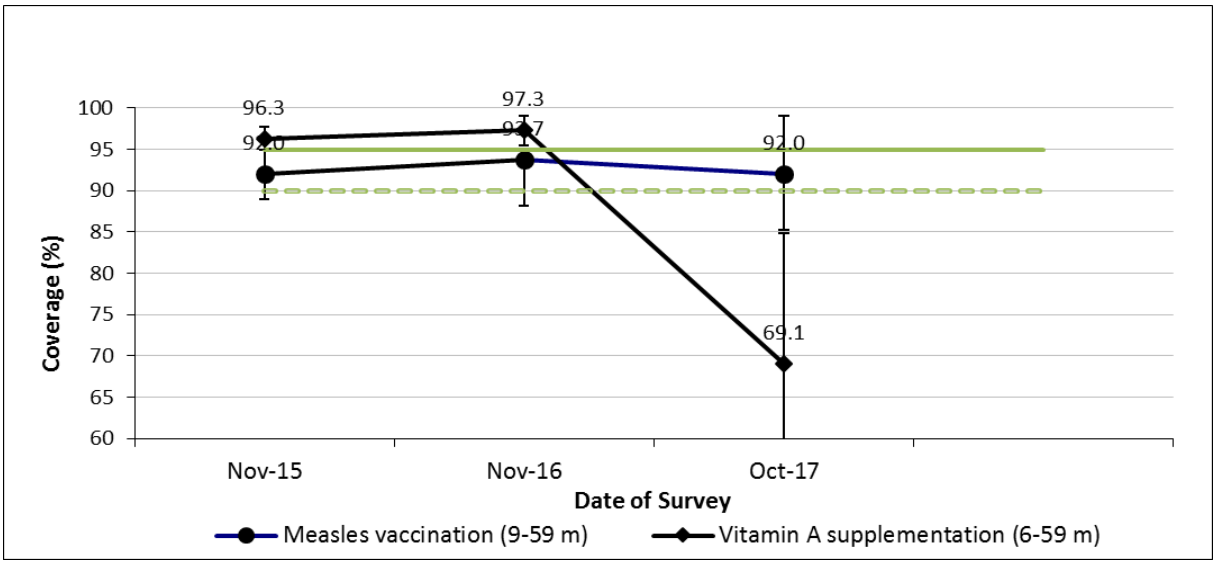
	Measles (with card) n= 419	**Measles (with card or confirmation from mother) N=515**
YES	74.8% (64.2-85.4 95% CI)	92.0 % (85.0-98.8 95% CI)

Vitamin A supplementation coverage results

Table 85: Vitamin A Supplementation for Children Aged 6-59 Months within Past 6 Months (N= 593)-Gendrassa Camp

	Vitamin A capsule (with card) n=339	Vitamin A capsule (with card or confirmation from mother) n=410
YES	57.2% (42.4-71.9 95% CI)	69.1 % (53.3-84.8 95% CI)

Figure 44: Trends in the Coverage of Measles Vaccination and Vitamin a Supplementation in Last 6 Months in Children 6-59 Months from 2015 to 2017-Gendrassa Camp



Diarrhoea Results

Table 86: Period Prevalence of Diarrhoea-Gendrassa Camp

	Number/total	% (95% CI)
Diarrhoea in the last two weeks	114/592	19.3 (10.9-27.5)

3.15. Anaemia Children 6 – 59 months

The total anaemia prevalence among children 6 to 59 months is of high public health significance 48.0 % (42.7-53.2 95% CI). This is extremely high in Young children of 6 to 23 months with an anaemia prevalence of 73.7% (66.6-80.7 95% CI)

Table 87: Prevalence of Total Anaemia, Anaemia Categories, and Mean Haemoglobin Concentration in Children 6-59 Months of Age and By Age Group-Gendrassa Camp

	6-59 months n = 592	**6-23 months** n=190	**24-59 months** n=402
Total Anaemia (Hb<11.0 g/dL)	(284) 48.0 % (42.7-53.2 95% CI)	(140) 73.7% (66.6-80.7 95% CI)	(144) 35.8 % (28.8-42.7 95% CI)
Mild Anaemia (Hb 10.0-10.9 g/dL)	(160) 27.0 % (23.8-30.1 95% CI)	(66) 34.7% (27.3-42.0 95% CI)	(94) 23.4% (18.5-28.2 95% CI)
Moderate Anaemia (7.0-9.9 g/dL)	(121) 20.4 % (16.3-24.5 95% CI)	(72) 37.9% (29.5-46.1 95% CI)	(49) 12.2% (8.2-16.1 95% CI)
Severe Anaemia (<7.0 g/dL)	(3) 0.5% (0.0-1.0 95% CI)	(2) 1.0% (0.0-1.5 95% CI)	(1) 0.2 (0.0-1.7 95% CI)
Mean Hb (g/dL) (SD / 95% CI) [range]	10.9 g/dL (10.7-11.0 95% CI) [6.1-16.6]	10.2 g/dL (9.9-10.4 95% CI) [6.4-13.4]	11.0 g/dL (11.2-11.4 95% CI) [6.1-16.6]

Table 88: Prevalence of Moderate and Severe Anaemia in Children 6-59 Months of Age and By Age Group-Gendrassa Camp

	6-59 months n = 592	**6-23 months** n= 190	**24-59 months** n= 402
Moderate and Severe Anaemia (Hb<10.0 g/dL)	(124) 20.9% (16.7-25.1 95% CI)	(74) 38.9% (30.1-47.7 95% CI)	(50) 12.4% (8.4-16.4 95% CI)

Figure 45: Trends in Anaemia Categories in Children 6-59 Months from 2015 to 2017-Gendrassa Camp

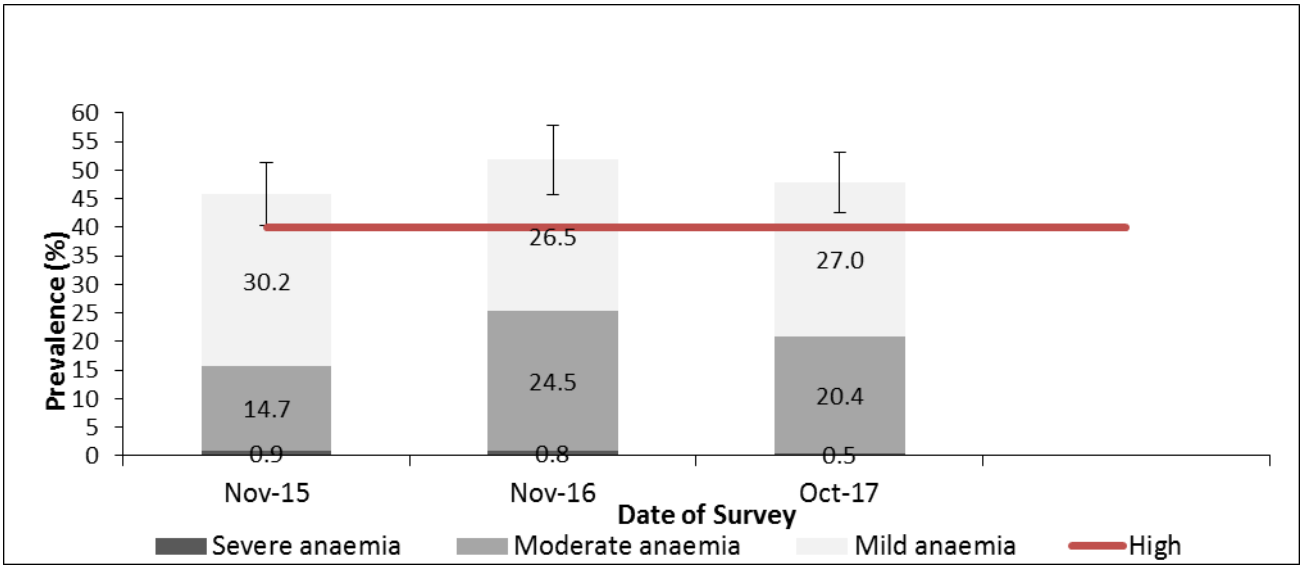
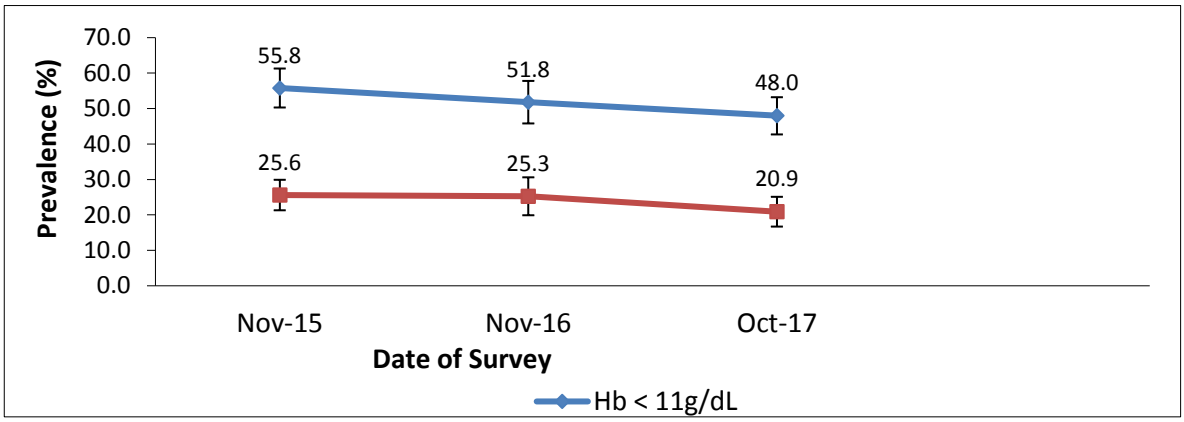
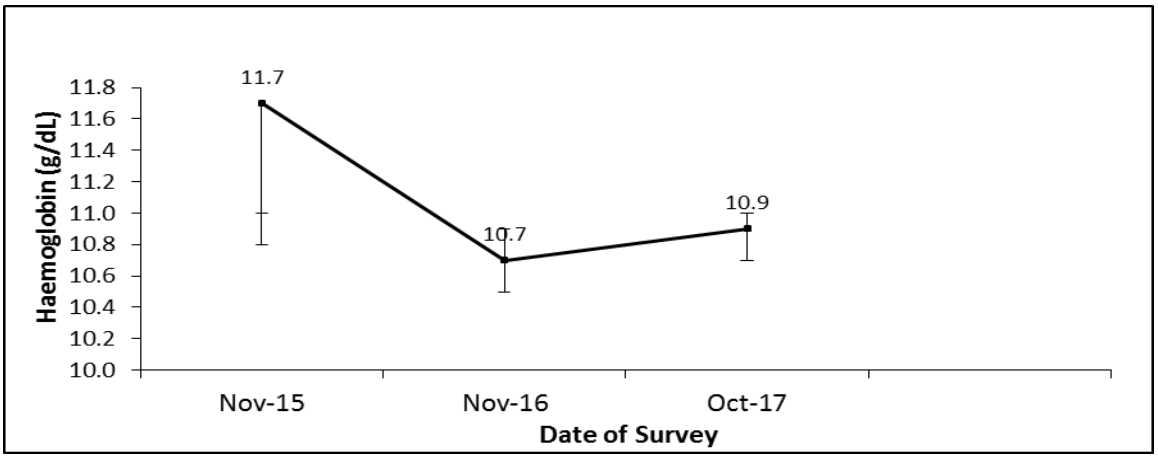


Figure 46: Trend in Total Anaemia (<11 G/Dl), and Moderate and Severe Anaemia (<10 G/Dl) With 95% CI in Children 6-59 Months from 2014 to 2016-Gendrassa Camp



The decrease in anaemia was not significant in 2017 in Batil camp

Figure 47: Trend in Mean Haemoglobin Concentration With 95% CI in Children 6-59 Months from 2014 to 2016-Gendrassa Camp

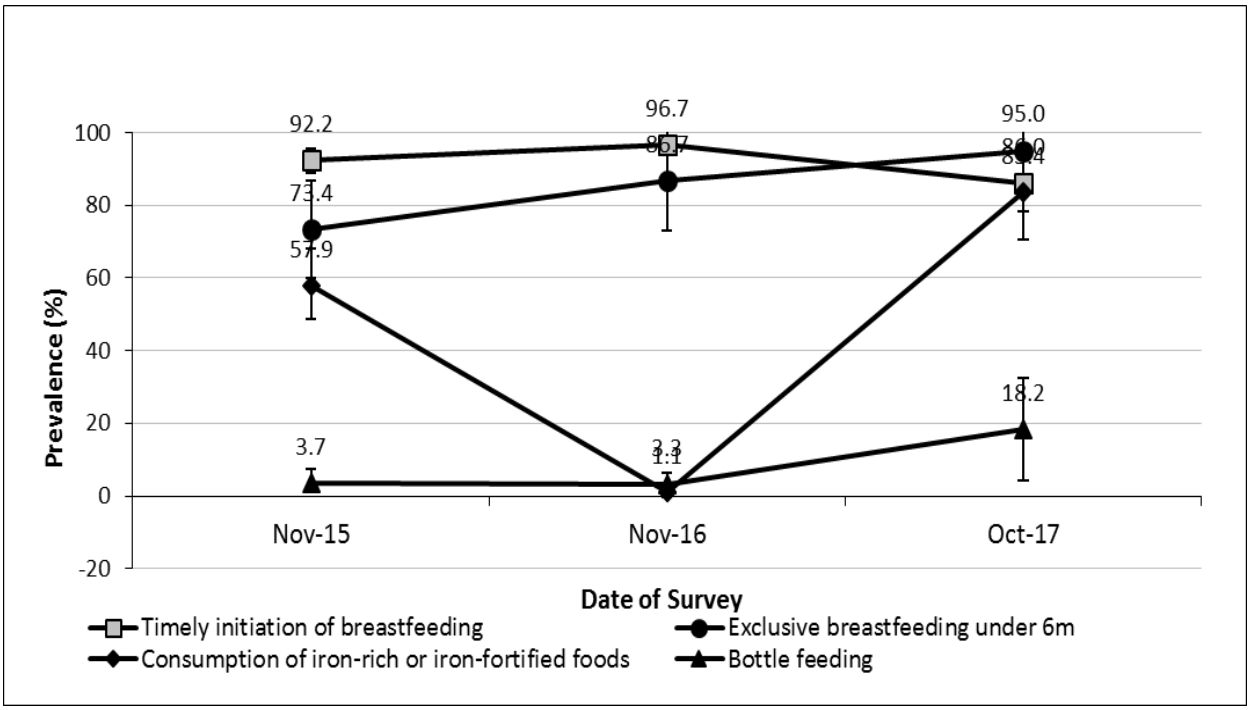


3.16. IYCF Children 0-23 months

Table 89: Prevalence of Infant and Young Child Feeding Practices Indicators-Gendrassa Camp

Indicator	Age range	Number/ total	Prevalence (%)	95% CI
Timely initiation of breastfeeding	**0-23 months**	198/230	86.0	78.3-93.7
Exclusive breastfeeding under 6 months	**0-5 months**	38/40	95.0	87.7-102.2
Continued breastfeeding at 1 year	**12-15 months**	29/30	96.7	89.8-103.5
Continued breastfeeding at 2 years	**20-23 months**	33/43	76.7	63.0-90.4
Introduction of solid, semi-solid or soft foods	**6-8 months**	18/33	54.5	32.0-77.0
Consumption of iron-rich or iron-fortified foods	**6-23 months**	156/187	83.4	70.4-96.4
Bottle feeding	**0-23 months**	42/231	18.2	4.0-32.3

Figure 48: Key IYCF Indicators from 2015 to 2017-Gendrassa Camp



Prevalence of intake

Infant formula

Table 90: Infant Formula Intake in Children Aged 0-23 Months-Gendrassa Camp

	Number/total	% (95% CI)
Proportion of children aged 0-23 months who receive infant formula (fortified or non-fortified)	44/231	19.0 (4.9-33.1)

Fortified blended foods

Table 91: FSB++ Intake in Children Aged 6-23 Months-Gendrassa Camp

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive FBF++	152/190	80.0(66.5-93.4)

3.17. Anaemia Women 15-49 years

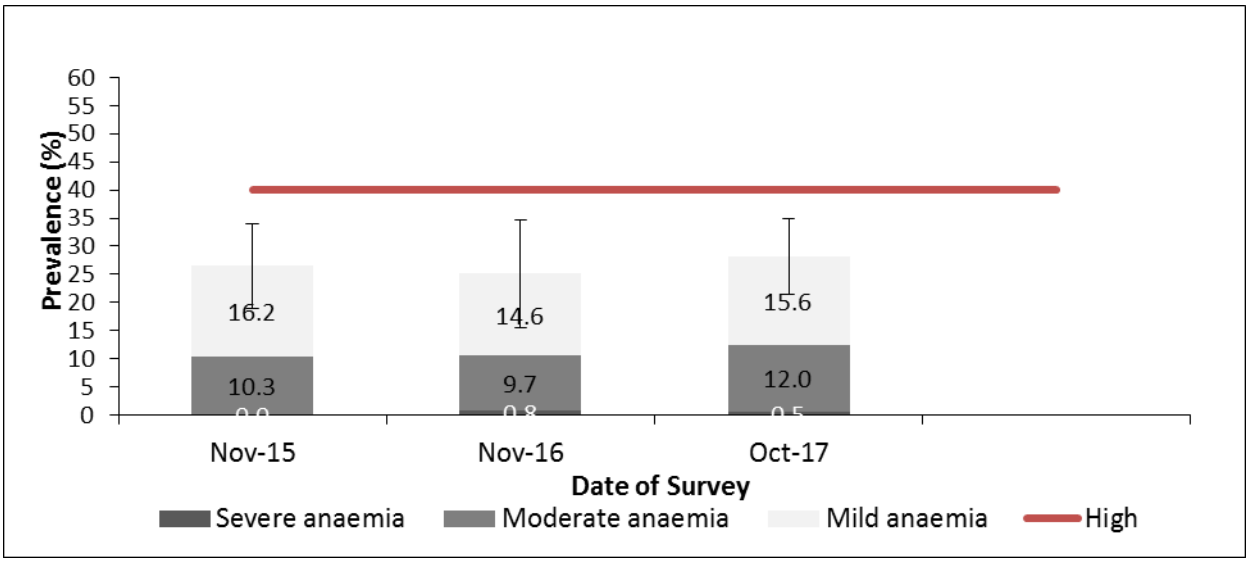
Table 92: Women Physiological Status and Age-Gendrassa Camp

Physiological status	Number/total	% of sample
Non-pregnant	203/245	82.3
Pregnant	42/245	17.2
Mean age (range)	26.4 (15-49)	

Table 93: Prevalence of Anaemia and Haemoglobin Concentration in Non-Pregnant Women of Reproductive Age (15-49 Years)-Gendrassa Camp

Anaemia in non-pregnant women of reproductive age (15-49 years)	**All n = 192**
Total Anaemia (<12.0 g/dL)	(54) 28.1% (21.4-34.8 95% CI)
Mild Anaemia (11.0-11.9 g/dL)	(30) 15.6% (9.8-21.4 95% CI)
Moderate Anaemia (8.0-10.9 g/dL)	(23) 12.0 % (7.1-16.8 95% CI)
Severe Anaemia (<8.0 g/dL)	(1) 0.5 (0.0-1.5 95% CI)
Mean Hb (g/dL) (SD / 95% CI) [range]	12.5 g/dL (12.2-12.7) [5.6-15.8]

Figure 49: Trends in Anaemia Categories in Women of Reproductive Age (Non-Pregnant) From 2015 to 2017-Gendrassa Camp



The anaemia prevalence in non-pregnant women of reproductive age increase non significantly in 2017 in Gendrassa camp (p>0.05).

