STANDARDISED EXPANDED NUTRITION SURVEY (SENS)

Final report

Doro, Yusuf Batil, Gendrassa and Kaya refugee camps, Upper Nile State, Maban County, South Sudan

Surveys conducted: 16 November- 4 December 2019

UNHCR
The UN Refugee Agency

In collaboration with

WFP, UNICEF, IMC, RI, & AAHI

WFP

unicef

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ACKNOWLEDGMENTS

ACRONYMS AND ABBREVIATIONS

AAHI	**Action Africa Help International**
ACTED	Agency for Technical Cooperation and Development
AWD	Acute Water Diarrhea
BSFP	Blanket Supplementary Feeding Programme
CI	Confidence Interval
CGs	Care Groups
CMR	Crude Mortality Rate
CHPs	Community Health Promoters
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
ODK	Open Data Kit
OPD	Outpatient Department
OTP	Out-patient Therapeutic Programme
PDM	Post Distribution Monitoring
PLW	Pregnant and Lactating Women
ProGress	UNHCR registration database for refugees
RI	Relief International
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
OTP	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

United Nations High Commissioner for Refugees (UNHCR) coordinanted the surveys in collaboration with the World Food Programme (WFP), International Medical Corps (IMC), Relief International (RI), and AAHI provided support in terms of logistics and nutrition supplies. Maban County is 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, Yusuf Batil, Gendrassa and Kaya. The overall aim of the survey was to assess the nutrition situation among the refugee population and to monitor ongoing programme interventions. In each of the camps a cross-sectional survey was conducted using the UNHCR Standardised Expanded Nutrition Survey (SENS) version 2, 2013 guidelines http://sens.unhcr.org/ and the Standardised Monitoring and Assessments of Relief and Transitions (SMART) guidelines https://smartmethodology.org/ . Systematic random sampling was used to identify the survey respondents.

Three population groups; children 6-59 months, infants 0-5 months and women of reproductive age 15-49 years were included in the survey. Household level indicators on food security were measured in households whether they included the target population groups or not.

A total of six survey teams composed of four members each (one team leader, one haemoglobin measurer, one anthropometric measurer and one anthropometric/haemoglobin measurement assistant carried out data collection in Doro camp. Data collection in the rest of the three camps (Gendrassa, Kaya and Yusuf Batil) was carried out by ten teams of four members. Two standardised trainings lasting five and four days respectively were conducted for Doro and the rest of the camps. The training included a standardisation and pilot test. The survey teams were supported by a team of 5 supervisors and 2 coordinators who roved between the teams during the data collection.

Mobile phone questionnaires using Open Data Kit (ODK) android software for all the modules was used for data collection. Data validation was carried out daily by the survey coordinator/supervisors which allowed for daily feedback to the survey teams. Data analysis is currently on-going using ENA for SMART July 9th, 2015 version for anthropometric indices and Epi info version 7.2.3.1 for all other data.

The overall nutrition situation in Doro was critical, Yusuf Batil was serious and Gendrassa and Kaya poor as indicated by the Global Acute Malnutrition (GAM) prevalence of 15.0% (12.3-18.0 95% C.I), 14.0% (11.3-17.2 95% C.I) 6.6% (6.1-7.1 95% C.I) and 9.1% (7.0-11.8 95% C.I) respectively based on weight for height z scores.[1] Compared to the situation in 2018 the nutrition situation deteriorated in Doro and Yusuf Batil refugee camps. It remained the same in Gendrassa and Kaya with the slight changes in both camps being statistically insignificant[2]. The change in Kaya, however, indicates a likely deteriorating situation.

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[1]

WHO/UNICEF categorization, prevention of malnutrition threshold-children under 5 years of age, December 2018

[2] P>0.05 therefore the change in prevalence were statistically insignificant

Addressing acute malnutrition (wasting) is of critical importance because of the heightened risk of disease and death for children who lose too much of their body weight. Severe acute malnourished children have a nine times elevated risk of death compared with normal children. Moderate acute malnourished children have a four times elevated risk of death compared with normal children while the risk for severe malnourished children increased to nine times.[3]

The 2019 global stunting prevalence was very high in all the Maban refugee camps (>30). Stunting prevalence remained the same as in 2018 in all the camps[4]. Stunting is an outcome of inadequate nutrition and repeated bouts of infection during the first 1000 days of a child's life. Stunting before the age of 2 years predicts poorer cognitive and educational outcomes in later childhood.[5]

Total anaemia prevalence among children aged 6 to 59 months in Maban remained very high above the 40% level of public health significance (WHO classification)[6]. Compared to 2018 the prevalence of anaemia remained the same in Doro and Kaya but deteriorated in both Yusuf Batil and Gendrassa. Anaemia is recognised to adversely affect the cognitive performance, behaviour and physical growth of infants, preschool and school-aged children, and increase the likelihood of associated morbidities. Anaemia is not only an indicator of potential iron deficiency in populations but can also be taken as a proxy indicator for other micronutrient deficiencies.

The OTP and TSFP enrolment based on all admission criterion in all the Maban camps did not meet the recommended standard of >90%. This indicates the need to strengthen case finding both at the community level and the screening at the facility level.

The coverage of measles vaccination in all the Maban refugee camps met the recommended ≥95% target. None of the Maban refugee camps met the vitamin A supplementation target coverage of ≥90%. Yusuf Batil and Kaya had a coverage of 83%, Gendrassa had 78% and Doro had the lowest coverage of 53%. Ante natal coverage ranged between 80-91%. Efforts to maintain the acceptable measles coverage and to strengthen the other areas that have gaps to be ensured in 2020.

30%, 11%,16% and 15% of children aged 6-59 months in Doro, Yusuf Batil, Gendrassa and Kaya respectively reported to have had diarrhoea in the last two weeks prior to the survey indicating a morbidity caseload requiring continued provision of health and hygiene services.

The rate of timely initiation of breastfeeding, exclusive breastfeeding and continued breastfeeding at one year was >90% in all the camps indicating a positive uptake of the breastfeeding messages. Timely introduction of complementary feeding ranged between

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[3] WHO child growth standards and identification of severe acute malnutrition in infants and young children. A joint statement by WHO and UNICEF, 2009.
[4] P>0.05 for al camps thus any changes were statistically insignificant
[5] http://www.who.int/nutrition/topics/globaltargets_stunting_policybrief.pdf
[6] WHO (2000) The Management of Nutrition in Major Emergencies

17- 52% which is low. The proportion of children aged 6 -23 months that had consumed iron-rich or iron-fortified foods ranged between 34-48% which is also low. After six months, adequate and appropriate infant complementary foods become necessary to complement breastmilk in order to meet the energy and other nutrient requirements of the infant (timely complementary feeding). Continued strengthening of IYCF awareness, promotion and support in regard to appropriate complementary feeding remains key including finding options to diversify the diet to include a better micronutrient profile.

Majority (87%) of the refugees in Maban reported resulting to negative coping strategies, including selling assets, cash borrowings, reducing meal quantities and frequency, and begging. This indicates that only 13% of the refugee households were not under significant stress to meet their food needs. This needs to increase to cover majority of the population.

Results summary

Table 1: Summary of Key Findings: SENS Nov-Dec 2019; Refugee camps in Maban, Upper Nile - South Sudan

	Doro		Yusuf Batil		Gendrassa		Kaya		
	Number / total	% (95% CI)	Number / total	% (95% CI)	Number / total	% (95% CI)	Number / total	% (95% CI)	Classification of public health significance or target (where applicable)
	2019		2019		2019		2019		
CHILDREN 6-59 months									
Acute Malnutrition (WHO 2006 Growth Standards)									
Global Acute Malnutrition (GAM)	90/601	15.0 (12.3-18.0)	75/536	14.0 (11.3 – 17.2)	44/668	6.6 (6.1-7.1)	50/549	9.1 (7.0-11.8)	Very high/critical if ≥ 15% (WHO-UNICEF classification);
Moderate Acute Malnutrition (MAM)	67/601	11.1 (8.9-13.9)	63/536	11.8 (9.3-14.8)	40/668	6.0 (5.5-6.5)	42/549	7.7 (5.7-10.2)	
Severe Acute Malnutrition (SAM)	23/601	3.8 (2.6-5.7)	12/536	2.2 (1.3 - 3.9)	4/668	0.6 (0.6-0.6)	8/549	1.5 (0.7-2.8)	
Oedema	0/601	0	0/536	0	0/668	0	1/549	0.2	
Mid Upper Arm Circumference (MUAC)									
MUAC <125mm and/or oedema	49/613	8.0 (6.1-10.4)	20/546	3.7 (2.4-5.6)	26/682	3.8 (3.5-4.1)	28/552	5.1 (3.5-7.2)	
MUAC 115-124 mm	43/613	7.0 (5.2-9.3)	16/546	2.9 (1.8-4.7)	24/682	3.5 (3.3-3.8)	223/552	4.2 (2.8-6.2)	
MUAC <115 mm and/or oedema	6/613	0.3 (0.4-2.1)	4/546	0.7 (0.3-1.9)	2/682	0.3 (0.3-0.3)	5/552	0.9 (0.4-2.1)	

	Doro		Yusuf Batil		Gendrassa		Kaya		Classification of public health significance or target (where applicable)
	Number / total	% (95% CI)	Number / total	% (95% CI)	Number / total	% (95% CI)	Number / total	% (95% CI)	
	2019		2019		2019		2019		
Stunting[7] (WHO 2006 Growth Standards)									
Total Stunting	256/596	43.0 (39.0-47.0)	249/539	46.2 (42.0-50.4)	243/672	36.2 (35.1-37.2)	261/542	48.2 (44.0-52.4)	Critical if ≥ 30% (WHO classification
Severe Stunting	93/596	15.6 (12.9-18.7)	74/539	13.7 (11.1-16.9)	69/672	10.3 (9.5-11.1)	75/542	13.8 (11.2-17.0)	
Programme enrolment / coverage									
Measles vaccination with card or recall (9-59 months)	557/572	97.4 (95.7-98.4)	512/525	97.5 (95.8-98.6)	625/638	98.0 (96.6-98.8)	498/505	98.6 (97.2-99.3)	Target of ≥ 95%
Vitamin A supplementation coverage with card or recall, within past 6 months with card or recall (6-59 months	325/613	53.0 (49.1-56.9)	458/546	83.9 (80.6-86.7)	534/682	78.3 (75.1-81.2)	459/552	83.2 (79.8-86.0)	Target of ≥ 90%
Therapeutic Feeding Program (OTP) (based on all admission criteria WHZ, oedema and MUAC)	4/24	16.7 (4.7-37.4)	7/70	10.0 (4.1-19.5)	0/5	0	3/11	27.3 (6.0-61.0	Target of ≥ 90%
Targeted Supplementary Feeding Program (TSFP) (based on all admission criteria WHZ and MUAC)	20/85	23.5 (15.0-34.0)	1/15	6.7 (0.2-32.0)	14/51	27.5 (15.9-41.7)	9/58	15.5 (7.4-27.4)	Target of ≥ 90%
Diarrhoea									
Diarrhoea in past 2 weeks	427/612	30.2	60/546	11.0		15.6	467/549	14.9	

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

	Doro		Yusuf Batil		Gendrassa		Kaya		Classification of public health significance or target (where applicable)
	Number / total	% (95% CI)	Number / total	% (95% CI)	Number / total	% (95% CI)	Number / total	% (95% CI)	
	2019		**2019**		**2019**		**2019**		
		(26.7-34.0)		(8.6-13.9)	573/679	(13.1-18.5)		(12.2-18.2)	
Deworming coverage within past 6 months (12-59 months)	22/543	40.9 (36.8-45.1)	374/488	76.6 (72.7-80.2)	337/574	58.7 (54.6-62.7)	336/472	71.2 66.9-75.1)	Target of ≥ 75%
Anaemia (children 6-59 months)									
Total Anaemia (Hb <11 g/dl)	341/611	55.8 (51.9-59.7)	304/546	55.7 (51.5-59.8)	390/678	57.5 (53.8-61.2)	275/551	49.9 (45.8-54.1)	High if ≥ 40%
Mild (Hb 10-10.9)	173/611	28.3 (2.9-32.0)	146/546	26.7 (23.2-30.6)	188/678	27.7 (24.5-31.2)	167/551	30.3 (26.6-34.3)	
Moderate (Hb 7-9.9)	161/611	26.4 (23.0-30.0)	154/546	28.2 (25.0-32.1)	195/678	28.8 (25.5-32.3)	107/551	19.4 (16.3-22.9)	
Severe (Hb <7)	7/611	1.2 (0.6-2.4)	4/546	0.7 (0.3-1.9)	7/678	1.0 (0.5-2.1)	1/551	0.2 (0.0-1.0)	
Anaemia (children 6-23 months)									
Total Anaemia (Hb <11 g/dl)	184/243	75.7 (69.8-81.0)	163/226	72.1 (65.8-77.9)	213/282	75.5 (70.1-80.4)	144/226	63.7 (57.1-70.0)	High if ≥ 40%
Mild (Hb 10-10.9)	87/243	35.8 (29.8-42.2)	70/226	40.0 (25.0-37.4)	89/282	31.6 (26.1-37.3)	75/226	33.2 (27.1-39.7)	

SENS Surveys Nov-Dec 2019; Maban refugee camps, South Sudan

	Doro		Yusuf Batil		Gendrassa		Kaya		Classification of public health significance or target (where applicable)
	Number / total	% (95% CI)	Number / total	% (95% CI)	Number / total	% (95% CI)	Number / total	% (95% CI)	
	2019		2019		2019		2019		
Moderate (Hb 7-9.9)	95/243	39.1 (32.9-45.5)	90/226	39.8 (33.4-46.5)	123/282	43.6 (37.6-49.6)	68/226	30.1 (24.2-36.5)	
Severe (Hb <7)	2/243	0.8 (0.1-2.9)	3/226	1.3 (.03-3.8)	1/282	0.4 (0.0-2.0)	1/226	0.4 (0.0- 2.4)	
CHILDREN 0-23 months									
IYCF indicators									
Timely initiation of breastfeeding	306/323	94.7 (91.7-96.7)	266/286	93.0 (89.4-95.7)	345/371	93.0 (89.9-95.2)	272/296	91.9 (88.2-94.7)	
Exclusive breastfeeding under 6 months	65/80	81.3 (71.0-89.1)	58/60	96.7 (88.5-99.6)	82/86	95.4 (88.5-98.7)	64/70	91.4 (82.3-96.8)	
Continued breastfeeding at 1year	59/60	98.3 (91.1-100)	43/44	97.7 (88.0-99.9)	59/61	96.7 (88.7-99.6)	46/49	93.9 (83.1-98.7)	
Continued breastfeeding at 2 years	39/47	83.0 (69.2-92.4)	49/61	80.3 (68.2-89.4))	55/71	77.5 (66.0-86.5)	28/47	59.6 (44.2-73.6)	
Introduction of solid, semi-solid or soft foods	21/41	51.2 (35.1-67.1)	11/21	52.4 (29.8-74.3)	13/44	29.6 (15.8-45.2)	8/38	17.4 (7.8-31.4)	
Consumption of iron-rich or iron-fortified foods	84/243	34.6 (28.6-40.9)	77/226	34.1 (27.9-40.7)	137/285	48.1 (42.1-54.0)	83/226	36.7 (30.4-43.4)	
Bottle feeding	4/323	1.2 (0.5-3.1)	13/287	4.6 (2.5-7.7)	14/370	3.8 (2.3-6.3)	18/296	6.1 (3.6-9.4)	
Proportion of children 6-23 months who received CSB++ in the last 24 hours	0/243	0	19/286	6.6 (4.1-10.2)	7/285	2.5 (1.0-5.0)	10/226	0	

SENS Surveys Nov-Dec 2019; Maban refugee camps, South Sudan

	Doro		Yusuf Batil		Gendrassa		Kaya		Classification of public health significance or target (where applicable)
	Number / total	% (95% CI)	Number / total	% (95% CI)	Number / total	% (95% CI)	Number / total	% (95% CI)	
	2019		2019		2019		2019		
WOMEN 15-49 years									
Anaemia (non-pregnant)									
Total Anaemia (Hb <12 g/dl)	83/247	33.6 (27.7-39.9)	63/242	26.0 (20.6-32.0)	128/324	39.5 (34.3-44.9)	54/256	21.1 (16.3-26.6)	High if ≥ 40%
Mild (Hb 11-11.9)	56/247	22.8 (17.6-28.4)	44/242	18.2 (13.5-23.6)	84/324	25.9 (21.5-31.0)	29/256	11.3 (7.7-15.9)	
Moderate (Hb 8-10.9)	26/247	10.5 (7.0-15.0)	17/242	7.0 (4.2-11.0)	44/324	13.6 (10.3-17.7)	23/256	9.0 (5.8-13.2)	
Severe (Hb <8)	1/247	0.4 (0-2.2)	2/242	0.8 (0.1-3.0)	0/324	0	2/256	0.8 (0.1-2.8)	
Programme enrolment pregnant women									
Pregnant women currently enrolled in the ANC	24/30	80.0 (61.4-92.3)	32/35	91.4 (76.9-98.2)	27/30	90.0 (73.5-97.9)	26/29	89.7 (72.7-97.8)	
Pregnant women currently receiving Iron-folic acid pills	21/30	70 (50.6-85.3)	32/35	91.4 (76.9-98.2)	27/30	90.0 (73.5-97.9)	26/29	89.7 (72.7-97.8)	
FOOD SECURITY									
Proportion of HH with a ration card	247/247	100	213/213	100	248/248	100	238/238	100	
Average House Hold Diversity Score(HDDS)		3.7		6.6		6.3		5.6	
Proportion of households *not consuming any* vegetables, fruits, meat, eggs, fish/seafood, and milk/milk products	68/248	27.4 (22.0-33.4)	20/213	9.4 (5.8-14.1)	4/248	1.6 (0.4-4.1)	27/238	39.9 (533.6-46.4)	
Proportion of households consuming either a plant or animal source of vitamin A	100/248	40.3 (34.2-46.7)	69/213	32.4 (26.2-39.1)	138/248	55.7 (49.2-61.9)	95/238	39.9 (33.6-46.4)	

SENS Surveys Nov-Dec 2019; Maban refugee camps, South Sudan

	Doro		Yusuf Batil		Gendrassa		Kaya		Classification of public health significance or target (where applicable)
	Number / total	% (95% CI)	Number / total	% (95% CI)	Number / total	% (95% CI)	Number / total	% (95% CI)	
	2019		2019		2019		2019		
Proportion of households consuming organ meat/flesh meat, or fish/seafood (food sources of haem iron)	154/248	62.1 (55.7-68.2)	193/213	90.6 (85.9-94.2)	237/248	95.5 (92.2-97.8)	63/238	73.5 (67.4-79.0)	
Proportion of households reporting using the following coping strategies over the past month*:									
Borrowed cash, food or other items with or without interest	95/247	38.5 (32.4-44.8)	178/213	36.8 (29.2-45.0)	190/246	77.2 (71.5-82.3)	205/238	86.1 (81.1-90.3)	
Sold any assets that would not have normally sold (furniture, seed stocks, tools, other NFI, livestock etc.)	78/247	31.6 (25.8-37.8)	88/213	15.8 (10.4-22.6)	88/248	35.5 (29.5-41.8)	91/238	38.2 (32.0-44.7)	
Requested increased remittances or gifts as compared to normal	67/247	27.1 (21.7-33.1)	7/211	3.3 (1.3-6.7)	49/248	19.8 (15.0-25.3)	19/238	8.0 (4.9-12.2)	
Reduced the quantity and/or frequency of meals and snacks	141/247	57.1 (50.7-63.3)	111/213	52.1 (45.2-59.0)	113/248	45.6 (39.3-52.0)	151/238	63.5 (57.0-69.6)	
Begged	37/247	15.0 (10.8-20.1)	2/213	0.9 (0.1-3.4)	27/246	11.0 (7.4-15.6)	1/237	3.4 (1.5-6.5)	
Engaged in potentially risky or harmful activities	69/247	28.1 (22.5-34.1)	85/213	39.9 (33.3-46.8)	79/246	32.1 (26.3-38.3)	91/238	38.2 (32.0-44.7)	
Households reporting using none of the listed coping strategies (n=21)	47/248	19.0 (14.3-24.4)	16/213	7.5 (4.4-11.9)	33/248	13.1 (9.3-18.2)	16/238	6.7 (3.9-10.7)	

Interpretation

Table 2: WHO prevalence thresholds for wasting in children aged 6-59 months (low weight-for-height)

Previous prevalence ranges	Label	New prevalence ranges 2018	Label
-	-	<2.5	Very low
<5%	Acceptable	2.5 - < 5	Low
5 – 9%	Poor	5 - <10	Medium
10 – 14%	Serious	10 - <15	High
>15%	Critical	≥ 15	Very high

Table 3: WHO prevalence thresholds for stunting in children aged 6-59 months (low height-for-age)

Previous prevalence ranges	Label	New prevalence ranges 2018	Label
-	-	<2.5	Very low
<20%	Acceptable	2.5 - < 10	Low
20 – 30%	Poor	10 - < 20	Medium
30 – 39%	Serious	20 - < 30	High
>40%	Critical	≥ 30	Very high

Table 4: WHO classification of public health significance for the prevalence of Anaemia (children 6- 59month-old and non-pregnant Women 15-49 years old)[2]

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

Source: WHO (2000)

- The overall nutrition situation in Doro was critical, Yusuf Batil was serious and Gendrassa and Kaya poor as indicated by the Global Acute Malnutrition (GAM) prevalence of 15.0% (12.3-18.0 95% C.I), 14.0% (11.3-17.2 95% C.I) 6.6% (6.1-7.1 95% C.I) and 9.1% (7.0-11.8) respectively based on weight for height z scores.[8] Severe Acute Malnutrition (SAM) was 3.8% (2.6-5.7 CI) in Doro (critical), 2.2% (1.3-3.9 CI) in Yusuf Batil (critical) as per UNHCR classificaion (SAM>2% critical), 0.6% (0.6-0.6 CI) in Gendrassa, and 1.5% (0.7-2.8 CI) in Kaya. Compared to the situation in 2018 the nutrition situation deteriorated in Doro and Yusuf Batil refugee camps with remarkable increase in the prevalence of GAM to high and very high levels. It remained the same in Gendrassa and Kaya with the slight changes in both camps

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[8]

WHO/UNICEF categorization, prevention of malnutrition threshold-children under 5 years of age, December 2018

being statistically insignificant[9]. The change in Kaya however indicates a likely deteriorating situation.

▪ The 2019 global stunting prevalence was very high in all the Maban refugee camps (>30). In Doro stunting was 43.0% (39.0-47.0 95% C.I), Yusuf Batil 46.2% (42.0-50.4 95% C.I), Gendrassa 36.2%, (35.1-37.2 95% C.I) and Kaya 48.2% (44.0-52.4 95% C.I). Stunting prevalence remained the same as in 2018 in all the camps[10]. Stunting is an outcome of inadequate nutrition and repeated bouts of infection during the first 1000 days of a child's life. Stunting before the age of 2 years predicts poorer cognitive and educational outcomes in later childhood.[11]

▪ The coverage of measles vaccination in all the Maban refugee camps met the recommended ≥95% target. The measles vaccination coverage improved in Doro refugee camp as compared to 2018 while in other three camps, the standard was maintained. None of the Maban refugee camps met the vitamin A supplementation target coverage of ≥90%. Yusuf Batil and Kaya had a coverage of 83%, Gendrassa had 78% and Doro had the lowest coverage of 53%. Ante natal coverage ranged between 80-91%. Efforts to maintain the acceptable measles coverage and to strengthen the other areas that have gaps to be ensured in 2020.

▪ 30%, 11%, 16% and 15% of children aged 6-59 months in Doro, Yusuf Batil, Gendrassa and Kaya respectively reported to have had diarrhoea in the last two weeks prior to the survey indicating a morbidity caseload requiring continued provision of health and hygiene services. The proportion of affected children remained the same in Doro and Gendrassa. In Yusuf Batil the proportion increased significantly from 6.6% to 11%. In Kaya the proportion reduced from 19.6 to 14.9%.

▪ In 2019 SENS deworming coverage among children aged 12-59 month was assessed for the first time. Doro, Gendrassa and Kaya did not meet the recommended standard (≥75%) indicating the need to strengthen this intervention. In Yusuf Batil the coverage was 76.6% which met the standard.

▪ Total anaemia prevalence among children aged 6 to 59 months in Maban remained very high above the 40% level of public health significance (WHO classification). The anaemia prevalence range was between 49.9-57.5%. Compared to 2018 the prevalence of anaemia remained the same in Doro and Kaya but deteriorated in both Yusuf Batil and Gendrassa. Children aged 6-23 months tend to be the most affected age group. The anaemia prevalence range for this age group was between 63.7-75.7% accross the four Maban refugee camps. The anaemia prevalence among women of reproductive age 15-49 years (non-pregnant) ranged between 21.1-39.5%. This prevalence is of medium public health significance and is above the expected <20% UNHCR target. Anaemia is recognised to adversely affect the cognitive performance, behaviour and physical growth of infants, preschool and

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[9] P>0.05 therefore the change in prevalence were statistically insignificant
[10] P>0.05 for all camps thus any changes were statistically insignificant
[11] http://www.who.int/nutrition/topics/globaltargets_stunting_policybrief.pdf

school-aged children, and increase the likelihood of associated morbidities. Anaemia is not only an indicator of potential iron deficiency in populations but can also be taken as a proxy indicator for other micronutrient deficiencies. Anaemia prevention and control interventions will require to be reviewed to guide implementation improvement that will be necessary for 2020 program implementation.

- The OTP and TSFP enrolment based on all admission criterion in all the Maban camps reported far below the recommended standard of ≥90%. This indicates the urgent need to strengthen active case finding and referral both at the community level and the screening at the facility level.

- The rate of timely initiation of breastfeeding, exclusive breastfeeding and continued breastfeeding at one year was >90% in all the camps indicating a positive uptake of the breastfeeding messages. Timely introduction of complementary feeding ranged between 17- 52% which is low. The proportion of children aged 6 -23 months that had consumed iron-rich or iron-fortified foods ranged between 34-48% which is also low. After six months of age, adequate and appropriate infant complementary foods become necessary to complement breastmilk in order to meet the energy and other nutrient requirements of the infant (timely complementary feeding). Continued strengthening of IYCF awareness, promotion and support remains key including finding options to diversify the diet to include a better micronutrient profile.

- All households surveyed reported 100% having ration cards indicating households having access to food assistance provided on monthly as GFD though at a 70% ration scale which provides 1491kcal/person/day (recommended 2100kcal/person/day). The household diet diversity score ranged between 3.7-6.6 out of 12 of the food groups. To fill the food gap, majority (87%) of the refugees in Maban reported resulting to negative coping strategies, including borrowing cash or food (36.8-86.1%), selling assets, (15.8-38.2%), reducing quantity or meals frequency (45.6-63.5%), begging (0.9-15%), engaged in risky or harmful activities (28.1-39.9%). This indicates that only an average 13% of the refugee households were not under significant stress to meet their food needs. This needs to increase to cover majority of the population.

RECOMMENDATIONS AND PRIORITIES

Nutrition related

- Maintain and strengthen the implementation of Community based Management of Acute Malnutrition (CMAM) program across all Maban refugee camps. This to provide both therapeutic and supplementary feeding programs including prevention of malnutrition, active case finding through screening, detection, referral through the community outreach programme.   (UNHCR, WFP, UNICEF, IMC, RI, and SP)

- Ensure consistent and regular blanket supplementary feeding programme all year round for children aged 6-59 months (Doro and Yusuf Batil); 6-23 months (Gendrassa and Kaya) and pregnant and lactating women in all refugee camps. This is to continue preventing malnutrition and to cover the nutrient gap these vulnerable groups have considering the predominant grain based general food diet. (UNHCR, WFP, IMC, and RI).

- Conduct the two step MUAC and WHZ scores (for children with MUAC at risk) through monthly screening at the BSFP sites and at the health care facilities' triage area for children 24-59 months in all camps to ensure both high MUAC and WHZ score coverage (IMC and RI).

- Continue to strengthen capacity development of nutrition and health staffs and community workers through training to facilitate quality provision of both curative and preventative components of nutrition (UNHCR, WFP, UNICEF, IMC, SP, and RI).

- Implement the Multi-sectoral IYCF Friendly Framework a UNHCR and Save the Children Initiative for support, promotion, and protection of Infant and Young Child Feeding (IYCF). Promotion of appropriate complementary feeding from six months onwards to be given key attention. (UNHCR, UNICEF, IMC, and RI).

- Strengthen the implementation of the anaemia prevention and control strategy in all refugee camps. This to include early and systematic screening/detection, diagnosis, referral of persons detected with anaemia signs and symptoms, and treatment at the health facilities. Funding allowing an in-depth assessment of the causes of anaemia, should be carried out. (UNHCR, WFP, UNICEF, IMC, RI, and SP).

- Continue regular supportive supervision, monitoring, quarterly/onsite joint monitoring, and yearly program performance evaluations in all camps to assess performance progress and formulate recommendations for any identified gaps (UNHCR, WFP, UNICEF, RI, IMC, and SP).

- Maintain and strengthen nutrition surveillance through quarterly mass MUAC screening. The screening exercise to also be used to ascertain coverage and to refer any malnourished children identified and not enrolled in the nutrition program (IMC and RI).

– Maintain and conduct the annual joint nutrition surveys (SENS) in all camps to analyse trends, assess program impact and facilitate evidence-based recommendations for nutrition programming (UNHCR, WFP, UNICEF, RI, IMC, and SP).

– Continue and strengthen the implementation of the Nutrition Assessment, Counselling and Support for HIV/AIDS and TB patients (UNHCR, WFP, UNICEF, RI, IMC, and SP)

Food security/Nutrition linkages related

– Food assistance providing the recommended 2100kcal/person/day including fortified blended food (CSB+) to facilitate basic nutrition provision at household level (UNHCR and WFP).

– Maintain the implementation of hybrid GFD/cash food assistance including milling assistance which allows better grain utilization. (UNHCR and WFP).

– Ensure routine monthly food basket monitoring to ensure that refugees receive their entitlement in addition to ensuring identified gaps are addressed in a timely manner (UNHCR, WFP, SP, and ACTED).

– Scale up the establishment of various agro-nutrition, food security and livelihood interventions in Maban to promote diet diversity and complement the general food ration (UNHCR, WFP, RI, and ACTED).

Health/Nutrition Linkages related

– Maintain and strengthen the provision of comprehensive primary health care programme to reduce the disease burden among the refugees in Maban. Key attention to be provided to the top morbidities including malaria prevention interventions that include blanket mosquito net distribution and bi-yearly indoor residue spraying (UNHCR, IMC, RI, MI and SP).

– Strengthen Vitamin A supplementation, deworming and maintain routine Expanded Program of Immunization (EPI) and campaigns as per National Ministry of Health schedule. (UNHCR, UNICEF, IMC, and RI).

– Maintain and strengthen reproductive health interventions at both the health facilities and community level. This to include 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 among women thus improved nutrition for both the mothers and their children. (UNHCR, RI, IMC, and SP).

Water Sanitation and Hygiene promotion related

– Maintenance of adequate clean water provision and provision of adequate water storage containers (UNHCR and ACTED).

- Hygiene promotion, latrine coverage and provision of adequate soap strengthening to facilitate the prevention and control of infections like diarrhea and other hygiene related illnesses. (UNHCR, IMC, RI, ACTED and SP).

1. INTRODUCTION

This report presents the results of nutrition survey conducted in Maban refugee camps from 16th November to 4th December 2019.
It is divided into the following sections:
- *Background*: This section sets out background information related to the health, nutrition and food security situation in the above refugee camps;
- *Methodology;*
- *Results:* presents the findings;
- *Limitations;*
- *Discussion; and*
- *Recommendations*.

1.1. Background

Maban County is in Upper Nile State in the north east of the Republic of South Sudan (RSS). It hosts Sudanese refugees fleeing from conflict in Blue Nile State in Sudan. The refugees reside in four camps which include Doro, Yusuf Batil, Gendrassa and Kaya. Maban is semi-arid region with sparse vegetation and no surface water. The climate is harsh with extreme temperatures during the dry season and occasional flooding in the rainy season. Rainy season in Maban runs from May through October.

The refugees in Maban have limited access to additional sources of income, the environment is not suitable for agricultural activities, and very few manage to keep livestock. Most of the refugees are largely dependent on the general food ration from World Food Programme (WFP) which is provided on monthly basis.

The land surface in Maban is composed of clay soil, which is impassable during the rainy season, however significant work has been carried out between and within camps to upgrade the quality of roads using marram. This ensures that humanitarian work is not hampered. Each camp has a market area which is accessible to all refugees. There are two main markets; one located in Bunj town that's run by the local host community and businesspeople from Ethiopia and a second located in south west of the county that serves Gendrassa, Batil, and Kaya.

In Maban, health, nutrition, water, sanitation and hygiene promotion, food security and livelihood interventions are provided by IMC, RI, SP, and ACTED with support from UNHCR in collaboration with WFP and UNICEF. MSF-B also provide health and nutrition services in Doro camp as operational partner. WFP main role is to ensure that refugees' food security needs are adequately addressed through provision of general food ration on monthly basis and the provision of supplementary feeding program supplies while UNICEF in collaboration with UNHCR provides support to the therapeutic nutrition programs.

Description of the population

There was a total population of 150,041 Sudanese refugees registered in the four camps as of end of October 2019. Doro hosted 60,943 refugees, Batil hosted 47,224 refugees, Gendrassa hosted 17,844 refugees, and Kaya hosted 24,030 refugees (Source; UNHCR ProGres). Children less than 5 years accounted for 18.7%, 19.0%, 16.3%, and 18.9% of the population in Doro, Batil, Gendrassa, and Kaya refugee camps respectively.

The main ethnic groups in the four camps are Ingassana, Uduk, jumjum, Nuba, Dafur, and magaja from Sudan. Islam and Christianity are the two dominant religions practiced in the camps. In, Sudan the country of origin, the refugees were agriculturalist and kept some herds of livestock such as; goat, sheep, and cattle. Sorghum, simsim, and maize are some main staple foods grown by the refugees. The ethnic profile of the camps changed since May 2017 following ethnic clashes between Uduk-majority and Ingassana tribes in Doro refugee camp. This led to the relocation of Ingassanas from Doro to the three other camps (Ingassana majority). Consequently, Doro hosts Uduk-majority while Batil, Gendrassa and Kaya became Ingassana-hosting camps.

Food security situation

The registered refugees in Maban camps are majorly dependent on general food ration provided by WFP. In Maban, the delivery and distribution of general food assistance is carried out by two partners, each serving two camps (Samaritan Purse in Doro and Yusuf Batil refugee camps and ACTED in Kaya and Gendrassa refugee camps). Throughout 2019, all registered refugees in the four camps received general food ration at a 70% scale following the 30% reduction since August 2015 due to funding constraints. The ration continues to not have a fortified food in it. In 2019, hybrid cash and in-kind food assistance was provided. Cereals were provided 100% in kind; pulses and cooking oil were provided both in kind and by cash . Salt and milling assistance were provided 100% in cash. There was no pipeline break from January to September 2019. Following the flooding season, October and November 2019 distribution cycles faced pipeline breakages due to access challenges. In October food assistance relied on the community leaders distributing what was available in the respective camps' WFP warehouses. In November, WFP through air drops managed to provide a partial 33% ration scale. During these two months the food was insufficient.

Table 5 : General Food Distribution Rations by months

Ration in g/p/d	Standard	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct & Nov	Dec
Cereals	500g	350	350	350	350	350	350	350	350	350	350	350
Lentils	50g	35	35	35	35	35	35	35	35	35	35	35
Veg oil	35g	21	21	21	21	21	21	21	21	21	21	21
Salt	5g	5	5	5	5	5	5	5	5	5	5	5
CSB+	50g	0	0	0	0	0	0	0	0	0	0	0
Kcal	2100	1491	1491	1491	1491	1491	1491	1491	1491	1491	1491	1491

% of standard (recommended 2100kcal) met	70	70	70	70	70	70	70	70	70	70	70
Cash distributed in SSP	850	850	860	860	850	840	850	530	1140	1600	820

South Sudan implements a biannual Post Distribution Monitoring (PDM) cycle. PDM was conducted once in 2019 (in March) by WFP with support from GFD partners and UNHCR. Although the second monitoring was conducted in Oct, it wasn't completed due to the flooding challengesRegular Food Basket Monitoring (FBM) is conducted every month during GFD in all Maban camps.

