

Standardised Expanded Nutrition Survey (SENS) DRAFT REPORT

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

Surveys conducted: 11th October - 6th November 2021



In collaboration with

WFP, CORDAID, RI, & AAHI



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ACRONYMS AND ABBREVIATIONS

AAHI	Action Africa Help International
ACTED	Agency for Technical Cooperation and Development
AWD	Acute Water Diarrhea
BCC	Behaviour Change and Communication
BSFP	Blanket Supplementary Feeding Programme
CGs	Care Groups
CHPs	Community Health Promoters
CI	Confidence Interval
CMR	Crude Mortality Rate
CORDAID	Catholic Organization for Relief and Development Aid
CSB	Corn-Soya Blend
DEFF	Design effect
ENA	Emergency Nutrition Assessment
EPI	Expanded Programme on Immunization
Epi Info	CDC software for epidemiological investigations
FCS	Food Consumption Score
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
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
TSFP	Therapeutic Supplementary Feeding Programme
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
URTI	Upper Respiratory Tract Infection
WASH	Water, Sanitation and Hygiene promotion
WAZ	Weight-for-Age z-score
WHZ	Weight-for-Height z-score
WFP	World Food Programme
WHO	World Health Organization

EXECUTIVE SUMMARY

Maban county hosts Sudanese refugees in four refugee camps of Doro, Yusuf Batil, Gendrassa, and Kaya fleeing from the conflict in Blue Nile State in Sudan. The first camp, Doro was established in November 2011 as a spontaneous settlement and followed by Yusuf Batil camp in May 2012. Gendrassa and Kaya refugee camps were established in July 2012 and May 2013 respectively. As of 31st October 2021, the total population was 171,640 with 35,113 children under five (source: UNHCR ProGres).

This report summarizes the results of the Standardized Expanded Nutrition Survey (SENS) conducted jointly by UNHCR in collaboration with WFP, RI, and CORDAID in the four Maban refugee camps of Doro, Yusuf Batil, Gendrassa, and Kaya from 11th October to 6th November 2021. The Overall objective was to assess the general nutrition and health status of the refugees, monitor ongoing programme interventions, and formulate workable recommendations for appropriate nutritional and public health interventions.

Objectives of the survey were as follows.

Specific primary objectives of the survey

- a. *To determine the demographic profile of the population.*
- b. *To determine the age dependency ratio.*
- c. *To measure the prevalence of acute malnutrition among children 6-59 months*
- d. *To measure the prevalence of stunting among children 6-59 months*
- e. *To determine the coverage of measles vaccination among children 9-59 months*
- f. *To determine the coverage of vitamin A supplementation in the last six months among children 6-59 months*
- g. *To determine the two-week period prevalence of diarrhoea among children 6-59 months.*
- h. *To measure the prevalence of anaemia among children 6-59 months and women of reproductive aged 15-49 years (non-pregnant).*
- i. *To investigate IYCF practices among children 0-23 months.*
- j. *To determine the populations' overall ability to meet their food needs with assistance:*
- k. *To determine the duration of the general in-kind food distribution for recipient households*
- l. *To determine the extent to which negative coping strategies are used by households.*
- m. *To assess household food consumption (quantity and quality).*
- n. *To establish recommendations on actions to be taken to address the situation*

Secondary objectives:

- a. *To determine the enrolment into the targeted supplementary (TSFP) and therapeutic (OTP/SC) nutrition programmes for children aged 6-59 months.*
- b. *To determine enrollment into the blanket supplementary feeding programme (BSFP) for children aged 6-23 months*
- c. *To determine the coverage of deworming with mebendazole or albendazole in the last six months among young children aged 12-59 months.*
- d. *To determine enrollment into the blanket supplementary feeding programme (BSFP) for pregnant women and lactating women with an infant less than 6 months aged 15-49 years.*
- e. *To determine enrolment into Antenatal Care clinic and coverage of iron-folic acid supplementation in pregnant women.*

Methodology

A cross-sectional survey was conducted in all Maban refugee camps in which a systematic simple random sampling was used to identify the households to be surveyed in all camps in accordance with UNHCR Standardised Expanded Nutrition Survey (SENS) version 3, 2019 guidelines <https://sens.unhcr.org/>. Five modules were selected to be included in this survey: 1) Demography; 2) Anthropometry and Health; 3) Anaemia; 4) IYCF; 5) Food Security. WASH and Mosquito net modules were not included due to available WASH data and KAP survey conducted in 2021 and time constraint due to COVID-19 situation. Smartphone questionnaires using Open Data Kit (ODK) android software for all five modules was used for data collection and entry replacing paper questionnaires. Data quality checks were routinely performed every evening by the UNHCR survey coordinator which allowed for daily feedback to the survey teams. Data analysis was conducted using Standardised Monitoring and Assessments of Relief and Transitions (ENA for SMART) version Jan 11th, 2020, software, version for anthropometric indices and Epi info version 7.2.4.0 for all other data.