Table 94: ANC Enrolment and Iron-Folic Acid Pills Coverage among Pregnant Women (15-49 Years)-Gendrassa Camp

	Number /total	**% (95% CI)**
Currently enrolled in ANC programme	39/42	92.9 (84.9-30.7)
Currently receiving iron-folic acid pills	39/42	92.9 (84.9-30.7)

3.18. Food Security

Table 95: Sample characteristics food security-Gendrassa camp

	Target (No.)	Total surveyed (No.)	% of the target
Households	228	232	101.7 %
Clusters (where applicable)	25	25	100%

Access to food assistance

Table 96: Ration card coverage

	Number/total	% (95% CI)
Proportion of households with a ration card	232/232	100.0(100.0-100.0)

All the surveyed households had a ration card

Negative household coping strategies

The refugees in Pamir refugee camps receive a reduced food ration at a 70% scale.

Table 97: Coping strategies used by the surveyed population over the past month - Gendrassa camp

	Number/total	% (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	166/226	73.5 (65.0-81.8)
Sold any assets that would not have normally sold (furniture, seed stocks, tools, other NFI, livestock etc.)	56/226	24.8 (17.5-31.9)
Requested increased remittances or gifts as compared to normal	37/226	16.4 (5.8-26.8)
Reduced the quantity and/or frequency of meals and snacks	137/227	60.4 (44.8-75.8)
Begged	61/227	26.9 (15.1-38.5)
Engaged in potentially risky or harmful activities	23/227	10.1(1.3-18.9)
Proportion of households reporting using none of the coping strategies over the past month	26/226	11.5 (2.9-20.1)

***** The total was over 100% as households used several negative coping strategies.

Only 11.5 % of households were not under significant stress to meet their needs as indicated by the proportion of household using none of the negative coping strategies over the past month prior to the survey.

Household dietary diversity

The last general food distribution ended 21+ days prior to the start of the survey data collection. The survey was carried out during the end of the harvest season.

Table 98: Average HDDS*- Gendrassa camp

	Mean (Standard deviation or 95% CI)
Average HDDS	5.1 (4.1-6.1)

Figure 50: Proportion of households consuming different food groups within last 24 hours – Gendrassa

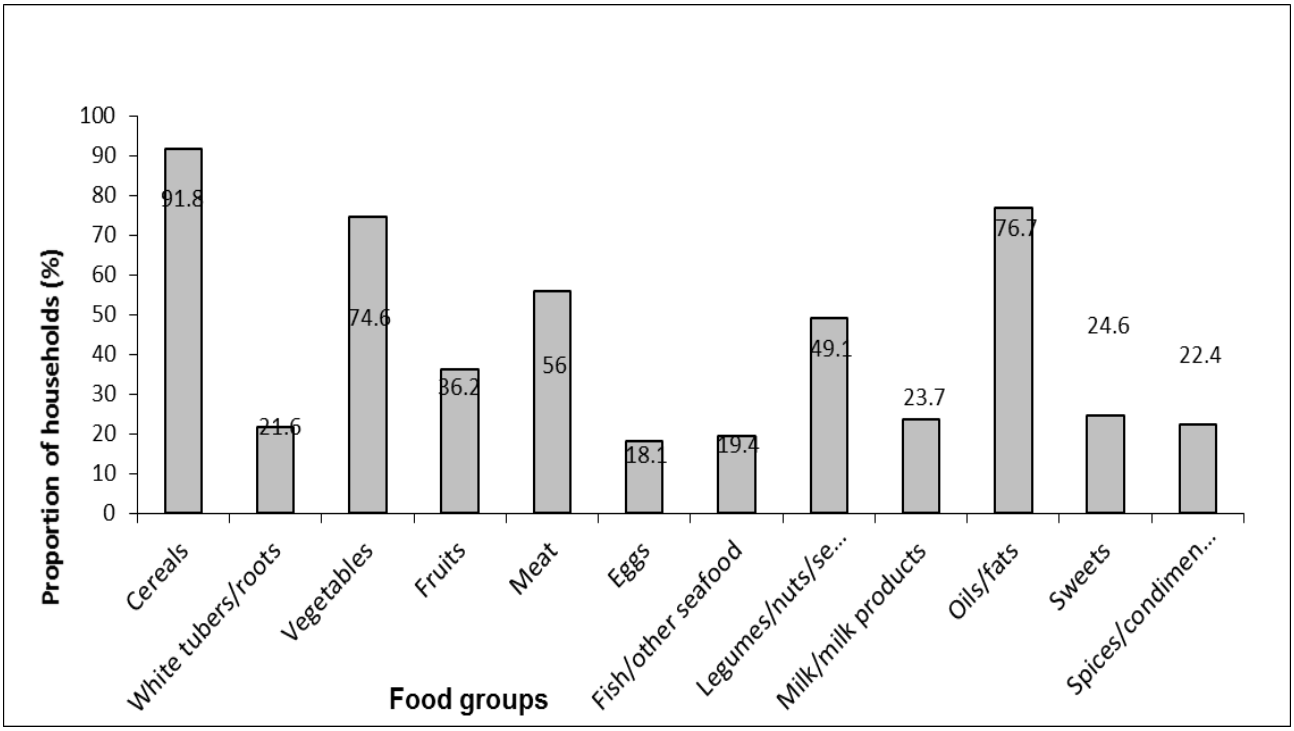


Table 99: Consumption of micronutrient rich foods by households- Pamir refugee camp, south Sudan (2017)

	Number/total	% (95% CI)
Proportion of households *not consuming any* vegetables, fruits, meat, eggs, fish/seafood, and milk/milk products	27/232	11.6 (1.6-21.6)
Proportion of households consuming either a plant or animal source of vitamin A	181/231	78.4 (65.0-91.7)
Proportion of households consuming organ meat/flesh meat, or fish/seafood (food sources of haem iron)	145/232	62.5 (48.9-76.0)

More than 2/3 of households reported consuming food groups containing iron and vitamin A

KAYA CAMP

The demographic characteristics are illustrated in table 100 below. It will be noticed that the number of under 5 survey is much higher than anticipated and there was no non response observed.

Table 100: Target and Actual Number Captured-Kaya Camp

		Total surveyed (No.)	% of the target
Children 6-59 months	485	582	120 %
Clusters (where applicable)	27	27	100 %

3.19. Anthropometric results (based on WHO standards 2006)

Table 101: Distribution of age and sex of sample-Kaya Camp

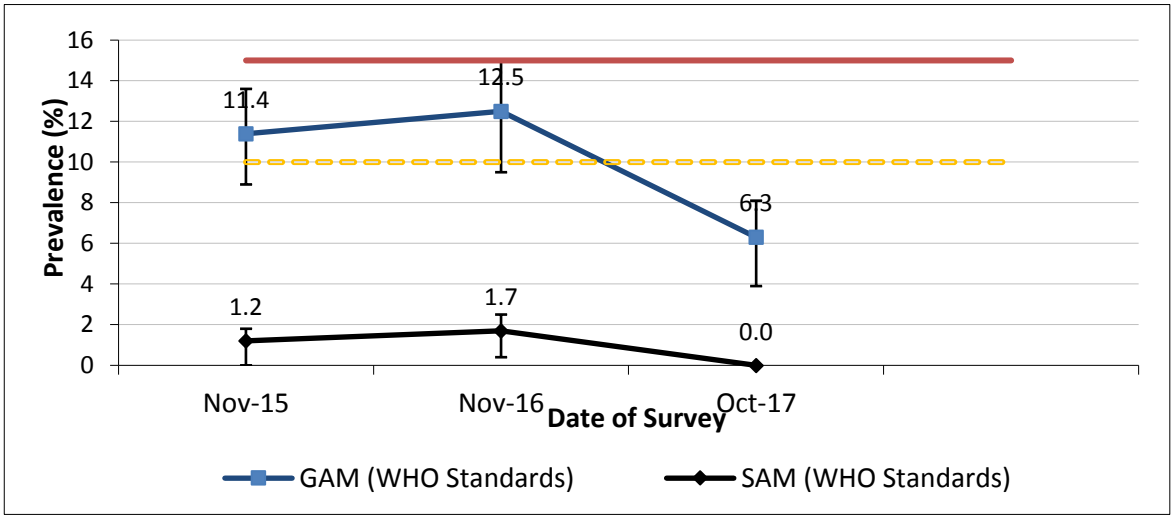
	Boys		Girls		Total		Ratio
AGE (mo)	**no.**	**%**	**no.**	**%**	**no.**	**%**	**Boy: girl**
6-17	87	58.4	62	41.6	149	25.6	1.4
18-29	72	58.1	52	41.9	124	21.3	1.4
30-41	74	50.7	72	49.3	146	25.1	1.0
42-53	80	57.1	60	42.9	140	24.1	1.3
54-59	11	47.8	12	52.2	23	4.0	0.9
Total	324	55.7	258	44.3	582	100.0	1.3

Table 102: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex-Kaya Camp

	All n = 572	**Boys** n = 318	**Girls** n = 254
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(36) 6.3 % (4.5 - 8.7 95% C.I.)	(16) 5.0 % (3.1 - 8.2 95% C.I.)	(20) 7.9 % (5.0 - 12.3 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(36) 6.3 % (4.5 - 8.7 95% C.I.)	(16) 5.0 % (3.1 - 8.2 95% C.I.)	(20) 7.9 % (5.0 - 12.3 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)

The prevalence of oedema is 0.0 %

Figure 51: Trends in the Prevalence of Global and Severe Acute Malnutrition Based On WHO Growth Standards in Children 6-59 Months from 2015 to 2017 – Kaya Camp



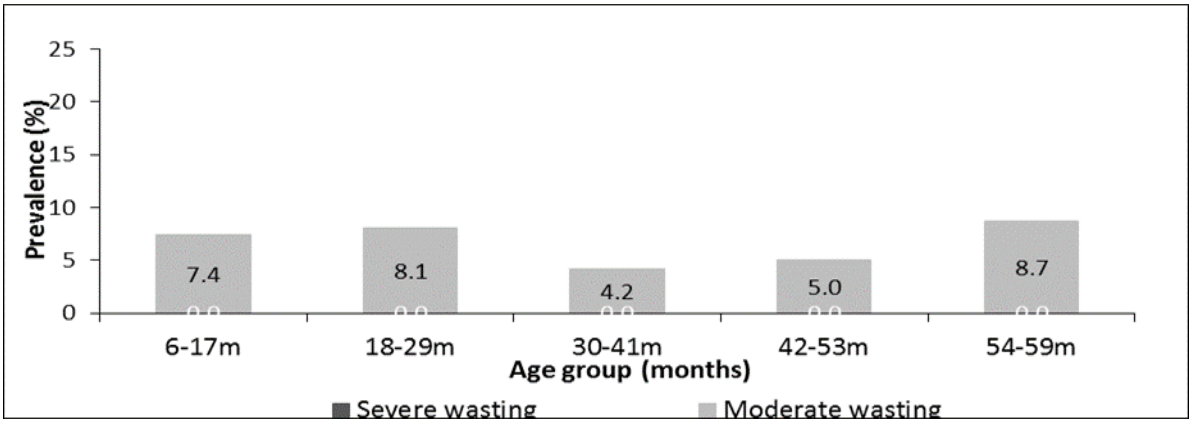
GAM prevalence decreased significantly in Kaya camp ($p<0.05$)

Table 103: **Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema-Kaya Camp**

		Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mo)	Total no.	No.	%	No.	%	No.	%	No.	%
6-17	149	0	0.0	11	7.4	138	92.6	0	0.0
18-29	123	0	0.0	10	8.1	113	91.9	0	0.0
30-41	143	0	0.0	6	4.2	137	95.8	0	0.0
42-53	141	0	0.0	7	5.0	134	95.0	0	0.0
54-59	23	0	0.0	2	8.7	21	91.3	0	0.0
Total	579	0	0.0	36	6.2	543	93.8	0	0.0

The 6-17 age group was more severely wasted compared to the other age groups

Figure 52: Trend in the Prevalence of Wasting By Age in Children 6-59 Months



The age groups of 54-59 months and 18-29 months were the most affected by the wasting in Kaya camp.

Table 104: Distribution of acute malnutrition and oedema based on weight-for-height z-scores- Kaya Camp

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 7 (1.2 %)	Not severely malnourished No. 574 (98.8 %)

Figure 53: Distribution of Weight-For-Height Z-Scores (Based On WHO Growth Standards The Reference Population Is Shown In Green and the Surveyed Population Is Shown In Red).
The Figure below shows that the distribution for weight-for-height z-scores for the survey sample is shifted to the left, illustrating a poorer status than the international WHO Standard population of children aged 6-59 months.

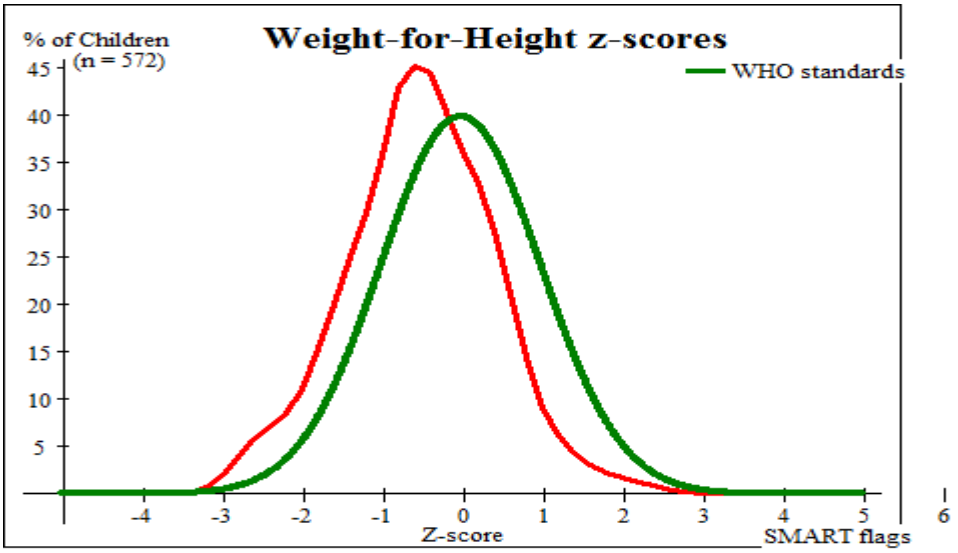


Table 105: Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex- Kaya Camp

	All n = 582	**Boys** n = 324	**Girls** n = 258
Prevalence of global malnutrition (< 125 mm and/or oedema)	(12) 2.1 % (1.0 - 4.1 95% C.I.)	(6) 1.9 % (0.7 - 5.0 95% C.I.)	(6) 2.3 % (0.8 - 6.7 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(11) 1.9 % (0.9 - 4.0 95% C.I.)	(6) 1.9 % (0.7 - 5.0 95% C.I.)	(5) 1.9 % (0.5 - 6.7 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(1) 0.2 % (0.0 - 1.3 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(1) 0.4 % (0.0 - 3.0 95% C.I.)