Though substantial impact is yet to be realized, livelihood activities that include agriculture, training and small-scale businesses continued in 2019. Agricultural outputs were greatly affected by the flooding in 2019. Demonstration sites located in each camp were used to train mothers and/or care takers discharged from nutrition programs. This aimed to encourage having household kitchen gardens and to also promote agriculture production both of which are nutrition sensitive activities that can contribute to better nutrition outcomes.

Health situation

In 2019 health care and nutrition services in Maban refugee camps were provided by three partners in five PHCCs and four PHCUs. In Doro refugee camp services were delivered by International Medical Corps (IMC) and Médecins Sans Frontier -Belgium (MSF-B). IMC also provided services in Gendrassa and Kaya. In Yusuf Batil health and nutrition services were provided by Relief International (RI). Cases that could not be managed at the PHCCs were referred to two main referral hospitals managed by RI (Gentil) and SP (Bunj) in Maban. All these health facilities served both refugees and the host community. In addition to the above malaria and vector control interventions including indoor residual spraying, malaria supplies gap filling, larvaciding, and health staff training were provided in 2019. This was supported by Mentor Initiative. Community outreach activities were also carried out using care groups in Yusuf Batil camp and community health promoters in Doro, Kaya, and Gendrassa camps. In all camps, there is health and nutrition sectoral committees that supports the care group and community health promoters. These structures provide community and health facility linkages. This played a key role in improving refugee health seeking behaviour.

Based on the UNHCR Health Information System data, the average Crude Mortality Rate (CMR) and Under Five Mortality Rate (U5 MR) across Maban refugee camps were 0.27 and 0.77 respectively. These rates remained within the standard thresholds of 0.75/1000/month and 1.5/1000/month.

Figure 1 : **Crude and under-5 mortality rates (Jan-Dec 2019) – Maban refugee Camps**
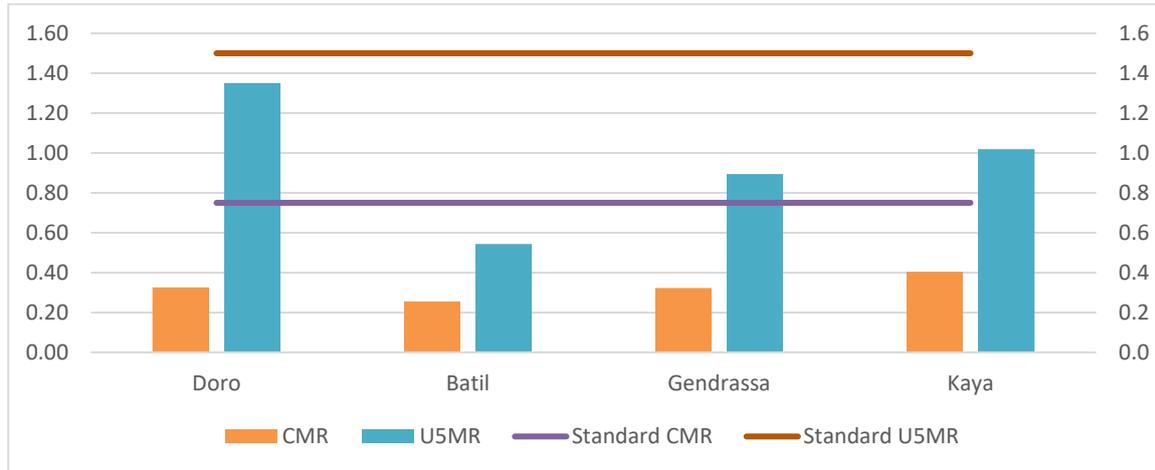
In 2019 the top five causes of morbidities included Upper Respiratory Tract Infections (URTI), malaria, Lower Respiratory Tract Infections (LRTI), skin diseases, and diarrhoea accounting for more than two-thirds of the overall morbidities. Malaria prevention in Maban interventions through MI support included indoor residual spraying in the second quarter of 2019 in all refugee camps, larval source management and proper use and maintenance of mosquito nets . Due to funding limitations, there was no blanket mosquito net distribution within the year. Long lasting insecticide nets were only provided to targerted groups (pregnant women).

In 2019, Maban county including the four refugee camps was hit by flooding that started in July, intensified in Oct through to November. This disrupted the provision of health, nutrition, WASH, and other activities in the camps. Services were reduced to emergency/ critical lifesaving services. Refugee workers (with remote support) provided this crucial service. This was due to access challenges that could not allow skilled staffs to travel to the camps, limited delivery of medical supplies and referrals of patients to Bunj and Gentil hospitals.

Nutrition situation
Nutrition services provided at the four refugee camps include:

- 8 Targeted Supplementary Feeding Programmes (TSFP) for moderately acute malnourished children aged 6-59 months using Plumpy'Sup or Corn Soya Blend Plus Plus (CSB++).
- 8 Outpatient therapeutic programmes for severely acute malnourished (SAM) children without medical complication. 3 Stabilisation Centres (SC) for SAM management with medical complication – in Doro (MSF-B); in Bunj Hospital (SP) and Yusuf Batil-Gentil (RI).
- Blanket Supplementary Feeding Program (BSFP) targeting children 6 to 23 months and Pregnant and Lactating Women (PLW). Both children and PLW receive 200g/person/day of CSB++. There were no food supplies to BSFP during survey period.

- Infant and young child feeding support and promotion programme provided at both the facility and community level. At the facility level this is integrated into the primary health care components i.e. Outpatient Department (OPD); Expanded Programme for Immunisation (EPI); Ante Natal Care (ANC), Post-Natal Care (PNC) Maternity and Nutrition. At the community level, community structures are used and include Community Health Promoters (CHPs), Care Groups (CG) and Mothers Support Group (MSGs).
- MUAC screening of children aged 6-59 months and Pregnant and Lactating Women (PLW) at health care facilities and nutrition centres. At the community level this includes active case finding on daily basis by CHPs and quarterly mass MUAC screening.
- Anaemia prevention and control measures mainstreamed into the health, nutrition, and livelihood interventions in all the camps.
- Capacity building. Several CMAM trainings were conducted at Maban and Juba level for partner nutrition and health staff. The main objective of the trainings was to equip staff with skills and knowledge that would ensure quality nutrition programming in all camps. From the program monitoring this continues to allow effective CMAM implementation.Maban faces high staff turn-over necessitating frequent trainings.

In 2019, a total of 6003 children 6 to 59 months were admitted into the TSFP in all Maban refugee camps. In OTP and SC, the total admissions were 2667 and 815 respectively. Admissions trends across all camps had a peak in the months of May through August 2019. This could be due to high prevalence of respiratory tract infections and malaria at the start of rainy season.

Figure 2: Number of Admissions to Treatment Programmes for MAM and SAM among Children aged 6-59 Months -Maban refugee camps Jan-Dec 2019
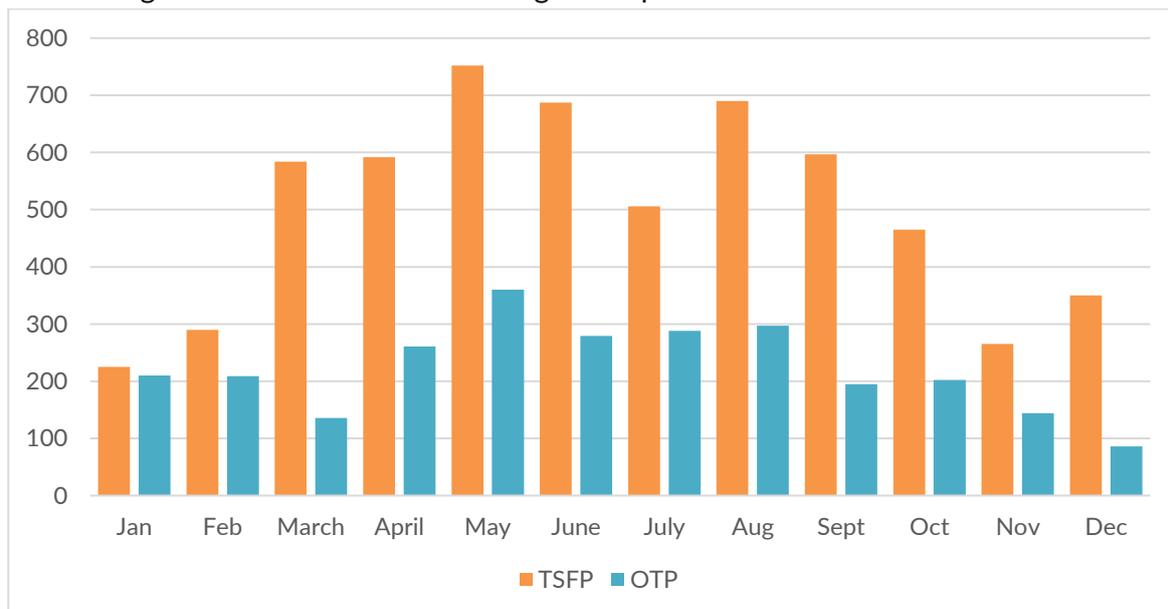
Quarterly nutrition surveillance in each camp using Mid Upper Arm Circumference (MUAC) continued to be carried out in 2019. The proportion of children aged 6-59 months that had

<12.5cm is as per the table below. Quarter 2 had the highest proportion which could be due to the increased morbidity caseload during that period.

Table 6: 2019 Quarterly Mass MUAC and/or Oedema screening trend; Maban refugee camps

	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Average Maban MUAC <12.5cm and/ or Oedema prevalence	4.7%	6%	4.4%	4.4%

Wash situation

Maban refugee camps rely on ground supply water for their daily needs. ACTED was the WASH partner for all the four Maban refugee camps in 2019. Maban refugee camps had 34 motorized boreholes (13 in Doro, 10 in Batil, 7 in Gendrassa, and 4 in Kaya camps) and 40 handpumps (17 in Doro, 7 in Batil, and 16 in Gendrassa camps) in 2019. The operation of the motorized submersible pumps (boreholes) was carried out using solar power and fuel systems. Solar energy provided 35-40% of the water production energy demand. The water system facilitated the provision of an average daily potable water per capita of 17.9 litres per person per day. Water quality monitoring was regularly followed up by checking the free residual chlorine (FRC) and turbidity levels. The FRC was in the range of 0.3-1mg/litres which is within the recommended standard.

The latrine coverage in Maban was 24.1 %. The 2019 flooding had huge negative impact on the water and sanitation services. Greater than 43% household latrines and 53% of institutional latrines collapsed during the flooding. The floods also damaged the water generators, hand pumps, drainage and distribution systems. Rehabilitation has been ongoing including restoring the water system (rehabilitation and flushing out 70 wells), construction of 1233 household latrines, 86 institutional latrine stances, decommissioning 2160 latrines and hygiene promotion under the flood response. WASH related soap and water storage containers remained inadequate with only 250g of soap provided per person per month and replacement of container only being targeted to vulnerable groups.

1.2. Survey Objectives

Specific primary objectives of the survey
      a. To determine the prevalence of acute malnutrition among children 6-59 months.
      b. To determine the prevalence of stunting among children 6-59 months.
      c. To determine the coverage of measles vaccination among children 9-59 months.
      d. To determine the coverage of vitamin A supplementation in the last six months among children 6-59 months.
      e. To determine the coverage of de-worming in the last six months among children 12-59 months.
      f. To assess the two-week period prevalence of diarrhoea among children 6-59 months.

> g. To determine the prevalence of anaemia among children 6-59 months and women of reproductive aged 15-49 years (non-pregnant).
> h. To investigate IYCF practices among children 0-23 months.
> i. To determine the coverage of ration cards and the duration the GFD ration lasts for recipient households.
> j. To determine the extent to which negative coping strategies are used by households.
> k. To assess household dietary diversity.
> l. To establish workable recommendations on actions to be taken to address the situation.

Secondary objectives:

> a. To determine the enrolment coverage of targeted supplementary feeding programme (TSFP), and outpatient therapeutic feeding programme (OTP) for children 6-59 months.
> b. To determine enrolment into Antenatal Care clinic and coverage of iron-folic acid supplementation in pregnant women.

2. METHODOLOGY

In Maban refugee camps, a cross-sectional survey was conducted using the UNHCR Standardized Expanded Nutrition Survey (SENS) version 2, 2013 guidelines http://sens.unhcr.org/ and Standardized Monitoring and Assessments of Relief and Transitions (SMART) methodology https://smartmethodology.org/ . Systematic random sampling was used to identify the survey respondents.

2.1. Sample size

The sample size was calculated using the Emergency Nutrition Assessment (ENA) for Standardized Monitoring and Assessment of Relief and Transitions (SMART) software version July 9th, 2015 following UNHCR SENS guidelines version 2 (2013). The GAM prevalence was estimated based on the 2018 survey results. The higher confidence interval for all the refugee camps was used as little was known about the progress made since the last surveys. The percentage of under-5 and average household size was derived from the UNHCR ProGres database. A non-response rate of 10% was used as household listing was carried before the survey data collection.

Table 7: Parameter used to calculate sample size

Location	Doro	Batil	Gendrassa	Kaya
Total camp population (UNHCR ProGres Oct 2019)	60943	47224	17844	24030
% population of U5 (UNHCR ProGres Oct 2019)	18.7	19	16.3	18.9
Estimated GAM prevalence (upper C.I SENS 2018) (%)	8.8	12.1	9.7	9.1

± Desired precision (%)	3	3.5	3	3
Non-response rate (%)	10	10	10	10
Average household size	4.5	5	4.5	4.6
Number of children (ENA)	343	320	327	325
Number of households for Anthropometry and health	503	416	551	462
Number of households for children anaemia	503	416	551	462
Number of households for IYCF	503	416	551	462
Number of households for women anaemia (half of HHs as per SENS guidelines)	251	208	276	231
Number of households for food security (half of HHs as per SENS guidelines)	251	208	276	231

As the population of children U5 was less than 10,000 in Batil, Gendrassa and Kaya camp a correction factor was used to calculate the sample size in ENA for SMART software during sample size calculation. The household sample size for anthropometry and health was used for IYCF and children anaemia mudole. Following UNHCR SENS guidelines half the sample size of anthropometry (every other household) was used as the sample size for women anaemia and food security modules. See table above for details.

2.2. Sampling Procedure; selecting households and individuals

Systematic random sampling was used to identify the survey respondents. The camps were divided into zones. Under the zones all households were physically labelled with unique numbers per zone/household in each camp. To reduce the non-response rate and ensure results were representative of people living in the camps at the time of the survey, empty shelters[12] as verified through neighbours were labelled but not included in the sampling frame. Using the list generated from the physical counting and labelled households a sampling interval for each camp was determined by dividing the total number of verified households by the estimated sample. The first household was thereafter determined randomly using the lottery method by drawing a random number within the sampling interval. The interval was applied across the sampling frame to generate a list of households to be surveyed in the field. Each team was provided with a list of households to be surveyed daily.

All the eligible household members were included in the survey; that is all children 6 to 59 months (0-23 months for IYCF) and women 15 to 49 years in a sampled household. The interview was 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. The survey defined a household as the number of people who regularly stay together and eat from the same pot.

In the event of an absent household or individual, the team members returned to the household during the day. If the household or individual was not found after returning, the

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[12] An empty house/tent or shelter was considered as abandoned and excluded from the nutrition survey if no one was present in that house/tent for the last one month

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 child was disabled with a physical deformity preventing certain anthropometric measurements, the child was still included in the assessment for the relevant indicators. If it was determined that a selected household did not have any eligible children, the relevant questionnaires were administered to the household.

2.3. Questionnaire and measurement methods

The questionnaires are attached in attached under **Appendix 3**

Mobile phone questionnaires using Open Data Kit (ODK) android software for all the modules was used for data collection. The questionnaires were prepared in English and administered in local and Arabic language. The questionnaires were pre-tested before the survey.

Four module questionnaires from SENS were designed to provide information on the relevant indicators of the different target groups as indicated in the survey objectives. The four-module questionnaire covered the following areas and the following measurements:

Children 6-59 months- This included questions and measurements of children aged 6-59 months. Information was collected on anthropometric status, oedema, and enrolment in selective feeding programmes, immunisation (measles), vitamin A supplementation, de-worming, and morbidity from diarrhoea in past two weeks before the survey and haemoglobin status.

Infant 0-23 months- This included question on infant and young child feeding for children aged 0- 23 months.

Women 15-49 years- This included questions and measurements of women aged 15 – 49 years. Information was collected on women's pregnancy status, coverage of iron-folic acid

pills and ANC attendance for pregnant women, and haemoglobin status for non-pregnant women.

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

Measurement methods

Household-level indicators
Food security: The questionnaire used was from UNHCR's Standardized Expanded Nutrition Survey (SENS) Guidelines for Refugee Populations Version 2 (2013).

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 an EPI card, child health card or birth notification if available. If no reliable proof of age was available, age was estimated in months using a local event calendar and recorded in months on the questionnaire/Phone. If the child's age could not be determined by using a local events calendar or by probing, the child's length/height was used for inclusion; the child had to measure between 65 cm and 110 cm.

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

Weight of children 6-59 months: measurements were taken to the closest 100 grams using an electronic scale (SECA scale). All children were weighed without clothes. 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.

Height/Length of children 6-59 months: children's height or length was taken to the closest millimetre using a wooden height board (Shorr Productions). 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 those greater than or equal to 87cm were measured standing up.

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

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 a standard tape. MUAC was recorded in millimetres.

Child enrolment in selective feeding programme for children 6-59 months: selective feeding programme coverage was assessed for the outpatient therapeutic programme and for the

supplementary feeding programme. This was verified by card or by showing images of the products given at the different programs

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

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

Deworming in last 6 months in children 12-59 months: whether the child received a deworming tablet over the past six months was recorded by asking the caregiver to recall if information was not available on the EPI card. A deworming tablet sample was shown to the caregiver when asked to recall.

Haemoglobin concentration in children 6-59 months and women 15-49 years: Hb concentration was taken from a capillary blood sample from the fingertip and recorded to the closest gram per decilitre by using the portable HemoCue Hb 301 Analyser (HemoCue, Sweden). If severe anaemia was detected, the child or the woman was referred for treatment immediately.

Diarrhoea in last 2 weeks in children 6-59 months: an episode of diarrhoea is 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 prior to the survey.

ANC enrolment and iron and folic acid pills coverage: if the surveyed woman was pregnant, it was assessed whether she was enrolled in the ANC programme and was receiving iron-folic acid pills. An iron-folic acid pill image 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 was assessed based on UNHCR Standardized Expanded Nutrition Survey (SENS) Guidelines for Refugee Populations version 2 (2013).

Referrals: Children aged 6-59 months were referred to health centre/post for treatment when MUAC was < 12.5 cm, WHZ <-2 z-score or oedema was present.

2.4. Case definitions and calculations

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

Table 8: Definitions of acute malnutrition using weight-for-height and/or oedema in children 6–59 months

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

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

Table 9: Definitions of stunting using height-for-age in children 6–59 months

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

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

Table 10: Definitions of underweight using weight-for-age in children 6–59 months

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

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

Table 11: MUAC malnutrition cut-offs in children 6-59 months

Categories of MUAC values
<125 mm
≥ 115 mm and <125 mm
< 115 mm

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

Coverage of SFP programme (%) =

$$100 \text{ x}$$

No. of surveyed children with MAM according to SFP criteria who reported being registered in SFP

No. of surveyed children with MAM *according to SFP admission criteria*

Coverage of OTP programme (%) =

100 x

No. of surveyed children with SAM according to OTP criteria who reported being registered in OTP

No. of surveyed children with SAM *according to OTP admission criteria*

Infant and young child feeding practices in children 0-23 months: Infant and young child feeding practices were assessed based on the UNHCR SENS IYCF module (Version 2 (2013) that is based on WHO recommendations (WHO, 2007 as follows):

Timely initiation of breastfeeding in children aged 0-23 months:
Proportion of children 0-23 months who were put to the breast within one hour of birth
Children 0-23 months who were put to the breast within one hour of birth

Children 0-23 months of age

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

Infants 0–5 months of age

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

Children 12–15 months of age

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

Infants 6–8 months of age

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

Children born in the last 24 months

Continued breastfeeding at 2 years:

Proportion of children 20–23 months of age who are fed breast milk
<u>Children 20–23 months of age who received breast milk during the previous day</u>
<div align="center">Children 20–23 months of age</div>

Consumption of iron rich or iron fortified foods in children aged 6-23 months
Proportion of children 6–23 months of age who receive an iron-rich or iron-fortified food that is specially designed for infants and young children, or that is fortified in the home.
<div align="center">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 <u>fortified in the home with a product that included iron during the previous day</u></div>
<div align="center">Children 6–23 months of age</div>

Bottle feeding:
Proportion of children 0-23 months of age who are fed with a bottle
<u>Children 0–23 months of age who were fed with a bottle during the previous day</u>
<div align="center">Children 0–23 months of age</div>

Anaemia in children 6-59 months and women of reproductive age: Anaemia is classified according to the following cut-offs in children 6-59 months and non-pregnant women of reproductive age. Anaemia cut-offs for pregnant women should be adjusted depending on the stage of pregnancy (gestational age). Pregnant women are not included in routine UNHCR nutrition surveys for the assessment of anaemia due sample size issues (usually a small number of pregnant women is found) as well as the difficulties in assessing gestational age in pregnant women.

Table 12: Definition of anaemia (WHO 2000)

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

2.5. Classification of public health problems and targets

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

Table 13: Classification of public health significance for children under 5 years of age

Prevalence %	Very High	High	Medium	Low	Very low
Low weight-for-height	≥15	10-<15	5-10	2.5-<5	<2.5

Low height-for-age[13]	≥30	20-<30	10-<20	2.5-<10	<2.5
Label	Critical	Serious	Poor	Acceptable	
Low weight-for-age[14]	≥30	20-29	10-19	<10	

Selective feeding programmes:
UNHCR Strategic Plan for Nutrition and Food Security 2008-2012 includes the following indicators. The table below shows the targeted performance indicators for malnutrition treatment programmes according to UNHCR Strategic Plan for Nutrition and Food Security 2008-2012 (same as Sphere Standards).

Table 14: Performance indicators for selective feeding programmes (UNHCR Strategic Plan for Nutrition and Food Security 2008-2012) *

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

* Also meet SPHERE standards for performance

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

Vitamin A supplementation coverage: UNHCR Strategic Plan for Nutrition and Food Security (2008-2012) states that the target for vitamin A supplementation coverage for children aged 6-59 months by camp, country and region should be >90%.

Anaemia data: UNHCR Global Strategy for Public Health (2017-2019) 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 <20%. The severity of the public health situation should be classified according to WHO criteria as shown in the table below.

Table 15: Classification of public health significance (WHO 2000)

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

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[13] WHO/UNICEF categorization, prevention of malnutrition threshold-children under 5 years of age, December 2018
[14] WHO (1995) Physical Status: The Use and Interpretation of Anthropometry and WHO (2000) The Management of Nutrition in Major Emergencies

2.6. Training, coordination and supervision

The survey was coordinated by Terry Theuri (Nutrition and Food Security Officer-Juba), Abe John M Kiri (Senior Nutrition and Food Security Associate), Dr Pepe Beavogui (Associate Public Health Officer) with support from Dr Sadia Azam (Associate Public Health Officer), Harriet George (WFP-Maban), Alule Bosco (RI) and Mawa Erastos, Alfred Nyolija, Alex Yope, and Muki Michael Gordon (IMC).

Due to the unique Maban camps' profile following the May 2017 conflict between the two main ethnicities of Uduk in Doro and Ingassana in the three camps (Yusuf Batil, Gendrassa, and Kaya), two separate survey teams were necessary to conduct the survey. A total of six survey teams composed of four members each (one team leader, one haemoglobin measurer, one anthropometric measurer and one anthropometric/haemoglobin measurement assistant carried out data collection in Doro camp. The survey enumerators were mainly from RI and IMC nutrition staff and CHPs. Data collection for the rest of the three camps (Gendrassa, Kaya and Yusuf Batil) was carried out by ten teams of four members.

Two trainings lasting five and four days respectively were conducted for Doro (from 11th to 15th Nov 2019) and the rest of the three camps (18th to 21st Nov 2019). Survey training topics were shared with the key nutrition focal persons of WFP, IMC, and RI before the training. The training focused on: the purpose and objectives of the survey, roles and responsibilities of each team member, familiarization with the questionnaires by reviewing the purpose of each question; interviewing skills; interpretation of calendar of events and age determination; how to take anthropometric measurements, common errors and data recording using the mobile phone Open Data Kit (ODK) technology. During the training, practical sessions on anthropometric measurements and anaemia testing were carried to allow teams to get adequate practice. Pilot tests were conducted in Doro and Yusuf Batil camp for the teams. Each team was asked to collect data from at least three households that had not been sampled to participate in the survey. After the pilot test, a feedback session was held, and data tools reviewed based on feedback from the teams.

2.7. Data collection

Data collection started in Doro camp on 16th to 23rd November 2019. In Gendrassa data collection was from 22nd to 27th November 2019, Kaya from 28th to 30th November, and Yusuf Batil camp from 2nd to 4th December 2019. Sundays were taken as break to allow enumerators, supervisors, and the coordinators to rest. During data collection the survey teams were supported 2 coordinators from UNHCR and by a team of 5 supervisors from IMC and RI who roved between the teams during the survey exercise. Data was collected using ODK for Android software.

2.8. Data analysis

 At the end of each day's data collection, the survey coordinators from UNHCR 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 synchronization and export. 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 to improve on any identified weak areas.

The ODK exported data in csv format. This was converted to Excel for further analysis. The nutritional indices were cleaned using flexible cleaning criteria from the observed mean (also known as SMART flags in the ENA for SMART software), rather than the reference mean (also known as WHO flags in the ENA for SMART software). This flexible cleaning approach is recommended in the UNHCR SENS Guidelines (Version 2, 2013) in accordance with SMART recommendations. For the weight-for-height index, a cleaning window of +/- 3 SD value contained in the SMART for ENA software was used.

Anthropometry indices were analysed using the ENA for SMART July 9th, 2015 version. Epi Info version 7.2.3.1 was used to analyse all the other data.

3.0 RESULTS

3.1 RESULTS FROM DORO REFUGEE CAMP

Table 16 below shows the actual number of children captured during survey verses targeted children in the survey. By the end of the SENS in Doro refugee camp, >100% of the targeted children were surveyed. See table below for details. The SENS guideline recommends that at least 80% of the targeted children to be surveyed.

Table 16 : Target and actual number captured-Doro refugee camp, South Sudan. (November 2019)

	Target (No.)	Total surveyed (No.)	% of the target
Children 6-59 months	343	613	179%

Anthropometric results (based on WHO Growth standards 2006)

The coverage of age documentation was 84%

Table 17 : Distribution of age and sex of sample-Doro refugee camp, South Sudan. (November 2019)

	Boys		Girls		Total		Ratio
AGE (mo)	no.	%	no.	%	no.	%	Boy: girl
6-17	82	50.3	81	49.7	163	26.6	1.0
18-29	79	51.6	74	48.4	153	25.0	1.1
30-41	64	46.4	74	53.6	138	22.5	0.9
42-53	63	55.3	51	44.7	114	18.6	1.2
54-59	25	55.6	20	44.4	45	7.3	1.3
Total	313	51.1	300	48.9	613	100.0	1.0

The overall ratio of boys: girls of 1.0 indicates that both sexes were equally represented

Table 18 : Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex-Doro refugee camp, South Sudan. (November 2019)

	All n = 601	Boys n = 303	Girls n = 298
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(90) 15.0 % (12.3 - 18.0 95% C.I.)	(48) 15.8 % (12.2 - 20.4 95% C.I.)	(42) 14.1 % (10.6 - 18.5 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(67) 11.1 % (8.9 - 13.9 95% C.I.)	(39) 12.9 % (9.6 - 17.1 95% C.I.)	(28) 9.4 % (6.6 - 13.2 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(23) 3.8 % (2.6 - 5.7 95% C.I.)	(9) 3.0 % (1.6 - 5.5 95% C.I.)	(14) 4.7 % (2.8 - 7.7 95% C.I.)

The prevalence of oedema was 0.0% and the data excluded SMART flags. Boys and girls were equally wasted ; p>0.05.

Figure 3 : Trends in the prevalence of global and severe acute malnutrition based on WHO growth standards in children 6-59 months from 2017 to 2019-Doro refugee camp, South Sudan.
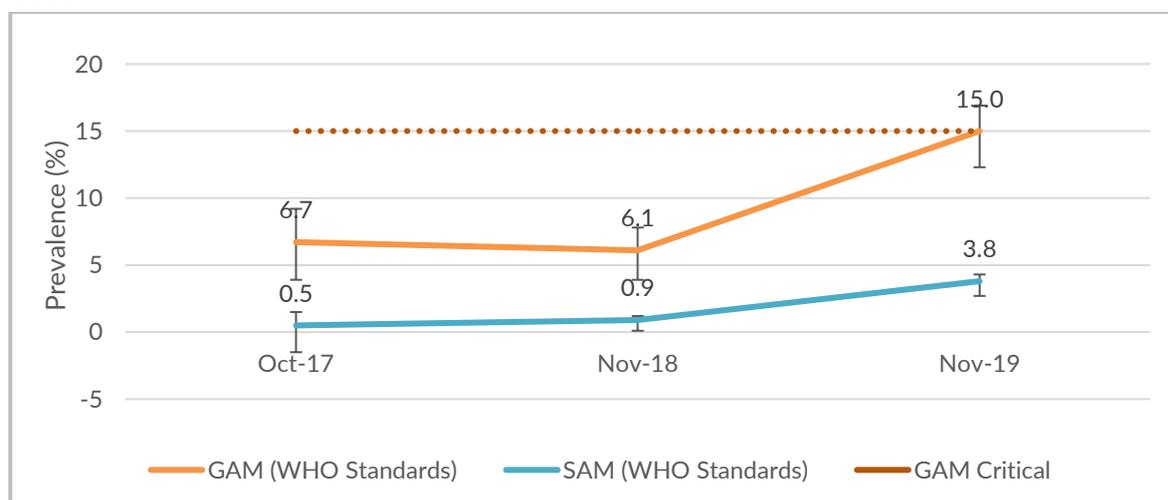
The GAM and SAM prevalence 2019 in Doro deteriorated as compared to 2018 and 2017.

Table 19 : Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema-Doro refugee Camp, South Sudan. (November 2019)

Age (mo)	Total no.	Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-17	160	6	3.8	23	14.4	131	81.9	0	0.0
18-29	150	11	7.3	20	13.3	119	79.3	0	0.0
30-41	136	4	2.9	13	9.6	119	87.5	0	0.0
42-53	111	1	0.9	7	6.3	103	92.8	0	0.0
54-59	44	1	2.3	4	9.1	39	88.6	0	0.0
Total	601	23	3.8	67	11.1	511	85.0	0	0.0

Children aged 18-29 months and 6-17 months tend to be most affected by acute malnutrition

Figure 4 : Trend in the prevalence of wasting by age in children 6-59 months- Doro refugee camp, South Sudan. (November 2019)
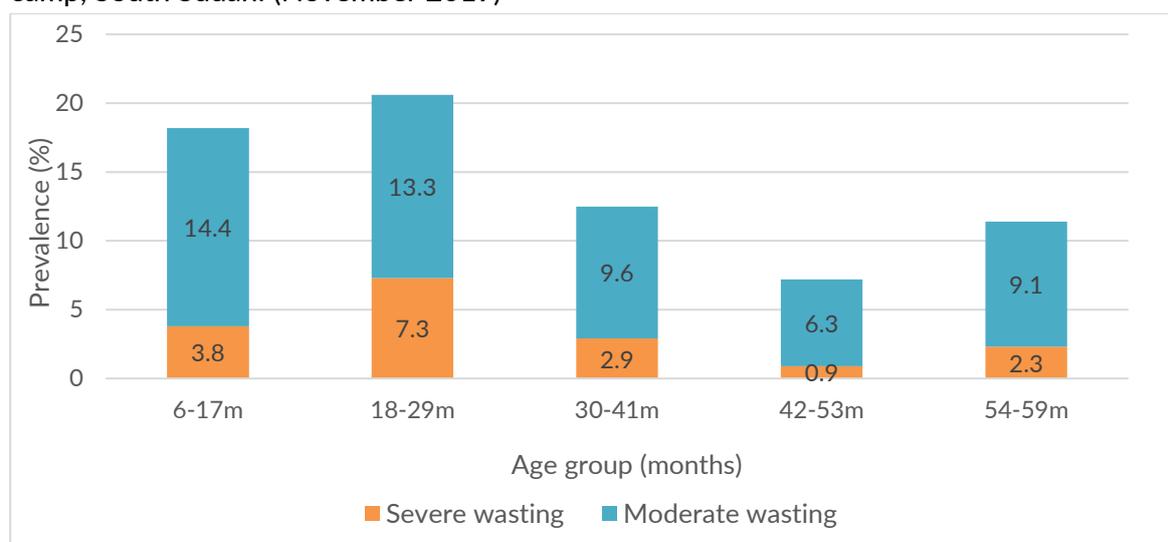
Children 6-17 and 18-29 months of age groups tend to be most affected by wasting indicating higher vulnerability of this age category.

Table 20 : Distribution of acute malnutrition and oedema based on weight-for-height z-scores-Doro refugee camp, South Sudan. (November 2019)

	<-3 z-score	**>=-3 z-score**
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 31 (5.1 %)	Not severely malnourished No. 582 (94.9 %)

Distribution of weight-for-height z-scores-Doro refugee camp, South Sudan. (Based on WHO growth standards) (November 2019)

Figure 5: 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.
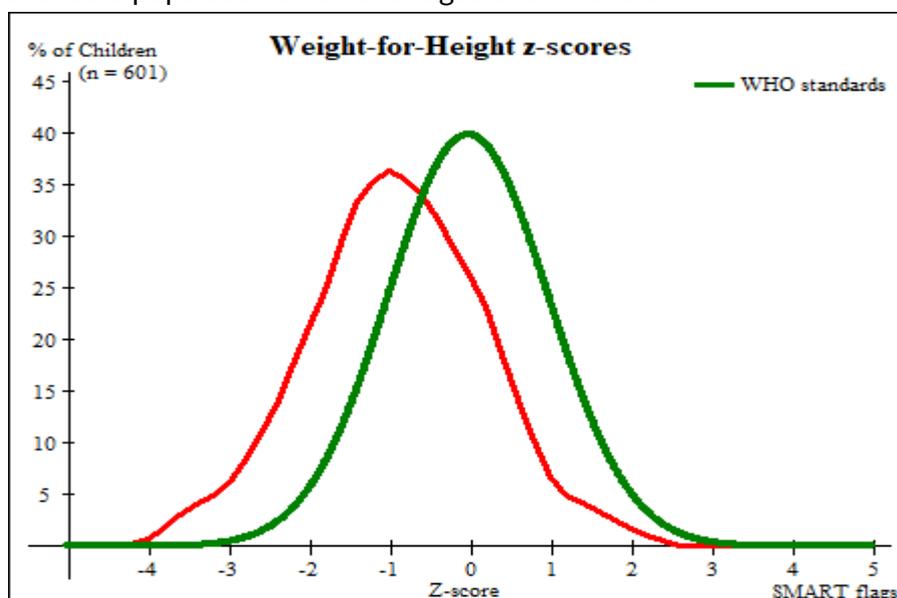
Table 21 : Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex-Doro refugee camp, South Sudan. (November 2019)

	All n = 613	**Boys** n = 313	**Girls** n = 300
Prevalence of global malnutrition (< 125 mm and/or oedema)	(49) 8.0 % (6.1 - 10.4 95% C.I.)	(21) 6.7 % (4.4 - 10.0 95% C.I.)	(28) 9.3 % (6.5 - 13.2 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(43) 7.0 % (5.2 - 9.3 95% C.I.)	(20) 6.4 % (4.2 - 9.7 95% C.I.)	(23) 7.7 % (5.2 - 11.2 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(6) 1.0 % (0.4 - 2.1 95% C.I.)	(1) 0.3 % (0.1 - 1.8 95% C.I.)	(5) 1.7 % (0.7 - 3.8 95% C.I.)

Boys and girls were equally affected by malnutirion based on MUAC; p>0.05.