The sample sizes for the four camps were calculated according to the SENS version 3 by using ENA for SMART considering the respective camps upper confidence interval GAM prevalence from the 2019 nutrition survey, percentage of children under-5, average household size, children U5 population derived from the UNHCR ProGres database, and a non-response rate of 10%.

The calculated sample sizes for anthropometric indicators were then used in all the survey modules to estimate the required number of individuals and households to be included in the surveys. All eligible children aged 0-59 months from all selected households were included in the Child Anthropometry and Health, Anaemia and IYCF modules, and Household Demography, whilst half of the selected households were selected for the Household Food Security and Women questionnaire (including anaemia). All households were selected for Demography in all the surveys.

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 set to conduct the survey. Trainings were provided to supervisors and enumerators in a hybrid of lectures and practices way, and the performance was evaluated by standard test and pilot day.

Results summary

Table 1. Summary of Key Findings: SENS Oct-Nov 2021; Refugee camps in Maban, Upper Nile - 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)	
	October 2021		November 2021		October 2021		November 2021		
CHILDREN 6-59 months									
Acute Malnutrition (WHO 2006 Growth Standards)									
Global Acute Malnutrition (GAM)	66/455	14.5 (11.6-18.0)	42/409	10.3 (7.7-13.6)	47/394	11.9 (9.1-15.5)	46/433	10.6 (8.1-13.9)	Very high/critical if ≥ 15% (WHO-UNICEF classification);
Moderate Acute Malnutrition (MAM)	53/455	11.6 (9.0-14.9)	30/409	7.3 (5.2-10.3)	41/394	10.4 (7.8-13.8)	42/433	9.7 (7.3-12.9)	
Severe Acute Malnutrition (SAM)	13/455	2.9 (1.7-4.8)	12/409	2.9 (1.7-5.1)	6/394	1.5 (0.7-3.3)	4/433	0.9 (0.4-2.4)	Critical if ≥ 2% (UNHCR classification)
Oedema	0/455	0	0/409	0	0/394	0	0/433	0	
Mid Upper Arm Circumference (MUAC)									
MUAC <125mm and/or oedema	19/458	4.1 (2.7-6.4)	10/409	2.4 (1.3-4.4)	10/394	2.5 (1.4-4.6)	15/433	3.5 (2.1-5.6)	
MUAC 115-124 mm	15/458	3.3 (2.0-5.3)	8/409	2.0 (1.0-3.8)	9/394	2.3 (1.2-4.3)	14/433	3.2 (1.9-5.4)	
MUAC <115 mm and/or oedema	4/458	0.9 (0.3-2.2)	2/409	0.5 (0.1-1.8)	1/394	0.3 (0.0-1.4)	1/433	0.2 (0.0-1.3)	
Stunting (WHO 2006 Growth Standards)									
Total Stunting	58/455	12.7 (10.0-16.1)	69/405	17.0 (13.7-21.0)	59/392	15.1 (11.9-18.9)	73/431	16.9 (13.7-20.8)	Critical if ≥ 30% (WHO classification)
Severe Stunting	15/455	3.3 (2.0-5.4)	14/405	3.5 (2.1-5.7)	13/392	3.3 (1.9-5.6)	20/431	4.6 (3.0-7.1)	