Table 106: **Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema-Kaya Camp**

		Severe wasting (< 115 mm)		Moderate wasting (>= 115 mm and < 125 mm)		Normal (> = 125 mm)		Oedema	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	151	1	0.7	7	4.6	143	94.7	0	0.0
18-29	127	0	0.0	4	3.1	123	96.9	0	0.0
30-41	146	0	0.0	0	0.0	146	100.0	0	0.0
42-53	142	0	0.0	0	0.0	142	100.0	0	0.0
54-59	23	0	0.0	0	0.0	23	100.0	0	0.0
Total	589	1	0.2	11	1.9	577	98.0	0	0.0

Table 107: Prevalence of underweight based on weight-for-age z-scores by sex-Kaya Camp

	All n = 578	**Boys** n = 321	**Girls** n = 257
Prevalence of underweight (<-2 z-score)	(204) 35.3 % (30.9 - 40.0 95% C.I.)	(108) 33.6 % (28.7 - 39.0 95% C.I.)	(96) 37.4 % (31.0 - 44.2 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(163) 28.2 % (24.9 - 31.8 95% C.I.)	(89) 27.7 % (23.3 - 32.6 95% C.I.)	(74) 28.8 % (23.6 - 34.6 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(41) 7.1 % (5.2 - 9.7 95% C.I.)	(19) 5.9 % (3.9 - 9.0 95% C.I.)	(22) 8.6 % (5.3 - 13.5 95% C.I.)

Table 108 : Prevalence of underweight by age, based on weight-for-age z-scores-Kaya Camp

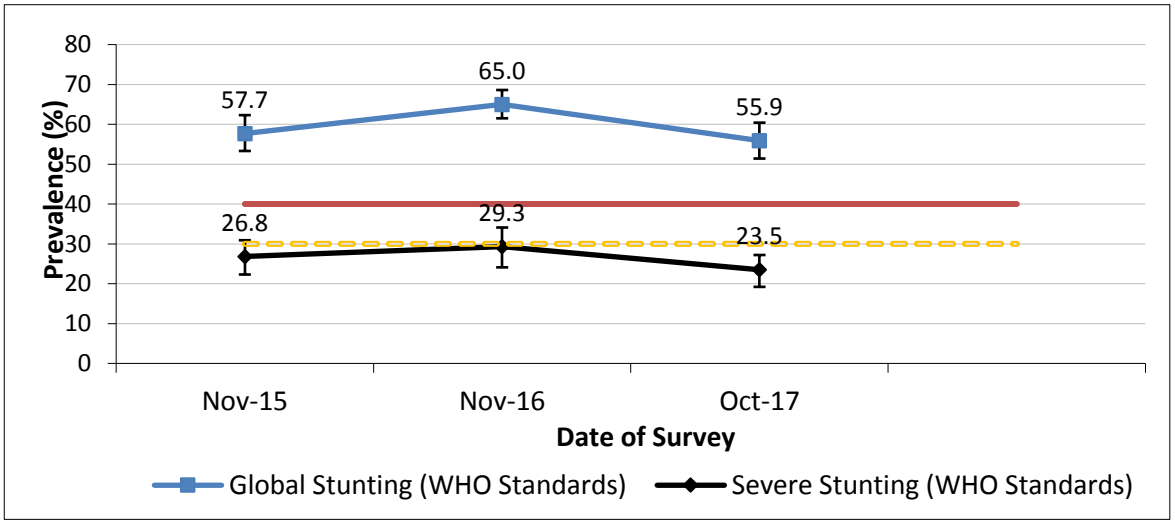
		Severe underweight (<-3 z-score)		Moderate underweight (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**Age (mo)**	**Total no.**	**No.**	**%**
6-17	145	2	1.4	27	18.6	**6-17**	145	2	1.4
18-29	124	11	8.9	35	28.2	**18-29**	124	11	8.9
30-41	146	17	11.6	53	36.3	**30-41**	146	17	11.6
42-53	140	9	6.4	38	27.1	**42-53**	140	9	6.4
54-59	23	2	8.7	10	43.5	**54-59**	23	2	8.7
Total	578	41	7.1	163	28.2	**Total**	578	41	7.1

Table 109: Prevalence of stunting based on height-for-age z-scores and by sex-Kaya Camp

	All n = 565	Boys n = 311	Girls n = 254
Prevalence of stunting (<-2 z-score)	(316) 55.9 % (51.4 - 60.4 95% C.I.)	(175) 56.3 % (51.2 - 61.2 95% C.I.)	(141) 55.5 % (49.0 - 61.8 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(183) 32.4 % (28.9 - 36.1 95% C.I.)	(102) 32.8 % (28.5 - 37.4 95% C.I.)	(81) 31.9 % (27.4 - 36.8 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(133) 23.5 % (19.8 - 27.8 95% C.I.)	(73) 23.5 % (19.4 - 28.2 95% C.I.)	(60) 23.6 % (18.6 - 29.5 95% C.I.)

Stunting prevalence is of high public health significance

Figure 54: Trends in the Prevalence of Global and Severe Stunting Based On WHO Growth Standards in Children 6-59 Months from 2015 to 2017- Kaya Camp

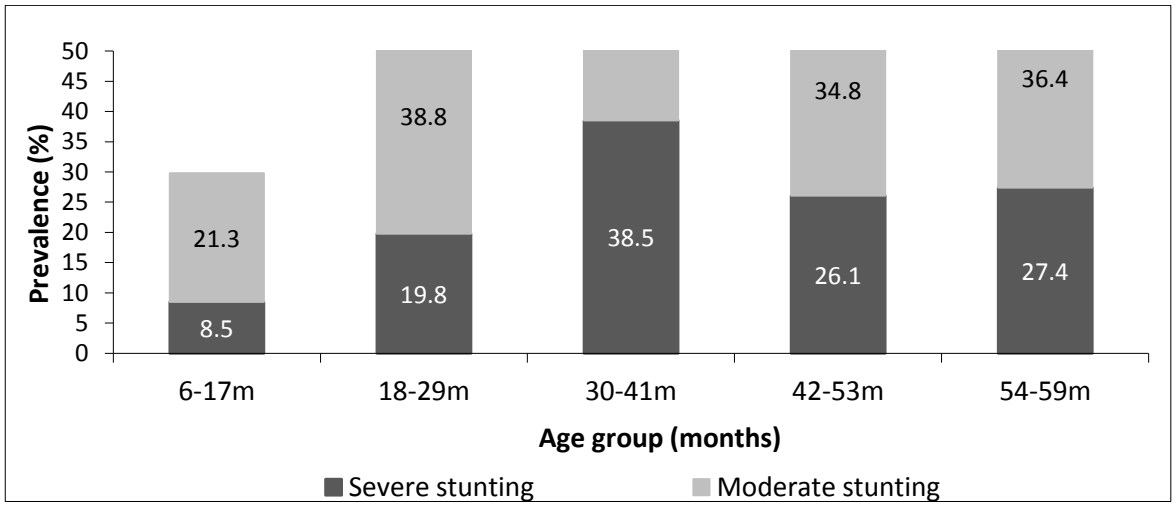


There is a non-significant decrease in stunting in Kaya camp in 2017 ($p<0.05$), however, the stunting prevalence remains above the public health significance.

Table 110: Prevalence of stunting by age based on height-for-age z-scores-Kaya camp

		Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	141	12	8.5	30	21.3	99	70.2
18-29	121	24	19.8	47	38.8	50	41.3
30-41	143	55	38.5	50	35.0	38	26.6
42-53	138	36	26.1	48	34.8	54	39.1
54-59	22	6	27.3	8	36.4	8	36.4
Total	565	133	23.5	183	32.4	249	44.1

Figure 55: Trends in the Prevalence of Stunting By Age in Children 6-59 Months



The age group of 30-41 months is the most affected by stunting in Kaya camp

Table 111: Mean z-scores, Design Effects and excluded subjects-Kaya Camp

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	572	-0.53±0.92	1.00	1	9
Weight-for-Age	578	-1.66±0.95	1.24	0	4
Height-for-Age	565	-2.21±1.11	1.11	1	16

* contains for WHZ and WAZ the children with edema.

3.20. Health/Feeding programme coverage

Table 112: Programme Coverage for Acutely Malnourished Children Based On MUAC, Oedema and WHZ-Kaya Camp

	Number/total	**% (95% CI)**
Supplementary feeding programme coverage	9/41	22.0(5.6-38.2)
Therapeutic feeding programme coverage	2/3	66.6(0.0-210.0)

Table 113: Programme coverage for acutely malnourished children based on MUAC and oedema-Kaya Camp

	Number/total	**% (95% CI)**
Supplementary feeding programme coverage	4/11	36.4 (0.0-86.8)
Therapeutic feeding programme coverage	-	-

Measles vaccination coverage results

Table 114: Measles Vaccination Coverage for Children Aged 9-59 Months (N=525)-Kaya Camp

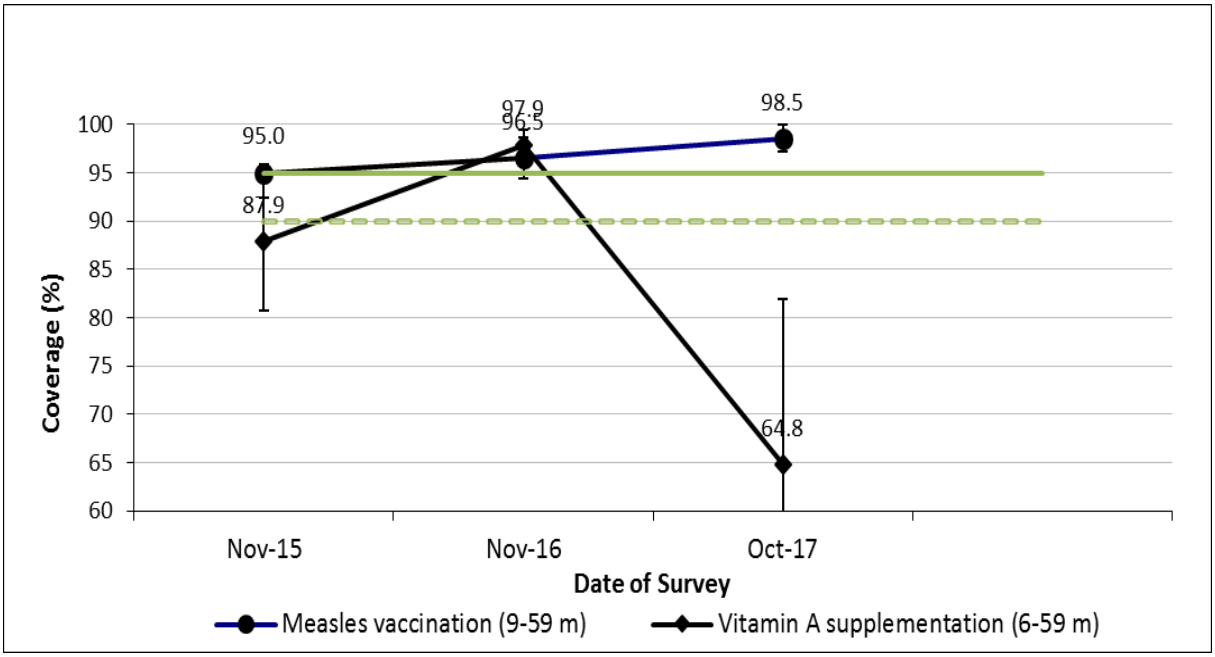
	Measles (with card) n= 401	Measles (with card or confirmation from mother) N=517
YES	76.4% (64.7-87.9 95% CI)	98.5 % (97.0-99.8 CI)

Vitamin A supplementation coverage results

Table 115: Vitamin A Supplementation for Children Aged 6-59 Months within Past 6 Months (N= 582)-Kaya Camp

	Vitamin A capsule (with card) n=307	Vitamin A capsule (with card or confirmation from mother) n=377
YES	52.7 % (36.4-69.0 95% CI)	64.8 % (47.6-81.9 95% CI)

Figure 56: Trends in the Coverage of Measles Vaccination and Vitamin a Supplementation in Last 6 Months in Children 6-59 Months from 2014 to 2016-Kaya Camp.



Diarrhoea Results

Table 116: Period Prevalence of Diarrhea-Kaya Camp

	Number/total	% (95% CI)
Diarrhoea in the last two weeks	100/582	17.2 (9.3-24.9)

3.21. Anaemia Results Children 6 – 59 months

The total anaemia prevalence among children 6 to 59 months is of high public health significance at 46.8% (40.6-53.0 5% CI). Prevalence of anaemia among children 6 to 23 months is also of high public health significance at 58.6% (49.2-68.0 95% CI).

Table 117: Prevalence of Total Anaemia, Anaemia Categories, and Mean Haemoglobin Concentration in Children 6-59 Months of Age and By Age Group-Kaya Camp

	6-59 months n = 581	**6-23 months** n=203	**24-59 months** n=378
Total Anaemia (Hb<11.0 g/dL)	(272) 46.8% (40.6-53.0 5% CI)	(119) 58.6% (49.2-68.0 95% CI)	(153) 40.5 % (34.4-46.5 95% CI)
Mild Anaemia (Hb 10.0-10.9 g/dL)	(168) 28.9% (24.8-33.0 95% CI)	(76) 37.4% (31.4-43.4 95% CI)	(92) 24.3% (18.9-29.9 95% CI)
Moderate Anaemia (7.0-9.9 g/dL)	(101) 17.4% (13.2-21.5 95% CI)	(41) 20.2 % (12.8-27.5 95% CI)	(60) 15.9% (12.1-19.5 95% CI)
Severe Anaemia (<7.0 g/dL)	(3) 0.5% (0.0-1.0 95% CI)	(2) 1.0% (0.0-1.3 95% CI)	(1) 0.3 (0.0-0.8 5% CI)
Mean Hb (g/dL) (SD / 95% CI) [range]	11.0 g/dL (10.7-11.1 95% CI) [5.5-14.3]	10.7 g/dL (10.4-10.9 95% CI) [5.5-13.4]	11.1 g/dL (10.9-11.2 95% CI) [6.8-14.3]

Table 118: Prevalence of Moderate and Severe Anaemia in Children 6-59 Months of Age and By Age Group-Kaya Camp

	6-59 months n = 581	**6-23 months** n= 203	**24-59 months** n= 378
Moderate and Severe Anaemia (Hb<10.0 g/dL)	(104) 17.9% (13.7-22.0 95% CI)	(43) 21.2 % (13.7-28.6 95% CI)	(61) 16.1% (12.4-19.8 95% CI)

Figure 57: Trends in Anaemia Categories in Children 6-59 Months from 2014 to 2016-Kaya Camp

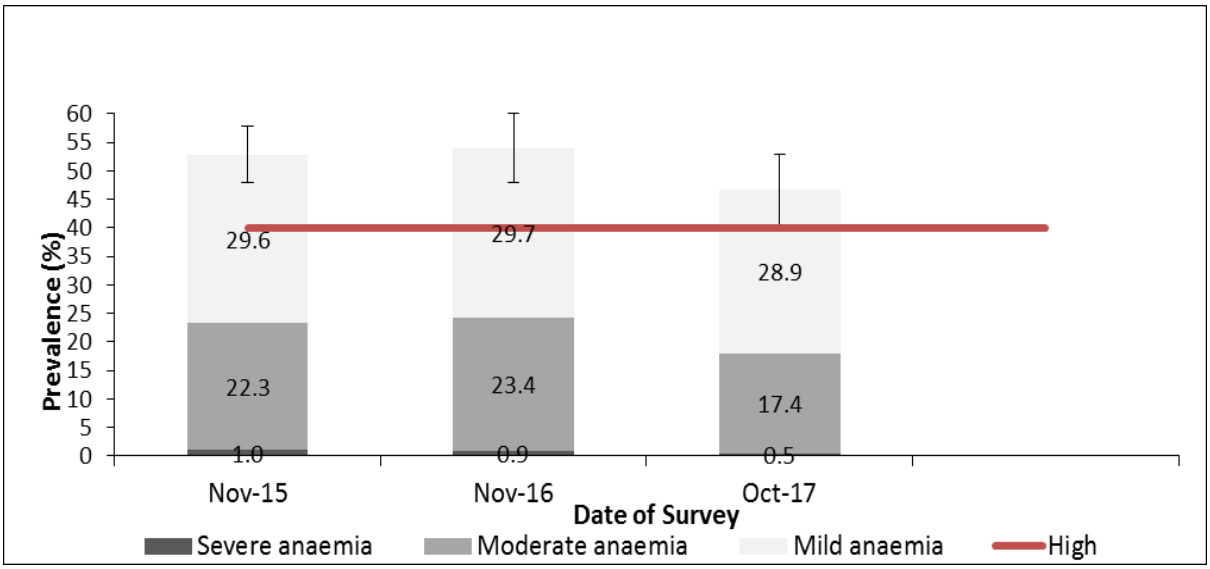
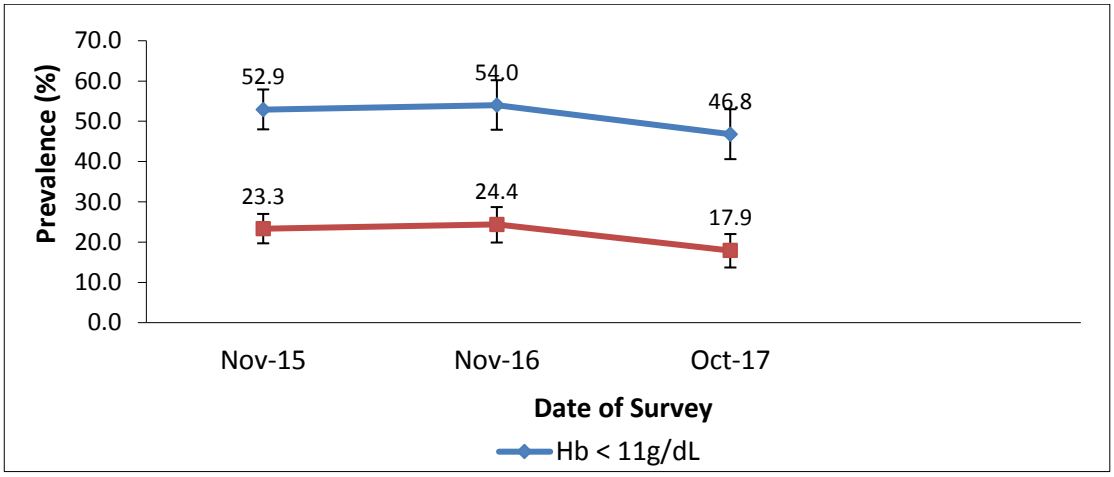
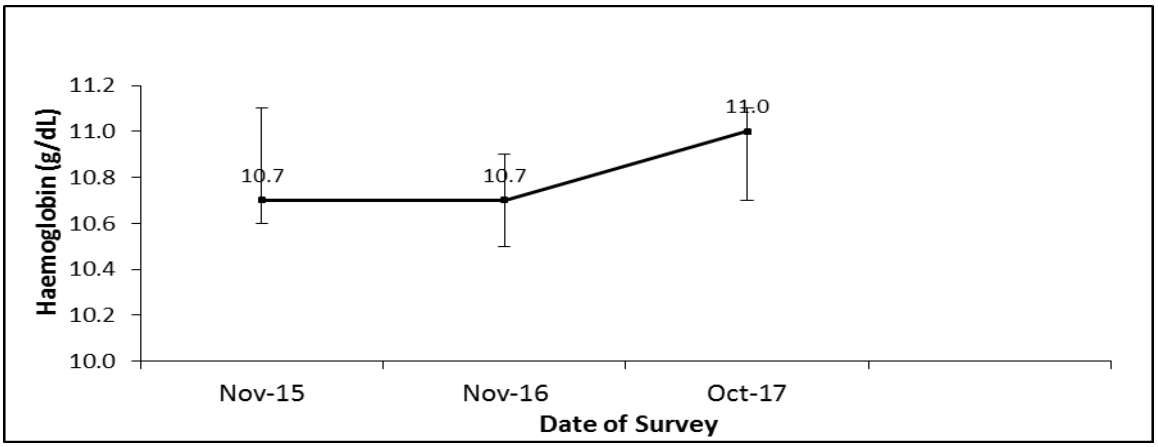