Table 22: Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema-Doro refugee camp, South Sudan. (November 2019)

Age (mo)	Total no.	Severe wasting (< 115 mm)		Moderate wasting (>= 115 mm and < 125 mm)		Normal (> = 125 mm)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-17	163	1	0.6	21	12.9	141	86.5	0	0.0
18-29	153	4	2.6	13	8.5	136	88.9	0	0.0
30-41	138	1	0.7	9	6.5	128	92.8	0	0.0
42-53	114	0	0.0	0	0.0	114	100.0	0	0.0
54-59	45	0	0.0	0	0.0	45	100.0	0	0.0
Total	613	6	1.0	43	7.0	564	92.0	0	0.0

Children 6-17 months tend to be most affected by wasting measured by MUAC

Table 23 : Prevalence of under-weight based on weight-for-age z-scores by sex-Doro refugee camp, South Sudan. (November 2019)

	All n = 602	Boys n = 307	Girls n = 295
Prevalence of underweight (<-2 z-score)	(231) 38.4 % (34.6 - 42.3 95% C.I.)	(120) 39.1 % (33.8 - 44.6 95% C.I.)	(111) 37.6 % (32.3 - 43.3 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(163) 27.1 % (23.7 - 30.8 95% C.I.)	(82) 26.7 % (22.1 - 31.9 95% C.I.)	(81) 27.5 % (22.7 - 32.8 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(68) 11.3 % (9.0 - 14.1 95% C.I.)	(38) 12.4 % (9.2 - 16.5 95% C.I.)	(30) 10.2 % (7.2 - 14.1 95% C.I.)

Boys and girls tend to be affected by underweight equally ; p>0.05.

Table 24 : Prevalence of underweight by age, based on weight-for-age z-scores-Doro refugee camp, South Sudan. (November 2019)

Age (mo)	Total no.	Severe underweight (<-3 z-score)		Moderate underweight (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-17	161	13	8.1	41	25.5	107	66.5	0	0.0
18-29	148	19	12.8	48	32.4	81	54.7	0	0.0
30-41	136	22	16.2	36	26.5	78	57.4	0	0.0
42-53	112	8	7.1	30	26.8	74	66.1	0	0.0
54-59	45	6	13.3	8	17.8	31	68.9	0	0.0
Total	602	68	11.3	163	27.1	371	61.6	0	0.0

The 18-29 months age group tend to be most affected by underweight

Table 25 : Prevalence of stunting based on height-for-age z-scores and by sex-Doro refugee camp, South Sudan. (November 2019)

	All n = 596	Boys n = 303	Girls n = 293
Prevalence of stunting (<-2 z-score)	(256) 43.0 % (39.0 - 47.0 95% C.I.)	(141) 46.5 % (41.0 - 52.2 95% C.I.)	(115) 39.2 % (33.8 - 44.9 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(163) 27.3 % (23.9 - 31.1 95% C.I.)	(83) 27.4 % (22.7 - 32.7 95% C.I.)	(80) 27.3 % (22.5 - 32.7 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(93) 15.6 % (12.9 - 18.7 95% C.I.)	(58) 19.1 % (15.1 - 23.9 95% C.I.)	(35) 11.9 % (8.7 - 16.2 95% C.I.)

Boys and girls were equally stunted ; p>0.05.

Figure 6 : Trends in the prevalence of global and severe stunting based on WHO growth standards in children 6-59 months from 2017 to 2019-Doro refugee camp, South Sudan. (November 2019)
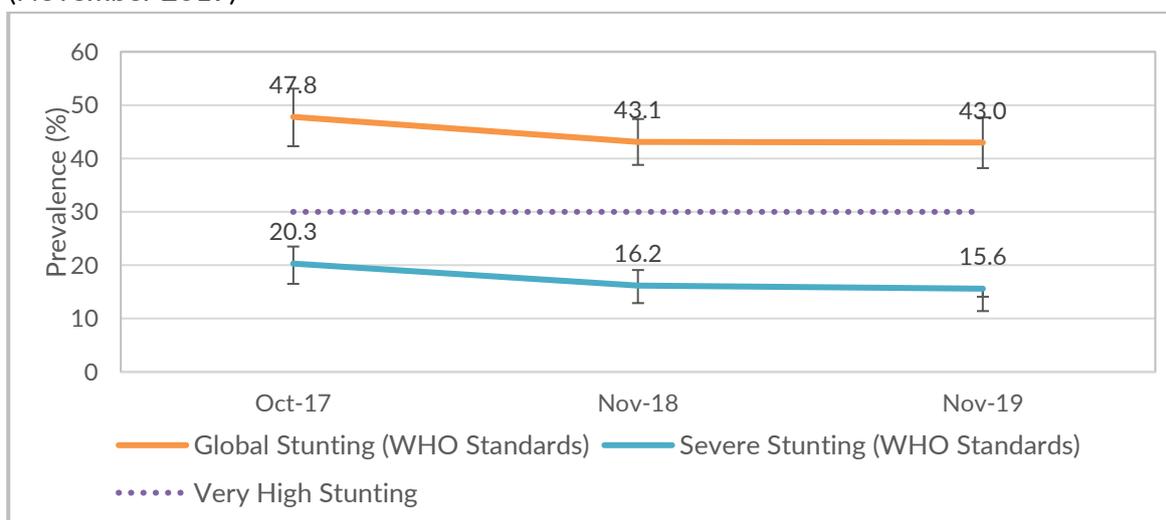
Stunting prevalence remained the same in 2019 as compared to 2018.

Table 26 : Prevalence of stunting by age based on height-for-age z-scores-Doro refugee camp, South Sudan. (November 2019)

Age (mo)	Total no.	Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z- score)		Normal (> = -2 z score)	
		No.	**%**	**No.**	**%**	**No.**	**%**
6-17	162	16	9.9	35	21.6	111	68.5
18-29	147	29	19.7	44	29.9	74	50.3
30-41	132	28	21.2	42	31.8	62	47.0
42-53	110	17	15.5	33	30.0	60	54.5
54-59	45	3	6.7	9	20.0	33	73.3
Total	596	93	15.6	163	27.3	340	57.0

Children 30-41 months tend to be most stunted

Figure 7 : Trends in the prevalence of stunting by age in children 6-59 months-Doro refugee camp, South Sudan. (November 2019)
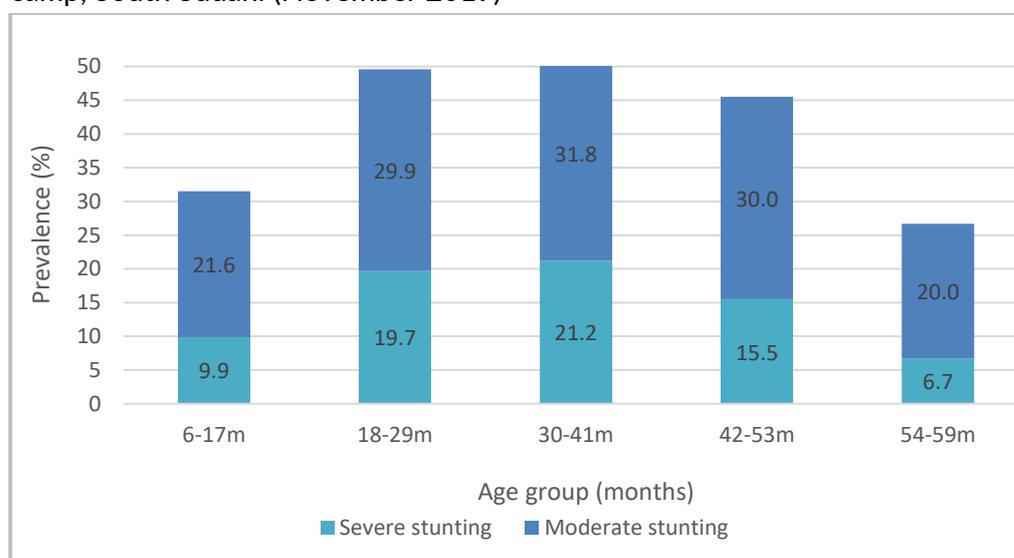
The 30-41 and 18-29 age groups tend to be most affected by stunting

Table 27: Prevalence of overweight based on weight for height cut offs and by sex (no oedma) -Doro refugee camp, South Sudan. (November 2019)

	All n = 601	Boys n = 303	Girls n = 298
Prevalence of overweight (WHZ > 2)	(3) 0.5 % (0.2 - 1.5 95% C.I.)	(1) 0.3 % (0.1 - 1.8 95% C.I.)	(2) 0.7 % (0.2 - 2.4 95% C.I.)
Prevalence of severe overweight (WHZ > 3)	(0) 0.0 % (0.0 - 0.6 95% C.I.)	(0) 0.0 % (0.0 - 1.3 95% C.I.)	(0) 0.0 % (0.0 - 1.3 95% C.I.)

The overweight proportion was the same for boys and girls.

Table 28: Prevalence of overweight by age, based on weight for height (no oedma) -Doro refugee camp, South Sudan. (November 2019)

Age (mo)	Total no.	Overweight (WHZ > 2)		Severe Overweight (WHZ > 3)	
		No.	%	No.	%
6-17	160	1	0.6	0	0.0
18-29	150	0	0.0	0	0.0
30-41	136	1	0.7	0	0.0
42-53	111	0	0.0	0	0.0
54-59	44	1	2.3	0	0.0
Total	601	3	0.5	0	0.0

Table 29 : Mean z-scores, Design Effects and excluded subjects-Doro refugee camp, South Sudan. (November 2019)

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	601	-0.91±1.09	1.00	0	12
Weight-for-Age	602	-1.72±1.05	1.00	0	11
Height-for-Age	596	-1.91±1.09	1.00	0	17

* contains for WHZ and WAZ the children with edema.

Feeding Programme Enrolment Coverage

In Doro refugee camp, the OTP and TSFP enrolment coverage based on both all admission criteria and using MUAC and Oedema only did not meet the recommended standard of ≥90%.

Selective feeding programme

Table 30 : Nutrition treatment programme enrolment coverage based on all admission criteria (weight-for-height, MUAC, oedema) -Doro refugee camp, South Sudan. (November 2019)

	Number/total	% (95% CI)
Proportion of children aged 6-59 months with severe acute malnutrition currently enrolled in therapeutic feeding programme*	20/85	23.5 (15.0-34.0)
Proportion of children aged 6-59 months with moderate acute malnutrition currently enrolled in supplementary feeding programme*	4/24	16.7 (4.7-37.4)

Table 31 : Nutrition treatment programme enrolment coverage based on MUAC and oedema only -Doro refugee camp, South Sudan. (November 2019)

	Number/total	% (95% CI)
Proportion of children aged 6-59 months with severe acute malnutrition currently enrolled in therapeutic feeding programme	19/43	44.2 (29.1-60.1)
Proportion of children aged 6-59 months with moderate acute malnutrition currently enrolled in therapeutic feeding programme	1/6	16.7 (0.4-64.1)

Measles vaccination coverage results

Table 32 : Measles vaccination coverage for children aged 9-59 months (N=572) -Doro refugee camp, South Sudan. (November 2019)

	Measles (with card) n= 320	Measles (with card <u>or</u> confirmation from mother) n= 557
YES	55.9% (51.9-60.0% CI)	97.4% (95.7-98.4 95 % CI)

Measles coverage in Doro camp met the recommended standard of ≥95%.

Vitamin A supplementation coverage results

Table 33 : Vitamin A supplementation for children aged 6-59 months within past 6 months (n=613) -Doro refugee camp, South Sudan. (November 2019)

	Vitamin A capsule (with card) n=90	Vitamin A capsule (with card <u>or</u> confirmation from mother) n=325
YES	14.7% (12.1-17.7 95% CI)	53.0% (49.1-56.9 95% CI)

Vitamin A coverage supplementation in Doro did not meet the recommended standard of >90%

Figure 8 : Trends in the coverage of measles vaccination and vitamin A supplementation in last 6 months in children 6-59 months from 2017 to 2019-Doro refugee camp, South Sudan.
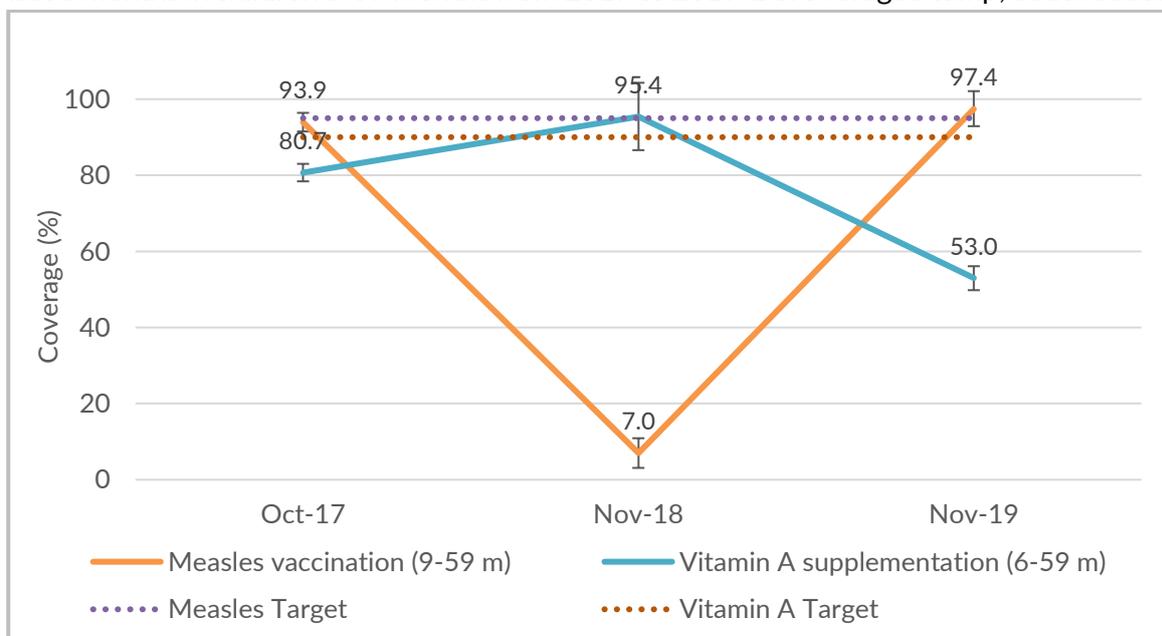
 In 2019 vitamin A supplementation reduced significantly compared to 2018.

Diarrhoea Results

Table 34 : Period prevalence of diarrhea-Doro refugee camp, South Sudan. (November 2019)

	Number/total	% (95% CI)
Diarrhoea in the last two weeks	427/612	30.2 (26.7-34.0)

Deworming

40.9% of children 12-59 months received a deworming tablet in last 6 months prior to the survey.

Table 35: Deworming coverage- Doro refugee camp, South Sudan. (November 2019)

	Number/total	% (95% CI)
Children received a deworming tablet in the last six months (12-59 months)	222/543	40.9 (36.8-45.1)

Deworming coverage was below the recommended target of ≥75%

3.3. Anaemia Children 6 - 59 months

The total anaemia prevalence among children 6 to 59 months was 55.8 % (51.9-59.7, 95% CI) which is of high public health significance. Children 6 to 23 months tend to be most affected compared to the 24-59 months agegroup.

Table 36: Prevalence of total anaemia, anaemia categories, and mean haemoglobin concentration in children 6-59 months of age and by age group- Doro refugee camp, South Sudan. (November 2019)

	6-59 months n = 611	**6-23 months** n=243	**24-59 months** n=370
Total Anaemia (Hb<11.0 g/dL)	(341) 55.8 % (51.9-59.7, 95% CI)	(184) 75.7% (69.8-81.0, 95% CI)	(157) 42.7% (37.7-47.8, 95% CI)
Mild Anaemia (Hb 10.0-10.9 g/dL)	(173) 28.3 % (2.9-32.0, 95% CI)	(87) 35.8% (29.8-42.2, 95% CI)	(86) 23.4% (19.3-28.0, 95% CI)
Moderate Anaemia (7.0-9.9 g/dL)	(161) 26.4% (23.0-30.0, 95% CI)	(95) 39.1% (32.9-45.5, 95% CI)	(66) 17.9% (14.4-22.2, 95% CI)
Severe Anaemia (<7.0 g/dL)	(7) 1.2% (0.6-2.4, 95% CI)	(2) 0.8% (0.1-2.9, 95% CI)	(5) 1.4% (0.58-3.14, 95% CI)
Mean Hb (g/dL) (SD / 95% CI) [range]	10.7 g/dL (10.4-10.9, 95% CI) [3.5-13.8]	10.1 g/dL (9.3-10.9,95% CI) [6.3-12.9]	10.9 g/dL (10.3-11.8, 95% CI) [5.0-14.7]

Children aged 6-23 months tend to be most affected by anaemia

Figure 9: Trends in Anaemia Categories in Children 6-59 Months from 2017 to 2019-Doro refugee camp, South Sudan. (November 2019)
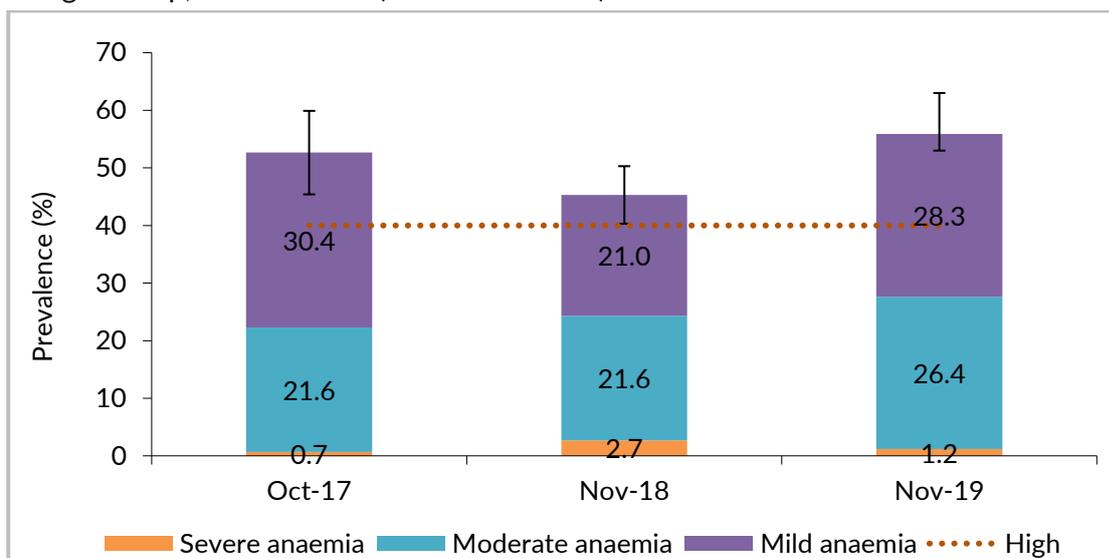
The proportion of moderate and mild anaemia indicated a rising trend in 2019 compared to the 2018

Table 37 : Prevalence of moderate and severe anaemia in children 6-59 months of age and by age group-Doro refugee camp, South Sudan. (November 2019)

	6-59 months n = 611	6-23 months n= 243	24-59 months n= 368
Moderate and Severe Anaemia (Hb<10.0 g/dL)	(168) 27.5% (24.1-31.2, 95% CI)	(97) 39.9% (33.7-46.4, 95% CI)	(71) 19.3% (15.6-23.6, 95% CI)

Figure 10 : Trend of total anaemia (<11 g/dl), and moderate and severe anaemia (<10 g/dl) among children aged 6-59 months from 2017 to 2019-Doro refugee camp, South Sudan. (November 2019)
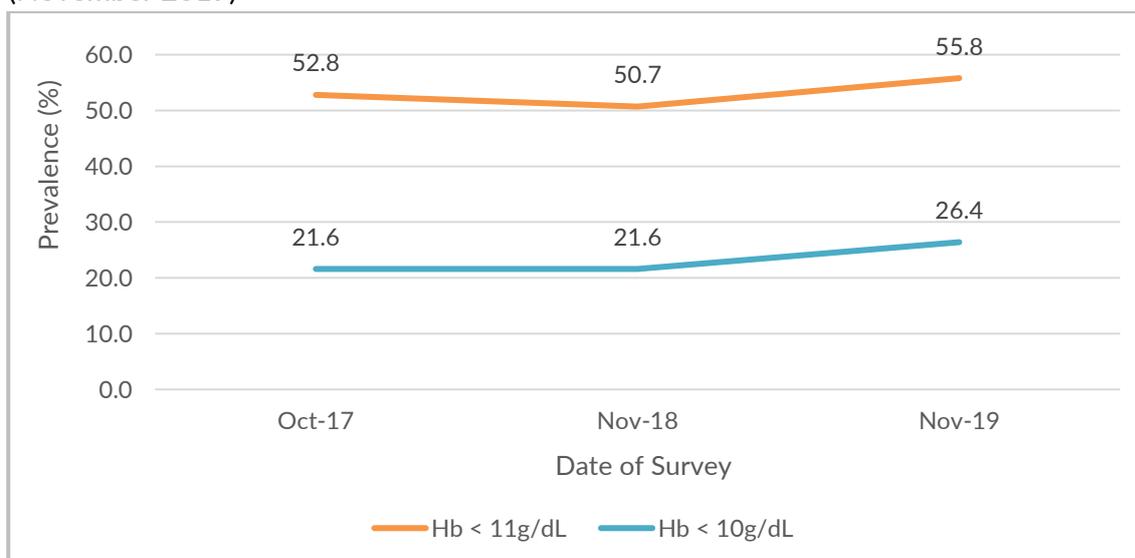
Although not statistically significant (p>0.05) there is an indication of an increasing trend in 2019 compared to 2018 and 2017

IYCF Children 0-23 Months

Table 38 : Prevalence of Infant and Young Child Feeding Practices Indicators- Doro refugee camp, South Sudan (November 2019)

Indicator	Age range	Number/ total	Prevale nce (%)	95% CI
Timely initiation of breastfeeding	0-23 months	306/323	94.7	(91.7-96.7)
Exclusive breastfeeding under 6 months	0-5 months	65/80	81.3	(71.0-89.1)
Continued breastfeeding at 1 year	12-15 months	59/60	98.3	91.1-100
Continued breastfeeding at 2 years	20-23 months	39/47	83.0	(69.2-92.4)
Introduction of solid, semi-solid or soft foods	6-8 months	21/41	51.2	(35.1-67.1)
Consumption of iron-rich or iron-fortified foods	6-23 months	84/243	34.6	(28.6-40.9)
Bottle feeding	0-23 months	4/323	1.2	(0.5-3.1)

Figure 11: Key IYCF indicators from 2016 to 2019- Doro refugee camp, South Sudan (November 2019)
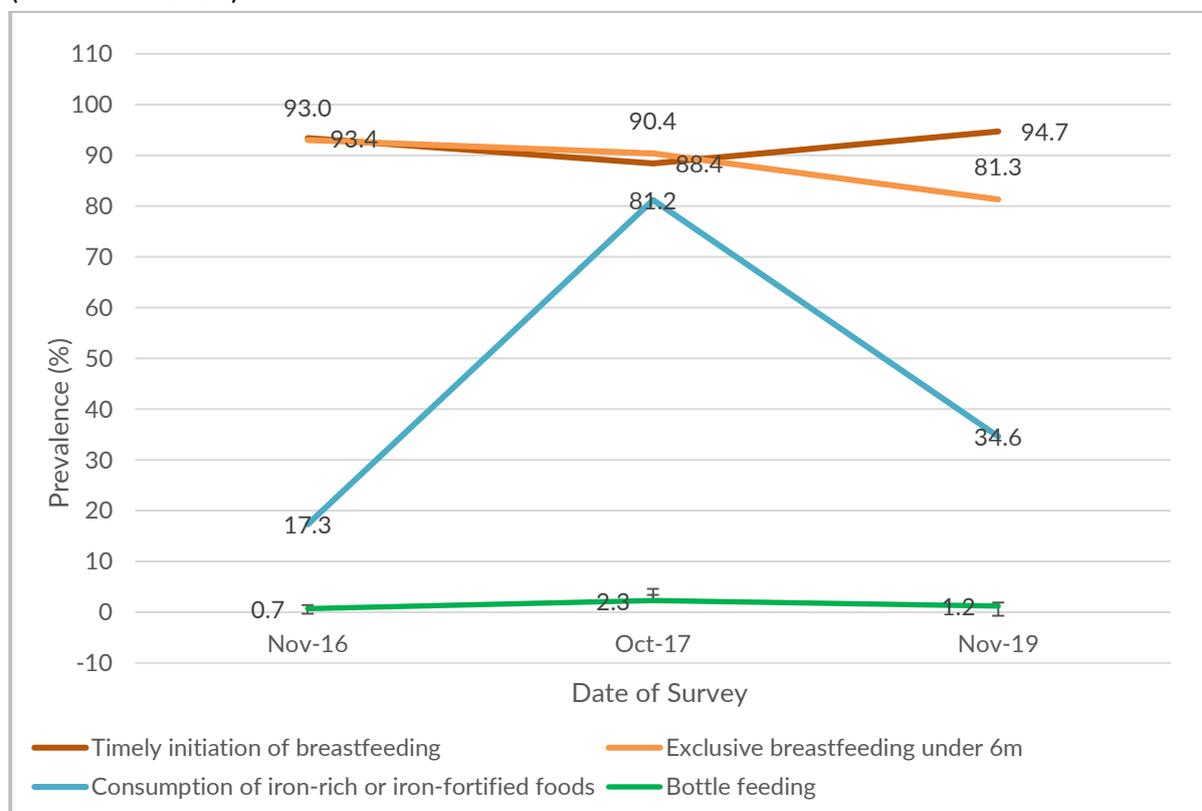
Consumption of iron rich foods decreased significantly in 2019 compared to 2018

Prevalence of Intake

Infant Formula

Table 39 : Infant formula intake in children aged 0-23 months- Doro refugee camp, South Sudan (November 2019)

	Number/total	**% (95% CI)**
Proportion of children aged 0-23 months who receive infant formula (fortified or non-fortified)	12/323	3.7 (2.1-6.4)

Fortified Blended Foods

Table 40 : CSB++ Intake in Children Aged 6-23 Months - Doro refugee camp, South Sudan (November 2019)

	Number/total	**% (95% CI)**
Proportion of children aged 6-23 months who receive CSB++	0/243	(0)

There was no food supplies to BSFP during the survey period.

Anaemia Women 15-49 Years Results

Table 41: Women Physiological Status and Age- Doro refugee camp, South Sudan (November 2019)

Physiological status	Number/total	% of sample
Non-pregnant	247	89.2
Pregnant	30	10.8
Mean age (range)	27.7 (15-49)	

Table 42 : Prevalence of anaemia and haemoglobin concentration in non-pregnant women of reproductive age (15-49 years) -Doro refugee camp, South Sudan (November 2019)

Anaemia in non-pregnant women of reproductive age (15-49 years)	All n = 247
Total Anaemia (<12.0 g/dL)	(83) 33.6 % (27.7-39.9, 95% CI)
Mild Anaemia (11.0-11.9 g/dL)	(56) 22.8 % (17.6-28.4, 95% CI)
Moderate Anaemia (8.0-10.9 g/dL)	(26) 10.5% (7.0-15.0, 95% CI)
Severe Anaemia (<8.0 g/dL)	(1) 0.4 (0.0-2.2, 95% CI)
Mean Hb (g/dL) (SD / 95% CI) [range]	12.5 g/dL (11.6-13.3, 95% CI) [7.0-17.0]

Figure 12 : Trends in anaemia categories in women of reproductive age (non-pregnant) from 2017 to 2019-Doro refugee camp, South Sudan (November 2019)
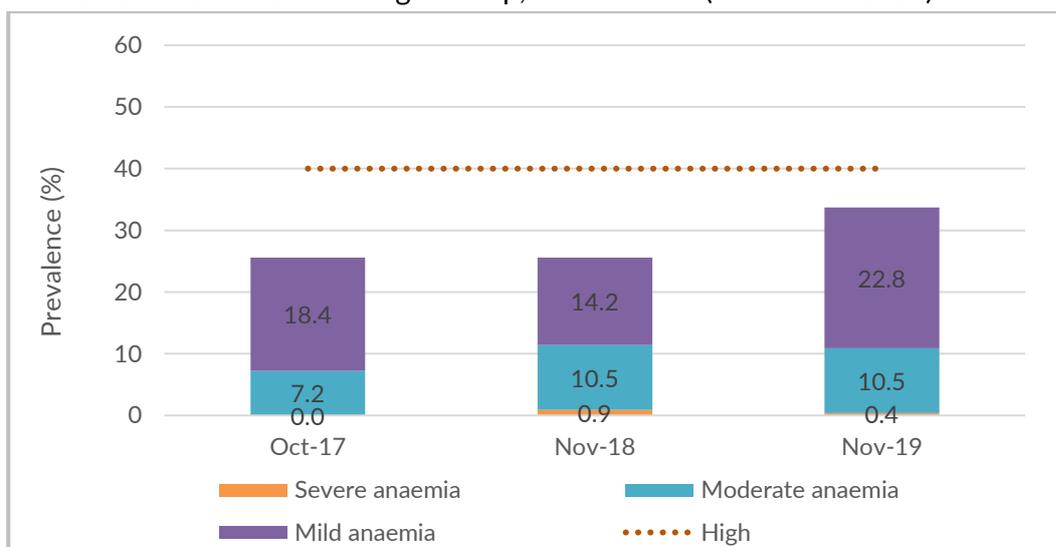
The proportion of mild anaemia indicated an increasing trend in 2019 while moderate anaemia remained the same

Table 43: ANC Enrolment and Iron-Folic Acid Pills Coverage among Pregnant Women (15-49 Years) - Doro refugee camp, South Sudan (November 2019)

	Number /total	% (95% CI)
Currently enrolled in ANC programme	24/30	80.0 (61.4-92.3)
Currently receiving iron-folic acid pills	21/30	70.0 (50.6-85.3)

4.2.5 Food security

Access to food assistance

Table 44: Ration card coverage- Doro refugee camp, **South Sudan (November 2019)**

	Number/total	% (95% CI)
Proportion of households with a ration card	247/247	100

All the surveyed households had a ration card.

Negative household coping strategies

The refugees in Doro refugee camp like other Maban refugee camps receive a reduced food ration at a 70% scale with removal of fortified food. This was provided using hybrid cash and in-kind modality in 2019. Cereals were provided at 100% in kind, lentils at 70% as inkind and 30% cash and cooking oil at 50% as inkind and 50% cash. Cash for milling and salt was provided at 100%. Of note is that the cash distribution figures vary from one month to other depending on the market assessment conducted every month prior to the GFD scheduled. To fill the food gap the refugee noted the use of the coping strategies below.

Table 45: Coping strategies used by the surveyed population over the past month - Doro refugee camp, South Sudan (November 2019).

	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	95/247	38.5 (32.4-44.8)
Sold any assets that would not have normally sold (furniture, seed stocks, tools, other NFI, livestock etc.)	78/247	31.6 (25.8-37.8)
Requested increased remittances or gifts as compared to normal	67/247	27.1 (21.7-33.1)
Reduced the quantity and/or frequency of meals and snacks	141/247	57.1 (50.7-63.3)
Begged	37/247	15.0 (10.8-20.1)
Engaged in potentially risky or harmful activities	69/247	28.0 (22.5-34.1)
Proportion of households reporting using none of the negative coping strategies over the past month	47/248	19.0 (14.3-24.4)

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

Only 19% of households were not under significant stress to meet their food 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 prior to the survey was in October 2019. This was an emergency distribution based on availability of commodities in the camp. The food ration was provided through the community leaders due to the access limitation by the partners as a result of the flooding. The survey was carried out during the end of the harvest season. Of note is that the harvest was also affected by the flooding. The survey period can thus be categorised as a worst-case scenario.

Table 46: Average HDDS- Doro refugee camp, South Sudan (November 2019)

	Mean (Standard deviation or 95% CI)
Average HDDS	3.7 (SD 2.1)

Figure 13: Proportion of households consuming different food groups within last 24 hours - Doro refugee camp, South Sudan (November 2019)
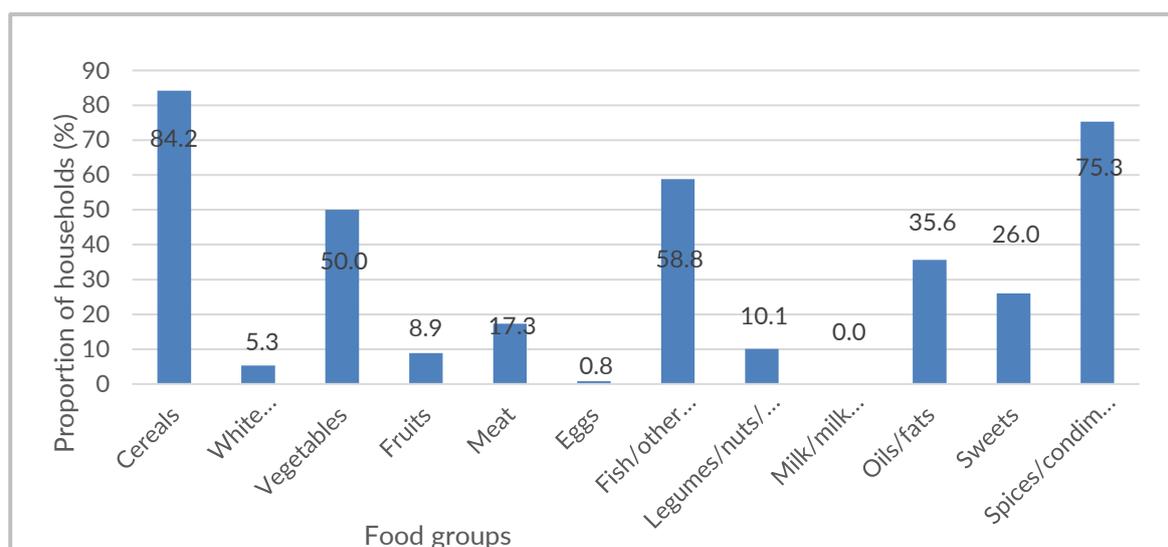
Table 47: Consumption of micronutrient rich foods by households- Doro refugee camp, South Sudan (November 2019)

	Number/total	% (95% CI)
Proportion of households *not consuming any* vegetables, fruits, meat, eggs, fish/seafood, and milk/milk products	68/248	27.4 (22.0-33.4)
Proportion of households consuming either a plant or animal source of vitamin A	100/248	40.3 (34.2-46.7)
Proportion of households consuming organ meat/flesh meat, or fish/seafood (food sources of haem iron)	154/248	62.1 (55.7-68.2)

The low proportions of households consuming food groups containing iron and vitamin A above is indicative of an inadequate diet that is likely to be contributing to the micronutrient deficiencies

3.2 YUSUF BATIL REFUGEE CAMP

Table below shows the actual number of children captured during survey verses the targeted children in the survey. By the end of the SENS in Yusuf Batil refugee camp, >100% of the targeted children were surveyed. See table below for details. The SENS guideline recommends that at least 80% of the targeted children to be surveyed.

Table 48 : Target and actual number captured- Yusuf Batil refugee camp, South Sudan. (December 2019)

	Target (No.)	Total surveyed (No.)	% of the target
Children 6-59 months	320	546	171 %

Anthropometric results (based on WHO Growth standards 2006) and Health

The coverage of age documentation was 85%

Table 49 : Distribution of age and sex of sample- Yusuf Batil refugee camp, South Sudan. (December 2019)

	Boys		Girls		Total		Ratio
AGE (mo)	no.	%	no.	%	no.	%	Boy: girl
6-17	65	47.8	71	52.2	136	24.9	0.9
18-29	77	52.7	69	47.3	146	26.7	1.1
30-41	51	44.7	63	55.3	114	20.9	0.8
42-53	56	51.4	53	48.6	109	20.0	1.1
54-59	22	53.7	19	46.3	41	7.5	1.2
Total	271	49.6	275	50.4	546	100.0	1.0

The overall ratio of boys: girls is 1.0 indicating both sexes were equally represented in the survey.

Table 50 : Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex- Yusuf Batil refugee camp, South Sudan. (December 2019)

	All n = 536	Boys n = 265	Girls n = 271
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(75) 14.0 % (11.3 - 17.2 95% C.I.)	(41) 15.5 % (11.6 - 20.3 95% C.I.)	(34) 12.5 % (9.1 - 17.0 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(63) 11.8 % (9.3 - 14.8 95% C.I.)	(35) 13.2 % (9.7 - 17.8 95% C.I.)	(28) 10.3 % (7.2 - 14.5 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(12) 2.2 % (1.3 - 3.9 95% C.I.)	(6) 2.3 % (1.0 - 4.9 95% C.I.)	(6) 2.2 % (1.0 - 4.7 95% C.I.)

The prevalence of oedema was 0.0% and the data excluded SMART flags. Boys and girls were equally wasted ; p>0.05.