SENS Surveys Oct-Nov 2021; 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)	
	October 2021		November 2021		October 2021		November 2021		
	Programme enrolment/coverage								
Measles vaccination with card or recall (9-59 months)	412/423	97.4 (95.4-98.5)	383/387	99.0 (97.4-99.6)	361/366	98.6 (96.8-99.4)	406/406	100 (100-100)	Target of ≥ 95%
Vitamin A supplementation coverage with card or recall, within past 6 months with card or recall (6-59 months)	448/461	97.2 (95.2-98.3)	406/411	98.8 (97.2-99.5)	386/394	98.0 (96.1-99.0)	428/433	98.9 (97.3-99.5)	Target of ≥ 90%
Therapeutic Feeding Program (OTP) (based on all admission criteria WHZ, oedema and MUAC)	2/14	14.3 (1.8-42.8)	0/14	0.0 (0.0-0.0)	1/6	16.7 (0.4-64.1)	2/5	40.0 (5.3-85.3)	Target of ≥ 90%
Targeted Supplementary Feeding Program (TSFP) (based on all admission criteria WHZ and MUAC)	8/61	13.1 (5.8-24.2)	5/37	13.5 (4.5-28.8)	5/46	10.9 (3.6-23.6)	13/50	26.0 (14.6-40.3)	Target of ≥ 90%
Diarrhoea									
Diarrhoea in past 2 weeks	127/460	27.6 (23.7-31.9)	57/410	13.9 (10.9-17.6)	37/393	9.4 (6.9-12.7)	40/433	9.2 (6.7-12.3)	
Deworming coverage within past 6 months (12-59 months)	355/375	94.7 (91.9-96.5)	335/351	95.4 (92.7-97.2)	319/338	94.4 (91.4-96.4)	356/377	94.4 (91.6-96.3)	Target of ≥ 75%
Anaemia (children 6-59 months)									
Total Anaemia (Hb <11 g/dl)	187/461	40.6 (36.2-45.1)	169/411	41.1 (36.5-45.9)	170/394	43.2 (38.4-48.1)	169/433	39.0 (34.6-43.7)	High if ≥ 40%

SENS Surveys Oct-Nov 2021; 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)	
	October 2021		November 2021		October 2021		November 2021		
Mild (Hb 10-10.9)	108/461	23.4 (19.8-27.5)	115/411	28.0 (23.9-32.5)	87/394	22.1 (18.3-26.4)	105/433	24.3 (20.5-28.5)	
Moderate (Hb 7-9.9)	78/461	16.9 (13.8-20.6)	54/411	13.1 (10.2-16.8)	80/394	20.3 (16.6-24.6)	63/433	14.6 (11.5-18.2)	
Severe (Hb <7)	1/461	0.2 (0.0-1.2)	0/411	0	3/394	0.8 (0.3-2.2)	1/433	0.2 (0.04-1.3)	
Anaemia (children 6-23 months)									
Total Anaemia (Hb <11 g/dl)	112/194	57.7 (50.5-64.8)	86/146	58.9 (50.5-67.0)	78/140	55.7 (47.1-64.1)	100/163	61.4 (53.4-68.9)	High if ≥ 40%
Mild (Hb 10-10.9)	56/194	28.9 (22.6-35.8)	57/146	39.0 (31.1-47.5)	43/140	30.7 (23.2-39.1)	53/163	32.5 (25.4-40.3)	
Moderate (Hb 7-9.9)	56/194	28.9 (22.6-35.8)	29/146	19.9 (13.7-27.3)	34/140	24.3 (17.4-32.3)	46/163	28.2 (21.5-35.8)	
Severe (Hb <7)	0/194	0.0 (0.0-0.0)	0/146	0.0 (0.0-0.0)	1/140	0.7 (0.0-3.9)	1/163	0.6 (0.0-3.4)	
CHILDREN 0-23 months									
IYCF indicators									
Timely initiation of breastfeeding	226/250	90.4	179/187	95.7	175/193	90.7	191/215	88.8	UNHCR Target of ≥

SENS Surveys Oct-Nov 2021; 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)	
	October 2021		November 2021		October 2021		November 2021		
		(86.1-93.8)		(91.7-98.1)		(85.7-94.4)		(83.9-92.7)	85%
Exclusive breastfeeding under 6 months	50/56	89.3 (78.1-96.0)	41/41	100.0 (91.4-100.0)	52/53	98.1 (89.9-100.0)	50/51	98.0 (89.6-100.0)	UNHCR Target of ≥ 75%
Continued breastfeeding at 1 year	43/46	93.5 (82.1-98.6)	28/29	96.6 (82.2-99.9)	34/36	94.4 (81.3-99.3)	32/33	97.0 (84.2-99.9)	UNHCR Target of ≥ 90%
Continued breastfeeding at 2 years	19/26	73.1 (52.2-88.4)	22/26	84.6 (65.1-95.6)	12/21	57.1 (34.0-78.2)	23/35	65.7 (47.8-80.9)	UNHCR Target of ≥ 60%
Introduction of solid, semi-solid or soft foods	16/38	42.1 (26.3-59.2)	14/24	58.3 (36.6-77.9)	14/28	50.0 (30.7-69.4)	15/27	55.6 (35.3-74.5)	UNHCR Target of > 60%
Consumption of iron-rich or iron-fortified foods	168/192	87.5 (82.0-91.8)	131/142	92.3 (86.6-96.1)	127/139	91.4 (85.4-95.5)	150/163	92.0 (86.8-95.7)	UNHCR Target of > 60%
Bottle feeding	2/250	0.8 (0.1-2.9)	5/187	2.7 (0.9-6.1)	5/193	2.6 (0.9-5.9)	5/215	2.3 (0.8-5.3)	UNHCR Target of < 5%
Proportion of children 6-23 months who received CSB++ in the last 24 hours	66/194	34.0 (27.4-41.2)	27/145	18.6 (12.6-25.9)	33/139	23.7 (16.9-31.7)	43/163	26.4 19.8-33.8	
WOMEN 15-49 years									
Anaemia (non-pregnant)									
Total Anaemia (Hb <12 g/dl)	48/225	21.3 (16.2-27.3)	19/202	9.4 (5.8-14.3)	65/219	29.7 (23.7-36.2)	41/254	16.1 (11.8-21.3)	High if ≥ 40%
Mild (Hb 11-11.9)	33/225	14.7 (10.3-20.0)	14/202	6.9 (3.8-11.4)	43/219	19.6 (14.6-25.5)	27/254	10.6 (7.1-15.1)	
Moderate (Hb 8-10.9)	15/225	6.7 (3.8-10.8)	5/202	2.5 (0.8-5.7)	20/219	9.1 (5.7-13.8)	14/254	5.5 (3.1-9.1)	
Severe (Hb <8)	0/225	0.0	0/202	0.0	2/219	0.9	0/254	0.0	