Figure 58: Trend in Total Anaemia (<11 G/Dl), and Moderate and Severe Anaemia (<10 G/Dl) With 95% CI in Children 6-59 Months from 2014 to 2016-Kaya Camp



There is a significant decrease in anaemia prevalence in Kaya camp ($p<0.05$)

Figure 59: Trend in Mean Haemoglobin Concentration With 95% CI in Children 6-59 Months from 2015 to 2017-Kaya Camp

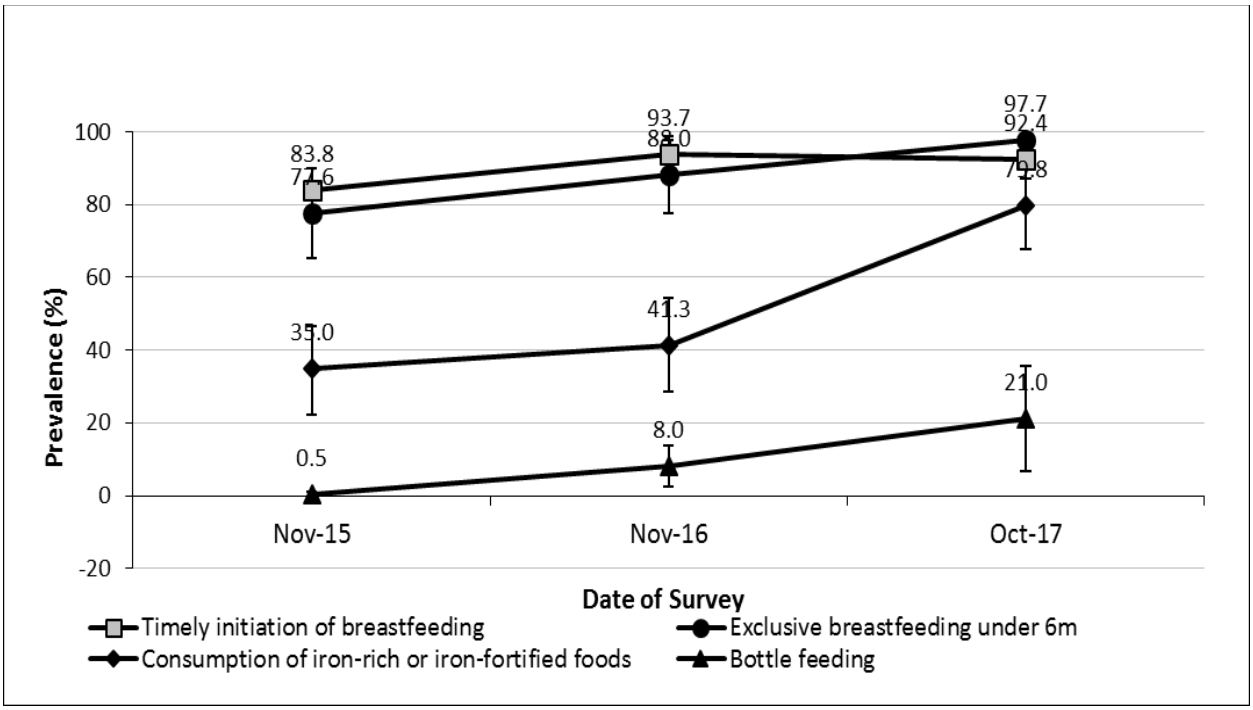


3.22. IYCF Children 0-23 months

Table 119: Prevalence of Infant and Young Child Feeding Practices Indicators-Kaya Camp

Indicator	Age range	Number/ total	Prevalence (%)	95% CI
Timely initiation of breastfeeding	**0-23 months**	230/249	92.4	87.8-97.0
Exclusive breastfeeding under 6 months	**0-5 months**	43/44	97.7	92.8-102.5
Continued breastfeeding at 1 year	**12-15 months**	30/31	96.8	90.5-103.0
Continued breastfeeding at 2 years	**20-23 months**	31/37	83.8	67.4-100.1
Introduction of solid, semi-solid or soft foods	**6-8 months**	31/56	55.4	39.3-71.3
Consumption of iron-rich or iron-fortified foods	**6-23 months**	162/203	79.8	67.6-91.9
Bottle feeding	**0-23 months**	52/248	21.0	6.5-35.4

Figure 60: Key IYCF Indicators from 2015 to 2017-Kaya Camp



Prevalence of intake

Infant formula

Table 120: Infant Formula Intake in Children Aged 0-23 Months-Kaya Camp

	Number/total	% (95% CI)
Proportion of children aged 0-23 months who receive infant formula (fortified or non-fortified)	52/249	20.9 (6.8-34.9)

Fortified blended foods

Table 121: FSB++ Intake in Children Aged 6-23 Months-Kaya Camp

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive FBF++	158/203	77.8(65.2-90.4)

3.23. Anaemia Women 15-49 years

Table 122: Women physiological status and age-Kaya Camp

Physiological status	Number/total	% of sample
Non-pregnant	213/237	89.9
Pregnant	24/237	10.1
Mean age (range)	26.8 (14-49)	

Table 123: Prevalence of Anaemia and Haemoglobin Concentration in Non-Pregnant Women of Reproductive Age (15-49 Years)-Kaya Camp

Anaemia in non-pregnant women of reproductive age (15-49 years)	**All n = 213**
Total Anaemia (<12.0 g/dL)	(61) 28.6% (21.5-35.7 95% CI)
Mild Anaemia (11.0-11.9 g/dL)	(29) 13.6% (9.2-17.9 95% CI)
Moderate Anaemia (8.0-10.9 g/dL)	(30) 14.1% (8.9-19.2 95% CI)
Severe Anaemia (<8.0 g/dL)	(2) 0.9 (0.0-2.2 95% CI)
Mean Hb (g/dL) (SD / 95% CI) [range]	12.5 g/dL (12.2-12.7) [7.1-15.7]

Figure 61: Trends in Anaemia Categories in Women of Reproductive Age (Non-Pregnant) From 2015 to 2017-Kaya Camp

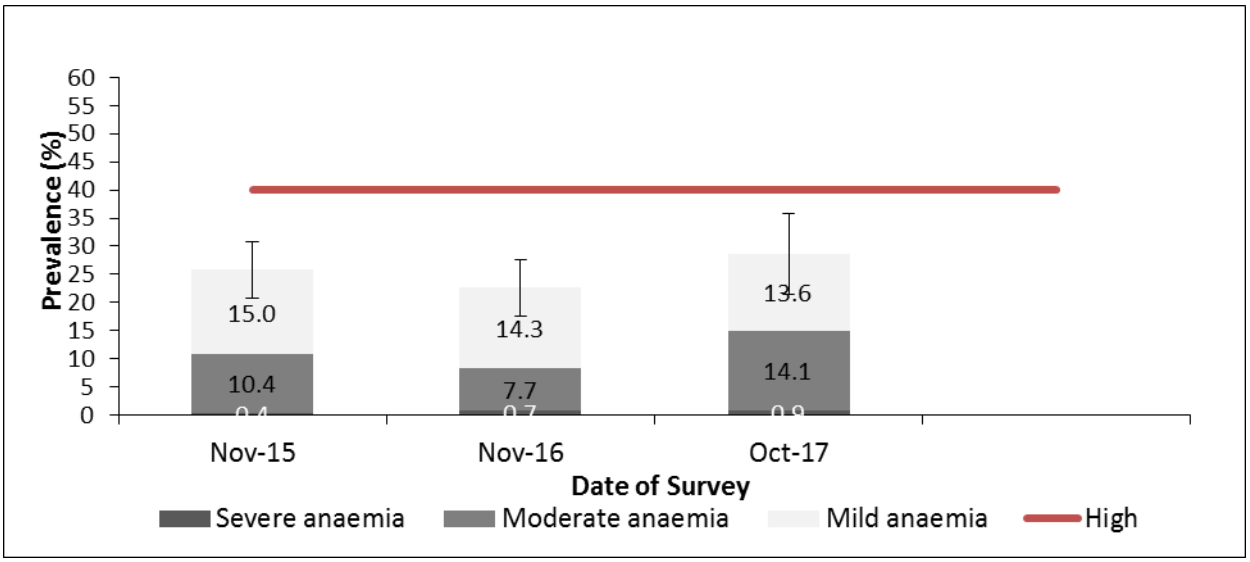


Table 124: ANC Enrolment and Iron-Folic Acid Pills Coverage among Pregnant Women (15-49 Years)

	Number /total	% (95% CI)
Currently enrolled in ANC programme	23/24	95.8 (87.5-104.0)
Currently receiving iron-folic acid pills	23/24	95.8 (87.5-104.0)

3.24. Food Security

Table 125: Sample characteristics food security-Kaya Camp

	Target (No.)	Total surveyed (No.)	% of the target
Households	237	217	91.6 %
Clusters (where applicable)	27	27	100%

Access to food assistance

Table 126: Ration card coverage

	Number/total	% (95% CI)
Proportion of households with a ration card	216/216	100.0(100.0-100.0)

All the surveyed households had a ration card

Negative household coping strategies

The refugees in Kaya refugee camps receive a reduced food ration at a 70% scale.

Table 127: Coping strategies used by the surveyed population over the past month Kaya Camp

	Number/total	% (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	164/212	77.4 (66.6-88.0)
Sold any assets that would not have normally sold (furniture, seed stocks, tools, other NFI, livestock etc.)	72/213	33.8 (21.8-45.7)
Requested increased remittances or gifts as compared to normal	61/213	28.6 (16.1-41.1)
Reduced the quantity and/or frequency of meals and snacks	157/213	73.7 (61.7-81.6)
Begged	87/213	40.8 (25.5-56.1)
Engaged in potentially risky or harmful activities	25/212	11.8(4.4-19.1)
Proportion of households reporting using none of the coping strategies over the past month	4/211	1.9(0.0-4.1)

***** The total was over 100% as households used several negative coping strategies.

Only 1.9 % of households were not under significant stress to meet their needs as indicated by the proportion of household using none of the negative coping strategies over the past month prior to the survey.

Household dietary diversity

The last general food distribution ended just 5 days prior to the start of the survey data collection. The survey was carried out during the end of the harvest season.

Table 128: Average HDDS*- Kaya refugee camp, south Sudan (2017)

	Mean (Standard deviation or 95% CI)
Average HDDS	4.8 (3.9-5.7)

Figure 62: Proportion of households consuming different food groups within last 24 hours – Kaya camp

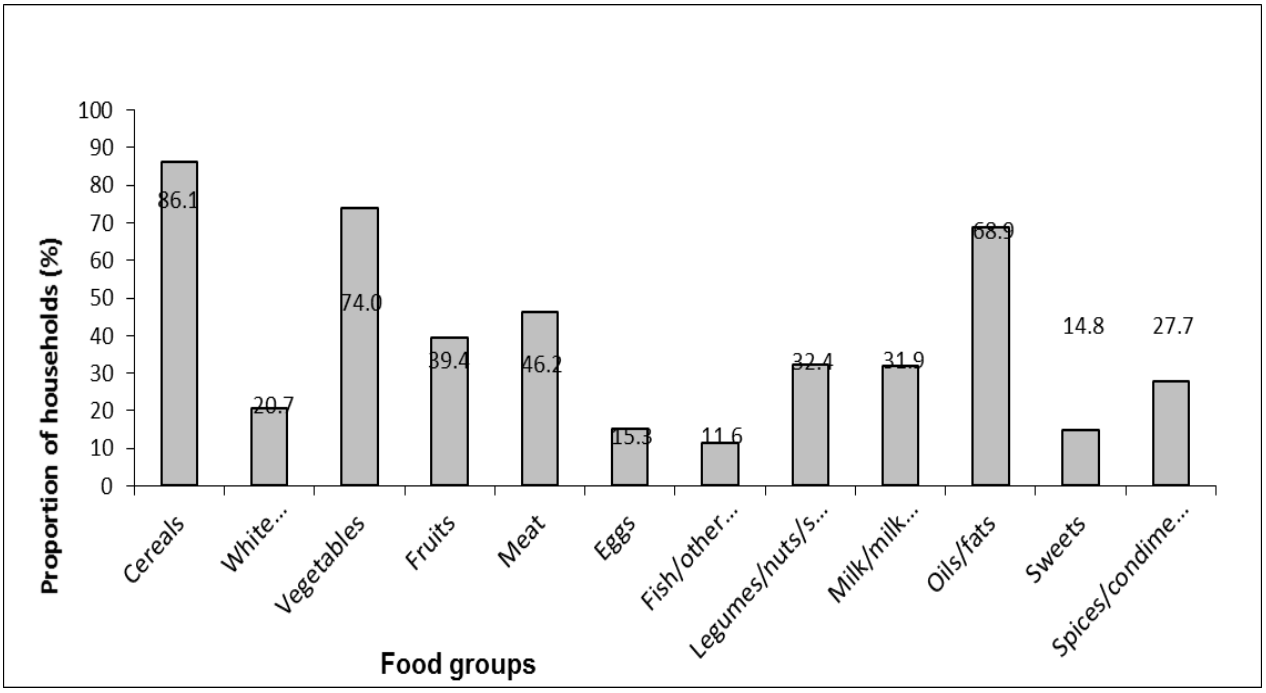


Table 129: Consumption of micronutrient rich foods by households- Kaya refugee camp, south Sudan (2017)

	Number/total	% (95% CI)
Proportion of households *not consuming any* vegetables, fruits, meat, eggs, fish/seafood, and milk/milk products	36/216	16.7 (5.0-28.2)
Proportion of households consuming either a plant or animal source of vitamin A	179/216	82.9 (71.2-94.4)
Proportion of households consuming organ meat/flesh meat, or fish/seafood (food sources of haem iron)	105/216	48.6 (32.5-64.6)

Majority of households (> 80 %) reported having consumed foods rich in vitamin A and almost half reported having consumed foods rich in iron.

3.25. Limitations

Data Quality

The plausibility report generated by the ENA software showed that the data was generally of good quality with a 13% in Doro, 8% in Yusuf Batil, 6% in Gendrassa and 11% score in Kaya. Age distribution data was generated as the main issue. This could be attributed to the low age documentation availability. Only approximately 50% of the children assessed had proper age documentation. In this light although an event calendar was used stunting results should be interpreted with caution. See appendix 1 for more details.

Data collection Enumerators

Training took a longer time than initially planned. This was to facilitate the capacity building of the enumerators to the acceptable level. Additional sessions of standardization and field test was also put in place to ensure their preparedness. Maban experiences a high staff turnover meaning a new lot of enumerators has to be trained from scratch every year

SFP/TFP Coverage

Selective feeding data needs to be interpreted with caution due to the small number of cases that were sampled during the survey. In addition to this although the surveyors had sachets of RUTF, RUSF and CSB++ to show the respondents, assessment to the feeding program was assessed based on recall in the absence of program cards. .

IYCF Indicators

Due to the small survey sample size for some indicators such as the “continued breastfeeding at 1 year” and the “continued breastfeeding at 2 years” need to also be interpreted with caution.