Figure 14 : Trends in the prevalence of global and severe acute malnutrition based on WHO growth standards in children 6-59 months from 2017 to 2019 -Yusuf Batil refugee camp Yusuf Batil refugee camp, South Sudan. (December 2019)
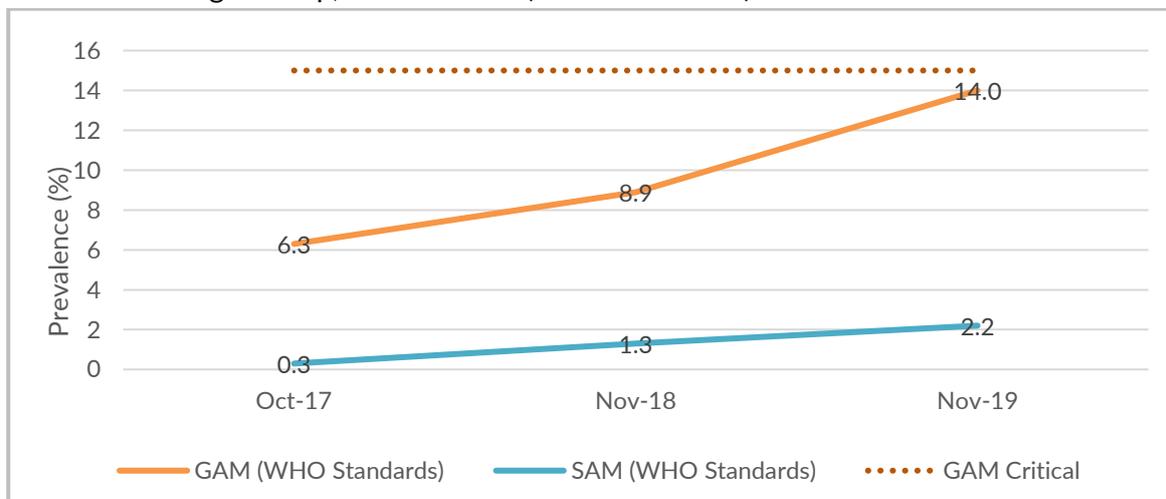
The GAM prevalence in 2019 increased significantly (p<0.05) compared to the last two years.

Table 51 : Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema- Yusuf Batil refugee camp, South Sudan. (December 2019)

Age (mo)	Total no.	Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-17	131	4	3.1	19	14.5	108	82.4	0	0.0
18-29	143	1	0.7	18	12.6	124	86.7	0	0.0
30-41	113	4	3.5	15	13.3	94	83.2	0	0.0
42-53	108	2	1.9	8	7.4	98	90.7	0	0.0
54-59	41	1	2.4	3	7.3	37	90.2	0	0.0
Total	536	12	2.2	63	11.8	461	86.0	0	0.0

The 6-17 and 30-41 age groups tend to be most affected by wasting.

Figure 15 : Trend in the prevalence of wasting by age in children 6-59 months- Yusuf Batil refugee camp, South Sudan. (December 2019)
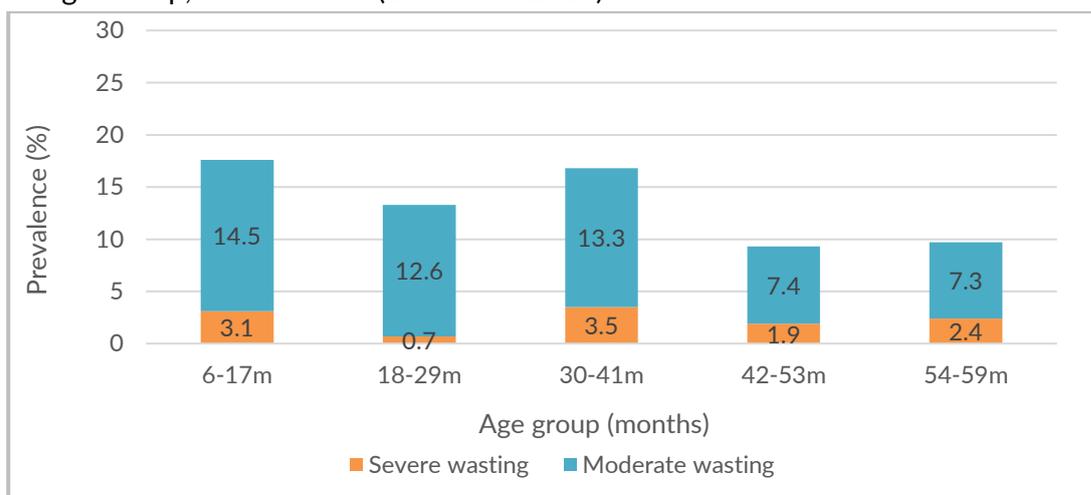
Children 6-17 and 30-41 tend to be most affected by wasting.

Table 52 : Distribution of acute malnutrition and oedema based on weight-for-height z-scores- Yusuf Batil refugee camp, South Sudan. (December 2019)

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 16 (2.9 %)	Not severely malnourished No. 529 (97.1 %)

Figure 16 : 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.
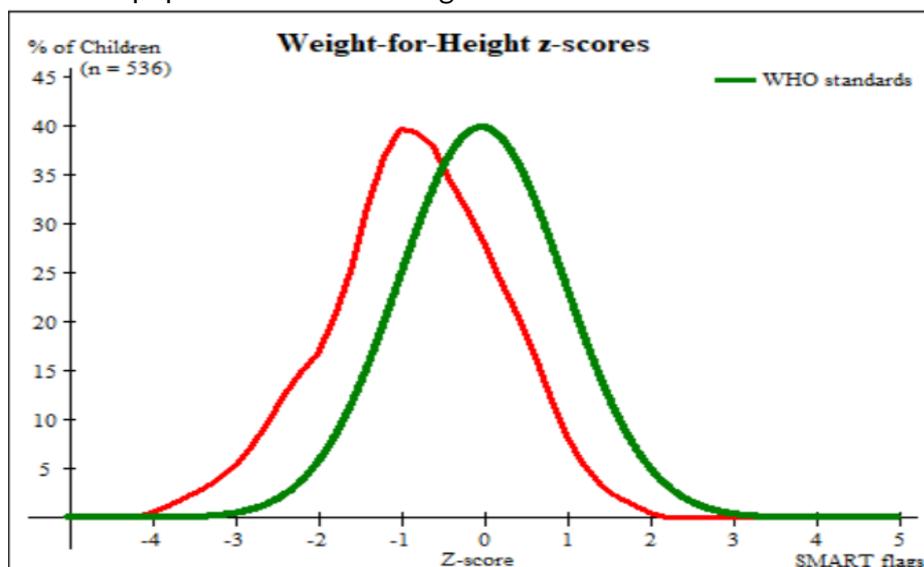
Table 53 : Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex- Yusuf Batil refugee camp, South Sudan. (December 2019)

	All n = 546	Boys n = 271	Girls n = 275
Prevalence of global malnutrition (< 125 mm and/or oedema)	(20) 3.7 % (2.4 - 5.6 95% C.I.)	(4) 1.5 % (0.6 - 3.7 95% C.I.)	(16) 5.8 % (3.6 - 9.2 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(16) 2.9 % (1.8 - 4.7 95% C.I.)	(4) 1.5 % (0.6 - 3.7 95% C.I.)	(12) 4.4 % (2.5 - 7.5 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(4) 0.7 % (0.3 - 1.9 95% C.I.)	(0) 0.0 % (0.0 - 1.4 95% C.I.)	(4) 1.5 % (0.6 - 3.7 95% C.I.)

Girls were more wasted based on the MUAC proportion <12.5cm compared to boys ; $p<0.05$.

Table 54 : Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema- Yusuf Batil refugee camp, South Sudan. (December 2019)

		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	136	3	2.2	11	8.1	122	89.7	0	0.0
18-29	146	1	0.7	4	2.7	141	96.6	0	0.0
30-41	114	0	0.0	1	0.9	113	99.1	0	0.0
42-53	109	0	0.0	0	0.0	109	100.0	0	0.0
54-59	41	0	0.0	0	0.0	41	100.0	0	0.0
Total	546	4	0.7	16	2.9	526	96.3	0	0.0

Children 6-17 months tends to be most affected by wasting measured by MUAC

Table 55 : Prevalence of underweight based on weight-for-age z-scores by sex- Yusuf Batil refugee camp, South Sudan. (December 2019)

	All n = 543	Boys n = 269	Girls n = 274
Prevalence of underweight (<-2 z-score)	(188) 34.6 % (30.7 - 38.7 95% C.I.)	(99) 36.8 % (31.3 - 42.7 95% C.I.)	(89) 32.5 % (27.2 - 38.2 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(152) 28.0 % (24.4 - 31.9 95% C.I.)	(77) 28.6 % (23.6 - 34.3 95% C.I.)	(75) 27.4 % (22.4 - 32.9 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(36) 6.6 % (4.8 - 9.0 95% C.I.)	(22) 8.2 % (5.5 - 12.1 95% C.I.)	(14) 5.1 % (3.1 - 8.4 95% C.I.)

Boys and girls were equally underweight ; p>0.05.

Table 56 : Prevalence of underweight by age, based on weight-for-age z-scores- Yusuf Batil refugee camp, South Sudan. (December 2019)

		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	134	5	3.7	38	28.4	91	67.9	0	0.0
18-29	146	14	9.6	42	28.8	90	61.6	0	0.0
30-41	113	8	7.1	30	26.5	75	66.4	0	0.0
42-53	109	4	3.7	28	25.7	77	70.6	0	0.0
54-59	41	5	12.2	14	34.1	22	53.7	0	0.0
Total	543	36	6.6	152	28.0	355	65.4	0	0.0

Children in age group of 54-59 months tend to be mostly underweight.

Table 57 : Prevalence of stunting based on height-for-age z-scores and by sex- Yusuf Batil refugee camp, South Sudan. (December 2019)

	All n = 539	Boys n = 268	Girls n = 271
Prevalence of stunting (<-2 z-score)	(249) 46.2 % (42.0 - 50.4 95% C.I.)	(142) 53.0 % (47.0 - 58.9 95% C.I.)	(107) 39.5 % (33.8 - 45.4 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(175) 32.5 % (28.7 - 36.5 95% C.I.)	(92) 34.3 % (28.9 - 40.2 95% C.I.)	(83) 30.6 % (25.4 - 36.4 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(74) 13.7 % (11.1 - 16.9 95% C.I.)	(50) 18.7 % (14.4 - 23.8 95% C.I.)	(24) 8.9 % (6.0 - 12.8 95% C.I.)

Boys tend to be more stunted than girls

Figure 17 : Trends in the prevalence of global and severe stunting based on who growth standards in children 6-59 months from 2017 to 2019- Yusuf Batil refugee camp, South Sudan. (December 2019)
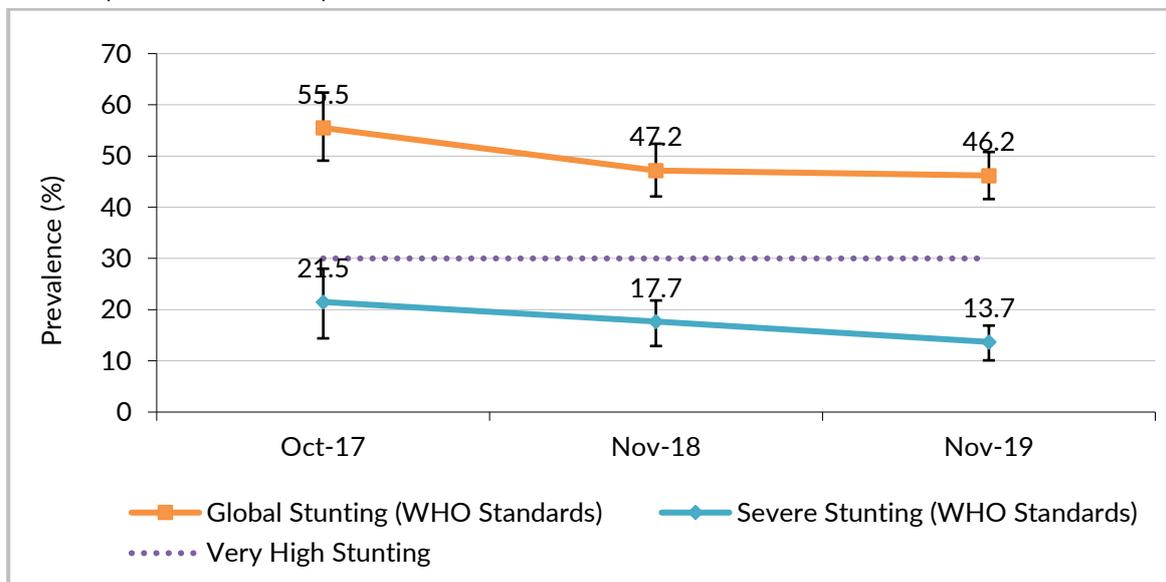
Global stunting remained the same 2019 compared to 2018

Table 58 : Prevalence of stunting by age based on height-for-age z-scores- Yusuf Batil refugee camp, South Sudan. (December 2019)

Age (mo)	Total no.	Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
		No.	%	No.	%	No.	%
6-17	132	12	9.1	39	29.5	81	61.4
18-29	145	24	16.6	47	32.4	74	51.0
30-41	113	16	14.2	37	32.7	60	53.1
42-53	108	13	12.0	38	35.2	57	52.8
54-59	41	9	22.0	14	34.1	18	43.9
Total	539	74	13.7	175	32.5	290	53.8

Children 54-59 months tend to be most stunted

Figure 18: Trends in the Prevalence of Stunting By Age in Children 6-59 Months- Yusuf Batil refugee camp, South Sudan. (December 2019)
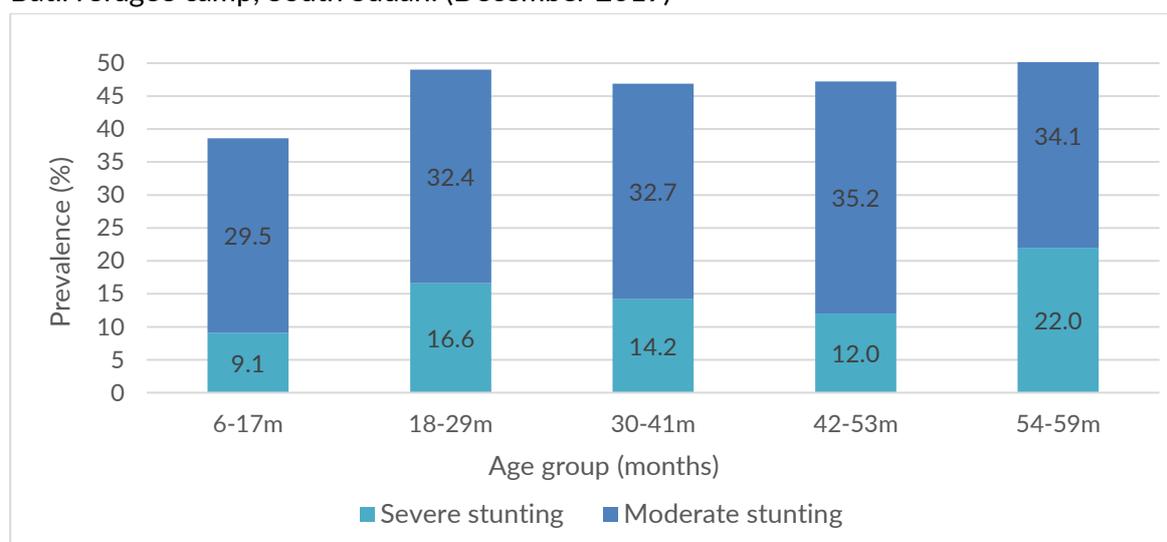
The 54-59 months age group tend to be most affected by stunting.

Table 59: Prevalence of overweight based on weight for height cut offs and by sex (no oedma)- Yusuf Batil refugee camp, South Sudan. (December 2019)

	All n = 536	Boys n = 265	Girls n = 271
Prevalence of overweight (WHZ > 2)	(0) 0.0 % (0.0 - 0.7 95% C.I.)	(0) 0.0 % (0.0 - 1.4 95% C.I.)	(0) 0.0 % (0.0 - 1.4 95% C.I.)
Prevalence of severe overweight (WHZ > 3)	(0) 0.0 % (0.0 - 0.7 95% C.I.)	(0) 0.0 % (0.0 - 1.4 95% C.I.)	(0) 0.0 % (0.0 - 1.4 95% C.I.)

Table 60: Prevalence of overweight by age, based on weight for height (no oedema)- Yusuf Batil refugee camp, South Sudan. (December 2019)

		Overweight (WHZ > 2)		Severe Overweight (WHZ > 3)	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**
6-17	131	0	0.0	0	0.0
18-29	143	0	0.0	0	0.0
30-41	113	0	0.0	0	0.0
42-53	108	0	0.0	0	0.0
54-59	41	0	0.0	0	0.0
Total	536	0	0.0	0	0.0

Table 61 : Mean z-scores, Design Effects and excluded subjects- Yusuf Batil refugee camp, South Sudan. (December 2019)

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	536	-0.83±1.02	1.00	1	9
Weight-for-Age	543	-1.62±0.93	1.00	0	3
Height-for-Age	539	-1.91±1.02	1.00	1	6

* contains for WHZ and WAZ the children with edema.

Feeding Programme Enrolment Coverage

In Yusuf Batil camp, **the OTP and TSFP enrolment coverage based on both all admission criteria and using MUAC and Oedema only did not meet the recommended standard of >90%.**

Selective feeding programme

Table 62 : Nutrition treatment programme enrolment coverage based on all admission criteria (weight-for-height, MUAC, oedema) - Yusuf Batil refugee camp, South Sudan. (December 2019)

	Number/total	% (95% CI)
Proportion of children aged 6-59 months with severe acute malnutrition currently enrolled in therapeutic feeding programme*	1/15	6.7 (0.2-32.0)
Proportion of children aged 6-59 months with moderate acute malnutrition currently enrolled in supplementary feeding programme*	7/70	10.0 (4.1-19.5)

Table 63 : Nutrition treatment programme enrolment coverage based on MUAC and oedema only - Yusuf Batil refugee camp, South Sudan. (December 2019)

	Number/total	% (95% CI)
Proportion of children aged 6-59 months with severe acute malnutrition currently enrolled in therapeutic feeding programme	5/16	31.3 (11.0-58.7)
Proportion of children aged 6-59 months with moderate acute malnutrition currently enrolled in therapeutic feeding programme	1/4	25.0 (0.6-80.6)

Measles vaccination coverage results

Table 64 : Measles vaccination coverage for children aged 9-59 months (N=525) - Yusuf Batil refugee camp, South Sudan. (December 2019)

	Measles (with card) n= 368	Measles (with card or confirmation from mother) n= 512
YES	70.1% (66.0-73.9 95% CI)	97.5 % (95.8-98.6; 95% CI)

Measles coverage in Yusuf Batil met the recommended standard of >=95%.

Vitamin A supplementation coverage results

Table 65 : Vitamin A supplementation for children aged 6-59 months within past 6 months (N= 546) - Yusuf Batil refugee camp, South Sudan. (December 2019)

	Vitamin A capsule (with card) n=32	Vitamin A capsule (with card <u>or</u> confirmation from mother) n=458
YES	5.9% (4.2-8.2; 95% CI)	83.9% (80.6-86.7 95% CI)

Vitamin A coverage supplementation in Yusuf Batil did not meet the recommended standard of >90%

Figure 19 : Trends in the coverage of measles vaccination and vitamin A supplementation in last 6 months in children 6-59 months from 2017 to 2019- Yusuf Batil refugee camp, South Sudan. (December 2019)
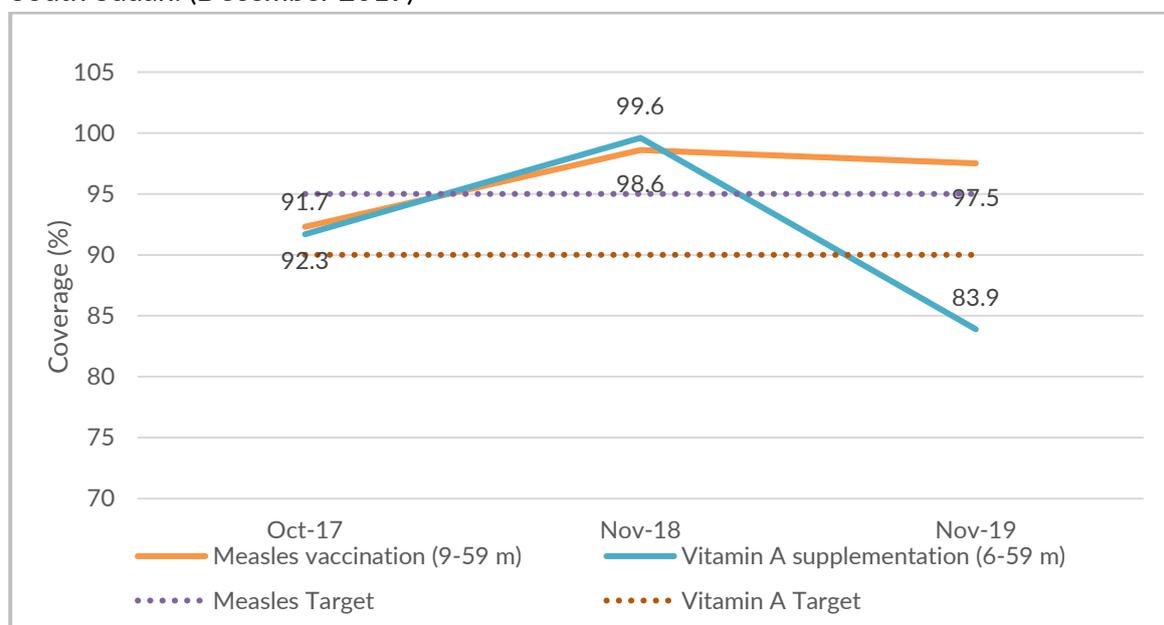
Diarrhoea Results

Table 66 : Period prevalence of diarrhea- Yusuf Batil refugee camp, South Sudan. (December 2019)

	Number/total	% (95% CI)
Diarrhoea in the last two weeks	60/546	11.0 (8.6-13.9)

Deworming

76.6% of children 12-59 months received a deworming tablet in last 6 months prior to the survey

Table 67: Deworming coverage - Yusuf Batil refugee camp, South Sudan. (December 2019)

	Number/total	% (95% CI)
Children received a deworming tablet in the last six months (12-59 months)	374/488	76.6 (72.7-80.2)

Deworming coverage in Yusuf Batil met the recommended standard (≥75%)

Anaemia Results Children 6 - 59 months

The total anaemia prevalence among children 6 to 59 months is of high health significance at 55.7% (51.5-59.8; 95% CI). Children 6 to 23 months tend to be most affected compared to the 24-59 months agegroup.

Table 68 : Prevalence of total anaemia, anaemia categories, and mean haemoglobin concentration in children 6-59 months of age and by age group- Yusuf Batil refugee camp, South Sudan. (December 2019)

	6-59 months n = 546	6-23 months n=226	24-59 months n=320
Total Anaemia (Hb <11.0 g/dl)	(304) 55.7% (51.5-59.8% CI)	(163) 72.2 % (65.8-77.9 95% CI)	(141) 44.1% (38.7-49.5; 95% CI)
Mild Anaemia (Hb 10.0-10.9 g/dl)	(146) 26.7 % (23.2-30.6; 95% CI)	(70) 40.0 % (25-37.4; 95% CI)	(76) 23.8% (19.4-28.7; 95% CI)
Moderate Anaemia (Hb 7.0-9.9 g/dl)	(154) 28.2% (25.0-32.1; 95% CI)	(90) 39.8% (33.4-46.5; 95% CI)	(64) 20.0% (16.0-24.7; 95% CI)
Severe Anaemia (Hb <7.0 g/dl)	(4) 0.7 % (0.3-1.9; 95% CI)	(3) 1.3 % (0.3-3.8; 95% CI)	(1) 0.3% (0.1-1.8; 95% CI)
Mean Hb (g/dl) (SD / 95% CI) [range]	10.8 g/dL (10.7-11.0; 95% CI [5.9-16.8]	10.1 g/dL (9.3-11.1; 95% CI) [6.9-13.5]	11.1 g/dL (10.2-12.0; 95% CI) [6.7-14.3]

Children aged 6-23 months tend to be most affected by anaemia

Figure 20 : Trends in Anaemia Categories in Children 6-59 Months from 2017 to 2019- Yusuf Batil refugee camp, South Sudan. (December 2019)
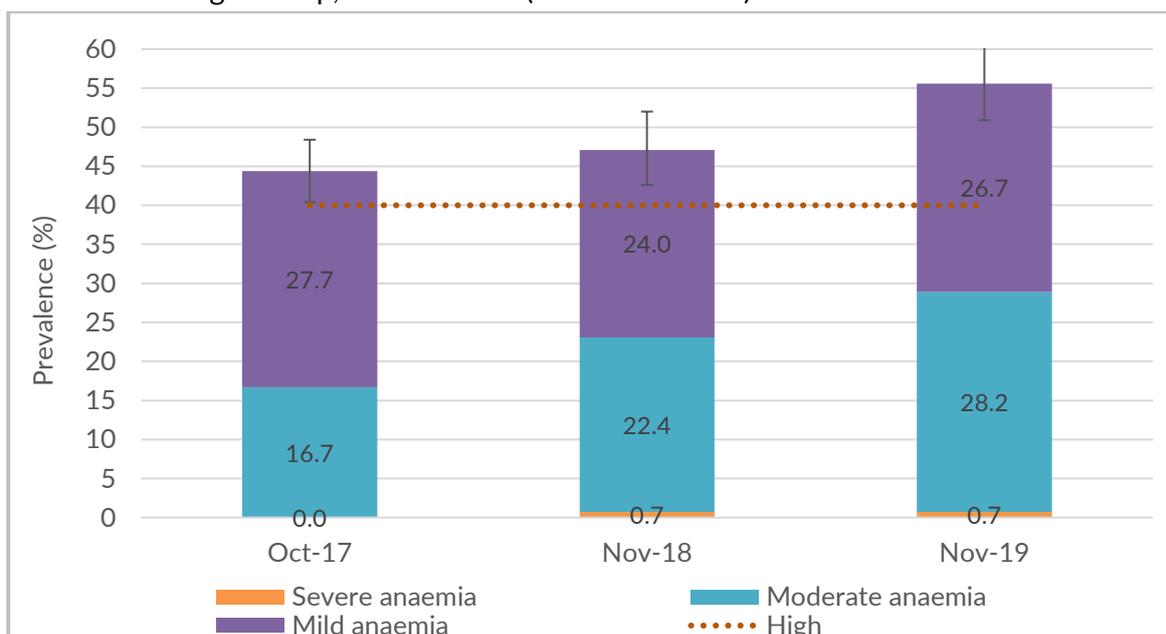
Table 69 : Prevalence of total anaemia, anaemia categories, and mean haemoglobin concentration in children 6-59 months of age and by age group- Yusuf Batil refugee camp, South Sudan. (December 2019)

	6-59 months n = 546	**6-23 months** n= 226	**24-59 months** n= 320
Moderate and Severe Anaemia (Hb<10.0 g/dL)	(158) 28.9 % (25.3-32.9;95% CI)	(93) 41.2% (34.7-47.9;95% CI)	(65) 20.3% (16.3-25.1; 95% CI)

Figure 21 : Trend in total anaemia (<11 g/dl), and moderate and severe anaemia (<10 g/dl) among children 6-59 months from 2017 to 2019- Yusuf Batil refugee camp, South Sudan. (December 2019)
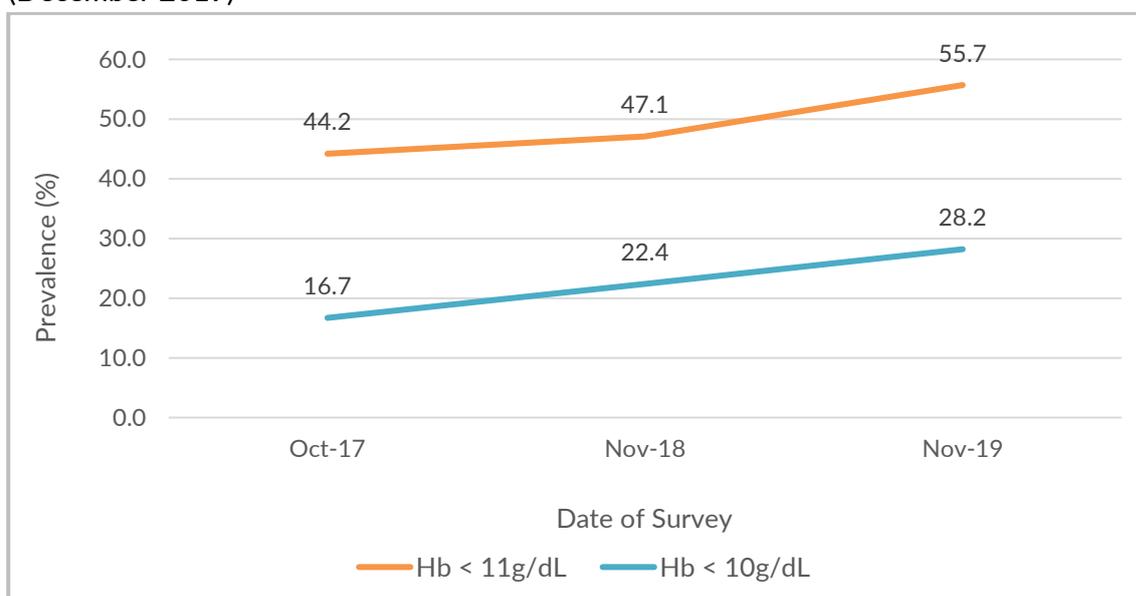
Anaemia prevalence increased in 2019 compared to the other years in Yusuf Batil

IYCF Children 0-23 Months

Table 70 : Prevalence of Infant and Young Child Feeding Practices Indicators- Yusuf Batil refugee camp, South Sudan. (December 2019)

Indicator	Age range	Number/ total	Prevalence (%)	95% CI
Timely initiation of breastfeeding	0-23 months	266/286	93.0	(89.4-95.7)
Exclusive breastfeeding under 6 months	0-5 months	58/60	96.7	(88.5-99.6)
Continued breastfeeding at 1 year	12-15 months	43/44	97.7	88.0-99.9
Continued breastfeeding at 2 years	20-23 months	49/61	80.3	(68.2-89.4)
Introduction of solid, semi-solid or soft foods	6-8 months	11/21	52.4	(29.8-74.3)
Consumption of iron-rich or iron-fortified foods	6-23 months	77/226	34.1	(27.9-40.7)
Bottle feeding	0-23 months	13/287	4.6	(2.5-7.7)

Figure 22: Key IYCF indicators from 2016-November 2019- Yusuf Batil refugee camp, South Sudan. (December 2019)
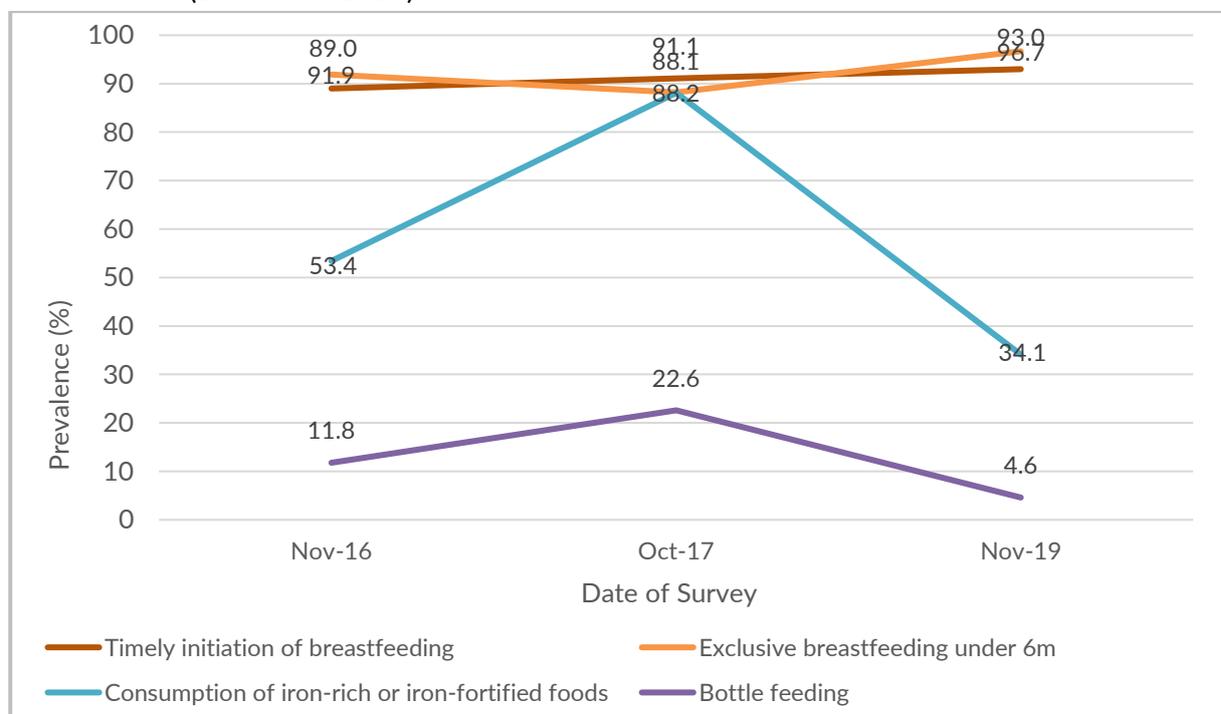
Timely initiation of breastfeeding, exclusive breastfeeding remained high in 2019 compared to the other years. Consumption of iron rich food however reduced significantly in 2019 compared to 2018. The proportion of children being bottle fed reduced in 2019.

Prevalence of Intake

Infant Formula

Table 71 : Infant formula intake in children aged 0-23 months- Yusuf Batil refugee camp, South Sudan. (December 2019)

	Number/total	% (95% CI)
Proportion of children aged 0-23 months who receive infant formula (fortified or non-fortified)	19/286	6.6 (4.1-10.2)

Fortified Blended Foods

Table 72 : CSB++ Intake in Children Aged 6-23 Months – Yusuf Batil refugee camp, South Sudan. (December 2019)

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive CSB++	3/226	1.3 (0.3-3.8)

There was no food supplies to BSFP during the survey period.

Anaemia Women 15-49 Years Results

Table 73: Women Physiological Status and Age- Yusuf Batil refugee camp, South Sudan. (December 2019)

Physiological status	Number/total	% of sample
Non-pregnant	242	87.4
Pregnant	35	12.6
Mean age (range)	27.2(15-49)	

Table 74 : Prevalence of anaemia and haemoglobin concentration in non-pregnant women of reproductive age (15-49 years) - Yusuf Batil refugee camp, South Sudan. (December 2019)

Anaemia in non-pregnant women of reproductive age (15-49 years)	All n = 242
Total Anaemia (<12.0 g/dL)	(63) 26 % (20.6-32.0; 95% CI)
Mild Anaemia (11.0-11.9 g/dL)	(44) 18.2 % (135-23.6; 95% CI)
Moderate Anaemia (8.0-10.9 g/dL)	(17) 7.0 % (4.2-11.0; 95% CI)
Severe Anaemia (<8.0 g/dL)	(2) 0.5 (0.1-3.0; 95% CI)
Mean Hb (g/dL) (SD / 95% CI) [range]	12.6 g/dL (11.9-13.4 95% CI) [5.6-15.5]

Figure 23 : Trends in anaemia categories in women of reproductive age (non-pregnant) from 2016 to 2019- Yusuf Batil refugee camp, South Sudan. (December 2019)
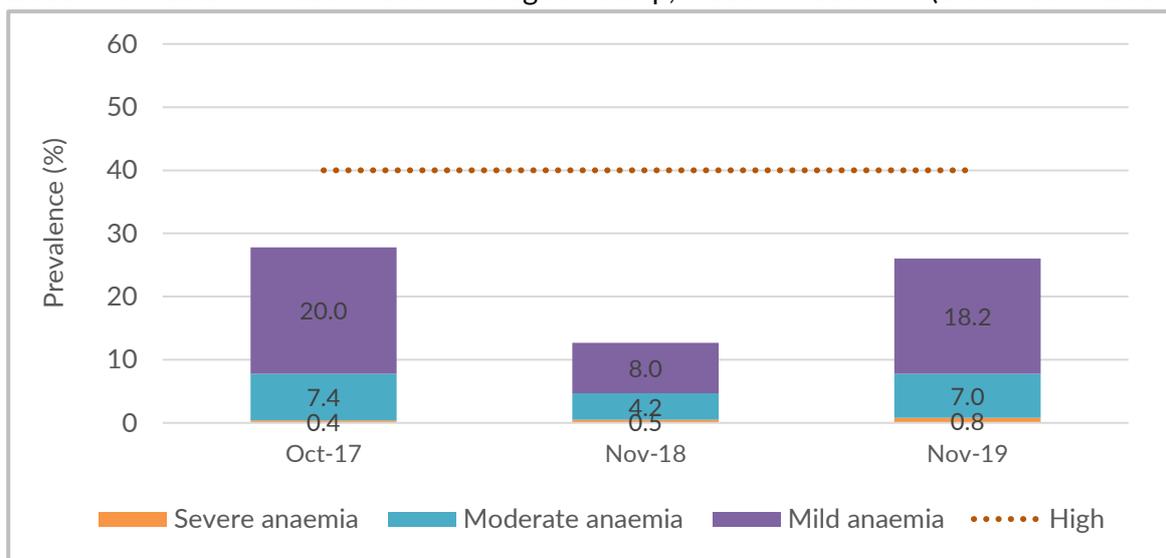
The proportion of mild anaemia increased in 2019 compared to 2018.