4.0 DISCUSSION and CONCLUSION

4.1. Nutritional Status of Young Children

The nutrition situation in all four Maban camps is poor (GAM prevalence between 5-9%) according to the WHO classification. Compared to 2016, the global acute malnutrition prevalence in all Maban refugee camps decreased. The poor status as well as improvement of the overall nutrition situation in 2017 is confirmed by the weighted GAM and SAM prevalences of 2017 (weighted GAM= 6.4 %, weighted SAM =0.4 %) lower than those of to 2016 (weighted GAM= 11.0 %, weighted SAM=1.6 %). The decrease in the global acute malnutrition in Doro and Kaya was significant ($p < 0.05$). The decrease was not significant in Yusuf Batil and Gendrassa camps ($p>0.05$), which means that the situation remained the same as in 2016 in those two camps. This pattern was also the same in reference to severe acute malnutrition as SAM decrease was significant Doro and Kaya camps ($p<0.05$) and non-significant in Batil and Gendrassa camps ($p>0.05$), meaning the prevalence of severe acute malnutrition remained the same in Doro and Yusuf Batil. In Doro camp in 2017, the GAM prevalence was **6.7 %** (5.0-8.9 95% CI) while the SAM prevalence was **0.5%** (0.2-1.3 95% CI). In Yusuf Batil camp, the GAM prevalence was **6.3 %** (4.2-9 3 95% CI) while the SAM prevalence was **0.3 %** (0.1-1.4 95% CI). In Gendrassa the GAM prevalence was **5.5%** (3.6-8.3 95% CI) while the SAM prevalence was **0.9%** (0.3-2.4 95% CI) and in Kaya the GAM prevalence was **6.3%** (4.5-8.7) 95% CI) while there was no severe acute malnutrition cases detected as the SAM prevalence was **0.0% .**Decrease in SAM was also significant in Doro and Kaya camps ($p<0.05$) Results from Doro and Kaya were better than those of host community where global acute malnutrition in several parts of South Sudan lies in the critical situation (15%-29%). The Maban host community May 2016 nutrition survey's GAM prevalence was 13.0 (10.1-16.5 95%CI) and SAM prevalence was 4.0 (2.5-6.3 95% CI) indicating a serious situation.

MUAC screening results showed the same downwards trend as the mass monthly/quarterly screenings. The MUAC results in 2017 remained the same even though the percentage showed experienced a slight decrease in Yusuf Batil, Gendrassa and Kaya camps. The gap in prevalence between the MUAC malnutrition and the Z-score malnutrition is much smaller than that of last year proportion. From the disparity between Weight –For –Height and MUAC results from last year survey, it was decided that at the blanket supplementary feeding centres and the health/nutrition centre triage areas to carry out a 2 stage screening monthly measurements at the facility and all children found to be at risk (125 -150mm) for the 6-23months and (125-160mm) for the 24-59 months to go through a second stage weight for height z-score measurement following which any child found to meet the admission criteria using the WHZ scores to be enrolled into the appropriate program. This was implemented mostly during BSFP sessions for 6 months between April and December 2017. Some months though were missed out (due to security related issues already raised, supply delays and/or internal organization issues from partners), the implementation of the 2-stage strategy with the support of Juba nutrition coordination had contributed to reduce the gap between WFH and MUAC.

The non-significant change in the GAM prevalence in Yusuf Batil and Gendrassa indicates that the current interventions in those two camps are able to prevent further deterioration and maintain the nutrition status at the current level but more efforts should be made to improve further the nutrition situation to feel a tangible difference. Meanwhile, In Doro and Kaya, nutrition interventions in 2017 triggered significant decrease ($p<0.05$) in malnutrition levels. Overall, in 2017, as per GAM prevalence, the nutrition situation in the 4 camps are similar and in constant improvement since 2015 as shown by the trends (figures 15, 27, 39 and 51). The lower GAM and SAM proportion are reflected also through the lower number of admissions in the camps in 2017 (figure 1 10, 11, 12 and 13) .The reason of such linear improvements in Maban might be attributed to implementation of end of 2016 survey recommendations. CMAM activities continued and were reinforced by key refresher trainings for staff both from technical programme management level

(TOT trainings) to outreach level (field roll-out trainings) . Active case finding for early detection and referral to health facilities were strengthened. Of importance were the 2-stage screening with both Weight-For Height and MUAC criteria maximizing cases identification. Also as compared with 2016, despite the delay (did not start in January 2017), BSFP for children 6-23 months started earlier than in 2016 and a higher number of sessions were held where children received 200g/person/day of Super cereal plus (CSB++). Promotion of IYCF, micronutrient deficiency reduction strategy through Vitamin A supplementation, deworming, general food ration, public health care provision and joint nutrition and livelihoods activities were important to improve the overall nutrition status in Maban camps. It is important to also recognize the support from WFP on supporting BSFP and TSFP. A part from training the refugee programme benefited also from the partnership with UNICEF through provision of Ready to Use Therapeutic Foods (RUTF) such as plumpy nut (1500 cartoons) and other assorted nutrition related drugs/medecines and supplies.
Coverage, IYCF and food security aspects will be discussed under section 4.2 and 4.5 respectively. Of note is that the GFD ration remained at 70 % (Food security aspects to be discussed in section 4.5).
To improve the overall nutrition situation from poor to acceptable (< 5 %), specific areas need to be qualitatively worked on within current interventions. Those include maintenance of current CMAM activities with a strong emphasis on improving referrals between TSFP, OTP and SC, monitoring aspects of anaemia strategy early implementation, regularity and consistency of BSFP throughout the year (particularly for pregnant and lactating women), increased coverage and monitoring of joint nutrition and livelihoods activities. In addition, more efforts should be put on promotion of IYCF interventions based on the updated guidelines. Unlike Maban, Pamir and Ajuong Thok camps benefited also from BSFP 24-59 months due to excess of stock.

Similar to 2016, Respiratory tract infections (RTI), malaria and watery diarrhoea were the top morbidities in 2017. A part from Doro which experienced a significant reduction, diarrhoea caseload increased in Yusuf Batil, Gendrassa and Kaya, especially during the period of instability (fig 2, 3, 4, 5). Diarrhoea among children aged 6-59 months in the last two weeks prior to nutrition survey ranged between 10.3% - 19.3 %. In comparison with 2016 SENS survey results where it was reported ranged between 5.3 % -20.1%. An increase has been noticed in Yusuf Batil camp from 5.3% to 16.2 % in 2017. One assumption on the discrepancy of diarrhoea rates between Doro and the other camps could be the presence of another health partner in Doro which was able to bridge the gap when the other one was affected by health facility vandalization during the ethnic clashes. Malnutrition and infection being related, morbidities are bound to affect nutrition negatively and vice versa thus the need to continue providing comprehensive public health care.

The prevalence of stunting was of high public health significance (≥40%) in all the Maban refugee camps. In Doro, Batil, Gendrassa and Kaya, the stunting prevalence was **47.8%** (43.5-52.1 95% CI), **55.5%** (50.3-60.6 95% CI), **48.7%** (43.5-54.0 95% CI) and **55.9%** (51.4 – 60.4 95% CI) respectively. As compared with 2016, there was a significant increase in Doro ($p<0.05$) while Kaya experienced a significant decrease ($p<0.05$). The stunting prevalence increased in Batil and Gendrassa but there were not significant ($p>0.05$). One assumption on the proportional increase on stunting in Batil, Gendrassa and Kaya and the decrease in Doro could be that the ethnic reshuffling of the camps that happened. In addition to the programming impact, a combination of food practices and anthropometric/physiologic/morphologic patterns might be more stunting-prone for the leading ethnicity in Doro than for the one in Batil, Gendrassa and Kaya. Stunting reflects chronic under nutrition and outcome of poor maternal health and nutrition before, during and after pregnancy, inadequate infant and young child feeding practices (suboptimal breastfeeding and limited complementary feeding in quantity, quality and variety) and recurrent infections[2].

[2] WHA Global Nutrition Targets 2025, Stunting Policy Brief, WHO 2014.

4.2. Programme Coverage

The measles coverage was **93.9%** (90.0-97.8 95% CI**)** in Doro, **92.3%** (85.4-99.2 95% CI) in Yusuf Batil, **92.0%** (85.0-98.8 95% CI) in Gendrassa and **98.5%** (97.0-99.8 95% CI) in Kaya. The target of >95% was only met in Kaya while in other camps the measles coverage was slightly below the target. Vitamin A coverage met the recommended target (>=90%) only in Yusuf Batil camp. Of note is that the results show both card and recall data. The measles vaccination coverage with card ranged from 65.9% % to 77.5 % while under vitamin A the range was 41.8 %% to 57.2 %. The low vitamin A proportions are due to delay on implementing the second round of polio/vitamin A campaign besides routine distribution since at the time of the data collection, more than 6 months after the first one (held in March 2017), the deadline of 6 months had passed without second campaign implementation. Also, the population figures to be used as denominator of calculation should be checked. Reorganization of activities with a focus on capacity-building /empowerment refugee staff should be done to increase the coverage in 2018.

Feeding programme enrolment coverage results were far below the >90% target even though coverage proportions were higher than those of 2016 in the camps. In 2017, coverage ranged between 10%-67 % for TFP and 22%-39% for TSFP. These results however need to be interpreted with caution due to the small sample sizes and might have not given a very reliable picture of the situation. Regarding Yusuf Batil and Gendrassa camps which has the lowest TFP coverages according to the nutrition survey (12.5% and 10.0% respectively) , the HIS data as of October 2017 showed higher coverages of 60% and 47 % respectively. For TSFP (SFP), the coverages tabulation from HIS as of October 2017 as compared with the nutrition survey results for Doro, Yusuf Batil, Gendrassa and Kaya were much higher since they were 50%, 43 %,80 % and 45 % respectively.. It could then be assumed that the nutrition programme coverage is much better than it looked from the survey results due to the low sample size used during the data collection. That is also why a coverage survey is recommended to ascertain the situation. However, as a yearly coverage survey in each camp is realistically difficult to implement, the quarterly mass MUAC exercise can be used to ascertain the coverage across the year. All children identified as malnourished will have a follow up question that confirms their enrolment status. Note that from monthly data in 2017, in 2017, average BSFP coverage for children 6-59 months was 78.7 % and that of PLW was 78.02%.

In each camp, Ante Natal Care (ANC) enrolment and iron-folic acid coverage were the same. This means any mother attending ANC was automatically given iron-folic acid pills. Ante Natal Care (ANC) enrolment and iron-folic acid coverage were each **76.8 %** (63.5-90.0 95% CI) in Doro, **100.0 %** in Yusuf Batil, **92.9%** (84.9-30.7 95% CI) in Gendrassa and **95.8%** (87.5-104.0% CI) in Kaya. Coverage is high in all the camps except in Doro where more effort should be put to allow better gains.

4.3. Anaemia in Young Children 6-59 Months and Women

Anaemia is used as a proxy indicator to assess for micronutrient deficiencies[3] . Anaemia prevalence among children 6-59 month in 2017 was **52.8%** (47.8-57.8 95% CI), **44.2 %** (39.7-49.1 95% CI), **48.0%** (42.7-53.2 95% CI) and **46.8 %** (40.6-53.0 95% CI) in Doro, Yusuf Batil, Gendrassa and Kaya respectively. The prevalence in all the camps still remains above the 40% public health significance threshold (WHO, 2000). However, there was a significant decrease in Kaya ($p<0.05$) while the anaemia status remain the same in other as the decrease or increase were not significant in Batil and Gendrassa. Doro experienced a non-significant increase. Children 6-23 months remain the age group most affected by anaemia (58.6% to 73.7 %) as compared the 24-59 months age category (41.4% to 26.3%) across the camps. This indicates increased vulnerability among the 6-23 age group.

[3] UNHCR Anaemia reduction strategy, 2011, UNHCR Strategic Plan for Nutrition and Food Security, 2012

Although anaemia prevalence is high, the majority of the children are mildly anaemic a part of Gendrassa where the number of moderately anaemic children was slightly higher than the number of mild anaemic cases. The prevalence of moderate and severe anaemia among children 6 to 59 in the Maban camps ranged between 20-25%. Severe cases proportions are very low.

Anaemia prevalence in non-pregnant women 15 to 49 months showed a higher proportion as compared with 2016. However, the increase was non-significant in all Maban camps. This means the situation remained the same as in 2016. Anaemia prevalence in all four camps remained within the medium range of public health significance. In Doro the prevalence was found to be **25.6 %** (20.3-30.9 95 %), **27.9 %** (20.6-35.2 95 %) in Yusuf Batil, **28.1 %** (21.4-34.8 95 %) in Gendrassa and **28.6 %** (21.5-35.7 95 %) in Kaya. According to the WHO classification the women anaemia prevalence is of low public health significance in Doro and of medium public health significance in the other camps.

As already known, anaemia prevalence can be attributed to a number of factors that characterise the camps' population such as reliance on the general food ration as their main source of food, inadequate micronutrient profile of the ration (70% GFD ration providing only half of iron daily energy requirements), high phytates anti-nutrients contents in the sorghum inhibiting iron absorption in the body. Also vitamin A playing a key role in iron absorption is present in very low proportions (2%). The refugee diets, despite effort to diversify them are still lacking green leafy vegetables and animal based which are good source of bioavailable iron. According to the food security data, on average only 50 % of the households (47.8 % in Doro, 54.1 % in Batil, 62.5 % in Gendrassa and 48.6 % in Kaya) were able to consume food sources rich in iron. Joint efforts between nutrition and FSL partners to increase the scope and number of beneficiaries of agro-nutrition initiatives towards micro-nutrient dense vegetables need to be more consistent.

In average, 16.0%, 7.6 % and 2 % of the morbidities in Maban camps are from diarrhoea, malaria and intestinal worms. These diseases are potential contributors to the high anaemia prevalence as they play an important role on the occurrence of malnutrition.

The Integrated Strategy to address anaemia and micro-nutrient deficiency was finalized and implemented. Among others, strategies /activities such as regular deworming, intestinal worm treatment and malaria prevention are to be reinforced to impact significantly anaemia reduction. Appropriate complementary feeding practices enhancing nutrient dense foods among infants refers at some point to the iron and micro-nutrient content of the CSB++ distributed during BSFP sessions. This might not be enough to accommodate the needs of children 6-23 months in an environment where the culture of sharing is still prevalent. Also, note that children 24-59 months are excluded from BSFP . Interventions aiming at improving complementary feeding would need to be continuously reinforced aside of exclusive and continued breastfeeding promotion.

4.4. Infant and Young Child Feeding (IYCF) Indicators

Similar to 2016, majority of the children in all camps were timely initiated for breastfeeding **(88.4%-92.4 %)** and were exclusively breast fed **(88.2%-97.7%)**. More than 95% of the mothers continued breastfeeding at 1 year and more than 76 % in Gendrassa and 83 % in other camps further continued into the second year. In terms of proportion, the results above indicate that efforts put on breastfeeding promotion and IYCF at large is effective and breastfeeding is well accepted and appropriately practiced by the refugee community. Breastfeeding reduces infant morbidity and mortality from diarrhoea and respiratory infections. The benefits of breastfeeding increase with its exclusiveness. Babies who are breastfed are generally healthier and achieve optimal growth and development compared to those who are fed on formula milk. Increasing awareness and support to lactating mothers must continue being provided and include birth spacing which is one of the probable reasons for the shorter duration of continued breast feeding up to two years. Reproductive health campaigns, meeting and awareness sessions on birth spacing and contraception were held in Maban camps in 2017 with a particular emphasis on men participation. In Batil, the care group model was used. Such initiatives needs to be reinforced.

Timely introduction of solid, semi-solid or soft foods is low in all camps. However, there is a noticeable improvement as compared with 2016 as more than 50% of children were benefiting from the timely introduction (one-third in 2016). According to the data, the consumption of iron-fortified foods improved in all camps as compared with 2016 since **81.2%** (71.5-90.9 95 %CI) in Doro, **88.1%** (78.3-97.7 95 %CI) in **Yusuf** Batil **83.4%** (70.4-96.4 95 %CI) in Gendrassa and **79.8%** (67.6-91.9 95 %CI) in Kaya of children 6-23 months were reported having consumed iron-rich or fortified foods 24 hours prior the survey. A part from children enrolled in the curative nutrition program for the management of acute malnutrition or mothers that sourced the products from the market, children receiving Blanket Supplementary Feeding Programme (BSFP) in Maban have nutritionally gained benefits from the CSB++. Even though BSFP 6-23 months delayed to start from the beginning of the year (April 2017), children benefited from that preventive intervention for 7 months at the period of the survey months as compared with 3 months in 2016. This might have impacted positively on the consumption of iron rich foods. BSFP PLW sessions were held for only 5 months. The general food ration does not provide a fortified blended food option as part of the food items and neither is milling assistance provided (stopped in March 2015). At the time of the survey, cash distribution had not yet started. This means the refugees have limited feeding options for this age group. Consistence of the BSFP for both children 6-23 months and PLW needs to be emphasized.
Some of the IYCF results need to be taken with caution to draw meaningful conclusions because of the small size of the sample. However, the findings provide an overview of the IYCF situation in Maban camps.