Table 75: ANC Enrolment and Iron-Folic Acid Pills Coverage among Pregnant Women (15-49 Years) – Yusuf Batil refugee camp, South Sudan. (December 2019)

	Number /total	% (95% CI)
Currently enrolled in ANC programme	32/35	91.4 (76.9-98.2)
Currently receiving iron-folic acid pills	32/35	91.4 (76.9-98.2)

4.2.5 Food security

Access to food assistance

Table 76: Ration card coverage- Yusuf Batil refugee camp, South Sudan. (December 2019)

	Number/total	% (95% CI)
Proportion of households with a ration card	213/213	100

All the surveyed households had a ration card.

Negative household coping strategies

The refugees in Batil refugee camp like other Maban refugee camps like other Maban refugee camps receive a reduced food ration at a 70% scale. This was provided using hybrid cash and in-kind modality in 2019. Cereals were provided at 100% in kind, lentils at 70% as inkind and 30% cash and cooking oil at 50% as inkind and 50% cash. Cash for milling and salt was provided at 100%. Of note is that the cash distribution figures vary from one month to other depending on the market assessment conducted every month prior to the GFD scheduled. To fill the food gap the refugee noted the use of the coping strategies below.

Table 77: Coping strategies used by the surveyed population over the past month – Yusuf Batil refugee camp, South Sudan. (December 2019)

	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	178/213	36.8 (29.2-45.0)
Sold any assets that would not have normally sold (furniture, seed stocks, tools, other NFI, livestock etc.)	88/213	15.8 (10.4-22.6)
Requested increased remittances or gifts as compared to normal	7/211	3.3 (1.3-6.7)
Reduced the quantity and/or frequency of meals and snacks	111/213	52.1 (45.2-59.0)
Begged	2/213	0.9 (0.1-3.4)
Engaged in potentially risky or harmful activities	85/213	39.9 (33.3-46.8)
Proportion of households reporting using none of the negative coping strategies over the past month	16/213	7.5 (4.4-11.9)

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

Only 7.5% of households were not under significant stress to meet their food 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 prior to the survey was in October 2019. This was an emergency distribution based on availability of commodities in the camp. The food ration was provided through the community leaders due to the access limitation by the partners as a result of the flooding. The survey was carried out during the end of the harvest season. Of note is that the harvest was also affected by the flooding. The survey period can thus be categorised as a worst-case scenario.

Table 78: Average HDDS- Yusuf Batil refugee camp, South Sudan. (December 2019)

	Mean (Standard deviation or 95% CI)
Average HDDS	6.6

Figure 24: Proportion of households consuming different food groups within last 24 hours – Yusuf Batil refugee camp, South Sudan (November 2019)
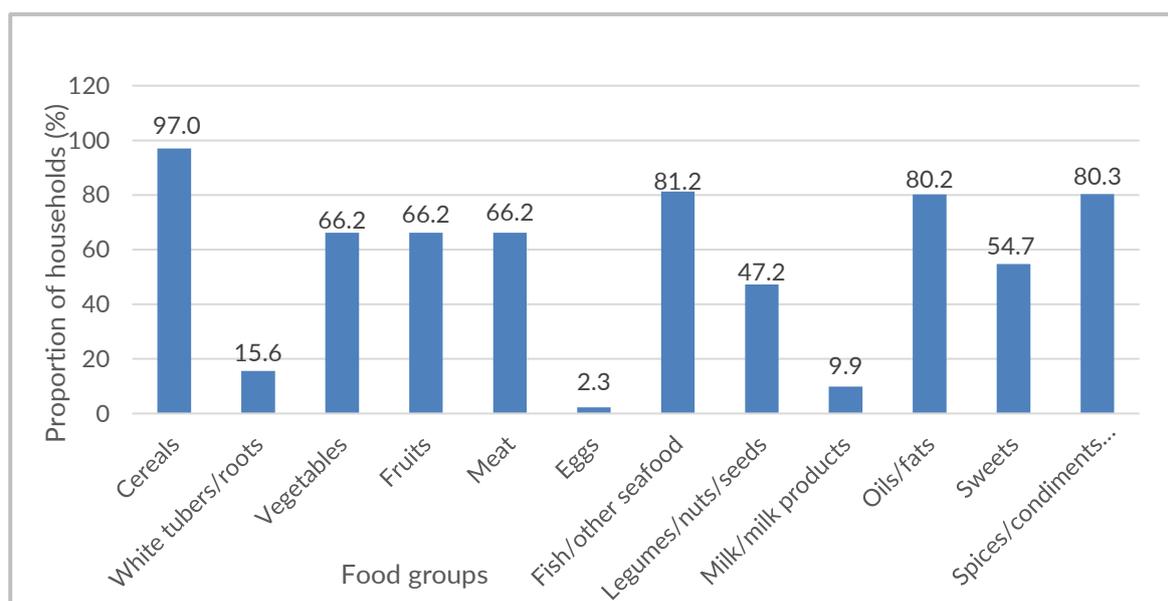
Table 79: Consumption of micronutrient rich foods by households- Yusuf Batil refugee camp, South Sudan. (December 2019)

	Number/total	% (95% CI)
Proportion of households *not consuming any* vegetables, fruits, meat, eggs, fish/seafood, and milk/milk products	20/213	9.4 (5.8-141.1)
Proportion of households consuming either a plant or animal source of vitamin A	69/213	32.4 (26.2-39.1)
Proportion of households consuming organ meat/flesh meat, or fish/seafood (food sources of haem iron)	193/213	90.6 (85.9-94.2)

The low proportion of households consuming food groups vitamin A above is indicative of an inadequate diet that is likely to be contributing to the micronutrient deficiencies. The proportion of fish was substantial. Fish was brought by the flood water during the survey period.

3.3 GENDRASSA REFUGEE CAMP

Table below shows the actual number of children captured during survey verses targeted children in the survey. By the end of the SENS in Gendrassa refugee camp, >100% of the targeted children were surveyed. See table below for details. The SENS guideline recommends that at least 80% of the targeted children to be surveyed.

Table 80 : Target and actual number captured-Gendrassa refugee camp, South Sudan. (November 2019)

	Target (No.)	Total surveyed (No.)	% of the target
Children 6-59 months	327	682	209 %

Anthropometric results (based on WHO standards 2006)

Table 81: The coverage of age documentation was 87%

Distribution of age and sex of sample- Gendrassa refugee camp, South Sudan. (November 2019)

	Boys		Girls		Total		Ratio
AGE (mo)	no.	%	no.	%	no.	%	Boy: girl
6-17	85	48.9	89	51.1	174	25.6	1.0
18-29	93	51.4	88	48.6	181	26.6	1.1
30-41	71	50.4	70	49.6	141	20.7	1.0
42-53	64	47.4	71	52.6	135	19.8	0.9
54-59	26	52.0	24	48.0	50	7.3	1.1
Total	339	49.8	342	50.2	681	100.0	1.0

The overall ratio of boys: girls is 1.0 indicating both sexes were equally represented.

Table 82 : Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex-Gendrassa refugee camp, South Sudan. (November 2019)

	All n = 668	Boys n = 334	Girls n = 334
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(44) 6.6 % (6.1 - 7.1 95% C.I.)	(26) 7.8 % (7.2 - 8.4 95% C.I.)	(18) 5.4 % (5.0 - 5.8 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(40) 6.0 % (5.5 - 6.5 95% C.I.)	(22) 6.6 % (6.1 - 7.1 95% C.I.)	(18) 5.4 % (5.0 - 5.8 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(4) 0.6 % (0.6 - 0.6 95% C.I.)	(4) 1.2 % (1.1 - 1.3 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)

 The prevalence of oedema was 0.0% and the data excluded SMART flags. Boys and girls were equally wasted ; p>0.05.

Figure 25 : Trends in the prevalence of global and severe acute malnutrition based on WHO growth standards in children 6-59 months from 2017 to 2019- Gendrassa refugee camp, South Sudan. (November 2019)
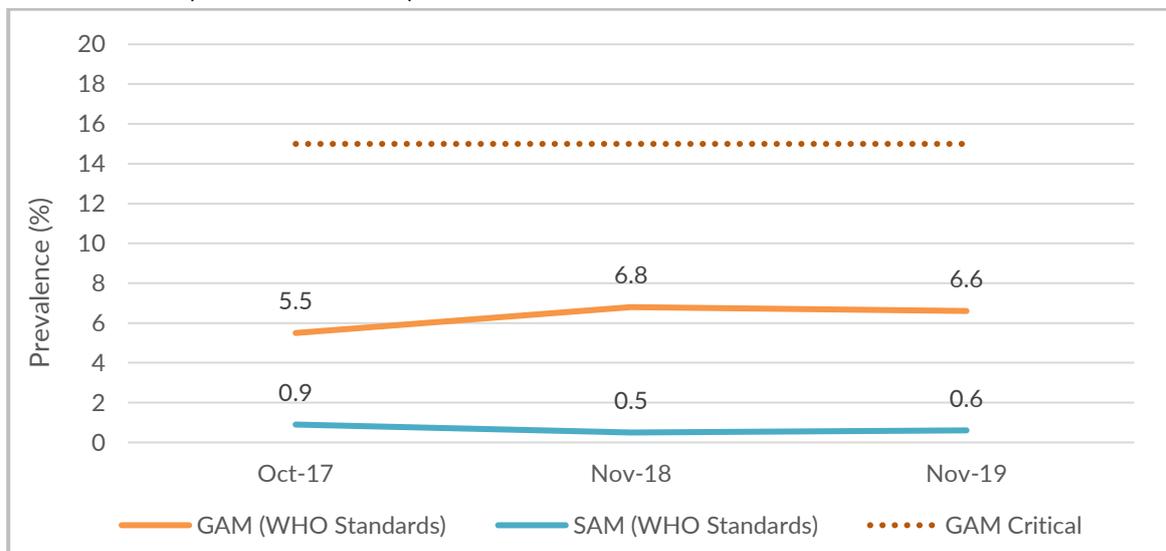
GAM prevalence in Gendrassa refugee camp remained the same as in 2018 ; p>0.05.

Table 83 : Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema-Gendrassa refugee camp, South Sudan. (November 2019)

Age (mo)	Total no.	Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-17	172	0	0.0	14	8.1	158	91.9	0	0.0
18-29	175	0	0.0	12	6.9	163	93.1	0	0.0
30-41	138	2	1.4	5	3.6	131	94.9	0	0.0
42-53	134	2	1.5	7	5.2	125	93.3	0	0.0
54-59	48	0	0.0	2	4.2	46	95.8	0	0.0
Total	667	4	0.6	40	6.0	623	93.4	0	0.0

Children 6-17 months tend to be most affected by wasting

Figure 26 : Trend in the Prevalence of Wasting By Age in Children 6-59 Months- Gendrassa refugee camp, South Sudan. (November 2019)
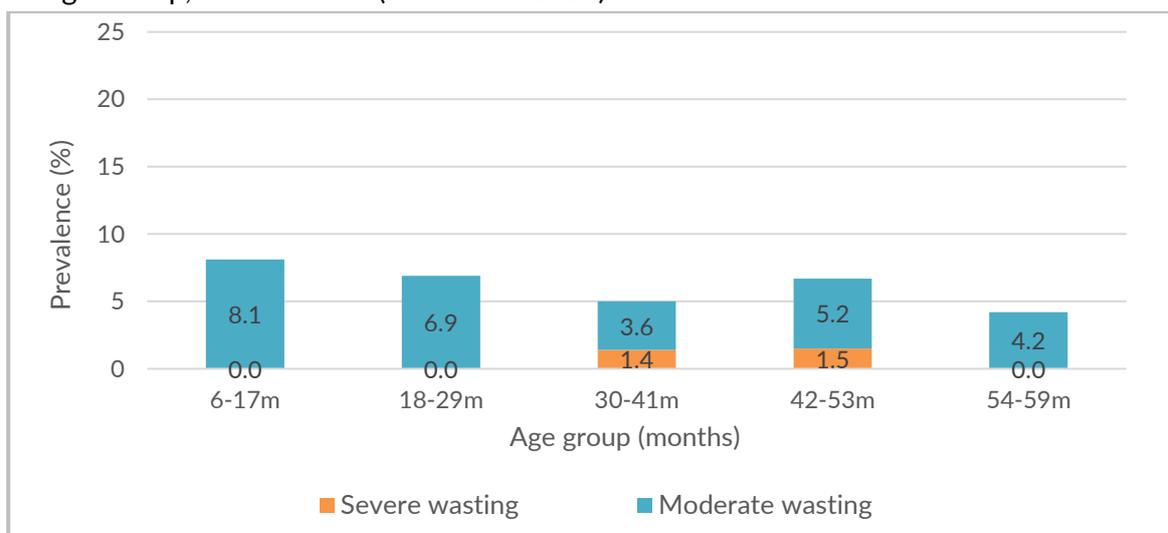
Table 84 : Distribution of acute malnutrition and oedema based on weight-for-height z-scores-Gendrassa refugee camp, South Sudan. (November 2019)

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 12 (1.8 %)	Not severely malnourished No. 668 (98.2 %)

Figure 27 : 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.
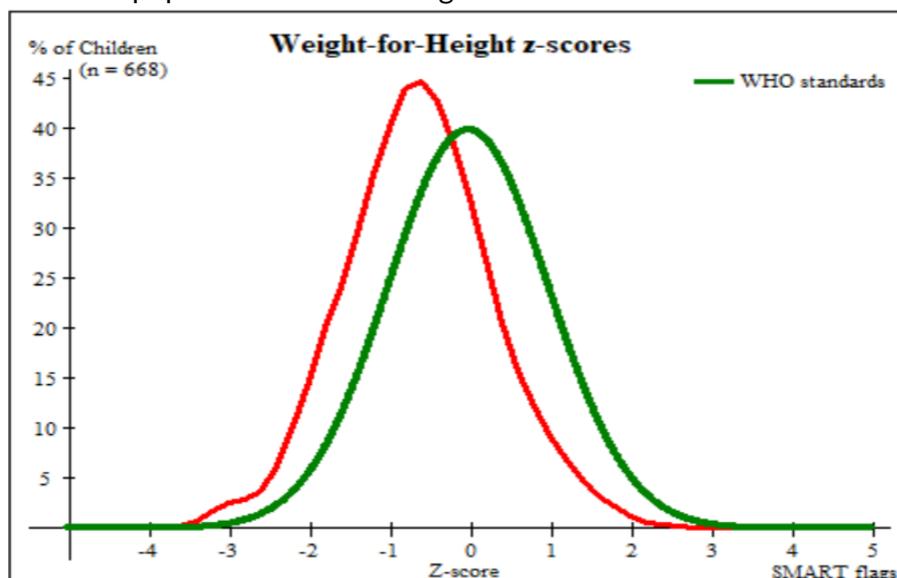
Table 85 : Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex-Gendrassa refugee camp, South Sudan. (November 2019)

	All n = 682	Boys n = 339	Girls n = 343
Prevalence of global malnutrition (< 125 mm and/or oedema)	(26) 3.8 % (3.5 - 4.1 95% C.I.)	(7) 2.1 % (1.9 - 2.2 95% C.I.)	(19) 5.5 % (5.1 - 6.0 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(24) 3.5 % (3.3 - 3.8 95% C.I.)	(6) 1.8 % (1.6 - 1.9 95% C.I.)	(18) 5.2 % (4.9 - 5.7 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(2) 0.3 % (0.3 - 0.3 95% C.I.)	(1) 0.3 % (0.3 - 0.3 95% C.I.)	(1) 0.3 % (0.3 - 0.3 95% C.I.)

Girls were more wasted based on MUAC proportion of <12.5cm that boys ; p<0.05

Table 86: Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by age-Gendrassa refugee camp, South Sudan. (November 2019)

Age (mo)	Total no.	Severe wasting (< 115 mm)		Moderate wasting (>= 115 mm and < 125 mm)		Normal (> = 125 mm)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-17	174	0	0.0	17	9.8	157	90.2	0	0.0
18-29	181	2	1.1	7	3.9	172	95.0	0	0.0
30-41	141	0	0.0	0	0.0	141	100.0	0	0.0
42-53	135	0	0.0	0	0.0	135	100.0	0	0.0
54-59	50	0	0.0	0	0.0	50	100.0	0	0.0
Total	681	2	0.3	24	3.5	655	96.2	0	0.0

Children 6-17 months tend to be most affected by wasting measured by MUAC

Table 87 : Prevalence of underweight based on weight-for-age z-scores by sex-Gendrassa refugee camp, South Sudan. (November 2019)

	All n = 678	Boys n = 337	Girls n = 341
Prevalence of underweight (<-2 z-score)	(162) 23.9 % (22.0 - 25.9 95% C.I.)	(74) 22.0 % (20.3 - 23.7 95% C.I.)	(88) 25.8 % (20.7 - 31.7 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(134) 19.8 % (17.6 - 22.1 95% C.I.)	(59) 17.5 % (16.2 - 18.9 95% C.I.)	(75) 22.0 % (16.7 - 28.3 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(28) 4.1 % (3.8 - 4.5 95% C.I.)	(15) 4.5 % (4.1 - 4.8 95% C.I.)	(13) 3.8 % (3.5 - 4.1 95% C.I.)

There was no difference in underweight between boys and girls ; p>0.05

Table 88 : Prevalence of underweight by age, based on weight-for-age z-scores-Gendrassa refugee camp, South Sudan. (November 2019)

Age (mo)	Total no.	Severe underweight (<-3 z-score)		Moderate underweight (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-17	174	4	2.3	23	13.2	147	84.5	0	0.0
18-29	179	9	5.0	39	21.8	131	73.2	0	0.0
30-41	141	8	5.7	27	19.1	106	75.2	0	0.0
42-53	135	5	3.7	32	23.7	98	72.6	0	0.0
54-59	49	2	4.1	13	26.5	34	69.4	0	0.0
Total	678	28	4.1	134	19.8	516	76.1	0	0.0

Children in age group of 54-59 months tend to be most underweight.

Table 89: Prevalence of stunting based on height-for-age z-scores and by sex-Gendrassa refugee camp, South Sudan. (November 2019)

	All n = 672	Boys n = 331	Girls n = 341
Prevalence of stunting (<-2 z-score)	(243) 36.2 % (35.1 - 37.2 95% C.I.)	(121) 36.6 % (33.8 - 39.4 95% C.I.)	(122) 35.8 % (31.1 - 40.7 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(174) 25.9 % (24.1 - 27.8 95% C.I.)	(87) 26.3 % (24.3 - 28.4 95% C.I.)	(87) 25.5 % (20.4 - 31.4 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(69) 10.3 % (9.5 - 11.1 95% C.I.)	(34) 10.3 % (9.5 - 11.1 95% C.I.)	(35) 10.3 % (9.5 - 11.1 95% C.I.)

There was no difference in stunting prevalence between boys and girls; p>0.05.

Figure 28 : Trends in the prevalence of global and severe stunting based on WHO growth standards in children 6-59 months from 2017 to 2019-Gendrassa refugee camp, South Sudan. (November 2019)
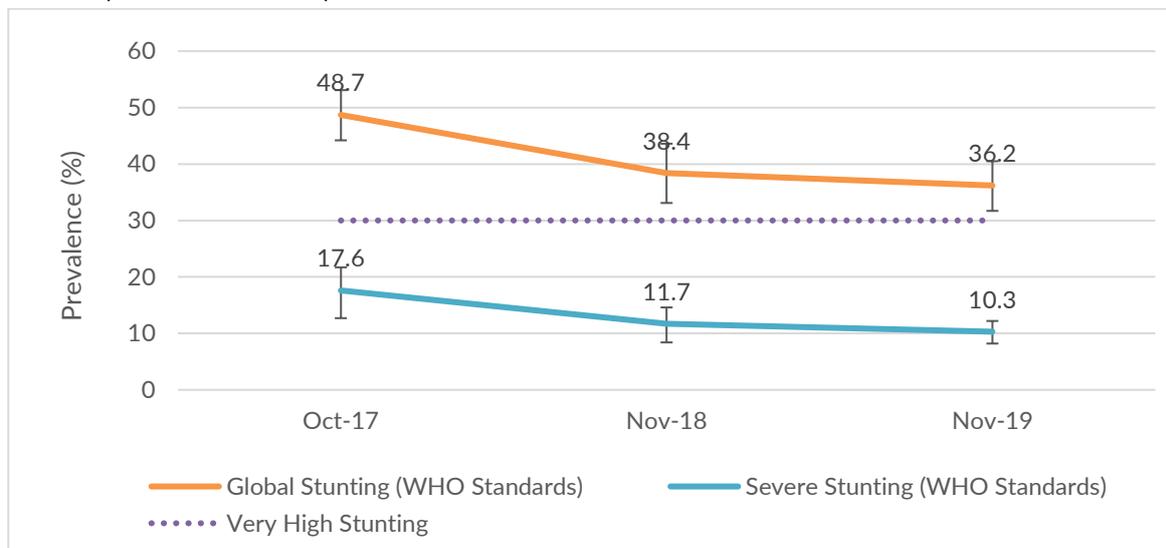
Stunting in Gendrassa refugee camp in 2019 remained the same as in 2018 but lower than 2017; p> 0.05.

Table 90 : Prevalence of stunting by age based on height-for-age z-scores-Gendrassa refugee camp, South Sudan. (November 2019)

Age (mo)	Total no.	Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
		No.	%	No.	%	No.	%
6-17	173	5	2.9	21	12.1	147	85.0
18-29	175	25	14.3	61	34.9	89	50.9
30-41	140	21	15.0	39	27.9	80	57.1
42-53	135	14	10.4	34	25.2	87	64.4
54-59	49	4	8.2	19	38.8	26	53.1
Total	672	69	10.3	174	25.9	429	63.8

Children 18-29 and 54-59 months tend to be most stunted.

Figure 29: Trends in the prevalence of stunting by age in children 6-59 months-Gendrassa refugee camp, South Sudan. (November 2019)
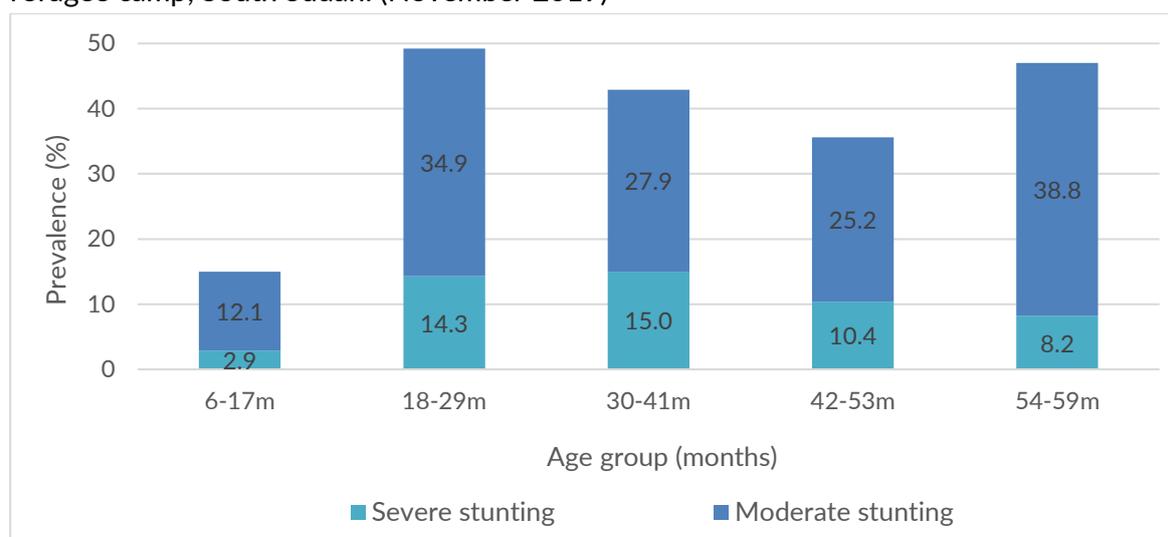
Table 91: Prevalence of overweight based on weight for height cut offs and by sex (no oedma) -Gendrassa refugee camp, South Sudan. (November 2019)

	All n = 668	Boys n = 334	Girls n = 334
Prevalence of overweight (WHZ > 2)	(2) 0.3 % (0.3 - 0.3 95% C.I.)	(2) 0.6 % (0.6 - 0.6 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)
Prevalence of severe overweight (WHZ > 3)	(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.)

Table 92: Prevalence of overweight by age, based on weight for height (no oedema) - Gendrassa refugee camp, South Sudan. (November 2019)

Age (mo)	Total no.	Overweight (WHZ > 2)		Severe Overweight (WHZ > 3)	
		No.	%	No.	%
6-17	172	1	0.6	0	0.0
18-29	175	0	0.0	0	0.0
30-41	138	1	0.7	0	0.0
42-53	134	0	0.0	0	0.0
54-59	48	0	0.0	0	0.0
Total	667	2	0.3	0	0.0

Table 93 : Mean z-scores, Design Effects and excluded subjects-Gendrassa refugee camp, South Sudan. (November 2019)

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	668	-0.63±0.92	1.00	2	12
Weight-for-Age	678	-1.38±0.93	1.00	1	3
Height-for-Age	672	-1.67±1.04	1.00	3	7

* contains for WHZ and WAZ the children with edema.

Feeding programme Enrolment Coverage

In Gendrassa refugee camp, the OTP and TSFP enrolment coverage based on both all admission criteria did not meet the recommended standard of >90%. This was also the case for TSFP enrolment coverage using MUAC and Oedema only. OTP enrolment coverage using MUAC and Oedema met the recommended standard.

Selective feeding programme

Table 94 : Programme Coverage for Acutely Malnourished Children Based on MUAC, Oedema and WHZ-Gendrassa refugee camp, South Sudan. (November 2019)

	Number/total	% (95% CI)
Proportion of children aged 6-59 months with severe acute malnutrition currently enrolled in therapeutic feeding programme*	14/51	27.5(15.9-41.7)
Proportion of children aged 6-59 months with moderate acute malnutrition currently enrolled in supplementary feeding programme*	0/5	0

Table 95 : Programme coverage for acutely malnourished children based on MUAC and oedema-Gendrassa refugee camp, South Sudan. (November 2019)

	Number/total	% (95% CI)
Proportion of children aged 6-59 months with severe acute malnutrition currently enrolled in therapeutic feeding programme	14/24	58.3 (36.6-77.9)
Proportion of children aged 6-59 months with moderate acute malnutrition currently enrolled in therapeutic feeding programme	2/2	100 (15.8-100.00)

Measles vaccination coverage results

Table 96: Measles vaccination coverage for children aged 9-59 months (N=682)-Gendrassa refugee camp, South Sudan. (November 2019)

	Measles (with card) n= 382	**Measles (with card or confirmation from mother) n=625**
YES	59.9% (56.0-53.6 95% CI)	97.7 % (96.6-98.8 95% CI)

Measles coverage in Gendrassa refugee camp met the recommended standard of >=95%.

Vitamin A supplementation coverage results

Table 97 : Vitamin A supplementation for children aged 6-59 months within past 6 months (N= 682) -Gendrassa refugee camp, South Sudan. (November 2019)

	Vitamin A capsule (with card) n=80	**Vitamin A capsule (with card or confirmation from mother) n=534**
YES	11.7% (9.5-14.4 95% CI)	78.3% (75.1-81.2 95% CI)

Vitamin A coverage supplementation in Gendrassa did not meet the recommended standard of >90%

Figure 30 : Trends in the coverage of measles vaccination and vitamin a supplementation in last 6 months in children 6-59 months from 2017 to 2019-Gendrassa refugee camp, South Sudan. (November 2019)
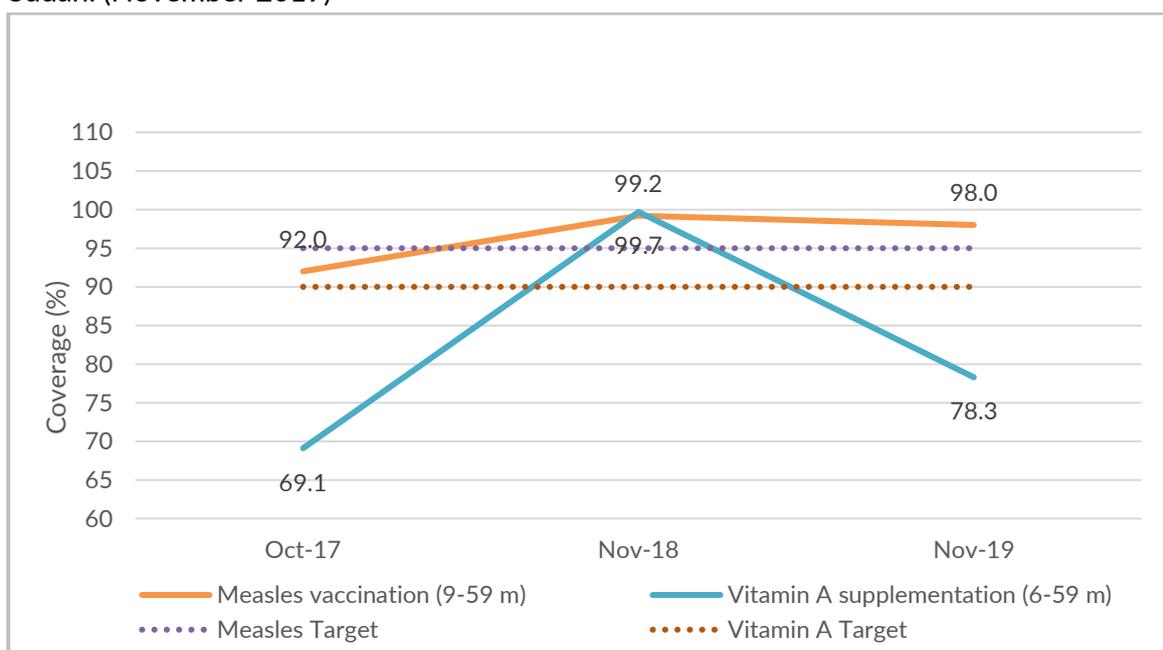
Diarrhoea Results

Table 98 : Period Prevalence of Diarrhoea-Gendrassa refugee camp, South Sudan. (November 2019)

	Number/total	% (95% CI)
Diarrhoea in the last two weeks	573/679	15.6 (13.1-18.5)

Deworming

58.7% of children 12-59 months received a deworming tablet in last 6 months prior to the survey

Table 99: Deworming coverage -Gendrassa refugee camp, South Sudan. (November 2019)

	Number/total	% (95% CI)
Children received a deworming tablet in the last six months (12-59 months)	337/574	58.7(54.6-62.7)

Deworming coverage in Gendrassa did not meet the recommended standard (≥75%)

Anaemia Children 6 - 59 months

The total anaemia prevalence among children 6 to 59 months is of high public health significance 57.5% (53.8-61.2 95% CI). Children of 6 to 23 months tend to be most affected compared to the 24-59 months age category.

Table 100 : Prevalence of total anaemia, anaemia categories, and mean haemoglobin concentration in children 6-59 months of age and by age group-Gendrassa refugee camp, South Sudan. (November 2019)

	6-59 months n = 678	6-23 months n=282	24-59 months n=396
Total Anaemia (Hb<11.0 g/dL)	(390) 57.5% (53.8-61.2 95% CI)	(213) 75.5% (70.1-80.4 95% CI)	(177) 44.7% (39.9-49.6 95% CI)
Mild Anaemia (Hb 10.0-10.9 g/dL)	(188) 27.7% (24.5-31.2 95% CI)	(89) 31.6% (26.1-37.3 95% CI)	(99) 25.0% (21.0-29.5 95% CI)
Moderate Anaemia (7.0-9.9 g/dL)	(195) 28.8 % (25.5-32.3 95% CI)	(123) 43.6 % (37.6-49.6 95% CI)	(72) 18.2% (14.7-22.3 95% CI)
Severe Anaemia (<7.0 g/dL)	(7) 1.0% (0.5-2.1 95% CI)	(1) 0.4% (0.0-2.0 95% CI)	(6) 1.5 (0.7-3.3 95% CI)
Mean Hb (g/dL) (SD / 95% CI) [range]	11.0 g/dL (10.8-11.1 95% CI) [4.8-15.1]	10.0 g/dL (9.0-10.9 95% CI) [6.9-12.9]	11.0 g/dL (10.2-12.0 95% CI) [5.4-15.2]

The prevalence of anaemia is signifiacantly higher among young children aged 6-23 months; P<0.05.

Figure 31: Trends in anaemia categories in children 6-59 months from 2017 to 2019-Gendrassa refugee camp, South Sudan. (November 2019)
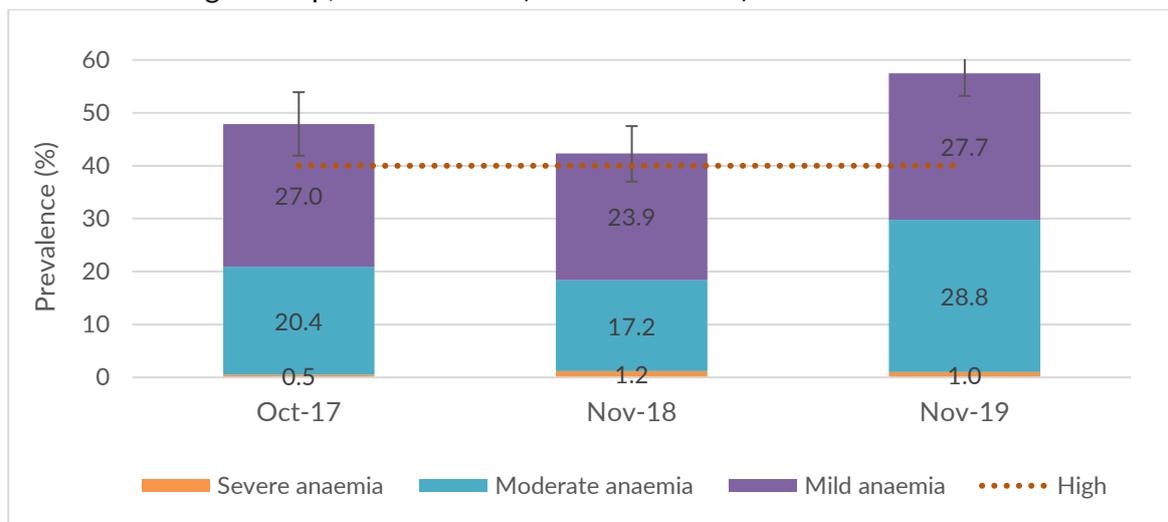
Table 101 : Prevalence of moderate and severe anaemia in children 6-59 months of age and by age group-Gendrassa refugee camp, South Sudan. (November 2019)

	6-59 months n = 678	6-23 months n=282	24-59 months n= 396
Moderate and Severe Anaemia (Hb<10.0 g/dL)	(202) 29.8% (26.5-33.3 95% CI)	(124) 44.0% (38.1-50.0 95% CI)	(78) 19.7% (16.1-23.9 95% CI)

Figure 32 : Trend in total anaemia (<11 g/dl), and moderate and severe anaemia (<10 g/dl) with 95% CI in children 6-59 Months from 2016 to 2019-Gendrassa refugee camp, South Sudan. (November 2019)
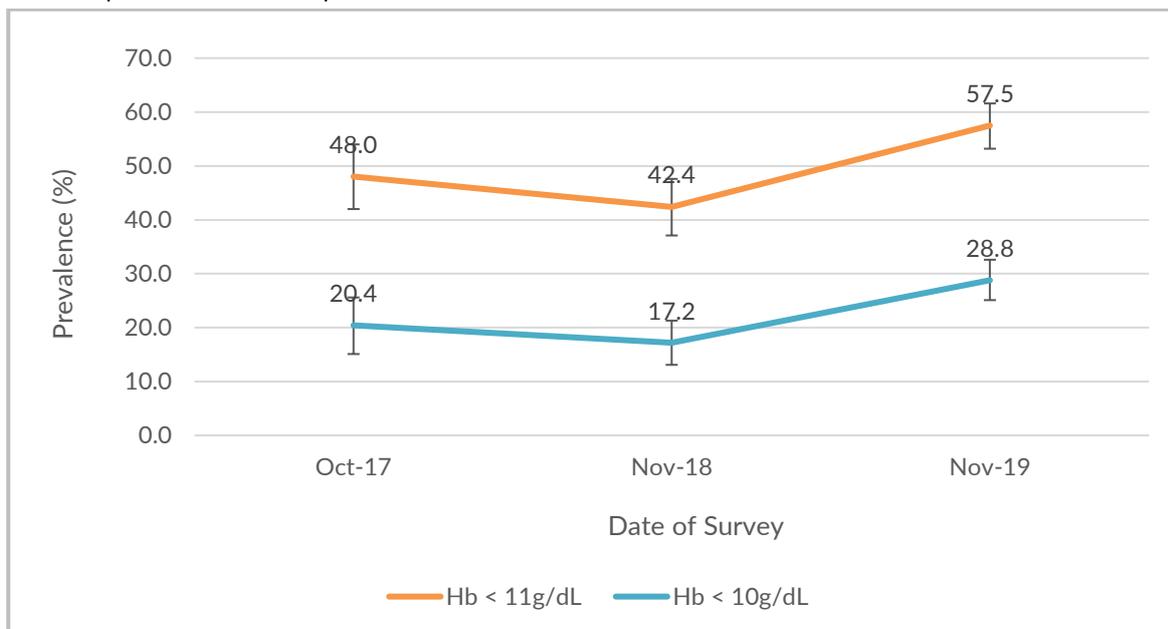
There was a significant increase in anaemia prevalence in 2019 compared to 2018.