In Doro, 2.3 % of the children 6-23 months were bottle fed. The proportions of bottle feeding were 22.6 %, 18.2 % and 21.0 % in in Yusuf Batil, Gendrassa and Kaya respectively.The proportions are much higher in the 3 later camps due to contributing factors such as presence of cows/livestock. By nature, Yusuf Batil, Gendrassa and Kaya are mostly populated by tribes renowned to be pastoralists. This implies cow milk consumption. Infant formula intake ranged from 1.0% to 23.6 % with the highest proportions still in Batil and Kaya camps. On that note, efforts should be consequently put in place in terms of IYCF to mitigate the feeding with cow milk through promotion of breastfeeding and adequate complementary feeding practices targeting especially alternative feeding. The cowmilk use would be detrimental mainly for the 0-6 months children. From 6 months when complementary feeding is recommended to start, the use of cup and spoon rather than bottle and attention to hygiene conditions should be emphasized during sensitization sessions. Bottle feeding and giving a baby breast milk substitutes such as infant formula or animal milk can threaten the baby's health and survival. Babies who do not receive breast milk do not receive protection from illnesses provided by the mother's antibodies and other components that are gained from her milk. These babies are more likely to fall ill with diarrhoea, respiratory and ear infections. Diarrhoea and respiratory infections, such as pneumonia, can be deadly in babies and young children and continue to be top morbidities in the Maban camps[4].[5] Efforts to reduce the proportion of children being bottle fed and formula fed when breast feeding is an option should be discouraged. Note that in 2018, South Sudan refugee operations are expected to benefit from the roll out of the IYCF-friendly framework.

4.5. Food Security

Food insecurity is one of the causes of undernutrition as it directly affects the nutritional status of individuals. Food insecurity is measured through three pillars namely food availability, food access and food utilization. It is a direct cause of malnutrition in terms of dietary intake and an indirect

[4] UNHCR health information systems
[5] http://www.factsforlifeglobal.org/resources/factsforlife-en-full.pdf

cause in terms of access and utilization. That is why improving overall food security is critical to improve nutrition, health and long-term development of children and other household members.
All households (100 %) in Batil, Gendrassa and Kaya and 98.6% in Doro had access to food assistance through ration card ownership. The General Food Ration is provided in Maban camps at 70 %, providing 1476 out of recommended 2100 Kilocalorie per day.
The Household Dietary Diversity Score (HDDS) aims to provide an indication of household economic access to food alongside providing a snapshot on the spectrum of food groups usually included on a normal diet. The HDDS was **5.3 %** in Doro, **5.0 %** in Batil, **5.1** % in Gendrassa and **4.8 %** in Kaya out of 12 foods groups. The majority of the household reported using one or more negative coping strategies. Borrowing cash or other items was reported by 52.1 % in Doro, 81.4 % in Batil, 73.5 % in Gendrassa and 77.4 % in Kaya respectively, selling of asset by 15.7 %, 35.9 %, 24.8 % and 33.8 % respectively, requesting remittances/gift by 6.0 %, 24.5 %, 16.4 % and 28.6 % respectively. Reducing quantity/frequency of meals by 47.2%, 72.0 %, 60.4 % and 73.7 % respectively, begging by 30.6 %, 44.7 %, 26.9 % and 40.8 % respectively and engaged in potentially risky /harmful activities by 5.8 %, 13.0 %, 10.1 % and 11.8 % respectively.
Only 26.2 % in Doro, 3.8 % in Batil, 11.5 % in Gendrassa and 1.9 % in Kaya reported using none of the negative coping strategies to bridge the assistance gap.

The energy content reduced ration of GFD is 1470 Kilocalories/person/per day (recommended daily intake of 100% is 2100Kcal/p/day). From the NutVal analysis, the ration at 70 % rate has an inadequate micronutrient profile. Fortified flour such as CSB++ or CSB + is not provided and only 53% of the daily iron requirements are included in it. Sorghum, which contributed the bulk of the iron (non-heme iron form) in the food is high in phytates, anti-nutrients that inhibit iron absorption in the body. Vitamin C, a nutrient that plays a key role in the facilitating iron absorption is also barely available from the GFD ration which only 2% of vitamin C. In addition, vitamin C is very easily destroyed when cooking at high temperatures. Other key micro nutrients including Vitamin A, folate and Vitamin B12 were also insufficient as the ration provided 35%, 46% and 0% of these respectively. Ways to fill the nutrient gap should thus be explored to avert the consequences. The reinforcement of already existing food security and livelihoods interventions is key. Focus on livelihoods intervention as a long-term strategy is one of the core strategic direction as per the Maban operation roadmap[6].

5. RECOMMENDATION AND PRIORITIES

Nutrition related

- UNHCR and partners to maintain and strengthen the implementation of CMAM program providing both therapeutic and supplementary feeding programs including prevention, active case finding through screening, detection, referral mechanism through the community outreach programme to facilitate the rehabilitation of the identified malnourished children (UNHCR, WFP, UNICEF, Partners).

- Timely start and consistent delivery of blanket supplementary feeding programme all year round for children 6-23months and consistent delivery of pregnant and lactating women continue preventing malnutrition and covering the nutrient gap these vulnerable groups have in light of a predominant grain based general food diet. It is important for UNHCR and WFP to work on early preposition of CSB++ (UNHCR, WFP, Partners).

[6] UNHCR/Maban Roadmap 2017-2020

- Reinforce the consistency the two step MUAC and WHZ scores (for children with MUAC at risk) screening monthly at the BSFP sites in all camps to ensure both high MUAC and WHZ score coverage (Partners).

- Continue to strengthen the capacity of established nutrition facilities and outreach activities in terms of staff and community workers training to facilitate quality provision of both curative and preventative components of nutrition (UNHCR, WFP and UNICEF).

- In line with the updated IYCF methods from recent Training of Trainers (ToT) and rollout trainings, and consider the use of UNHCR multi-sectoral IYCF friendly framework to reinforce Infant and Young Child Feeding (IYCF) and community outreach education aspects to prevent malnutrition from occurring in the first place In 2018, South Sudan is expected to be one of the countries to benefit from the roll out of the IYCF-friendly framework. IYCF in Maban to prioritise the creation of awareness on appropriate complementary feeding from six months an area that requires significant improvement (UNHCR, UNICEF and Partners).

- Improve the CMAM programming by implementing the updated national CMAM guidelines

- Reinforce the anaemia prevention and control strategy implementation by improving the early and systematic screening/detection g, diagnosis and treatment at key contact points at health facility as well as regular reporting.In addition, particular attention to screening and referral of severe anaemia cases to the health facilities for treatment is recommended.

- Reinforce regular supervision monitoring, quarterly joint monitoring and yearly program performance evaluations in all camps to assess performance progress and formulate recommendations for any identified gaps (UNHCR, WFP, UNICEF, and Partners).

- Carry out nutrition surveillance through quarterly mass MUAC screening. The screening exercise to also be used to ascertain coverage and to refer any malnourished children identified (Partners).

- Undertake annual joint nutrition surveys in all camps to analyse trends, assess program impact and facilitate evidence based recommendations for nutrition programming (UNHCR, WFP, UNICEF and Partners).

Food security related

- Provision of food assistance providing the recommended 2100kcal/person/day to facilitate basic nutrition provision at household level (UNHCR and WFP).

- Continue the routine monthly food basket monitoring on site to ensure that refugees receive their entitlement in addition to ensuring identified gaps are addressed in a timely manner (UNHCR, WFP and Food security partners).

- Improve timely data collection, frequency , reporting and feedback to community of post distribution monitoring at the household level in all camps (WFP, UNHCR and partners)
- Expand the coverage of sustainable food security and livelihood solutions (with increased focus on agro-nutrition) in the refugee context in all camps that promote diet diversity and complement the general food ration (UNHCR, WFP and Partners).

Health related

- Maintain and strengthen the provision of comprehensive primary health care programme providing both curative and preventative community outreach services to reduce the disease burden among the refugees in Maban (UNHCR and Partners).

- Ensure Vitamin A supplementation and deworming is maintained in all the refugee camps including the periodic campaigns at least two times in the year. Kaya to pay attention to increasing the coverage to acceptable standards (UNHCR and Partners).

- UNICEF, UNHCR and Partners to ensure the EPI program continues to maintain the acceptable standards (UNHCR, UNICEF and Partners).

- Strengthen reproductive health interventions including healthy timing and spacing of pregnancies to improve birth outcomes, allow for continued breastfeeding until at least 24 months, reduce the risk of iron deficiency anaemia and maternal mortality thus improved nutrition for both the mothers and their children. (UNHCR and Partners).

- Reinforce comprehensive linkages between health nutrition and WASH by maintaining and improving cross cutting sectoral impact activities such as mosquito net distribution, WASH water ponds mitigation/WASH facilities usage for livelihood support, vector control activities (Indoor Residual Spraying, larviciding etc.).

- Reinforce the community engagement strategies to increase ownership and responsibilities from the community.

- Based on 2017 experience in Maban , strengthen the reinforcement of the capacities of the refugee staff to take over health and nutrition activities

- Update regularly incase of any change of situation the emergency health and nutrition plans.

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7. SURVEY TEAM

Survey coordination, team supervision and technical team		
UNHCR		
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S/No	Names	Status
TEAM LEADERS		
1	Zecharia Chan	Dropped out at some point
2	Adam Sila T	Completed
3	Abok Dau	Completed
4	Luke Yousif	Completed
5	Isaiah Khalifa	Completed
6	David Balla	Completed
7	Hamedanil Nicola	Completed
8	Adiye Rose	Dropped out at some point
9	Pawuoi John Ajuang	Completed
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10	Boboya Nickson	Dropped out at some point
11	Muki Michael	Dropped out at some point
12	Rose Jelly	Dropped out at some point
13	Taban Chaplain	Dropped out at some point
14	Mary Sunday Andrew	Completed

15	Abe John M Kiri	Completed
16	Everlyn Owii	Completed
17	Joseph John Chol	Completed
18	Robert Dravuga	Completed
ENUMERATORS		
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22	Dan Luke	Completed
23	Mohammed Yousif	Completed
24	Phillip Hama	Completed
25	Matta Naja	Completed
26	Soura Ajack	Completed
27	Siama Salim B	Completed
28	Halima Balla	Completed
29	Mohammed Alemin	Completed
30	Asharaf Algowa	Completed
31	Osman Yousif	Completed
32	Issa Bashir	Completed
33	Haidar Unsa	Completed
34	Balgis Hassan D	Completed
35	Ataib Nekola	Completed
36	Musa Bagar	Completed
37	Alimam Abdallah Omar	Completed
38	Zanab Abudigin	Completed
39	Sabit Alsheikh	Completed
40	Osman Falati	Completed
41	Kumandan Serdal Ali	Completed
42	Ahmed Abujal Muzek	Completed
43	Kamal Mohammed	Completed
44	Manahil Asheikh	Completed
45	Abulela Damsar	Completed
46	Hamedanil Nicola	Completed
47	Ezadin Hassan	Completed
48	Eklas Noreen Osman	Completed
49	Hassan Wadbass	Completed
50	Mohammed Hassan S	Completed
51	Abdrahaman Nile B	Completed
52	Rowda Almak S	Completed
53	Hawa Ibrahim	Completed
54	Musa Alfator	Completed
55	Kharima Ismail	Completed
56	Osman Atom	Completed
57	Junubia Osman	Completed
58	Shaibu Osman	Completed
59	Senje Albur	Completed

60	Bashir Khawaja	Completed
61	Hamdan Hanguk	Completed
62	Osman Ramadan	Completed
63	Omar Bashir	Completed
64	Mahajub Yagub	Completed

8. APPENDICES

8.1. Appendix 1: SMART Plausibility Check Reports

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

Overall data quality

Criteria Flags* Unit Excel. Good Accept Problematic Score

Flagged data Incl % 0-2.5 >2.5-5.0 >5.0-7.5 >7.5
(% of in-range subjects) 0 5 10 20 **5** (3.2 %)

Overall Sex ratio Incl p >0.1 >0.05 >0.001 <=0.001
(Significant chi square) 0 2 4 10 **2** (p=0.099)

Overall Age distrib Incl p >0.1 >0.05 >0.001 <=0.001
(Significant chi square) 0 2 4 10 **10** (p=0.000)

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

Dig pref score - height Incl # 0-7 8-12 13-20 > 20
0 2 4 10 **0** (6)

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 2 6 20 **0** (1.05)
Skewness WHZ Excl # <±0.2 <±0.4 <±0.6 >=±0.6
0 1 3 5 **0** (-0.08)

Kurtosis WHZ Excl # <±0.2 <±0.4 <±0.6 >=±0.6
0 1 3 5 **0** (0.02)

Poisson dist WHZ-2 Excl p >0.05 >0.01 >0.001 <=0.001
0 1 3 5 **0** (p=0.801)

OVERALL SCORE WHZ = 0-9 10-14 15-24 >25 **17** %

The overall score of this survey is 17 %, this is acceptable.

Appendix 2: SMART Plausibility Check Report – Yusuf Batil

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

(If it is not mentioned, flagged data is included in the evaluation. Some parts of this plausibility report are more for advanced users and can be skipped for a standard evaluation)

Overall data quality

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

Flagged data Incl % 0-2.5 >2.5-5.0 >5.0-7.5 >7.5
(% of in-range subjects) 0 5 10 20 **0** (1.9 %)

Overall Sex ratio Incl p >0.1 >0.05 >0.001 <=0.001
(Significant chi square) 0 2 4 10 **0** (p=0.153)

Overall Age distrib Incl p >0.1 >0.05 >0.001 <=0.001
(Significant chi square) 0 2 4 10 **10** (p=0.000)

Dig pref score - weight Incl # 0-7 8-12 13-20 > 20
0 2 4 10 **0** (6)

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

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

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 2 6 20 **0** (0.99)

Skewness WHZ Excl # <±0.2 <±0.4 <±0.6 >=±0.6
0 1 3 5 **0** (-0.07)

Kurtosis WHZ Excl # <±0.2 <±0.4 <±0.6 >=±0.6
0 1 3 5 **1** (-0.24)

Poisson dist WHZ-2 Excl p >0.05 >0.01 >0.001 <=0.001
0 1 3 5 **0** (p=0.221)

OVERALL SCORE WHZ = 0-9 10-14 15-24 >25 **13** %

The overall score of this survey is 13 %, this is good.

SMART Plausibility Check Report – Gendrassa

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

(If it is not mentioned, flagged data is included in the evaluation. Some parts of this plausibility report are more for advanced users and can be skipped for a standard evaluation)

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	**Score**
Flagged data	Incl	%	0-2.5	>2.5-5.0	>5.0-7.5	>7.5	
(% of in-range subjects)			0	5	10	20	**0** (1.2 %)
Overall Sex ratio	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**0** (p=0.497)
Overall Age distrib	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**10** (p=0.000)
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** (11)
Dig pref score - MUAC	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**2** (8)
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	2	6	20	**0** (0.93)
Skewness WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**1** (-0.22)
Kurtosis WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**0** (0.08)
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<=0.001	
			0	1	3	5	**0** (p=0.210)

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

The overall score of this survey is 15 %, this is acceptable.

SMART Plausibility Check Report – Kaya

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

(If it is not mentioned, flagged data is included in the evaluation. Some parts of this plausibility report are more for advanced users and can be skipped for a standard evaluation)

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	**Score**
Flagged data (% of in-range subjects)	Incl	%	0-2.5 0	>2.5-5.0 5	>5.0-7.5 10	>7.5 20	**0** (1.6 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	**0** (p=0.966)
Overall Age distrib (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	**10** (p=0.000)
Dig pref score - weight	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**0** (5)
Dig pref score - height	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**2** (10)
Dig pref score - MUAC	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**0** (7)
Standard Dev WHZ . .	Excl	SD	<1.1 and <1.15 and <1.20 and >=1.20 or				
	Excl	SD	>0.9 0	>0.85 2	>0.80 6	<=0.80 20	**0** (1.03)
Skewness WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	**0** (0.03)
Kurtosis WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	**1** (-0.28)
Poisson dist WHZ-2	Excl	p	>0.05 0	>0.01 1	>0.001 3	<=0.001 5	**0** (p=0.567)

OVERALL SCORE WHZ = 0-9 10-14 15-24 >25 **13** %

The overall score of this survey is 13 %, this is good.