Figure 33: Trend in mean haemoglobin concentration in children 6-59 months from 2016 to 2019-Gendrassa refugee camp, South Sudan. (November 2019)
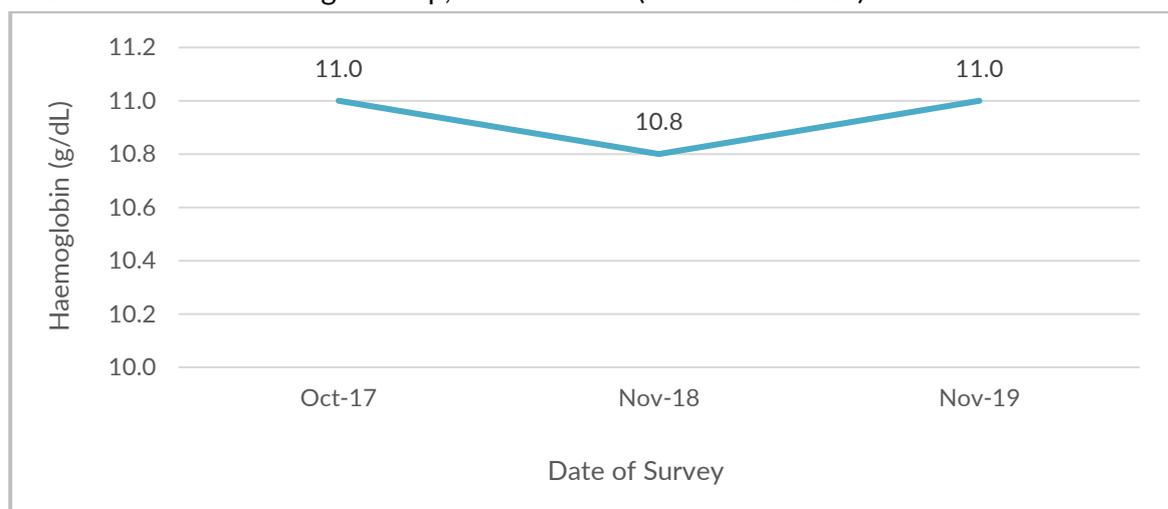
IYCF Children 0-23 Months

Table 102 : Prevalence of Infant and Young Child Feeding Practices Indicators- Gendrassa refugee camp, South Sudan (November 2019)

Indicator	Age range	Number/ total	Prevale nce (%)	95% CI
Timely initiation of breastfeeding	0-23 months	345/371	93.0	(89.9-95.2)
Exclusive breastfeeding under 6 months	0-5 months	82/86	95.4	(88.5.-98.7)
Continued breastfeeding at 1 year	12-15 months	59/61	96.7	(88.7-99.6)
Continued breastfeeding at 2 years	20-23 months	55/71	77.5	(66.0-86.5)
Introduction of solid, semi-solid or soft foods	6-8 months	13/44	29.6	(15.8-45.2)
Consumption of iron-rich or iron-fortified foods	6-23 months	137/285	48.1	(42.1-54.0)
Bottle feeding	0-23 months	14/370	3.8	(2.3-6.3)

Figure 34 : Key IYCF indicators from 2017-November 2019- Gendrassa refugee camp, South Sudan. (November 2019)
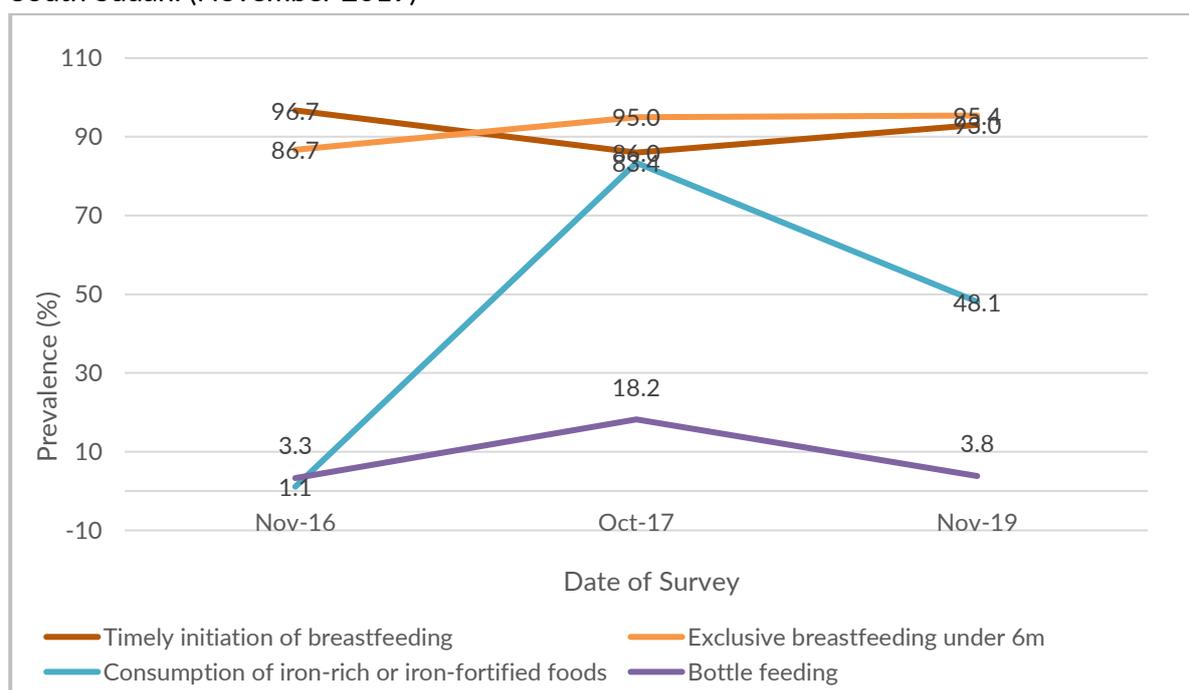
Timely initiation of breastfeeding and exclusive breastfeeding remained high in 2019 compared to 2017. Consumption of iron rich foods decreased significantly in 2019 compared to 2017. Bottle feeding reduced in 2019 compared to 2017.

Prevalence of Intake

Infant Formula

Table 103 : Infant formula intake in children aged 0-23 months- Gendrassa refugee camp, South Sudan (November 2019)

	Number/total	% (95% CI)
Proportion of children aged 0-23 months who receive infant formula (fortified or non-fortified)	32/371	8.6 (6.2-11.9)

Fortified Blended Foods

Table 104 : CSB++ Intake in Children Aged 6-23 Months – Gendrassa refugee camp, South Sudan (November 2019)

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive CSB++	7/285	2.5 (1.0-5.0)

There was no BSFP supplies during the survey period.

Anaemia Women 15-49 Years Results

Table 105: Women Physiological Status and Age- Gendrassa refugee camp, South Sudan (November 2019)

Physiological status	Number/total	% of sample
Non-pregnant	324	91.5
Pregnant	30	8.5
Mean age (range)	27.0(15-49)	

Table 106 : Prevalence of anaemia and haemoglobin concentration in non-pregnant women of reproductive age (15-49 years) -Gendrassa refugee camp, South Sudan. (November 2019)

Anaemia in non-pregnant women of reproductive age (15-49 years)	All n = 324
Total Anaemia (<12.0 g/dL)	(128) 39.5% (34.3-44.9 95% CI)
Mild Anaemia (11.0-11.9 g/dL)	(84) 25.9% (21.5-31.0 95% CI)
Moderate Anaemia (8.0-10.9 g/dL)	(44) 13.6 % (10.3-17.1 95% CI)
Severe Anaemia (<8.0 g/dL)	(0) 0
Mean Hb (g/dL) (SD / 95% CI) [range]	12.3 g/dL (11.5-13.3) [8.3-16.1]

Figure 35 : Trends in anaemia categories in women of reproductive age (non-pregnant) from 2016 to 2019-Gendrassa refugee camp, South Sudan. (November 2019)
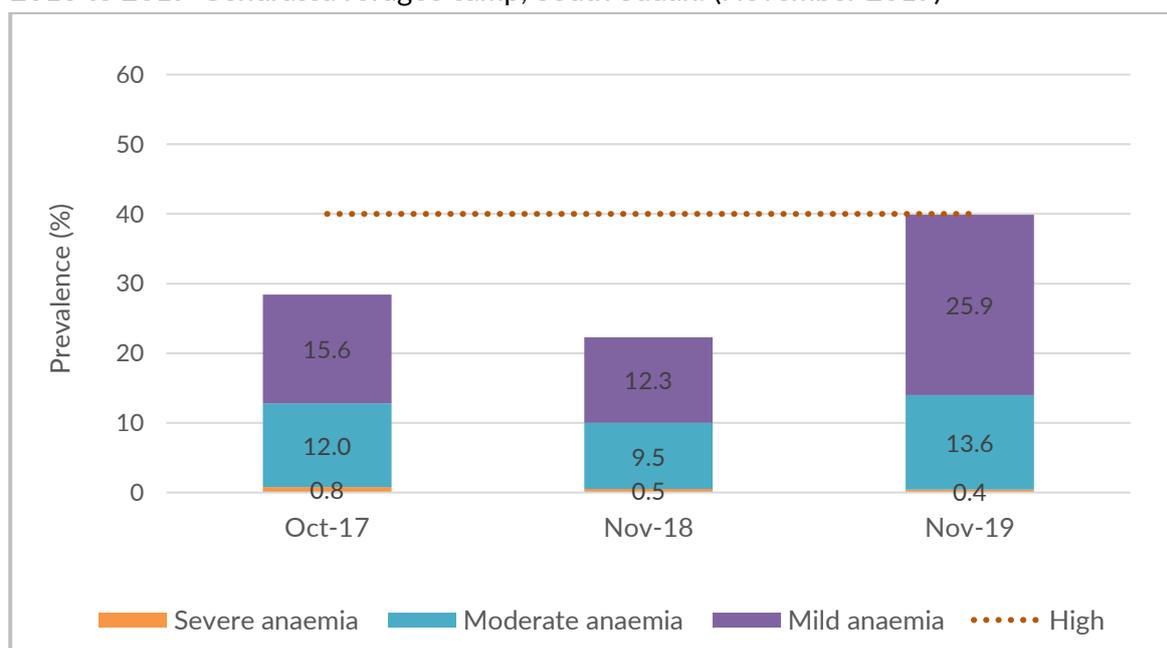
Table 107: ANC Enrolment and Iron-Folic Acid Pills Coverage among Pregnant Women (15-49 Years) - Gendrassa refugee camp, South Sudan (November 2019)

	Number /total	% (95% CI)
Currently enrolled in ANC programme	27/30	90.0 (73.5-97.9)
Currently receiving iron-folic acid pills	27/30	90.0 (73.5-97.9)

Food security
Access to food assistance

Table 108: Ration card coverage- Gendrassa refugee camp, South Sudan. (November 2019)

	Number/total	% (95% CI)
Proportion of households with a ration card	248/248	100

All the surveyed households had a ration card.

Negative household coping strategies
The refugees in Gendrassa refugee camp like other Maban refugee camps receive a reduced food ration at a 70% scale. This was provided using hybrid cash and in-kind modality in 2019. Cereals were provided at 100% in kind, lentils at 70% as inkind and 30% cash and cooking oil at 50% as inkind and 50% cash. Cash for milling and salt was provided at 100%. Of note is that the cash distribution figures vary from one month to other depending on the market assessment conducted every month prior to the GFD scheduled. To fill the food gap the refugee noted the use of the coping strategies below.

Table 109: Coping strategies used by the surveyed population over the past month - Gendrassa refugee camp, South Sudan (November 2019)

	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	190/246	77.2 (71.5-82.3)
Sold any assets that would not have normally sold (furniture, seed stocks, tools, other NFI, livestock etc.)	88/248	35.5 (29.5-41.8)
Requested increased remittances or gifts as compared to normal	49/248	19.8 (15.0-25.3)
Reduced the quantity and/or frequency of meals and snacks	113/248	45.6 (39.3-52.0)
Begged	27/246	11.0 (7.4-15.6)
Engaged in potentially risky or harmful activities	79/246	32.1 (26.3-38.3)
Proportion of households reporting using none of the negative coping strategies over the past month	33/248	13.1 (9.3-18.2)

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

Only 13.1% 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 prior to the survey was in October 2019. This was an emergency distribution based on availability of commodities in the camp. The food ration was provided through the community leaders due to the access limitation by the partners as a result of the flooding. The survey was carried out during the end of the harvest season. Of note is that the harvest was also affected by the flooding. The survey period can thus be categorised as a worst-case scenario.

Table 110: Average HDDS- Gendrassa refugee camp, South Sudan (November 2019)

	Mean (Standard deviation or 95% CI)
Average HDDS	6.3 (SD 2.3)

Figure 36: Proportion of households consuming different food groups within last 24 hours - Gendrassa refugee camp, South Sudan (November 2019)
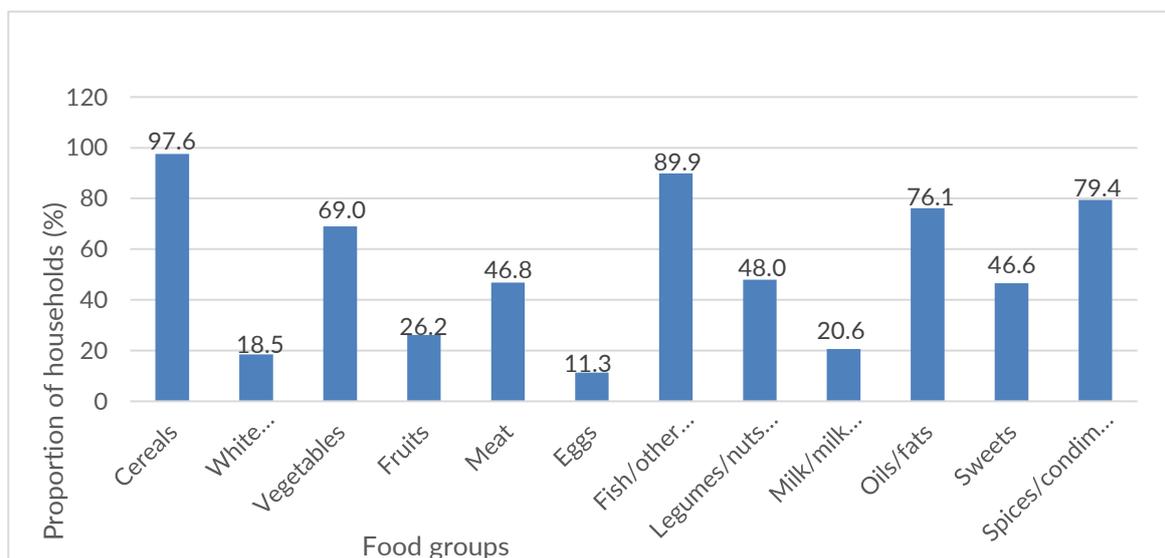
Table 111: Consumption of micronutrient rich foods by households- Gendrassa refugee camp, South Sudan (November 2019)

	Number/total	% (95% CI)
Proportion of households *not consuming any* vegetables, fruits, meat, eggs, fish/seafood, and milk/milk products	4/248	1.6 (0.4-4.1)
Proportion of households consuming either a plant or animal source of vitamin A	138/248	55.7 (49.2-61.9)
Proportion of households consuming organ meat/flesh meat, or fish/seafood (food sources of haem iron)	237/248	95.5 (92.2-97.8)

Most of the households were accessing fish during the survey period. The fish was brought by the flood waters during the survey period.

3.4 KAYA REFUGEE CAMP

Table below shows the actual number of children captured during survey verses targeted children in the survey. By the end of the SENS in Kaya refugee camp, >100% of the targeted children were surveyed. See table below for details. The SENS guideline recommends that at least 80% of the targeted children to be surveyed.

Table 112 : Target and Actual Number Captured-Kaya refugee camp, South Sudan. (November 2019)

	Target (No.)	Total surveyed (No.)	% of the target
Children 6-59 months	325	552	170 %

Anthropometric results (based on WHO standards 2006)

The coverage of age documentation was 85%

Table 113 : Distribution of age and sex of sample-Kaya refugee camp, South Sudan. (November 2019)

	Boys		Girls		Total		Ratio
AGE (mo)	no.	%	no.	%	no.	%	Boy: girl
6-17	69	46.6	79	53.4	148	26.8	0.9
18-29	67	46.2	78	53.8	145	26.3	0.9
30-41	51	48.1	55	51.9	106	19.2	0.9
42-53	53	51.5	50	48.5	103	18.7	1.1
54-59	21	42.0	29	58.0	50	9.1	0.7
Total	261	47.3	291	52.7	552	100.0	0.9

The overall ratio of boys: girls of 0.9 indicates that both sexes were equally represented

Table 114 : Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex-Kaya refugee camp, South Sudan. (November 2019)

	All n = 549	Boys n = 261	Girls n = 288
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(50) 9.1 % (7.0 - 11.8 95% C.I.)	(22) 8.4 % (5.6 - 12.4 95% C.I.)	(28) 9.7 % (6.8 - 13.7 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(42) 7.7 % (5.7 - 10.2 95% C.I.)	(18) 6.9 % (4.4 - 10.6 95% C.I.)	(24) 8.3 % (5.7 - 12.1 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(8) 1.5 % (0.7 - 2.8 95% C.I.)	(4) 1.5 % (0.6 - 3.9 95% C.I.)	(4) 1.4 % (0.5 - 3.5 95% C.I.)

The prevalence of oedema was 0.2% and the data excluded SMART flags. Boys are girls were equally wasted.

Figure 37: Trends in the prevalence of global and severe acute malnutrition based on WHO growth standards in children 6-59 months from 2017 to 2019 - Kaya refugee camp, South Sudan. (November 2019)
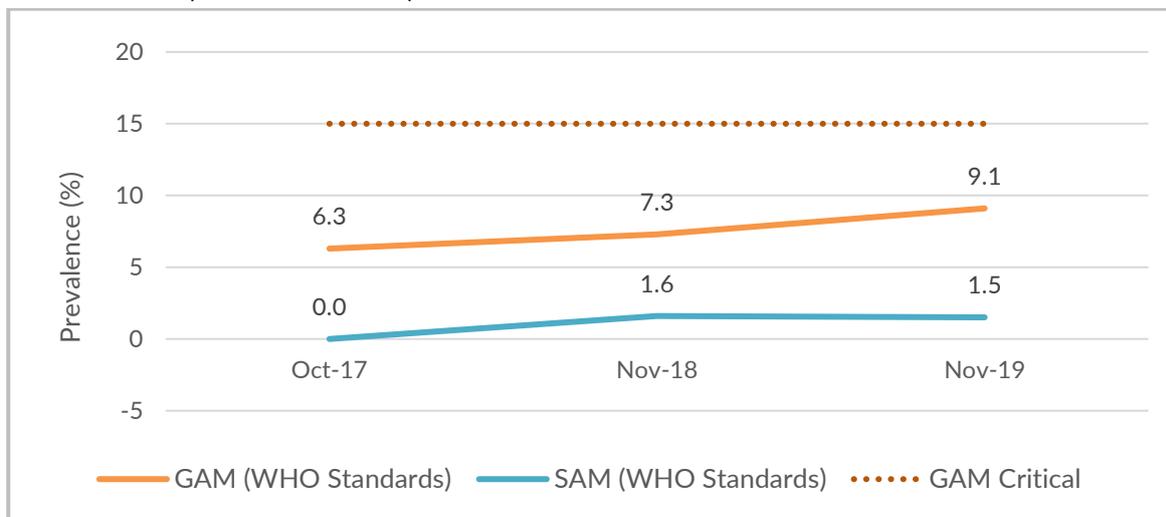
The GAM prevalence in 2019 remained the same as in 2018 with the increase being statistically insignificant; p>0.05. The slight increase however indicates a deteriorating trend.

Table 115: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema-Kaya refugee camp, South Sudan. (November 2019)

Age (mo)	Total no.	Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-17	148	3	2.0	21	14.2	124	83.8	0	0.0
18-29	145	1	0.7	9	6.2	134	92.4	1	0.7
30-41	104	1	1.0	5	4.8	98	94.2	0	0.0
42-53	102	2	2.0	2	2.0	98	96.1	0	0.0
54-59	50	0	0.0	5	10.0	45	90.0	0	0.0
Total	549	7	1.3	42	7.7	499	90.9	1	0.2

Children 6-17 months tend to be most affected by acute malnutrition.

Figure 38 : Trend in the prevalence of wasting by age in children 6-59 months- Kaya refugee camp, South Sudan. (November 2019)
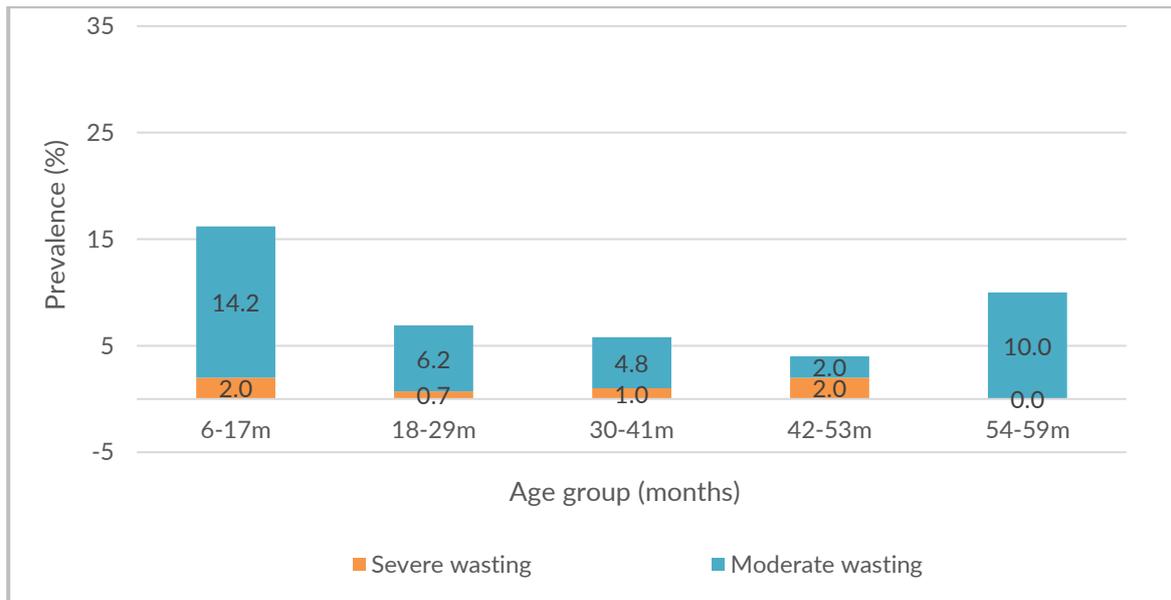
Table 116 : Distribution of acute malnutrition and oedema based on weight-for-height z-scores-Kaya refugee camp, South Sudan. (November 2019)

	<-3 z-score	**>=-3 z-score**
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 1 (0.2 %)
Oedema absent	Marasmic No. 8 (1.5 %)	Not severely malnourished No. 542 (98.4 %)

Figure 39 : 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.

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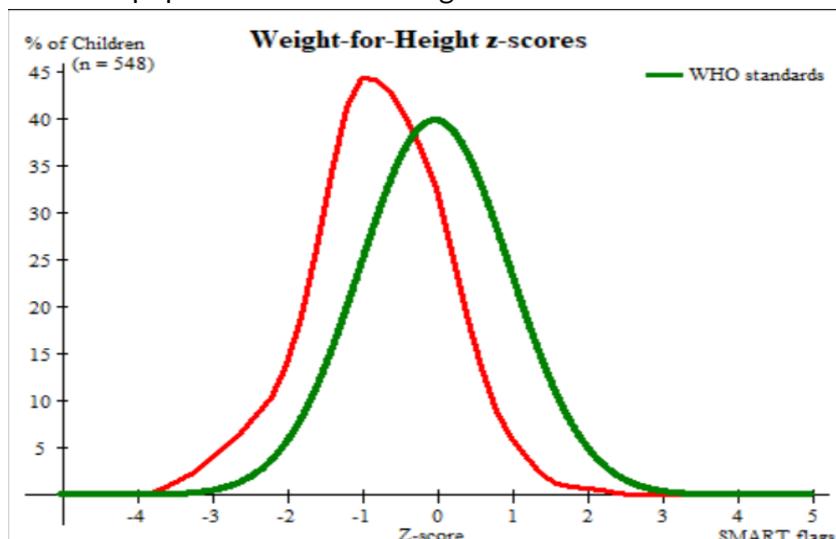
Table 117 : Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex-Kaya refugee camp, South Sudan. (November 2019)

	All n = 552	**Boys** n = 261	**Girls** n = 291
Prevalence of global malnutrition (< 125 mm and/or oedema)	(28) 5.1 % (3.5 - 7.2 95% C.I.)	(9) 3.4 % (1.8 - 6.4 95% C.I.)	(19) 6.5 % (4.2 - 10.0 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(23) 4.2 % (2.8 - 6.2 95% C.I.)	(8) 3.1 % (1.6 - 5.9 95% C.I.)	(15) 5.2 % (3.1 - 8.3 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(5) 0.9 % (0.4 - 2.1 95% C.I.)	(1) 0.4 % (0.1 - 2.1 95% C.I.)	(4) 1.4 % (0.5 - 3.5 95% C.I.)

Boys and girls were equally affected by malnutirion based on MUAC p>0.05

Table 118: Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema-Kaya refugee camp, South Sudan. (November 2019)

		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	148	4	2.7	20	13.5	124	83.8	0	0.0
18-29	145	0	0.0	3	2.1	142	97.9	1	0.7
30-41	106	0	0.0	0	0.0	106	100.0	0	0.0
42-53	103	0	0.0	0	0.0	103	100.0	0	0.0
54-59	50	0	0.0	0	0.0	50	100.0	0	0.0
Total	552	4	0.7	23	4.2	525	95.1	1	0.2

Children 6-17 months tends to be most affected by wasting measured by MUAC

Table 119 : Prevalence of underweight based on weight-for-age z-scores by sex-Kaya refugee camp, South Sudan. (November 2019)

	All n = 549	**Boys** n = 259	**Girls** n = 290
Prevalence of underweight (<-2 z-score)	(175) 31.9 % (28.1 - 35.9 95% C.I.)	(83) 32.0 % (26.7 - 38.0 95% C.I.)	(92) 31.7 % (26.6 - 37.3 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(147) 26.8 % (23.2 - 30.6 95% C.I.)	(72) 27.8 % (22.7 - 33.5 95% C.I.)	(75) 25.9 % (21.2 - 31.2 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(28) 5.1 % (3.6 - 7.3 95% C.I.)	(11) 4.2 % (2.4 - 7.4 95% C.I.)	(17) 5.9 % (3.7 - 9.2 95% C.I.)

Table 120 : Prevalence of underweight by age, based on weight-for-age z-scores-Kaya refugee camp, South Sudan. (November 2019)

Age (mo)	Total no.	Severe underweight (<-3 z-score)		Moderate underweight (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-17	146	12	8.2	34	23.3	100	68.5	0	0.0
18-29	144	5	3.5	44	30.6	95	66.0	1	0.7
30-41	106	6	5.7	26	24.5	74	69.8	0	0.0
42-53	103	1	1.0	31	30.1	71	68.9	0	0.0
54-59	50	4	8.0	12	24.0	34	68.0	0	0.0
Total	549	28	5.1	147	26.8	374	68.1	1	0.2

Children in age group of 18-29 months tend to be most underweight.

Table 121 : Prevalence of stunting based on height-for-age z-scores and by sex-Kaya refugee camp, South Sudan. (November 2019)

	All n = 542	Boys n = 257	Girls n = 285
Prevalence of stunting (<-2 z-score)	(261) 48.2 % (44.0 - 52.4 95% C.I.)	(132) 51.4 % (45.3 - 57.4 95% C.I.)	(129) 45.3 % (39.6 - 51.1 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(186) 34.3 % (30.4 - 38.4 95% C.I.)	(91) 35.4 % (29.8 - 41.4 95% C.I.)	(95) 33.3 % (28.1 - 39.0 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(75) 13.8 % (11.2 - 17.0 95% C.I.)	(41) 16.0 % (12.0 - 20.9 95% C.I.)	(34) 11.9 % (8.7 - 16.2 95% C.I.)

Boys and girls were equally stunted as the difference was not statistically significant ; $p > 0.05$

Figure 40 : Trends in the prevalence of global and severe stunting based on WHO growth standards in children 6-59 months from 2017 to 2019- Kaya refugee camp, South Sudan. (November 2019)
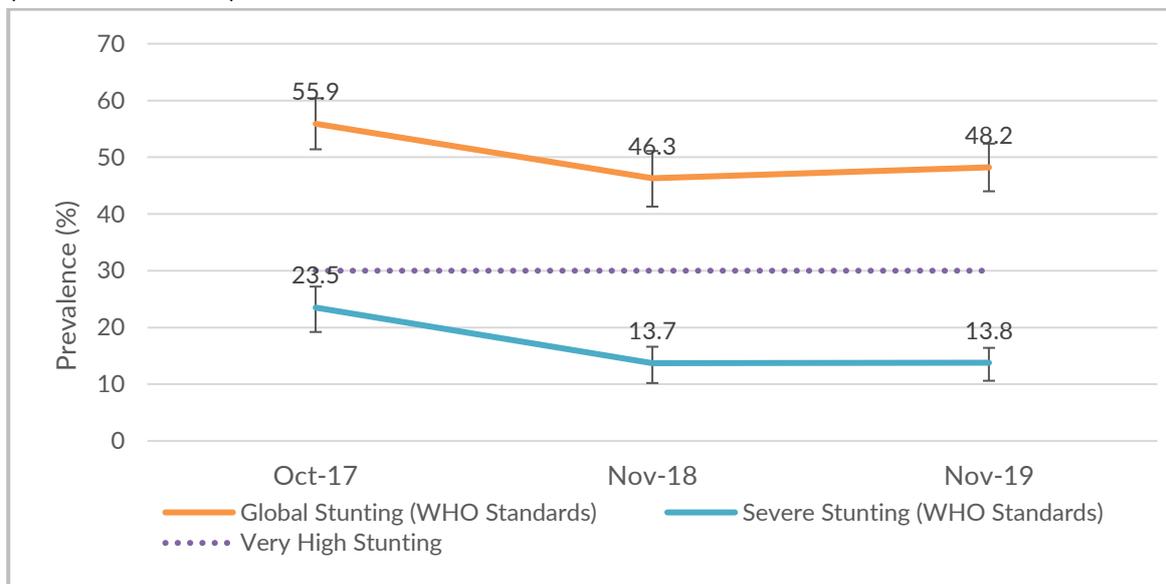
Stunting prevalence remained the same in 2019 compared to 2018 ; p>0.05.

Table 122 : Prevalence of stunting by age based on height-for-age z-scores-Kaya refugee camp, South Sudan. (November 2019)

		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	140	15	10.7	38	27.1	87	62.1
18-29	144	28	19.4	50	34.7	66	45.8
30-41	105	14	13.3	42	40.0	49	46.7
42-53	103	13	12.6	40	38.8	50	48.5
54-59	50	5	10.0	16	32.0	29	58.0
Total	542	75	13.8	186	34.3	281	51.8

Children in age groups of 18-29 and 30-41 months tend to be most stunted.

Figure 41 : Trends in the prevalence of stunting by age in children 6-59 months- Kaya refugee camp, South Sudan. (November 2019)
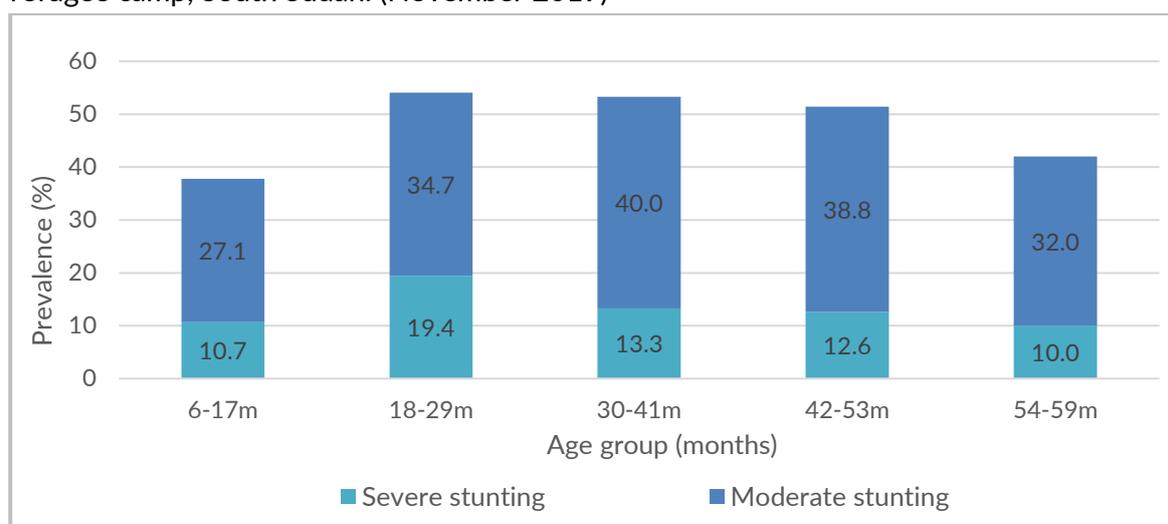
Table 123: Prevalence of overweight based on weight for height cut offs and by sex (no oedma)-Kaya refugee camp, South Sudan. (November 2019)

	All n = 549	**Boys** n = 261	**Girls** n = 288
Prevalence of overweight (WHZ > 2)	(2) 0.4 % (0.1 - 1.3 95% C.I.)	(1) 0.4 % (0.1 - 2.1 95% C.I.)	(1) 0.3 % (0.1 - 1.9 95% C.I.)
Prevalence of severe overweight (WHZ > 3)	(0) 0.0 % (0.0 - 0.7 95% C.I.)	(0) 0.0 % (0.0 - 1.5 95% C.I.)	(0) 0.0 % (0.0 - 1.3 95% C.I.)

Table 124: Prevalence of overweight by age, based on weight for height (no oedema)-Kaya refugee camp, South Sudan. (November 2019)

Age (mo)	Total no.	Overweight (WHZ > 2)		Severe Overweight (WHZ > 3)	
		No.	%	No.	%
6-17	148	1	0.7	0	0.0
18-29	145	0	0.0	0	0.0
30-41	104	0	0.0	0	0.0
42-53	102	1	1.0	0	0.0
54-59	50	0	0.0	0	0.0
Total	549	2	0.4	0	0.0

Table 125 : Mean z-scores, design effects and excluded subjects-Kaya refugee camp, South Sudan. (November 2019)

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	548	-0.78±0.91	1.00	2	2
Weight-for-Age	549	-1.59±0.89	1.00	1	2
Height-for-Age	542	-1.91±1.01	1.00	1	9

* contains for WHZ and WAZ the children with edema.

Feeding Programme Enrolment Coverage

In Kaya refugee camp, the OTP and TSFP enrolment coverage based on both all admission criteria and using MUAC and Oedema only did not meet the recommended standard of >90%.

Selective feeding programme

Table 126 : Nutrition treatment programme enrolment coverage based on all admission criteria (weight-for-height, MUAC, oedema) -Kaya refugee camp, South Sudan. (November 2019)

	Number/total	% (95% CI)
Proportion of children aged 6-59 months with severe acute malnutrition currently enrolled in therapeutic feeding programme*	9/58	15.5 (7.4-27.4)
Proportion of children aged 6-59 months with moderate acute malnutrition currently enrolled in supplementary feeding programme*	3/11	27.3 (6.0-61.0)

Table 127: Nutrition treatment programme enrolment coverage based on MUAC and oedema only -Kaya refugee camp, South Sudan. (November 2019)

	Number/total	% (95% CI)
Proportion of children aged 6-59 months with severe acute malnutrition currently enrolled in therapeutic feeding programme	6/23	26.1 (10.2-48.4)
Proportion of children aged 6-59 months with moderate acute malnutrition currently enrolled in therapeutic feeding programme	1/5	20.0 (0.5-71.6)

Measles vaccination coverage results

Table 128 : Measles vaccination coverage for children aged 9-59 months (N=505) -Kaya refugee camp, South Sudan. (November 2019)

	Measles (with card) n= 326	Measles (with card <u>or</u> confirmation from mother) N=498
YES	64.6% (60.3-68.6 95% CI)	98.6 % (97.2-99.3 95% CI)

Measles coverage in Doro camp met the recommended standard of ≥95%.

Table 129: **Vitamin A supplementation coverage results**

Vitamin A supplementation for children aged 6-59 months within past 6 months (N= 552) - Kaya refugee camp, South Sudan. (November 2019)

	Vitamin A capsule (with card) n=50	Vitamin A capsule (with card <u>or</u> confirmation from mother) n=459
YES	9.1% (6.9-11.7 95% CI)	83.2% (79.8-86.0 95% CI)

Vitamin A coverage supplementation in Doro did not meet the recommended standard of >90%

Figure 42 : Trends in the coverage of measles vaccination and vitamin A supplementation in last 6 months in children 6-59 months from 2017 to 2019-Kaya refugee camp, South Sudan. (November 2019)
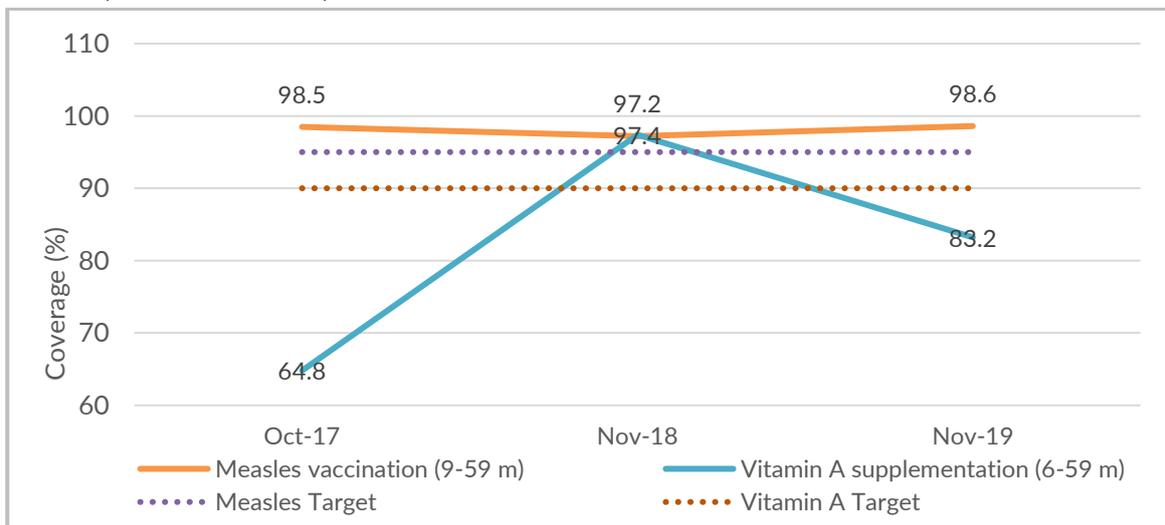
Diarrhoea Results

Table 130 : Period prevalence of diarrhea-Kaya refugee camp, South Sudan. (November 2019)

	Number/total	% (95% CI)
Diarrhoea in the last two weeks	467/549	14.9 (12.2-18.2)

Deworming

71.2% of children 12-59 months received a deworming tablet in last 6 months prior to the survey

Table 131: Deworming coverage- Kaya refugee camp, South Sudan. (November 2019)

	Number/total	% (95% CI)
Children received a deworming tablet in the last six months (12-59 months)	336/472	71.2(66.9-75.1)

Deworming coverage in Kaya did not meet the recommended standard (≥75%)

Anaemia Results Children 6 - 59 months

The total anaemia prevalence among children 6 to 59 months is of high public health significance at 49.9% (45.8-54.1 95% CI). Children 6 to 23 months tend to be most affected compared to the 24-59 months age group.

Table 132 : Prevalence of total anaemia, anaemia categories, and mean haemoglobin concentration in children 6-59 months of age and by age group-Kaya refugee camp, South Sudan. (November 2019)

	6-59 months n = 551	6-23 months n=226	24-59 months n=325
Total Anaemia **(Hb<11.0 g/dL)**	(275) 49.9% (45.8-54.1 95% CI)	(144) 63.7% (57.1-70.0 95% CI)	(131) 40.3% (35.1-45.7 95% CI)
Mild Anaemia **(Hb 10.0-10.9 g/dL)**	(167) 30.3% (26.6-34.3 95% CI)	(75) 33.2% (27.1-39.7 95% CI)	(92) 28.3% (23.7-33.4 95% CI)
Moderate Anaemia **(7.0-9.9 g/dL)**	(107) 19.4% (16.3-22.9 95% CI)	(68) 30.1 % (24.2-36.5 95% CI)	(39) 12.0% (8.9-16.0 95% CI)
Severe Anaemia **(<7.0 g/dL)**	(1) 0.2% (0.0-1.0 95% CI)	(1) 0.4% (0.0-2.4 95% CI)	(0) 0.0 (0.0-0.0 5% CI)
Mean Hb (g/dL) **(SD / 95% CI)** **[range]**	11.2 g/dL (11.0-11.3 95% CI) [6.0-18.9]	10.4 g/dL (9.5-11.2 95% CI) [6.5-15.2]	11.1 g/dL (10.5-11.9 95% CI) [7.4-14.2]

The prevalence of anaemia is signifiacnlty higher among young children aged 6-23 months.

Figure 43 : Trends in anaemia categories in children 6-59 months from 2016 to 2019-Kaya refugee camp, South Sudan. (November 2019)
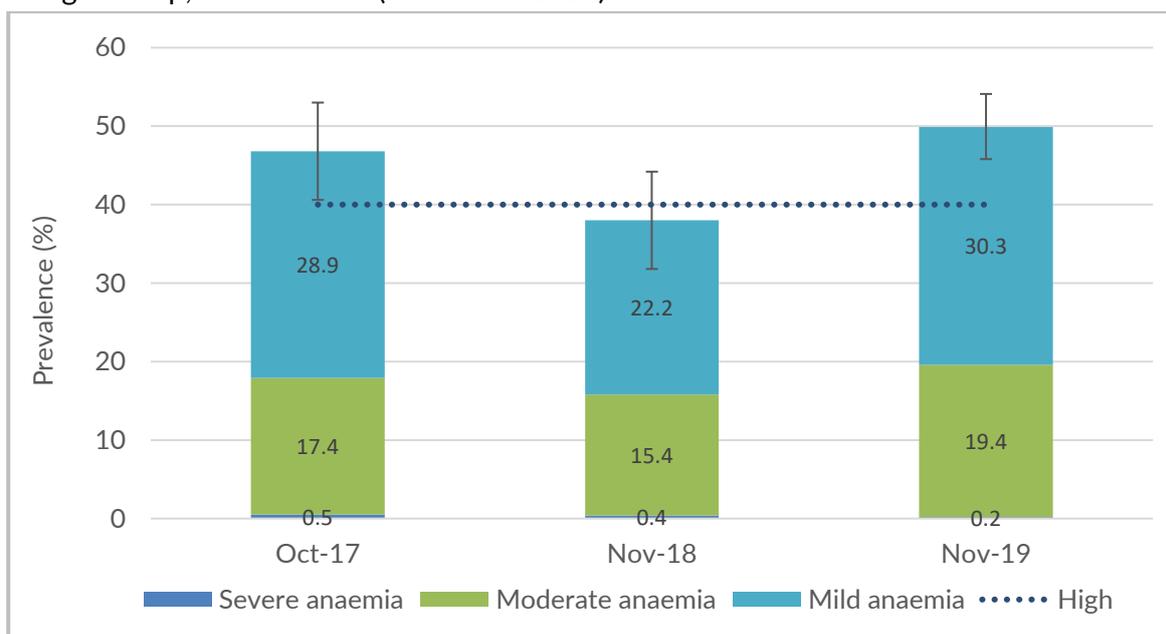
Table 133 : Prevalence of moderate and severe anaemia in children 6-59 months of age and by age group-Kaya refugee camp, South Sudan. (November 2019)

	6-59 months n = 551	6-23 months n= 226	24-59 months n= 325
Moderate and Severe Anaemia (Hb<10.0 g/dL)	(108) 19.6% (16.5-23.1 95% CI)	(69) 30.5% (24.6-37.0 95% CI)	(39) 12.0% (8.9-16.0 95% CI)

Figure 44 : Trend in total anaemia (<11 g/dl), and moderate and severe anaemia (<10 g/dl) with 95% ci in children 6-59 months from 2017 to 2019-Kaya refugee camp, South Sudan. (November 2019)
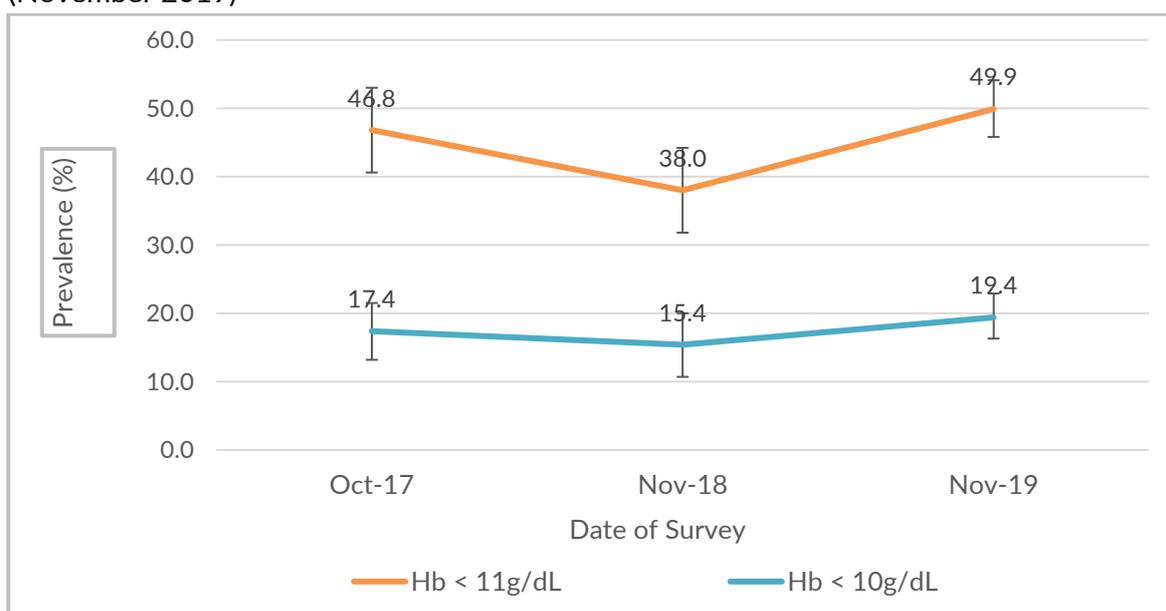
The anaemia prevalence in 2019 increased significantly ; p<0.05.

Figure 45: Trend in Mean Haemoglobin Concentration in Children 6-59 Months from 2016 to 2019-Kaya refugee camp, South Sudan. (November 2019)
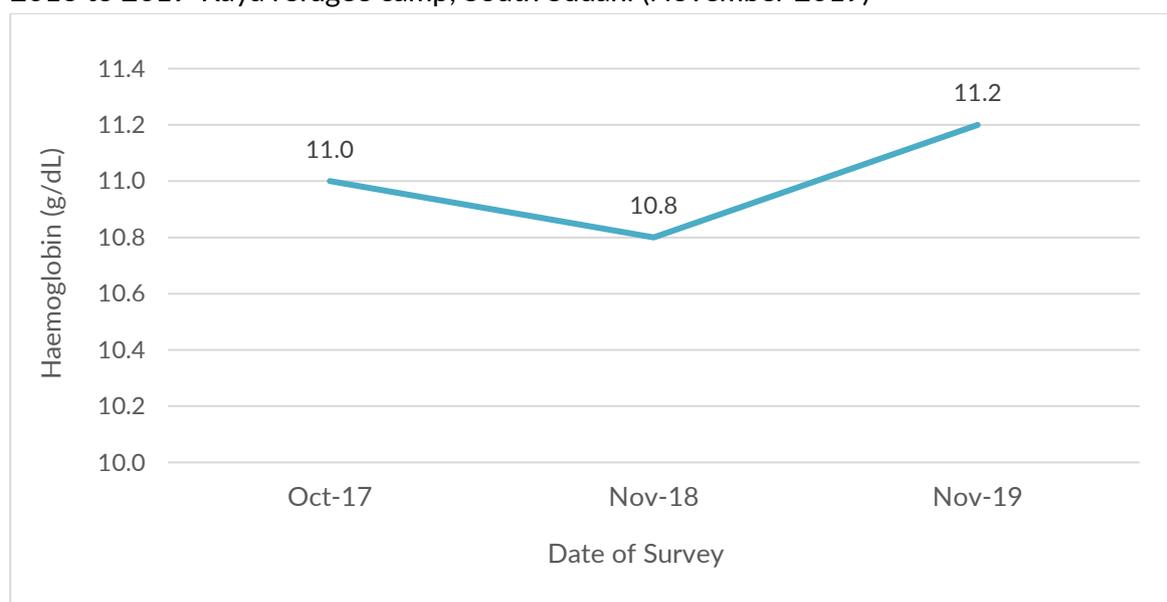
IYCF Children 0-23 Months

Table 134 : Prevalence of Infant and Young Child Feeding Practices Indicators- Kaya refugee camp, South Sudan (November 2019)

Indicator	Age range	Number/total	Prevalence (%)	95% CI
Timely initiation of breastfeeding	0-23 months	272/296	91.9	(88.2-94.7)
Exclusive breastfeeding under 6 months	0-5 months	64/70	91.4	(82.3-96.8)
Continued breastfeeding at 1 year	12-15 months	46/49	93.9	(83.1-98.7)
Continued breastfeeding at 2 years	20-23 months	28/47	59.6	(44.2-73.6)
Introduction of solid, semi-solid or soft foods	6-8 months	8/38	17.4	(7.8-31.4)
Consumption of iron-rich or iron-fortified foods	6-23 months	83/226	36.7	(30.4-43.4)
Bottle feeding	0-23 months	18/296	6.1	(3.6-9.4)

Figure 46: Key IYCF indicators from 2014-November 2019- Kaya refugee camp, South Sudan. (November 2019)
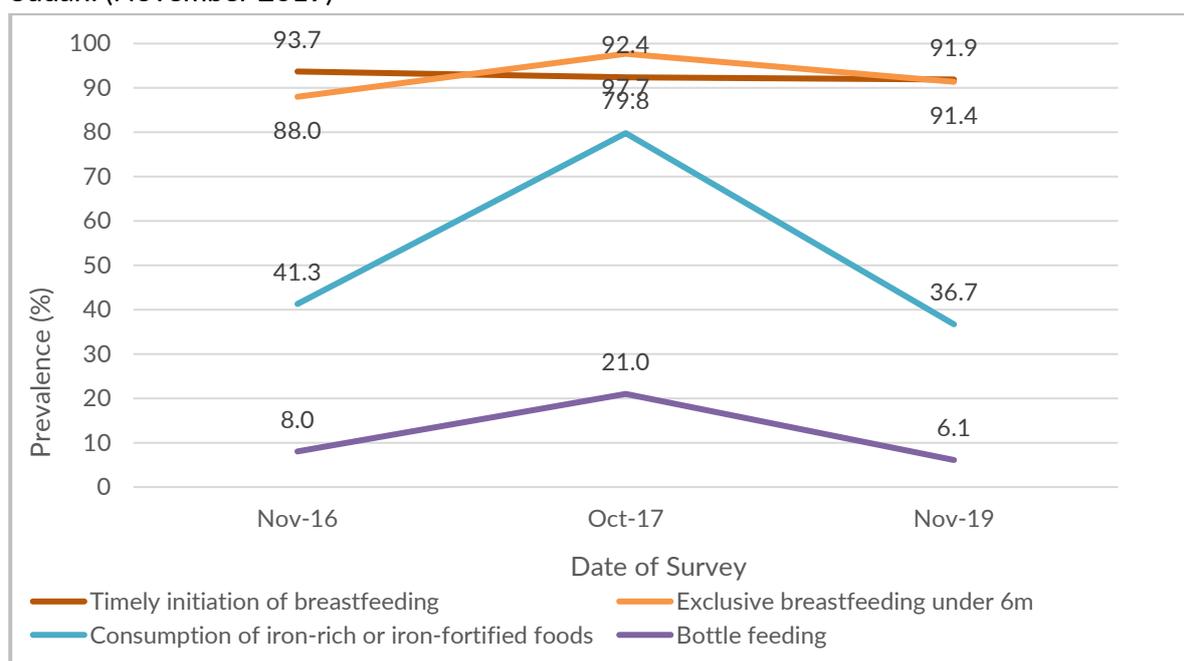
Prevalence of Intake

Infant Formula

Table 135 : Infant formula intake in children aged 0-23 months- Kaya refugee camp, South Sudan (November 2019)

	Number/total	% (95% CI)
Proportion of children aged 0-23 months who receive infant formula (fortified or non-fortified)	24/296	8.1 (5.3-11.8)

Fortified Blended Foods

Table 136 : CSB++ Intake in Children Aged 6-23 Months – Kaya refugee camp, South Sudan (November 2019)

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive CSB++	0/226	0

There were no food supplies to the BSFP during the survey period.

Anaemia Women 15-49 Years Results

Table 137: Women Physiological Status and Age- Kaya refugee camp, South Sudan (November 2019)

Physiological status	Number/total	% of sample
Non-pregnant	257	90
Pregnant	29	10
Mean age (range)	27.3 (15-49)	

Table 138 : Prevalence of anaemia and haemoglobin concentration in non-pregnant women of reproductive age (15-49 years) -Kaya refugee camp, South Sudan. (November 2019)

Anaemia in non-pregnant women of reproductive age (15-49 years)	All n =256
Total Anaemia (<12.0 g/dL)	(54) 21.1 % (16.3-26.6 95% CI)
Mild Anaemia (11.0-11.9 g/dL)	(29) 11.3 % (7.7-15.9 95% CI)
Moderate Anaemia (8.0-10.9 g/dL)	(23) 9.0% (5.8-13.2 95% CI)
Severe Anaemia (<8.0 g/dL)	(2) 0.8% (0.1-2.8 95% CI)
Mean Hb (g/dL) (SD / 95% CI) [range]	12.7 g/dL (12.0-13.6) [6.0-16.0]

Figure 47 : Trends in anaemia categories in women of reproductive age (non-pregnant) from 2017 to 2019-Kaya refugee camp, South Sudan. (November 2019)
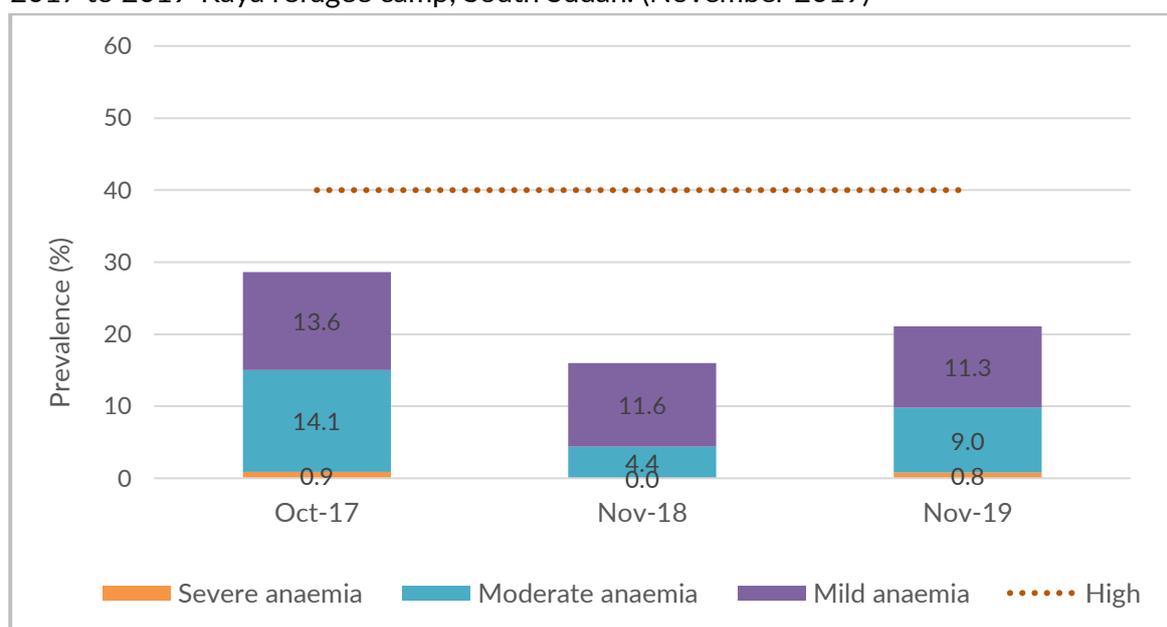
Table 139: ANC Enrolment and Iron-Folic Acid Pills Coverage among Pregnant Women (15-49 Years) - Kaya refugee camp, South Sudan (November 2019)

	Number /total	% (95% CI)
Currently enrolled in ANC programme	26/29	89.7 (72.2-97.8)
Currently receiving iron-folic acid pills	26/29	89.7 (72.2-97.8)

Food security
Access to food assistance

Table 140: Ration card coverage- Kaya refugee camp, South Sudan. (November 2019)

	Number/total	% (95% CI)
Proportion of households with a ration card	238/238	100

All the surveyed households had a ration card.

Negative household coping strategies
The refugees in Kaya refugee camp like other Maban refugee camps receive a reduced food ration at a 70% scale. This was provided using hybrid cash and in-kind modality in 2019. Cereals were provided at 100% in kind, lentils at 70% as inkind and 30% cash and cooking oil at 50% as inkind and 50% cash. Cash for milling and salt was provided at 100%. Of note is that the cash distribution figures vary from one month to other depending on the market assessment conducted every month prior to the GFD scheduled. To fill the food gap the refugee noted the use of the coping strategies below.

Table 141: Coping strategies used by the surveyed population over the past month - Kaya refugee camp, South Sudan (November 2019)

	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	205/238	86.1 (81.1-90.3)
Sold any assets that would not have normally sold (furniture, seed stocks, tools, other NFI, livestock etc.)	91/238	38.2 (32.0-44.7)
Requested increased remittances or gifts as compared to normal	19/238	8.0 (4.9-12.2)
Reduced the quantity and/or frequency of meals and snacks	151/238	63.5 (57.0-69.9)
Begged	1/237	3.4 (1.5-6.5)
Engaged in potentially risky or harmful activities	91/238	38.2 (32.0-44.7)
Proportion of households reporting using none of the negative coping strategies over the past month	16/238	6.7 (3.9-10.7)

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

Only 6.7% 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 prior to the survey was in November but at a 33% ration scale. This was an emergency distribution based on availability of commodities in the camp. The survey was carried out during the end of the harvest season. Of note is that the harvest was also affected by the flooding. The survey period can thus be categorised as a worst-case scenario.

Table 142: Average HDDS- Kaya refugee camp, South Sudan (November 2019)

	Mean (Standard deviation or 95% CI)
Average HDDS	5.6 (SD 2.3)

Figure 48: Proportion of households consuming different food groups within last 24 hours -Kaya refugee camp, South Sudan (November 2019)
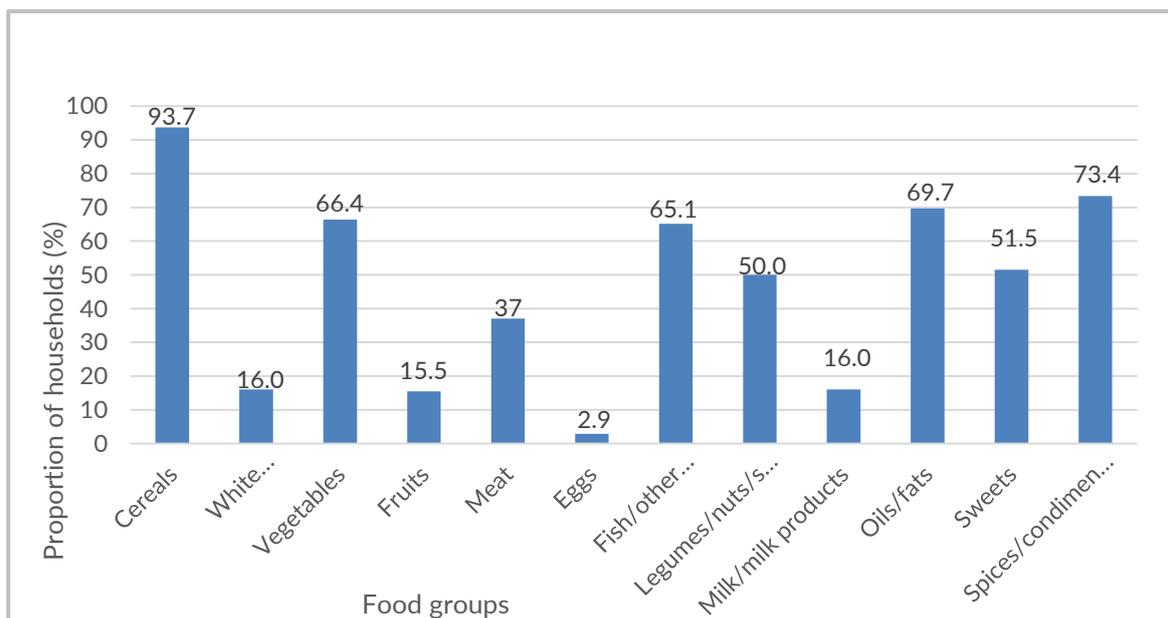
Table 143: Consumption of micronutrient rich foods by households- Kaya refugee camp, South Sudan (November 2019)

	Number/total	% (95% CI)
Proportion of households *not consuming any* vegetables, fruits, meat, eggs, fish/seafood, and milk/milk products	27/238	39.9 (33.6-46.4)
Proportion of households consuming either a plant or animal source of vitamin A	95/238	39.9 (33.6-46.4)
Proportion of households consuming organ meat/flesh meat, or fish/seafood (food sources of haem iron)	63/238	73.5 (67.4-79.0)

4.0 LIMITATIONS

The age documentation coverage ranged from 80 to 87% across the Maban refugee camps. Although an event calendar was used by the survey teams to ascertain age, stunting results need to be interpreted with caution because z-scores for height-for-age require accurate ages to within two weeks

Due to the dynamics of the ethnic groups in Maban, two sets of surveys teams (One in Doro and the other for the three camps - Yusuf Batil, Gendrassa, and Kaya camps) had to be trained as the two groups could not be mixed. This increased the training duration to two weeks instead of one.

TSFP/OTP coverage results should be interpreted with caution due to the small number of cases that were sampled during the survey. This indicator is rather interpreted as measuring enrolment coverage not programme coverage.

Due to the small survey sample size for some indicators such as the exclusive breastfeeding "introduction of solid, semi-solid or soft foods" and the "continued breastfeeding at 2 years" results to be interpreted with caution.

5.0 DISCUSSION

Nutritional Status of Young Children

The nutrition situation in all four Maban camps remained critical in Doro, serious in Yusuf Batil, and poor in Gendrassa and Kaya camps according to the WHO clasification. This is as indicated by the GAM prevalence of 15.0% in Doro, 14.0% in Yusuf Batil, 6.6% in Gendrassa, and 9.1% in Kaya camps. Compared to the situation in 2018 the GAM prevalence in Doro and Yusuf Batil refugee camps significantly deteriorated while the situation remained the same in Gendrassa and Kaya with the changes in both camps being statistically insignificant. The change in Kaya however indicates a likely deteriorating situation. The prevalence of severe acute malnutrition was 3.8% in Doro, 2.2% in Yusuf Batil classified as critical level by UNHCR threshold of SAM >2%, 0.6% in Gendrassa, and 1.5% in Kaya camp. In Doro and Yusuf Batil camps, the levels were above the UNHCR acceptable levels of <2%. Compared to 2018 the SAM prevalence in Doro increased significantly while in the other camps it remained the same with the noted changes being insignificant; p>0.05. Severe acute malnourished children have a nine times elevated risk of death compared with normal children. Moderate malnourished children have a four times elevated risk of death compared with normal children.[15] The remarkable increase in acute malnutrition in Doro and Yusuf Batil is of high concern. In 2019 the CMAM program continued. Appropriate ready to use therapeutic and supplementary foods for the management of acute malnutrition were in place. No pipeline break was experienced in 2019 for therapeutic nutrition supplies. Supplementary feeding Plumpy'Sup had a two-month pipeline gap within which CSB++ was used as a replacement. In addition to the CMAM program preventive blanket supplementary

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[15] WHO child growth standards and identification of severe acute malnutrition in infants and young children. A joint statement by WHO and UNICEF, 2009.

feeding continued for children 6-23 months and pregnant and lactating women. BSFP supplies faced pipeline breaks for 9 out of 12 months. Supplies were only available for three months from April to May 2019. In 2019 from July to October, Maban experienced flooding at a severity not witnessed since 1984. This resulted in interruption of the provision of services. Roads were impassable, crops were destroyed, and infrastructure destroyed. **43%** of household latrines and **53%** of latrines at schools and health facilities collapsed across the four refugee camps. Food assistance was also affected as supplies could not be transported by road. October and November 2019 distribution cycles were provided based on an emergency ration scale meeting approximately 33% of the standard ration scale. The survey was carried out towards the end of the flooding thus reflects the likely effects of this. Availability and timely prepositioning of supplies in the Maban will be required in 2020 to allow the rehabilitation of the malnourished children and to support the nutrition needs of the 6-23 months age group a key window of opportunity for growth.

Stunting prevalence in all the Maban refugee camps remained very high in 2019. This was the same 2018 indicating that the underlying contributing factors remain unaddressed. Stunting is an outcome of inadequate nutrition and repeated bouts of infection during the first 1000 days of a child's life. Stunting before the age of 2 years predicts poorer cognitive and educational outcomes in later childhood. Many factors contribute to stunted growth and development and some of these included; poor maternal and nutrition, inadequate infant and young child feeding practice, and infections. Other factors included poor sanitation conditions leading to diarrhoeal diseases. Stunting levels were higher among children of age groups 18-29 and 30-41 months. This could be as a result of inadequate childcare feeding practices after breastfeeding is stopped. Action across multiple areas will be required to maintain efforts gained. This to include promotion of infant and young child feeding practices, ensuring adequate water and sanitation, infection control and maternal health and nutrition support.[16]

Morbidity

The interaction between malnutrition and infections are cyclic with each exacerbating the other. 11%-30.2% of children age 6-59 months in Maban refugee camps reported having had diarrhoea in the last two weeks prior to the survey indicating morbidity burden needing attention. Doro refugee camp had the highest proportion of children affected by diarrhoea (30.2%). The proportion of affected children remained the same in Doro and Gendrassa. In Yusuf Batil the proportion increased significantly from 6.6% to 11%. In Kaya the proportion reduced from 19.6 to 14.9%. Interventions to prevent diarrhoea, hygiene promotion, provision of safe drinking water, and hand washing both at facility and community level need to be strengthened. Attention also needs to be given to other top morbidities such as respiratory tract infections, acute watery diarrhoea, malaria, skin diseases among others within the camps to reduce the burden.

Programme Coverage

Measles vaccination, Vitamin A and Deworming coverage

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[16] Allen LH. Nutritional influences on linear growth: a general review, Eur J Clin Nutr 1994; 48: S75-S89.

The coverage of measles vaccination in all the Maban refugee camps met the recommended ≥95% target. None of the Maban refugee camps met the vitamin A supplementation target coverage of ≥90%. Yusuf Batil and Kaya had Vitamin A coverage of 83%, Gendrassa had 78% and Doro had the lowest coverage of 53%. The results are combined for both cards and recall. Efforts to maintain the acceptable measles coverage and to strengthen the other areas that have gaps to be ensured in 2020.

Deworming coverage among children aged 12-59 months was assessed for the first time in 2019. This will act as a baseline for comparison in subsequent years. Only one refugee camp (Yusuf Batil) met the recommended target. Intestinal worms are one of the top morbidities in the refugee camps indicating the need for deworming. Worm infections interfere with children's nutrition uptake which can result in malnutrition, anaemia and stunted growth. Deworming is recommended as a public health intervention for all young children 12–59 months of age, school going children and women of reproductive age.[17] Routine deworming at the health facility level and during bi yearly National Immunisation Days (NIDs) is advised at the various refugee camps. In 2019 the second NID campaign did not take place following the flood disrupting service provision. Efforts to improve this will be required in 2020.

Selective feeding programs enrolment coverage

The OTP and TSFP feeding programme enrolment coverage indicator using the WHZ, MUAC, and oedema was far below the recommended target of >90%. OTP and TSFP coverage measure the enrolment efficacy of the nutrition programs. Using all admission criteria, the enrolment coverage ranged from 0-28% for both OTP and TSFP. Although the sample sizes of these indicators were small, to allow meaningful conclusions to be drawn, the enrolment coverage for SAM and MAM cases highlights the need to improve screening of malnourished children using both MUAC and WHZ-scores. Of concern is that most of the cases identified with acute malnutrition based on the WHZ scores (73.2%) did not meet the MUAC cut off <125mm. This indicates the need to also ensure case finding at the various points on contact at the facility level in addition to the community efforts. Based on the survey data analysis the facility level screening to include an expanded screening criterion where the MUAC at risk category go through a second stage WHZ screening. The range for children aged 6-23months recommended for 2020 is MUAC 125-145mm and for 24-59 months 125-155mm. Any child found to meet the admission criteria using the WHZ scores to be enrolled into the appropriate program.

Anaemia in Children 6-59 Months and Women

Anaemia is recognised to adversely affect the cognitive performance, behaviour and physical growth of infants, preschool and school-aged children, and increase the likelihood of associated morbidities. Anaemia is not only an indicator of potential iron deficiency in populations but can also be taken as a proxy indicator for other micronutrient deficiencies. The survey results showed anaemia prevalence among children 6-59 month in Maban refugee camps was 55.8% in Doro, 55.7% in Yusuf Batil, 57.5%% in Gendrassa, and 49.9%

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[17] https://www.who.int/nutrition/publications/guidelines/deworming/en/

in Kaya. This is very high as it is above the 40% level of public health significance (WHO classification). Compared to 2018 the prevalence of anaemia remained the same in Doro and Kaya but deteriorated in both Yusuf Batil and Gendrassa. Children aged 6-23 months tend to be the most affected age group. The anaemia prevalence range for this age group was between 63.7-75.7% across the four Maban refugee camps.