8.2. Appendix 2: Assignments of Clusters

Doro Cluster Allocation

DORO CLUSTER ALLOCATION			
Community	**sheiks**	**Population Size**	**Cluster**
Anyile	Juma Matar	2381	**1,2**
Baldugu	Ramadan Mohamed	185	**RC**
Balila	Delil Zaik	2286	**RC**
Balila Dawala	Idris Mohamed	568	**3**
Bee	Bebai Bam	3395	**4,5**
Belatuma	Samuel Jeka	3875	**6,7**
Belatuma	Talha Jebal	1248	**8**
Benamayu 1	Joshua Musa	2157	**RC**
Benamayu 2	Raha Erke Ube	1125	**9**
Borfa	Musa Labib	2197	**10**
Chali 1	Alnur Waya	3032	**RC,11**
Chali 2	Abdalbakheit Luye	2358	**12,13**
Jindi	Lemam Haris	3005	**14,15**
Jindi	Sila Hassan	1381	**16**
Kolnugura	Lakin Dukan	2216	**17,18**
Mayak 1	Ali Shatta	1624	**19**
Mayak 2	Alfeki Woro Lal	1458	**20**
Nuba	Kuku Adam	307	**21**
	Abdul Azizi (Batil)-ES		**22**
	Abdallah Osma (Gend)		
	Abdallah Issa (Gend)		
	Nimerin Alemin (Gend)-ES		**23**
	Rejab Alhaji (Gend)		**24**
	Ahmad Sukurin (Kaya)-NS		**25**
	Hassen Abduljalil (Kaya)		
	Elias Ajabulu (Batil)-NS		**26**
	Agabu Al-leben (Kaya)	**8360**	
	Adam Abdallah (Kaya)		
	Isaac (Kaya)		
	Mondisi Sawus (Kaya)		
Samari 2	Ali Yanti	769	**27**
Samari 4	Sabanai Philip	1081	**28**
Soda	Joseph Nota	1153	**29**
Wadaga	Abusok Idris	689	**30**
Wadaga	Ramadan Anaim	1175	**31**
Yabus	Khalid Itineen	1057	**32**

Batil Cluster Allocation

BATIL CLUSTER ALLOCATION				
UMDA	SHEIKHS	HH	Population	Cluster
Ahmed Mahajoub Adam	Agabalabun Hamadanil		2	
Ahmed Mahajoub Adam	Elyas Ajabon		1	
Ali Jakalo	Abdalla Mohammed Adam		85	
Ali Jakalo	Aburas Abdalla Turmbal		509	1
Ali Jakalo	Ali Jakolo Suliman		933	
Ali Jakalo	Jadain Meaida Alemin		183	2
Ali Jakalo	Jader Galmo Eta		265	
Ali Jakalo	Juma Bilel		952	
Ali Jakalo	Khamis Abulang		182	3
Ali Jakalo	Mohammed Godor Male		352	
Ali Jakalo	Musa Bagar		491	
Ali Jakalo	Osman Mohammed Makawi		566	4
Ali Jakalo	Sarduk Dol Ahmed		1451	5
Almak Mufatish Meleh	Abduli Gulous		241	
Almak Mufatish Meleh	Abdulmajid Tom		965	
Almak Mufatish Meleh	Abusitta Suliman Lol		784	RC
Almak Mufatish Meleh	Albashir Saad Lol		1395	6
Almak Mufatish Meleh	Albur Hussein Adam		822	
Almak Mufatish Meleh	Asadig Tayog Som		1455	7
Almak Mufatish Meleh	Bashir Komondan Lol		526	8
Almak Mufatish Meleh	Mufatish Hamid Kon		1103	9
Almak Mufatish Meleh	Osman Karab Asheikh		1163	
Almak Mufatish Meleh	Ramadhan Safa John		872	10
Almak Mufatish Meleh	Sabun Mugort Jor		1181	11
Almak Mufatish Meleh	Sadig Malad Alnur		562	
Almak Mufatish Meleh	Saraf Aljundi Sadig		1403	12
Alnumeri Maki	Aburizig Hangug		1371	13
Alnumeri Maki	Alfaki Tifil		91	

Alnumeri Maki	Khalifa Gasim		871	14
Alnumeri Maki	Khalifa Nasir		714	
Gedem Sil Sil	Alnil Alkheir Aseemut		658	15
Gedem Sil Sil	Asad Matar Margan		226	
Gedem Sil Sil	Babikir Bungut Toksuma		412	
Gedem Sil Sil	Bakhit Berfa Dor		410	
Gedem Sil Sil	Bashir Eissa Leyam		239	16
Gedem Sil Sil	Bungut Bata Jabvir		551	
Gedem Sil Sil	Bunzuga Bonj Rafar		192	
Gedem Sil Sil	Darwish Shawish Waifa		510	
Gedem Sil Sil	Erfa Kheiralla Tirgel		514	17
Gedem Sil Sil	Fadalmula Som		449	
Gedem Sil Sil	Hassen Ratina Hussein		353	
Gedem Sil Sil	Hussein Batel Kalfa		458	18
Gedem Sil Sil	Jor Mahadi Aljundi		154	
Gedem Sil Sil	Khames Kurmuk Yok		547	
Gedem Sil Sil	Lagot Daso Eda		438	
Gedem Sil Sil	Mohammed Tongut Kadamas		271	19
Gedem Sil Sil	Mohammed Umran Idris		384	
Gedem Sil Sil	Suliman Air Lay		621	
Hamid Joda	Abbud Hassen Haroun		371	20
Hamid Joda	Abdullahi Yousif Alwali		230	
Hamid Joda	Alamin Kotom Gogain		318	
Hamid Joda	Aldew Altom Abdalla		499	
Hamid Joda	Alnazir Joda Altom		390	21
Hamid Joda	Altom Rajab Saed		593	
Hamid Joda	Bakhit Munsour Alamin		468	
Hamid Joda	Idris Mohammed Saad		372	RC
Hamid Joda	Maduk Musa Moi		833	
Hamid Joda	Nuri Abdalla Jaifa		617	22
Hamid Joda	Omer Maida Abdalla		2479	23
Ibrahim Adam	Abdalla Dikam Abas		11	
Ibrahim Adam	Abdulazim Baduri		18	
Ibrahim Adam	Abdulgadir Hamdan Alyam		47	
Ibrahim Adam	Ahmed Ageed Jalal		14	
Ibrahim Adam	Ali Hano Salim		8	
Ibrahim Adam	Asaad Alnair		69	
Ibrahim Adam	Babikir Humdan		7	
Ibrahim Adam	Ibrahim Idres Turok		5	
Jakalo Adam	Ali Matar Makana		191	
Jakalo Adam	Jahala Kassala Omer		178	24
Jakalo Adam	Jakolo Adam		476	
Jakalo Adam	Osman Siliman		226	
Mistirbis Abushok	Adam Jurfa Hamid		488	

Mistirbis Abushok	Ibrahim Alfil Alabyat		165	25
Mistirbis Abushok	Ibrahim Bade Falah		473	
Mistirbis Abushok	Ismaeil Meleh Hussein		201	
Mistirbis Abushok	Musa Mufatish Abdalla		214	
Mistirbis Abushok	Nile Yassin Sanduk		245	
			189	
Rajab Serdal	Abjal Gumfa Suldak		602	RC
Rajab Serdal	Alshaieb Asyak Koi		338	
Rajab Serdal	Awad Doka Konzar		380	
Rajab Serdal	Eissa Semat Belfa		331	26
Rajab Serdal	Juma Megas Kol		430	
Rajab Serdal	Moon Jumada Shanfa		415	
Rajab Serdal	Sebit Alum		478	
Rajab Serdal	Umbasha Alamin Leyam		1352	27

Gendrassa Cluster Allocation

GENDRASSA CLUSTER ALLOCATION				
Community	SHEIKHS	HH	Population	Cluster
BAU	Abdulgadir Karam		180	
BAU	Asir Tilyan		553	1
BAU	Hessen Bagar		1941	2,3,4
FADEMIA	About Jamum		162	RC
FADEMIA	Almansy Khamis		575	5
FADEMIA	Bade Altom		97	
FADEMIA	Bakhit Masom		562	6
FADEMIA	Matar Yasin		206	
FADEMIA	Sabit Balla		877	7
KUKURS	Abass Abdallaziz		492	8
KUKURS	Alhadi Semat		1786	9,10,11
KUKURS	Alhaji Afandi		520	12
KUKURS	Ali Aljudi		1553	13,14
KUKURS	Azaki Saad		856	15,RC
KUKURS	Bashir Hassan		350	
KUKURS	Eid Atom		1585	16,17,18
KUKURS	Khalifa Bakhit		1370	19,20
KUKURS	Mohammed Doka		421	
KUKURS	Nimir Siliman		682	21,RC
KUKURS	Ramadhani Yagub		237	
KUKURS	Sadik Adud		532	22
MAGAJA	Abdallah Isa		29	
MAGAJA	Abdallah Osman		2	
MAGAJA	Rajab Alhaj		42	
			68	
SODA-NORTH	Alfaki Bata		366	23
SODA-NORTH	Homeda Ahmed Musa		25	
SODA-NORTH	Mohamud Atom		369	
SODA-SOUTH	Ibrahim Siliman		542	24
SODA-SOUTH	Tifil Saad		248	
SODA-SOUTH	Timsah Ali		462	25

Kaya Cluster Allocation

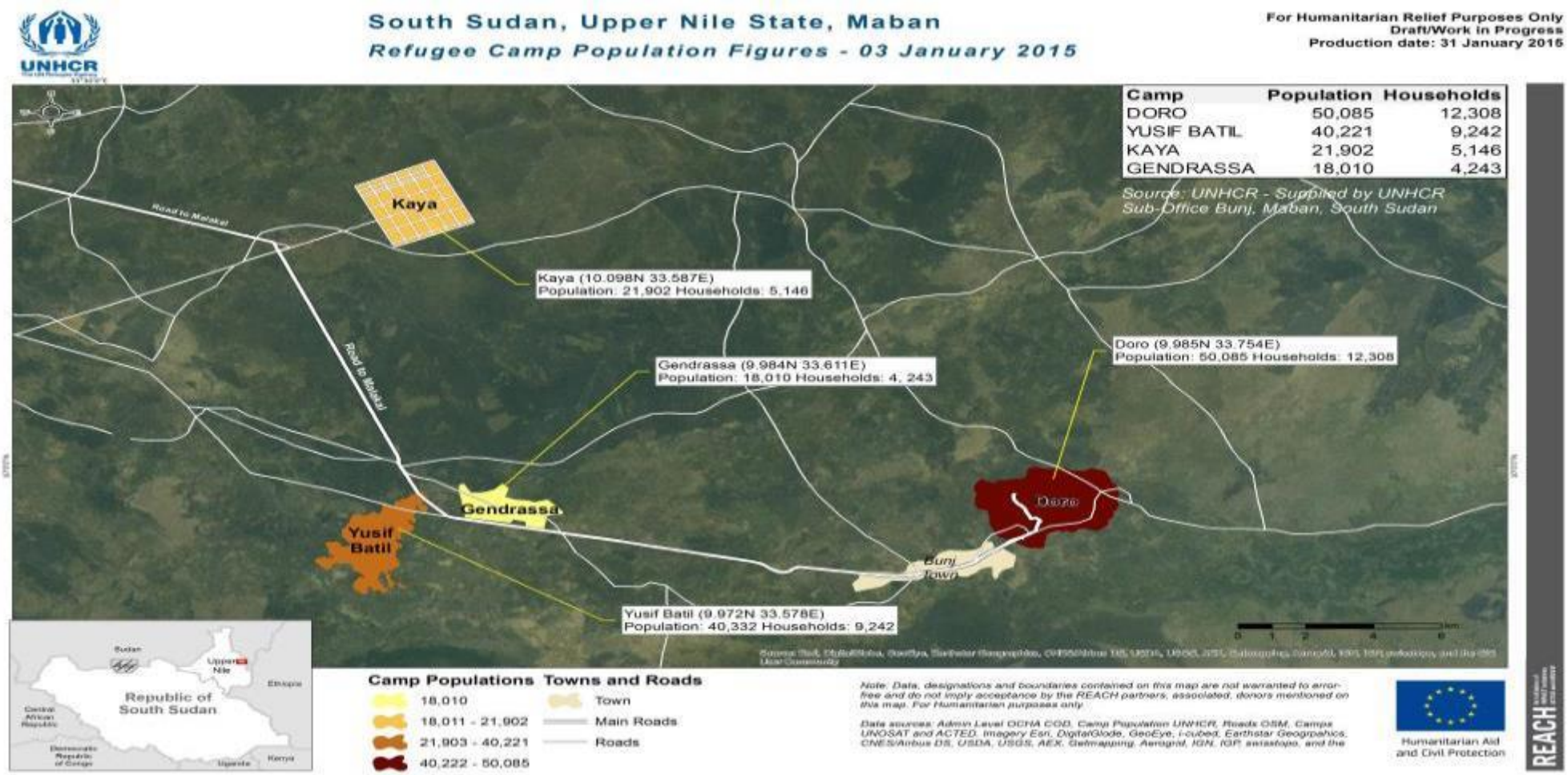
KAYA CLUSTER ALLOCATION				
COMMUNITY	SHEIKH	HH	Population	Cluster
ARMAU	SHEIKH ABDALLAH BASHIR		91	
ASILIK	SHEIKH FETISH KOL		120	1
BALDUGU	SHEIKH ALMAK FARNA		1	
BELMET	SHEIKH ALFAKI BARAS		225	2
BINDISI	SHEIKH SILIMAN ABDARAHAMAN		15	
BOFE	SHEIKH HASSAN HUSSEIN RAHMA		80	3
FUGULUK	SHEIKH MAHMUD DEEN ISSA		107	
GABANITE	SHEIKH BALLA ALBE		309	RC,4
GODOR	SHEIKH MOHAMED YOUSIF BASHIR		164	5
GUREN	SHEIKH RAJAB SEID		177	6
JUMJUM	SHEIKH ADAM ABDALLAH		30	
KALTUMA	SHEIKH RAMADAN SAID		1	
KAMER	SHEIKH OSMAN ALEMIN		272	7
KAMEROL GARIB	SHEIKH MOHAMMED MUSA WANGI		141	8
KAMEROL SHARIG	SHEIKH WADBES NIMER		198	9
KURBA	SHEIKH ATEIB KOJELI		111	RC
LIFIR	SHEIKH OSMAN SOM		200	10
MADA	SHEIKH ALHAJ DIAR JUBARA		3	
MAGAJA	SHEIKH ABDULGADIR HAMDAN ALYAM		2	
MAGAJA	SHEIKH AGABALABUN HAMADANIL		5	
MAGAJA	SHEIKH AHMED AGEED JALAL		1	
MAGAJA	SHEIKH AHMED SHUKRI		3	
MAGAJA	SHEIKH ALI HANO SALIM		2	
MAGAJA	SHEIKH AWADALLA ALMUDIR BARAKAT		4	
MAGAJA	SHEIKH GARUM MAHAMOUD BASHIR		4	
MAGAJA	SHEIKH IBRAHIM IDRES TUROK		5	
MAGAJA	SHEIKH NASRADEIN BADAWI BALOL		3	
MAGAJA	SHEIKH SAAD SHELBI		2	
MAGAJA	SHEIKH TUMSAH ADLAN SUAT		3	
MAK	SHEIKH ABDALLAH NIMER		273	11,12
MALIFA	SHEIKH ABDRAHAMAN GUMFUT		100	
MAYAK	SHEIKH HAJER ABOMINA		5	
MEDELIK	SHEIKH ATOM TAYUK		155	13
MIFOL	SHEIKH DAEEB BAGAR ADAM		329	14,15
MOL	SHEIKH MORDIEN AWAD		219	RC
MOSE	SHEIKH MONJIL MOL NASSIR		106	16
MUFU	SHEIKH ALMINA JARUM		26	
MUFU	SHEIKH GISIZ ATEIB		3	
MUFU	SHEIKH LIMAM MOBRUK		8	
			1226	17,18,19,20,21,22
PUDURBEL GARIB	SHEIKH ORTHA ADOW		106	23
PUDURUBEL SHARIG	SHEIKH HASSAN RABI		177	24
SABUNABUT	SHEIKH MOHAMED YOUSIF JODA		152	25
SODA	SHEIKH MADANI BAFE		122	

SODA AMOL	SHEIKH ABAS ALBE		79	26
TOMFONA	SHEIKH MAKI SEID		16	
TORMILE	SHEIKH NASRIDEEN ABDALLAH ADAM		10	
WADABOK	SHEIKH ALHADI ADAM		43	
WADAGA	SHEIKH MOHANDIS SHAWISH		25	
WADAGA	SHEIKH HASSAN ABDALGELIL		32	
WADAGA	SHEIKH ISAAC ABDARAHAMAN		83	27

8.3. Appendix 3: Event Calendar

Local Events calender							
MONTH	Seasons						
		2012	2013	2014	2015	2016	2017
JANUARY	CPA celebrations New year celebrations	Referendum day 9th January	CPA celebrations New Year 1st January 57	CPA celebrations New Year 1st January 45	CPA celebrations New Year 1st January 33	21	9
FEBRUARY		24th Feb SAF fighting among themselves	Sorghum Harvest 56	Sorghum Harvest 44	32	20	8
MARCH			55	43	31	19	7
APRIL			54	42	Demonstrations in the camps for Khartoum election 30	18	6
MAY	1st rains SPLA day 15th May 1st crop planting	Detang attack	53	41	29	17	Conflict between Refugee 5
JUNE	Cultivation World refugee day 20th June / weeding of crops		52	40	28	16	Ramadan
JULY	Crop weeding		51	39	Month of Ramadan 27	15	3
AUGUST			50	38	26	14	2
SEPTEMBER	Harvest		49	37	25	Month of Eid Idahia 13	Eid Adha 1
OCTOBER	Last month of harvest		48	36	24	12	0
NOVEMBER	End of rain season	59	47	35	23	11	
DECEMBER	December World AIDS day 1st December	58	Juba fighting starts 15th December 46	34	22	Conflicts between refugees and Host Communities 10	

8.4. Appendix 4: Map Of the area



8.5. Appendix 5: UNHCR Standardised Expanded Nutrition Survey (SENS) Questionnaire

المفوضية الموحد مسح التغذية الموسعة (SENS) استبيان

Greeting and reading of rights:

THIS STATEMENT IS TO BE READ TO THE HEAD OF THE HOUSEHOLD OR, IF THEY ARE ABSENT, ANOTHER ADULT MEMBER OF THE HOUSE BEFORE THE INTERVIEW. DEFINE A HOUSEHOLD AS A GROUP OF PEOPLE WHO LIVE TOGETHER AND ROUTINELY EAT OUT OF SAME POT. DEFINE HEAD OF HOUSEHOLD AS MEMBER OF THE FAMILY WHO MANAGES THE FAMILY RESOURCES AND IS THE FINAL DECISION MAKER IN THE HOUSE.

تحية وقراءة من الحقوق

هذا البيان هو أن تقرا قبل المقابلة لربة الاسرة أو إذا ما غاب أو عضو آخر البالغين من البيت.تعريف سكان لبيت مجموعة من الناس الذين يعيشون معا ويأكلون بشكل روتيني فى قدر او (هال) واحد تعريف مسؤول اوربة البيت فرد من أفراد الأسرة الذي يدير موارد الأسرة وهو صانع القرار النهائي فى البيت.:

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

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

مرحبا، اسمي _____ وأنا أعمل مع [المفوضية]. نود أن ندعو أهل بيتك للمشاركة في الدراسة أن تبحث في الحالة الغذائية والصحية للناس الذين يعيشون في هذا المخيم.

- المفوضية في رعاية هذا المسح التغذوي.
- المشاركة في هذا المسح هو تماما اختيارك. يمكنك أن تقرر عدم المشاركة، أو إذا كنت تفعل المشاركة يمكنك إيقاف المشاركة في هذا المسح في أي وقت ولأي سبب. إذا كنت تتوقف عن أن تكون في هذه الدراسة، فإنه لن يكون لها أي تأثير سلبي على كيفية التعامل معك أو أسرتك أو ما تلقي المساعدات لك.
- إذا كنت توافق على المشاركة، وسوف أسألك بعض الأسئلة عن عائلتك وسوف أيضا قياس الوزن والطول للأطفال كل في الأسرة الذين هم أكبر سنا من 6 أشهر والذين تقل أعمارهم عن 5 سنوات بالإضافة إلى هذه التقييمات، I سيتم اختبار كمية صغيرة من الدم من الاصبع من الأطفال والنساء لمعرفة إذا كان لديهم فقر الدم.
- قبل أن نبدأ أن أطلب منكم أي أسئلة أو اتخاذ أي قياسات، سوف نطلب منك موافقتك على الدولة هذا النموذج. التأكد من أن أي وستبقى المعلومات التي سوف تقدم في سرية تامة.
- يمكنك أن تسأل أي سؤال لي أن لديك حول هذا المسح قبل أن تقرر المشاركة أم لا.
- إذا كنت لا تفهم المعلومات أو إذا لم تكن الإجابة على الأسئلة الخاصة بك لالارتياح

SENS- MORTALITY QUESTIONNAIRE (One questionnaire per HH)

Date (dd/mm/yyyy) / يوم مقابلة:	**Camp**المعسكرة	**Cheikh/Boma…….**	**Block/Code Number/**رغم مربع
|___|___|/|___|___|/|___|___||___|___|	Doro=1, Yusuf Batil =2 , Gendrassa=3 , Kaya=4 |___|	|___||___|___|	|___||___|___|
Cluster Number(*in cluster survey only*)……	**HH Number**رغم ربة البيت	**House/Tent Number** رغم خيمة/بيت	**Team Number**رغم فريق
|___|___|	|___|___||___|___|	|___|___||___|___|	|___|

#	**COL1**مربع1	**COL2**	**COL3**	**COL4**	**COL5**	**COL6**
	NAME اسم	SEX نوع /زكر/انثى M/F	AGE IF **≥5 YRS** 5<سنة **UNIT:** وحدة **YRS**	AGE IF **< 5 YRS** 5>سنة ازا سنة **SPECIFY UNIT:** حدد الوحدة **DAYS / MONTHS / YRS** يوم /شهر/سنة	BORN BETWEEN **LAST 3 MONTHS** AND TODAY تم ميالد فى بين واليوم (ازكر اليوم) **(Y/N)**	JOINED HOUSEHOLD BETWEEN **END (3 MONTHS)** AND TODAY **بيت مزدوزة بين اخر و اليوم (Y/N)**
A.	**LIST ALL MEMBERS WHO ARE CURRENTLY LIVING IN THIS HOUSEHOLD AND EATING FROM THE SAME POT** سجل كل اعضاء الزين يسكنون الان فى هزى البيت وياكلون فى نفس هلا(قدر)					
01						
02						

03						
04						
05						
06						
07						
08						
09						
10						
11						
12						
B.	**DID ANY MEMBERS OF THE HOUSEHOLD LEAVE BETWEEN LAST 3 MONTHS AND TODAY? IF SO LIST THEM** و هل اعضاء البيت يسكن بين نهاية (ازكر اليوم) اليوم ازا نعم سجلهم					
01						
02						
03						

C. DID ANY MEMBERS OF THE HOUSEHOLD DIE BETWEEN LAST 3 MONTHS AND TODAY? IF SO LIST THEM هل العضاء البيت يموتون بين نهاية(ازكر اليوم)واليوم؟ازا نعم سجلهم						
01						
02						

MORTALITY SUMMARY (for supervisor only) (خلاصة الوفيات (خاص لمشرف

		TOTAL الجملة	**Under 5** 5 تحت
1. Members present now يقدم الاعضاء الان	**A.** COL **1**		
2. Joined household between last 3 months) and	**A**. COL **6**		
3. Members that left the household between last 3	**B**. COL **1**		
4. Births between last 3 months) and today بين المواليد	**A, B**. COL **5**		
5. Deaths between last 3 months) and today بين	**C**. COL **1**		

NB:

- Household members are defined as members who are living together *in the camp* and who are eating from the same cooking الاعضاء البيت هم الزين يسكنون فى معسكرة وياكلون فى نفس اكل
- Members of the household present now are the members who slept in the household last night. Members of the الاعضاء البيت الموجدين الان household who نامو فى البيت فى الليل الماضيى وايضا الاضاء البيت الزين نامو فى البيت فى ليل الماضى وزهبوا الى شوق وسوف يعودون قبل نهية اليوم يمكن تسجيل ايضا slept here last night but who are away today to the market/elsewhere and will return before the end of the day should be listed here also.
- A child who was born and dead during the recall period is counted as a death only when entering data in ENA (SMART Version 1, April 2006). الطفل الزى تم ميلادة و مات خلال فترة زكر يمكن تسجلة كلا ميت

SENS CHILDREN 6-59 QUESTIONNAIRE

Date (dd/mm/yyyy) / يوم مقابلة:	**Camp**المعسكرة	**Cheikh/Boma…….**	**Block/Code Number/**رغم مربع
|___|___|/|___|___|/|___|___||___|___|	Doro=1, Yusuf Batil =2 , Gendrassa=3 , Kaya =4 |___|	|___|___|___|	|___|___|___|
Cluster Number(*in cluster survey only*)……	**HH Number**رغم ربة البيت	**House/Tent Number** رغم خيمة/بيت	**Team Number**رغم فريق
|___|___|	|___|___||___|___|	|___|___||___|___|	|___|

If child is less than 6 months stop at the dark line (CH6) and proceed to IYCF.

Date of interview (dd/mm/yyyy): التاريخ المقابلة يوم/شهر/سنة |___|___||___|___|/|___|___|/|___|___|	**Cluster Number (*in cluster survey only*)** رغم المجموع |___|___|		**Team number**رغم الفريق |___|

CH1	**CH2**	**CH3**	**CH4**	**CH5**	**CH6**	**CH7**	**CH8**	**CH9**	**CH10**	**CH11**	**CH12**	**CH13**	**CH14**	**CH 15**	**CH16**

ID البطاقة	HH ربة البيت	Consent الموفقة given 1=yes نعم 2=no لا 3=absent غاٌب	Sex نوع (m/f) زكر/انثى	Birthdate* تاريخ الميلاد dd/mm/yyyy يوم/شهر/سنة	Age** سنة (شهور) (months)	Weight وزن (kg) ±100g 100جرا م+	Height طول (سنتمتر) (cm) ±0.1cm	Oedema وزمة الامعاء (y/n)	MUAC قياس يد الاعلى (mm)	Child enrolled الطفل المسجل 1=SFP الكل الاضافى 2=TFP الكل اللعلاج 3=None لاثيئ	Measles الحصبة 1=yes card نعم لى بطاقة 2=yes recall نعم ازكر 3=no or don't know لا عرف	Vit. A in past 6 فيتامين ا فى فتر 6شهور أmonths (show capsule) 1=yes card نعم لى بطاقة 2=yes recall نعم ازكر 3=no or don't know لا اعرف	Diarrhoea in past 2 weeks اسهلات خلال فترة 2اسبوع الماضية 1=yes نعم 2=no لا 8=DK لا اعرف	DPT3/ Penta 3 1=yes card لى ذ عم بـ طاقة 2=yes recall ن ازكر عم 3=no or don't know عرف لا	Hb *(g/dL)*
01				/ /											
02				/ /											
03				/ /											
04				/ /											
05				/ /											
06				/ /											
07				/ /											
08				/ /											

09				/ /												
10				/ /												
11				/ /												
12				/ /												
13				/ /												

*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.

الالواثائق فية التاريخ/شهر/سنة الميلاد ازا يوجد سجل الواثائق الرسمية ولا تسجل حتى لوالام يتزكر التاريخ الميلاد اترك خالية ازا الوثائق رسمية غير موجود.وازا لا توجد وثائق الميلاد خمن حسب التاريخ ا حواديث المحلى. وازا سجل موجود سجل

Annex -SENS IYCF questionnaire

No	QUESTION الاسئللة	ANSWER CODES الجابات	
SECTION IF1			
IF1	Sex نوع	Male زكر..... 1 Female انثى 2	|___|
IF2	Birthdate التاريخ الميلاد RECORD FROM AGE DOCUMENTATION. LEAVE BLANK IF NO VALID AGE DOCUMENTATION سجل من وثيق	Day/Month/Year.....|___|___| /|___|___| / |___|___||___|___| **يوم/شهر/سنة**	
IF3	Child's age in months سنة الطفل فى شهر	IF AGE DOCUMENTATION NOT AVAILABLE, ESTIMATE USING EVENT CALENDAR. IF AGE DOCUMENTATION AVAILABLE, RECORD THE AGE IN MONTHS FROM THE DATE OF BIRTH *ازا لا توجد وثقةتاريخ الميلاد خمن التارغ خلال حدث فى المحلى*	|___|___|
IF4	Has [NAME] ever been breastfed? هل (الاسم) دائما يرضى	Yes نعم..... 1 No لا..... 2 DK لا اعرف 8	|___| **IF ANSWER IS 2 or 8 GO TO IF7**
IF5	How long after birth did you first put [NAME] to the breast? بعد الميلاد مباشرأ كم من زمن رضيض الطفل؟	Less than one hour بعد اقل من ساعة ..... 1 Between 1 and 23 hours ساعة 23 و بين 1 .. 2 More than 24 hours ساعة 24 اكثر من ..... 3 DK لا اعرف 8	|___|
IF6	Was [NAME] breastfed yesterday during the day or at night?	Yes نعم ..... 1 No لا 2	|___|

	هل رضيض الفلك خلال نهار ام الليل؟	DK لا اعرف 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?

الان اريد اسال عن السائل ممكن اخزت خلال النهار امس و فى ليل.لى رغبة لمعرفة ازا طفلك لة مواد حتلا لو مغلوط مع بعض من اكل خلال يوم او ليل امس(اسم) هل استلام بعض من مزكورة:

ASK ABOUT EVERY LIQUID. IF ITEM WAS GIVEN, CIRCLE '1'. IF ITEM WAS NOT GIVEN, CIRCLE '2'. IF CAREGIVER DOESN'T KNOW, CIRCLE '8'. EVERY LINE MUST HAVE A CODE.

اسال عن السائل ازا اخزوا ضع دئرة فى (1) و ازا لم تاخز ضع دئرة فى (2) و ام ازا لاعرف ضع دئرة فى (8)

	Yes	No	DK
7A. Plain water مياة السهل	7A.....1	2	8
7B. Infant formula: for example (Libto Mama)] طفل مرضيى على سبيل المثال اضيف عيش الماحلى من اكل قوى غير قوى(مبتومامة, لبتونيل)	7B.....1	2	8
7C. Milk such as tinned, powdered, or fresh animal milk: for example (Nido, Formost) لبن علبة المجفيف او لحم حيوان طازج على سبيل المثل اضيف بعض لبن علب	7C.....1	2	8
7D. Juice or juice drinks (Gungules-Aradeb, Kedem) عصير او مشروب عصير اضيف مشروبات المحلى (قنفوليس, اريديب, قديم) .	7D.....1	2	8

	7E. Clear broth or Soup مرق الصافى	7E.....1 8	2
	7F. Sour milk or yogurt for example: (Zabadi , Roob) لبن حامض (زبادي , روب)	7F.....1 8	2
	7G. Thin porridge for example: (Medida Khafif) **نثة خفيف ازكر اسم المحلى (**مديدة خفيف)	7G.....1 8	2
	7H. Tea or coffee with milk الشاى لبن او قهوة	7H.....1 8	2
	7I. Any other water-based liquids (kastar), Serilak): for example sodas, other sweet drinks, herbal infusion, gripe water, clear tea with no milk, black coffee, ritual fluids ازكر بعض من السوائل مثل مشروبات غازية و مشرونبا ت الشاى خالى من لبن مشروبات الحلوة مشروبات عشبية	7I.....1 8	2
IF8	Yesterday, during the day or at night, did [NAME] eat solid or semi-solid (soft, mushy) food? امس خلال اليوم او اليل هل (اسم) اكلت اكل صلب ام شبة صلب (لين عصبى)	Yesنعم..... .1 No لا .....2 DK... لااعرف..... ..8	|___|
SECTION IF3			
IF9	Did [NAME] drink anything from a bottle with a nipple yesterday during the day or at night? هل (اسم) شرب اى شئ من زجاج لة حلمةا امس خلال النها ر او اليل	Yes نعم ..... .1 No لا 2	|___|

		DK لا اعرف ……..8	
SECTION IF4			
IF10	Is child aged 6-23 months? هل طفلك عمره 6-23 شهر REFER TO IF2	Yes نعم ……1 No لا ……2	|___| **IF ANSWER IS 2 STOP NOW** **ازا اللجا بة 2 قف الان**
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? الان اريد عن اسا ل بعض غزاء ت (اسم)توكل طفلك لة هزى المواد حتى لو مخلوت مع اغزية اخرى امس خلال اليل او نها ر (اسم) يا كل التا لي: ASK ABOUT EVERY ITEM. IF ITEM WAS GIVEN,CIRCLE '1'. IF ITEM WAS NOT GIVEN, CIRCLE '2'. IF CAREGIVER DOESN'T KNOW, CIRCLE '8'. EVERY LINE MUST HAVE A CODE. اسا ل كل المواد ازا المواد قد ضع دائرة (1)ازا المواداعطى دائرة (2)و ازا لم تعرف ضع دائرة (8) كل خطوط عن تكن لة رمز Yes No DK		
IF12	11A. **Flesh foods** for example: beef, goat, lamb, mutton, pork, rabbit, chicken, duck, liver, kidney, heart غزاء لحمى (سجل كل لحم العا مة مثل سمك دجاج وكبد)على سبيل مثا ل لحم بقر ضا ن بط ارنب لحم خنزير كبد كلية 11B CSB+ Premix الغزاء المخلوتة وقوى وسجل الموجود فى المنطقة 11C. **FBF++** : for example CSB++ صويا وف ول زرة مثل الـ قوى الـ غزاء	11A……1 2 8 11B……1 2 8 11C……1 2 8	

	11D. **RUTF** : for example Plumpy'Nut® (SHOW SACHET) يسد تعامل هزة الجا الغزاء المحلى الغزئية هزى سجل العلاج في	11D……1 8	2
	11E. **RUSF** : for example Plumpy'Sup® (SHOW SACHET) في دالا ضا محلى الجاهزة الكل وجوالم الكل هزة سجل	11E……1 8	2
		11F……1 8	2
	11G. Infant formula: for example Libto Mama .الطفل لو صفة الا قوى حديدى ال الغزئية اسماء هزة من بعض ازكر الرضى	11G……1 8	2
	11H. **List 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.المصنع لين سجل بعض الغزي من فرق ولة المنطقة في الموجون يرضى والاط فال لاط فال او و صلب صلب شبة الغزئي**	11H……1 8	2

SENS QUESTIONNAIRE Women 15-49 years

15-49 الاذ ساء

Date of interview (dd/mm/yyyy): **الم قابل ل تاريخ** |___|___|___|___|/|___|___|/|___|___|	**Cluster Number (*in cluster survey only*)** الم جموع ذ مرة |___|___|	**Team number** |___| رغم الـ فريق

WM1	**WM2**	**WM3**	**WM4**	**WM5**	**WM6**	**WM7**	**WM8**
ID **الـ بطا قة**	**HH** **ربـ ة الـ بـ يت**	**Consent given** **الـ ق بول اعطى** 1=yes نعم 2=no لا 3=absent الغائب	**Age العم ر (السنة)** (years)	**Are you pregnant? هل حامل ان ت** 1=yes ذ عم 2=no لا (GO TO WM 8) 8=DK لااعرف (GO TO WM 8)	**Are you currently <u>enrolled</u> in the ANC programme?** هل سجلت فى برنامج المؤتمر الوطنى الافريقى 1=yes 2=no (If no, STOP) 8=DK (If DK, STOP)	**Are you currently <u>receiving</u> iron-folate pills (*SHOW PILL*)?** **تستلم حبوب حامض الفوليك الحديدية حاليا** 1=yes (STOP NOW) قف الان 2=no (STOP NOW) قف الان 8=DK (STOP NOW) قف الان	**الـ دم فـ قر Hb** (g/L or g/dL) **(Only for non-pregnant women)** فقط للنساء غير الحبلى
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