Anaemia prevalence in non-pregnant women aged 15 to 49 months was 33.6% in Doro, 26.0% in Yusuf Batil, 39.5% in Gendrassa, and 21.1% in Kaya refugee camps. This increased significantly in Yusuf Batil, Gendrassa. In Doro the proportion in 2019 was higher than 2018. In Kaya there was no significant change. This indicates a deteriorating situation of the reproductive age women micronutrient profile in most of the refugee camps. According to the WHO classification the women anaemia prevalence is of medium public health significance in all the camps. ANC coverage ranged from 80 to 91.4 % and Iron folic acid coverage ranged from 70 to 91.4%. This should be maintained and strengthened in 2020.

The anaemia prevalence is likely to be attributed to several factors. This include a i) Insufficient diet; ii) diet that lacks adequate diversity leading to insufficient micronutrients; iii) disease burden requiring continuous attention; iv) increased demand for iron among infants, women or reproductive age; v) inappropriate feeding practices among others. A 70% ration continued to be provided on a monthly basis in Maban comprising of sorghum, hybrid cash and in-kind for pulses and oil and cash for salt. Assuming the cash provided is used to buy pulses and oil the GFD basket provided only 54% of the daily iron requirements. Sorghum, which contributed the bulk of this iron is high in phytates, anti-nutrients that inhibit iron absorption in the body. In addition to this the GFD only provided 3% of the recommended daily intake of vitamin C, a nutrient that plays a pivotal role in iron absorption. In addition to this BSFP faced pipeline shortages thus the nutrient gap faced by vulnerable groups could not be bridged. From the HDDS analysis only a range of 34.1-48.1% children 0-23 months had consumed food rich in iron during the survey. This did not compare to the household level consumption of fish which was significantly higher compared to other years due to the availability of fish that was brought by the floods. Introduction of appropriate complementary feeds at 6 months remained low at a range of 17.4 to 52.4% across the Maban camps. Malaria and intestinal worms' infection were among the top morbidities. These coupled with the negative effects from the flooding (loss of harvest and disruption of services) could have led to the deteriorating situation. A multisectoral approach to anaemia prevention and control will continue to be required in 2020. This to address nutritional, health and other underlying causes. The health and nutrition facility-based capacity for anaemia prevention and treatment, community screening and referral, scaling up of livelihood options that complement the existing food assistance options and information, education and communication of diet diversity and appropriate utilisation to be prioritised in 2020 and beyond.

IYCF indicators

Infant and young child feeding practices directly affect the nutritional status of children under two years of age and consequently impacting on the child survival. Continued

strengthening of IYCF awareness, promotion and support remain key in improving the nutrition status, health, and development of children age 0-23 months.

From the survey results, the proportion of children 0-23 months who had timely initiation of breastfeeding was 94.7% in Doro, 93.0% in Yusuf Batil, 93.0% in Gendrassa, and 91.9% in Kaya camps. This meets the UNHCR target of ≥85%. Early initiation to breastmilk within one hour of birth reduces the risk of neonatal mortality. Infants with delayed initiation of breastfeeding for more than 24 hours after birth, are 2.4 times more likely to die during the first month of life. Interventions to ensuring all delivered children receive timely initiation of breastfeeding should be enhanced.

The rate of exclusive breastfeeding for the first six months of life was 81.3% in Doro, 96.7% in Yusuf Batil, 95.4% in Gendrassa, and 91.4% in Kaya camp. This also met the UNHCR target of ≥75%. The risk of neonatal death is increased if milk-based fluids or solids are provided to breastfed neonate. Breastmilk alone (exclusive) satisfies the nutritional and fluid requirement of an infant for the first six months in life in all settings and climate. Beyond this month, additional foods are required to meet the energy and other nutrient requirements of the infants. From the survey results, continued breastfeeding at one year and up to 2 years ranged between 94%-98% and 60%-83% in Maban camps respectively. In all camps, the results indicate a positive uptake of exclusive breastfeeding and the need to breastfeed up to one year. Uptake of the need to continue breastfeeding in to the second-year messages needs to be strengthened. Any impeding barriers to this including birth spacing needs to be identified and addressed.

Timely introduction of complementary feeding ranged between 17- 52% which is low. After six months appropriate and adequate infant complementary foods become necessary to complement the breastmilk. This is required to meet the energy and other nutrient requirements of the infants. IYCF messaging on complementary feeding needs to be strengthened as this has direct impact on stunting outcomes especially in Kaya and Gendrassa camps where the proportions are very low.

1.2 to 6.1% of the surveyed children aged 0-23 months were bottle fed. 3.7 to 8.6% received infant formula. Keep both bottle feeding and infant formula low to be continued in 2020. Infant formula is a nonhuman milk product formulated from animal milk or vegetable protein (soy) and adapted to the physiological characteristics of infants. The risks of infection or malnutrition from using breastmilk substitutes are likely to be greater than the risk of HIV transmission through breastfeeding. In addition to this bottle feeding is associated with increased diarrhoeal disease due to the contamination likelihood of the bottle and nipple. It is therefore necessary to support all women to achieve early initiation and exclusive breastfeeding for the first six completed months and the continuation of breastfeeding into the second year of life to provide the best chance of survival for infants and young children[18]

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[18] Operation Guidance on IFE, section 5.2.8, v2.1, Feb 2007

Some of the IYCF results needs careful and cautious interpretation as the sample was small to draw meaningful conclusions. These findings however give an idea of the status of infant and young feeding practices among the surveyed population.

Food security

Food insecurity is one of the causes of undernutrition as it directly affects the nutritional status of an individual. It is also a direct cause of malnutrition in terms of dietary intake and an underlying cause in terms of access to and utilization of food. Improving overall food security remains key to improved nutrition, health, and long-term development of children and other households' members.

From the survey results, all households in Maban refugee camps had access to food assistance provided through monthly GFD as indicated by the 100% ration card coverage. The general food ration in all camps is provided at a 70% ration scale which provided 1476 kcal/person/day of the 70% ration is provided as opposed to the recommended 2100 kcal/person/day. The household diet diversity score ranged between 3.7-6.6 out of 12 of the food groups. In all four camps, most households reported using one or more negative copying strategies of borrowing cash or food (36.8-86.1%), selling assets, (15.8-38.2%), reducing quantity or meals frequency (45.6-63.5%), begging (0.9-15%), engaged in risky or harmful activities (28.1-39.9%). Only a small proportion of range between 6.7-19.0 reported not using any of the negative coping strategies to fill the food assistance gap. This group is likely to be benefiting from the complementary livelihood interventions in place. This however needs to be scaled up to increase the proportion to cover majority of the population.

From the NutVal analysis, the reduced ration has an inadequate micronutrient profile. The ration does not provide a fortified flour option like CSB+. 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 was also barely available from the GFD ration. The ration provided only 2% of vitamin C. In addition, vitamin C is very easily destroyed when cooking at high temperatures. Other key micronutrients including Vitamin A, folate and Vitamin B12 were also insufficient. Ways to fill the nutrient gap should thus be explored to avert the consequences. This to include the expansion of livelihood to complement the food assistance in place

6.0 RECOMMENDATION AND PRIORITIES

Nutrition related
- Maintain and strengthen the implementation of Community based Management of Acute Malnutrition (CMAM) program across all Maban refugee camps. This to provide both therapeutic and supplementary feeding programs including prevention of malnutrition, active case finding through screening, detection, referral through the community outreach programme.   (UNHCR, WFP, UNICEF, IMC, RI, and SP)

- Ensure consistent and regular blanket supplementary feeding programme all year round for children aged 6-59 months (Doro and Yusuf Batil); 6-23 months (Gendrassa and Kaya) and pregnant and lactating women in all refugee camps. This is to continue preventing malnutrition and to cover the nutrient gap these vulnerable groups have considering the predominant grain based general food diet. (UNHCR, WFP, IMC, and RI).

- Conduct the two step MUAC and WHZ scores (for children with MUAC at risk) through monthly screening at the BSFP sites and at the health care facilities' triage area for children 24-59 months in all camps to ensure both high MUAC and WHZ score coverage (IMC and RI).

- Continue to strengthen capacity development of nutrition and health staffs and community workers through training to facilitate quality provision of both curative and preventative components of nutrition (UNHCR, WFP, UNICEF, IMC, SP, and RI).

- Implement the Multi-sectoral IYCF Friendly Framework a UNHCR and Save the Children Initiative for support, promotion, and protection of Infant and Young Child Feeding (IYCF). Promotion of appropriate complementary feeding from six months onwards to be given key attention. (UNHCR, UNICEF, IMC, and RI).

- Strengthen the implementation of the anaemia prevention and control strategy in all refugee camps. This to include early and systematic screening/detection, diagnosis, referral of persons detected with anaemia signs and symptoms, and treatment at the health facilities. Funding allowing an in-depth assessment of the causes of anaemia, should be carried out. (UNHCR, WFP, UNICEF, IMC, RI, and SP).

- Continue regular supportive supervision, monitoring, quarterly/onsite joint monitoring, and yearly program performance evaluations in all camps to assess performance progress and formulate recommendations for any identified gaps (UNHCR, WFP, UNICEF, RI, IMC, and SP).

- Maintain and strengthen nutrition surveillance through quarterly mass MUAC screening. The screening exercise to also be used to ascertain coverage and to refer any malnourished children identified and not enrolled in the nutrition program (IMC and RI).

- Maintain and conduct the annual joint nutrition surveys (SENS) in all camps to analyse trends, assess program impact and facilitate evidence-based recommendations for nutrition programming (UNHCR, WFP, UNICEF, RI, IMC, and SP).

- Continue and strengthen the implementation of the Nutrition Assessment, Counselling and Support for HIV/AIDS and TB patients (UNHCR, WFP, UNICEF, RI, IMC, and SP)

Food security/Nutrition linkages related
- Food assistance providing the recommended 2100kcal/person/day including fortified blended food (CSB+) to facilitate basic nutrition provision at household level (UNHCR and WFP).

- Maintain the implementation of hybrid GFD/cash food assistance including milling assistance which allows better grain utilization. (UNHCR and WFP).

- Ensure routine monthly food basket monitoring to ensure that refugees receive their entitlement in addition to ensuring identified gaps are addressed in a timely manner (UNHCR, WFP, SP, and ACTED).

- Scale up the establishment of various agro-nutrition, food security and livelihood interventions in Maban to promote diet diversity and complement the general food ration (UNHCR, WFP, RI, and ACTED).

Health/Nutrition Linkages related
- Maintain and strengthen the provision of comprehensive primary health care programme to reduce the disease burden among the refugees in Maban. Key attention to be provided to the top morbidities including malaria prevention interventions that include blanket mosquito net distribution and bi-yearly indoor residue spraying (UNHCR, IMC, RI, MI and SP).

- Strengthen Vitamin A supplementation, deworming and maintain routine Expanded Program of Immunization (EPI) and campaigns as per National Ministry of Health schedule. (UNHCR, UNICEF, IMC, and RI).

- Maintain and strengthen reproductive health interventions at both the health facilities and community level. This to include 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 among women thus improved nutrition for both the mothers and their children. (UNHCR, RI, IMC, and SP).

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- Continued capacity building of both health and nutrition refugee staff to ensure quality health and nutrition program implementation.

Water Sanitation and Hygiene promotion related

- Maintenance of adequate clean water provision and provision of adequate water storage containers (UNHCR and ACTED).

- Hygiene promotion, latrine coverage and provision of adequate soap strengthening to facilitate the prevention and control of infections like diarrhea and other hygiene related illnesses. (UNHCR, IMC, RI, ACTED and SP).

7.0 APPENDICES

APPENDIX 1: SURVEY TEAM

Survey coordination, team supervision and operational support		
UNHCR		
Terry Theuri	Nutrition and Food Security Officer	Juba
Abe John M KIRI	Senior Nutrition Associate	Bunj
Dr. Pepe Beavogui	Associate Public Health Officer	Bunj
Dr. Sadia AZAM	Associate Public Health Officer	Bunj
WFP		
Harriet Mamio George	Monitoring assistant	Bunj
IMC		
Muki Michael	Senior Nutrition Officer	Maban
Alex Yope	Outreach Supervisor	Maban
Alfred Nyolija	Senior Outreach Supervisor	Maban
Mawa Erastos	M&E Officer	Maban
RI		
Alule Bosco	Nutrition Officer	Maban

Data Analysis		
Terry Theuri	Nutrition and Food Security Officer	UNHCR – Juba

Health information system and WASH data consolidation		
Sebit Mustafa	Health and Information systems Officer	UNHCR-Juba
Joseph WANI	WASH Associate	UNHCR-Bunj

Report writing		
Terry THEURI	Nutrition and Food Security Officer	UNHCR-Juba
Abe John M KIRI	Senior Nutrition Associate	UNHCR-Bunj

Technical Report Review		
Dr. Gebrewold Petros Yohannes	Public Health Officer	UNHCR-Juba
Naser MOHMAND	Senior Regional Nutrition and Food Security Officer	UNHCR - Nairobi (Regional bureau)

APPENDIX 2: SUMMARY OF THE OVERALL QUALITY OF ANTHROPOMETRIC DATA

Doro refugee camp

Overall data quality

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

Flagged data          Incl    %    0-2.5 >2.5-5.0 >5.0-7.5   >7.5
(% of out of range subjects)        0      5        10        20        0
(2.0 %)

Overall Sex ratio     Incl    p    >0.1  >0.05    >0.001   <=0.001
(Significant chi square)             0      2        4        10        0
(p=0.600)

Age ratio(6-29 vs 30-59) Incl p    >0.1  >0.05    >0.001   <=0.001
(Significant chi square)             0      2        4        10        4
(p=0.005)

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

Dig pref score - height Incl   #    0-7   8-12     13-20     > 20
                                     0      2        4        10        2 (9)

Dig pref score - MUAC  Incl    #    0-7   8-12     13-20     > 20
                                     0      2        4        10        2 (9)

Standard Dev WHZ       Excl    SD   <1.1  <1.15    <1.20    >=1.20
.                                   and   and      and       or
.                      Excl    SD   >0.9  >0.85    >0.80    <=0.80
                                     0      5        10        20        0
(1.09)

Skewness   WHZ         Excl    #    <±0.2 <±0.4    <±0.6    >=±0.6
                                     0      1        3         5        0 (-
0.01)

Kurtosis   WHZ         Excl    #    <±0.2 <±0.4    <±0.6    >=±0.6
                                     0      1        3         5        0 (-
0.05)

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

OVERALL SCORE WHZ =                 0-9   10-14    15-24     >25        8 %
```

The overall score of this survey is 8 %, this is excellent.

Yusuf Batil refugee camp

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	Score
Flagged data (% of out of range subjects) (1.7 %)	Incl	%	0-2.5 0	>2.5-5.0 5	>5.0-7.5 10	>7.5 20	**0**
Overall Sex ratio (Significant chi square) (p=0.864)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	**0**
Age ratio(6-29 vs 30-59) (Significant chi square) (p=0.008)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	**4**
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** (8)
Dig pref score - MUAC (10)	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**2**
Standard Dev WHZ .	Excl	SD	<1.1 and	<1.15	<1.20 or	>=1.20	
. (1.02)	Excl	SD	>0.9 0	>0.85 5	>0.80 10	<=0.80 20	**0**
Skewness WHZ 0.21)	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	**1** (-
Kurtosis WHZ 0.12)	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	**0** (-
Poisson dist WHZ-2 (p=)	Excl	p	>0.05 0	>0.01 1	>0.001 3	<=0.001 5	**0**
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	**9** %

The overall score of this survey is 9 %, this is excellent.

Gendrassa refugee camp

Overall data quality

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

Flagged data          Incl   %     0-2.5 >2.5-5.0 >5.0-7.5   >7.5
(% of out of range subjects)         0     5        10        20        0
(1.8 %)

Overall Sex ratio     Incl   p     >0.1  >0.05    >0.001   <=0.001
(Significant chi square)             0     2         4        10        0
(p=0.908)

Age ratio(6-29 vs 30-59) Incl p    >0.1  >0.05    >0.001   <=0.001
(Significant chi square)             0     2         4        10        4
(p=0.001)

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 (9)

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

Standard Dev WHZ      Excl   SD    <1.1  <1.15    <1.20    >=1.20
.                                   and   and      and      or
.                     Excl   SD    >0.9  >0.85    >0.80    <=0.80
                                     0     5        10        20        0
(0.92)

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        0
(0.16)

Poisson dist WHZ-2    Excl   p     >0.05 >0.01    >0.001   <=0.001
                                     0     1         3         5        5
(p=0.000)

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

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

Kaya refugee camp

Overall data quality

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

Flagged data              Incl   %     0-2.5 >2.5-5.0 >5.0-7.5   >7.5
(% of out of range subjects)             0      5       10        20        0
(0.4 %)

Overall Sex ratio         Incl   p     >0.1  >0.05    >0.001   <=0.001
(Significant chi square)                 0      2        4        10        0
(p=0.202)

Age ratio(6-29 vs 30-59)  Incl   p     >0.1  >0.05    >0.001   <=0.001
(Significant chi square)                 0      2        4        10        4
(p=0.001)

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

Dig pref score - height   Incl   #     0-7   8-12     13-20     > 20
                                         0      2        4        10        2 (9)

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      5       10        20        0
(0.91)

Skewness   WHZ            Excl   #     <±0.2 <±0.4    <±0.6    >=±0.6
                                         0      1        3         5        0 (-
0.15)

Kurtosis   WHZ            Excl   #     <±0.2 <±0.4    <±0.6    >=±0.6
                                         0      1        3         5        1
(0.32)

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

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

The overall score of this survey is 9 %, this is excellent.

APPENDIX 3: SURVEY QUESTIONNAIRES

Greeting and reading rights.

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 لرية الاسرة أو إذا ما غاب أو عضو آخر البالغين من البيت. تعريف سكان لبيت مجموعة من الناس الذين يعيشون معا ويأكلون بشكل روتيني في قدر او (هال) واحد تعريف مسؤول اورية البيت فرد من أفراد الأسرة الذي يدير موارد الأسرة وهو صانع القرار النهائي في 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 تلقى 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، سيتم اختبار كمية صغيرة من الدم من الأصبع 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 لى 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 الخاص بك، لا تعلن موافقتك على هذا النموذج.

شكرا لك

Questionnaire for Children 6-59 months (every HH)

THIS QUESTIONNAIRE IS TO BE ADMINISTERED TO ALL CARETAKERS OF A CHILD THAT LIVES WITH THEM AND IS BETWEEN 6-59 MONTHS OF AGE

Date (dd/mm/yyyy)					Team Number			Zone		Block			Village		Block		
|___|___|/|___|___|/|___|___||___|___|					|___|			|___|___|		|___|___|			|___|___|		|___|___|		
CH1	CH2	CH 3	CH4	CH5	CH6	CH7	CH8	CH9	CH10	CH11	CH12	CH13	CH14	CH15	CH16	CH17	CH18
ID	HH	Consent given 1=Yes 2=No 3=Absent	Sex (M/F)	Birth date* dd/mm/yyyy	Age** in months	Oedema*** (Y/N)	MUAC*** (CM)	Weight (KG) ±100g	Height (CM) ±0.1cm	Is child enrolled in the nutrition program? 1=TSFP 2=OTP/SC 3=None	Is the child enrolled in to the BSFP program? 1_Yes 2-No	Has the child been vaccinated against Measles? 1=Yes card 2=Yes recall 3=No or don't know	Has the child received Vitamin A in past 6 months? (show capsule) 1=Yes card 2=Yes recall 3=No or don't know	Was the child dewormed in the past 6 months? (show capsule) 1=Yes card 2=No or don't know	Has [name] had diarrhea in the last two weeks, including today? # 1=yes 2=no 3=Unknown	If yes, was [name] the taken to the health facility? 1=Yes 2=No 8=DK	HB (g/dl)
01				/ /													
02				/ /													
03																	
04																	

*Record from EPI/health card/age documentation if available. Leave blank if no valid age documentation. **Estimate using event calendar and recall if age documentation not available. ***C7 & C8: Refer to the clinic for malnutrition is not already enrolled in TSFP/OTP/SC if Oedema =Y or MUAC <12.5cm.   #Diarrhoea: 3 or more loose stools within 24hrs

QUESTIONNAIRE for Women 15-49 years (every other household)

Date of interview (dd/mm/yyyy)			Camp		Zone		Block	Village	Team
|___|___|/|___|___|/|___|___||___|___|									|___|___|

WM1	WM2	WM3	WM4	WM5	WM6	WM7	WM8
ID البطاقة	HH ربة البيت	Consent given القبول اعطى 1=yes نعم 2=no لا 3=absent الغائب	Age (years)	Are you pregnant? هل انت حامل 1=yes نعم 2=no لا (GO TO WM 8) 8=DK* لااعرف (GO TO WM 8)	Are you currently enrolled 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 receiving 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	فقر الدمHb g/dL) (Only for non-pregnant women) فقط للنساء غير الحبلى
01							
02							
03							
04							
05							

*DK=don't know; Refer any woman with HB <8g/dl

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IYCF Questionnaire (0-23 months) (every household)

Date (dd/mm/yyyy)	Camp	Zone	
|___|___|/|___|___|/2019		|___|___||___|___||___|___|	
	Household	Team Number	
	|___|___|	|___|___|	

No	QUESTION الاسئلة	ANSWER CODES الاجابات	
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 وثقتاريغ 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 بين 1 و 23 ساعة ..... 2 More than 24 hours اكثر من 24 ساعة .... 3 DK لا اعرف 8	|___|
IF6	Was [NAME] breastfed yesterday during the day or at night? هل رضيض الفللك خلال نهار ام الليل؟	Yes نعم .... 1 No لا .... 2 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 (Nan, Mami) [طقل 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, cow milk, goat milk) 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		2	8
7F. Sour milk or yogurt for example: (Zabadi , Roob) لبن حامض (زبادي , روب)	7F..........................1		2	8
7G. Thin porridge for example: (Medida Khafif) نثة خفيف ازكر اسم المحلى (مديدة خفيف)	7G..........................1		2	8
7H. Tea or coffee with milk الشاى لبن او قهوة	7H..........................1		2	8
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 مشروبات ازكر بعض من السوائل مثل مشروبات غازية و مشرونبا ت الشاى خالى من لبن مشروبات الحلوة مشروبات عشبية	7I..........................1		2	8

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...............8 لااعرف	|___|
SECTION IF3		
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 النهار او اليل	Yes نعم........................1 No لا........................2 DK اعرف لا...............8	|___|
SECTION IF4		
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
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 الموادداعطى دائرة (2)و ازا لم تعرف ضع دائرة (8) كل خطوط عن تكن لة رمز Yes No DK		

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	11A................................1 2 8
11C. **FBF++** : for example CSB++ الغزاء القوى مثل زرة وفول صويا	11C................................1 2 8
11D. **RUTF** : for example Plumpy'Nut® (SHOW SACHET) الجا هزة يستعامل فى العلاج سجل هزى الغزئية المحلى الغزاء	11D................................1 2 8
11E. **RUSF** : for example Plumpy'Sup® (SHOW SACHET) محلى دالاضا فى سجل هزة الكل الموجو الكل الجاهزة	11E................................1 2 8
11G. Infant formula: for example Nan, Mami. االقوى لوصفة الطفل الرضى ازكر بعض من هزة اسماء الغزئية ال حديدى	11G................................1 2 8
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. Celerac; Food with groundnut and green leaves added to it** (سجل لين المصنع للاطفال والاطفال يرضى الموجون فى (المنطقة ولة فرق من الغزي بعض الغزئي شبة صلب وصلب او	11H................................1 2 8

Food Security questionnaire (1 questionnaire per every other household)

Date (dd/mm/yyyy)		Camp		Zone	
|___|___|/|___|___|/2019					
Block		**Village**		**Team Number**	
				|___|___|	

No	QUESTION	ANSWER CODES	
SECTION 1			
1.	Does your household have a ration card? هل تملك أسرتك بطاقة تموينية؟	Yes ....1 No 2	|___| **IF ANSWER IS 1 GO TO Q3**
2.	Why do you not have a ration? لم لا تملك أسرتك بطاقة تموينية؟	Not given one at registration, even if eligible................................1 Lost card ....2 Traded/Sold card ....3 New arrival who is eligible but not yet registered ....4 Not eligible (not in targeting criteria) ....5 Other(Specify)............................6	|___|
	As the households are receiving a reduced ration are they using any of the below coping strategies		
3.	In the last month, have you or anyone in your household borrowed cash, food or other items with or without interest? في الشهر الماضي، هل قمت أو هل قامت أسرتك بإقتراض المال، الطعام أو غير مواد مع أو دون فائدة لتلبية احتياجات الطعام الأساسية؟	Yes ....1 No ....2 Don't Know............................8	|___|
4.	In the last month, have you or anyone in your household sold any assets that you would not have normally sold (furniture, seed stocks, tools, other NFI, livestock etc.)? في الشهر الماضي، هل قمت أو هل قامت أسرتك ببيع ممتلكات (مجوهرات، هواتف، أثاث، أجهزة كهربائية، أدوات إنتاجية، مواشٍ، الخ) لتلبية احتياجات الطعام الأساسية؟	Yes ....1 No ....2 Don't Know............................8	|___|
5.	In the last month, have you or anyone in your household requested increased remittances or gifts as compared to normal? في الشهر الماضي، هل طلبت أو هل طلبت أسرتك زيادة التحويلات المالية أو الهدايا مقارنة مع الوضع الطبيعي لتلبية احتياجات الطعام الأساسية ؟	Yes ....1 No ....2 Don't Know............................8	|___|
6.	In the last month, have you or anyone in your household reduced the quantity and/or frequency of meals and snacks? في الشهر الماضي، هل قمت أو هل قامت أسرتك بتقليل كمية أو عدد وجبات الطعام لتتكيف مع نقص الطعام أو المال لشرائه؟	Yes ....1 No ....2 Don't Know............................8	|___|
7.	In the last month, have you or anyone in your household begged (asked for help from strangers to support your food needs)? في الشهر الماضي، هل قمت أو هل قام أي فرد من أفراد أسرتك بالتسول لتلبية إحتياجات الطعام الأساسية؟	Yes ....1 No ....2 Don't Know............................8	|___|
8.	In the last month, have you or anyone in your household engaged in: hunting wild animals,	Yes ....1 No 2	|___|

SENS Surveys Nov-Dec 2019; Maban refugee camps, South Sudan

	cutting of big trees and selling, stealing(taking something from someone/other people without their knowledge to support your food needs), cross boarder smuggling, charcoal burning or any other risky or harmful activities في الشهر الماضي، هل قمت أو هل قام أي فرد من أفراد أسرتك ب [عدد نشاطات يحتمل أن تكون خطرة أو مؤذية مثل نشاطات محلية غير قانونية] أو بأي نشاطات خطرة أو مؤذية أخرى لتلبية إحتياجات الطعام الأساسية؟	Don't Know............................8	
SECTION 2			
11.	Now I would like to ask you about the types of foods that you or anyone else in your household ate yesterday during the day and at night. I am interested in whether you or anyone else in your household had the item even if it was combined with other foods. I am interested in knowing about meals, beverages and snacks eaten or drank inside or outside the home. الآن أود أن أسألك حول نوع الأطعمة التي تناولتها أو تناولتها أسرتك البارحة أثناء النهار او الليل. أنا مهتم في إذا ما كنت أو أي احد من أفراد أسرتك تناول أي طعام حتى لو امتزج مع طعام أخر. أشمل جميع الوجبات، بما فيه الوجبات الخفيفة، و المشروبات التي تناولتها أو تناولتها أسرتك داخل أو خارج البيت.	**READ THE LIST OF FOODS AND DO NOT PROBE. RECORD** *(1)* **IN THE BOX IF ANYONE IN THE HOUSEHOLD ATE THE FOOD IN QUESTION, OR** *(0)* **IN THE BOX IF NO ONE IN THE HOUSEHOLD ATE THE FOOD.**	
	1. Cereals: Sorghum, millet. maize, rice أية حبوب	1..|___|	
	2. White roots and tubers: Any white cassava, white sweet potatoes or other foods made from roots أية جذور البيضاء	2..|___|	
	3A. Vitamin A rich vegetables and tubers: Any carrot, tomato, pumpkin, squash that are orange inside + other locally available vitamin A rich vegetables أية الخضار و درنات الغنية بالفيتامين أ	3A..|___|	
	3B. Dark green leafy vegetables: Any dark green leafy vegetables, including wild forms + locally available vitamin A rich leaves such as cassava leaves, Pumpkin leaves, cassava leaves, Kerkede leaves, Kudra, bean leaves, أية خضار ذات الأوراق الخضراء الداكنة بما فيه البرية منها	3B..|___|	
	3C. Other vegetables: Any other vegetables (e.g. Okra, cabbage, green pepper, onion, eggplant, cucumber,) + *other locally available vegetables* أية خضار أخرى	3C..|___|	
	4A. Vitamin A rich fruits: Any mango (ripe, fresh and dried), ripe papaya, and 100% fruit juice made from these + *other locally available vitamin A rich fruits* أية فواكه غنية بالفيتامين أ	4A..|___|	

4B. Other fruits: Any other fruits such as guava, tamarind, baobab, lemon including wild fruits and 100% fruit juice made from these

أية أنواع أخرى من الفواكه

4B..|___|

5A. Organ meat: Liver, kidney, heart and intestines

أية لحوم عضوية

5A..|___|

5B. Flesh meats: Beef, pork, mutton, poutry, rabbit meat, Bush meat and guinea fowl meat

أية لحوم

5B..|___|

6. Eggs:

أي بيض

6..|___|

7. Fish and seafood: Samak

أي سمك و ثمار البحر

7..|___|

8. Legumes, nuts and seeds: Groundnut, Simsim, Ades, Yellow split peas, beans(JarJaro), pumpkin seeds

أية بقول، مكسرات و بذور

8..|___|

9. Milk and milk products: Any milk, infant formula, cheese, yogurt or other milk products:

أي حليب و منتجاته

9..|___|

10. Oils and fats :Zed

أية زيوت و دهون

10..|___|

9. **Sweets**: sugar, honey, sweetened soda or sweetened juice drinks, sugary foods such as chocolates, candies, cookies, sweet biscuits and cakes

أية سكريات

11..|___|

12. Spices, condiments, beverages: (Any spices (black pepper, salt), condiments (soy sauce, hot sauce), coffee, tea, alcoholic beverages.

أية بهارات، توابل و مشروبات

12..|___|

APPENDIX 4: EVENTS CALENDAR

Seasons	Religious Holidays	Other Events	Months / Years	Age (M)	Height Range
Sorghum harvest			November 2019	0	
Groundnut harvest		Global hand-washing day	October 2019	1	
1st Maize harvest			September 2019	2	
Weeding of crops, Last groundnut harvest		World breastfeeding week	August 2019	3	
Sorghum, maize groundnut planting continues			July 2019	4	
Rain starts, Sorghum, maize groundnut planting		World refugee day (20 June)	June 2019	5	
		SPLA day	May 2019	6	
Land preparation start			April 2019	7	
Land preparation start		Celebration of Yusuf Kuwa	March 2019	8	65-70 cm
			February 2019	9	
		New year celebrations	January 2019	10	71-76 cm
	Christmas (25 Dec)	World Aid Day	December 2018	11	
Sorghum harvest			November 2018	12	
Groundnut harvest	Comboni day	Global hand-washing day	October 2018	13	
1st Maize harvest	Bible course		September 2018	14	
Weeding of crops, Last groundnut harvest		World breastfeeding week	August 2018	15	
Sorghum, maize groundnut planting continues			July 2018	16	
Rain starts, Sorghum, maize groundnut planting		World refugee day (20 June)	June 2018	17	
		SPLA day	May 2018	18	77-80 cm
Land preparation start			April 2018	19	
Land preparation start		Celebration of Yusuf Kuwa	March 2018	20	
			February 2018	21	
		New year celebrations	January 2018	22	
	Christmas (25 Dec)	World Aid Day	December 2017	23	81-86 cm
Sorghum harvest			November 2017	24	
Groundnut harvest	Comboni day	Global hand-washing day	October 2017	25	
1st Maize harvest	Bible course		September 2017	26	
Weeding of crops, Last groundnut harvest		World breastfeeding week	August 2017	27	
Sorghum, maize groundnut planting continues			July 2017	28	
Rain starts, Sorghum, maize groundnut planting		World refugee day (20 June)	June 2017	29	
		SPLA day	May 2017	30	
Land preparation start			April 2017	31	
Land preparation start		Celebration of Yusuf Kuwa	March 2017	32	87-90 cm
			February 2017	33	
		New year celebrations	January 2017	34	
	Christmas (25 Dec)	World Aid Day	December 2016	35	
Sorghum harvest			November 2016	36	
Groundnut harvest	Comboni day	Global hand-washing day	October 2016	37	
1st Maize harvest	Bible course		September 2016	38	
Weeding of crops, Last groundnut harvest		World breastfeeding week	August 2016	39	
Sorghum, maize groundnut planting continues			July 2016	40	
Rain starts, Sorghum, maize groundnut planting		World refugee day (20 June)	June 2016	41	91-99 cm
		SPLA day	May 2016	42	
Land preparation start			April 2016	43	
Land preparation start		Celebration of Yusuf Kuwa	March 2016	44	
			February 2016	45	
		New year celebrations	January 2016	46	
	Christmas (25 Dec)	World Aid Day	December 2015	47	
Sorghum harvest			November 2015	48	
Groundnut harvest	Comboni day	Global hand-washing day	October 2015	49	
1st Maize harvest	Bible course		September 2015	50	
Weeding of crops, Last groundnut harvest		World breastfeeding week	August 2015	51	100-110 cm
Sorghum, maize groundnut planting continues		SPLA day	July 2015	52	
Rain starts, Sorghum, maize groundnut planting		World refugee day (20 June)	June 2015	53	
		SPLA day	May 2015	54	
Land preparation start			April 2015	55	
Land preparation start		Celebration of Yusuf Kuwa	March 2015	56	
			February 2015	57	
		New year celebrations	January 2015	58	
Groundnut harvest	Christmas (25 Dec)	World Aid Day	December 2014	59	

| Sorghum harvest | | Comboni day | Global hand-washing day | November 2014 | 60 | |

How to Use a Local Events Calendar

Survey inclusion and exclusion criteria

Survey inclusion criteria: these are the cut-off birth dates for children to be eligible to participate in the 6-59 months sample.
• Included in the survey are all children born between November 2014 and April 2019.

Survey exclusion criteria: all children born as of these dates are excluded from the sample (i.e. they are over 59 months or under 6):
• Excluded from the survey are all children born before November 2014 and April 2019.

When to use the events calendar?

• The events calendar is a tool that helps determine the approximate age of children who have no reliable administrative documents (birth certificate, child's health notebook, etc.)
• It includes all different events that occurred during the 60 months that preceded the survey, and serves as a reference and check-list for surveyors and surveyed populations.

How to use the events calendar

• Use a line of questions phrased as follows: ***"<name> was he/she born before or after <event>?"***
• Choose the events in the most appropriate column of the calendar to reduce the range at each question.
• The child's mother usually knows either the age of the child in years, or the birth date (but without any official corroboration. In both cases, it is necessary to refine the age estimation by using the events calendar.

1. When the mother knows the age in years, convert the age in months using the calendar and ask her questions relating to the events that occurred around the child's birth. Specify with the mother:
• On the calendar, whether a particular even occurred about the time the child was born (e.g. end of Ramadan); ask the mother whether the birth occurred before or after this event;
• Ask her the season in which the child was born: rain, warm or cold season, etc.;
• This information will allow you to estimate the child's age in a more reliable and accurate way.

2. When the mother knows the child's birth date, but has no official document to prove it:
• Locate the birth date on the calendar;
• Ask the mother questions on events that occurred around the child's birth (religious holiday, celebration, season, etc.) in order to estimate the age in actual months.

3. When the mother knows neither the age nor the birth date, the events listed in the calendar will help her remember the circumstances of her child's birth and to estimate the age in months:
• Ask the mother, or the person who cares for the child, if she remembers the period or an event that surrounded the birth of the child;
• According to her answer, ask further questions to locate the month and year of the birth.

4. When it is absolutely impossible to get any reliable indication from the mother, look for a child of similar stature in the neighbourhood:
• Determine the age of the other child;
• Estimate the age difference between both children using the calendar;
• Deduce the age of the surveyed child.

*To determine the age of a child, the surveyor must enter on the questionnaire either the date of birth or the age in months, **but not both.***
If the child has a health notebook or an official identity document that indicates his/her birth date; write down the birth date on the questionnaire.

APPENDIX 5: MAP OF MABAN