SENS Surveys Oct-Nov 2021; 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)	
	October 2021		November 2021		October 2021		November 2021		
		(0.0-0.0)		(0.0-0.0)		(0.1-3.3)		(0.0-0.0)	
Programme enrolment/coverage pregnant women									
Pregnant women currently enrolled in the ANC	20/22	90.9 (70.8-98.9)	26/28	92.9 (76.5-99.1)	22/23	95.7 (78.1-99.9)	27/29	93.1 (77.2-99.2)	
Pregnant women currently receiving Iron-folic acid pills	20/22	90.9 (70.8-98.9)	25/28	89.3 (71.8-97.7)	22/23	95.7 (78.1-99.9)	27/29	93.1 (77.2-99.2)	
DEMOGRAPHY % [95% CI]									
Household size and Composition									
Average household size (mean, SD / range)	460	5.7 (2.6) [1-14]	370	6.2 (2.5) [1-15]	379	5.9 (2.6) [1-14]	433	5.9 (2.5) [1-13]	
Percent of children U2	299/2633	11.4	196/2289	8.6	197/2239	8.8	220/2540	8.7	
Percent of children U5	610/2633	23.2	463/2289	20.2	448/2239	20.0	491/2540	19.3	
Percent of pregnant women	55/2633	2.1	48/2289	2.1	42/2239	1.9	43/2540	1.7	
Household Head Profile									
Female headed households	344/459	75.0 (70.8-78.7)	177/370	47.8 (42.8-52.9)	191/379	50.4 (45.4-55.4)	208/433	48.0 (43.3-52.7)	
Male headed households	104/459	22.7 (19.1-26.7)	162/370	43.8 (38.8-48.9)	162/379	42.7 (37.9-47.8)	193/433	44.6 (40.0-49.3)	
Children headed households	3/459	0.7 (0.2-1.9)	2/370	0.5 (0.2-2.0)	0/380	0.0 (0.0-0.0)	1/433	0.2 (0.0-1.3)	
Age dependency ratio (mean, SD / range)	453	1.8 (1.4) [0.0-7.0]	366	1.7 (1.3) [0.0-6.0]	375	1.6 (1.2) [0.0-6.0]	425	1.5 (1.2) [0.0-8.0]	
FOOD SECURITY									
Food Assistance									

SENS Surveys Oct-Nov 2021; 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)	
	October 2021		November 2021		October 2021		November 2021		
Proportion of households receiving a food assistance (in-kind and/or cash grants and/or food vouchers)	240/240	100.0 (98.5-100.0)	192/192	100.0 (98.1-100.0)	192/192	100.0 (98.1-100.0)	220/220	100.0 (98.3-100.0)	
Average number of days general food ration lasts out of [insert cycle] days (mean, SD / range)	237	11.7 (6.8) [1-28]	191	14.1 (5.0) [1-28]	192	14.2 (5.1) [3-28]	220	13.3 (5.1) [3-30]	
Proportion of households receiving cash grants	240/240	100.0 (98.5-100.0)	192/192	100.0 (98.1-100.0)	192/192	100.0 (98.1-100.0)	220/220	100.0 (98.3-100.0)	
Negative coping strategy (proportion of households reporting using the following coping strategies over the past month*):									
Rely on less preferred and/or less expensive foods	235/240	97.9 (95.2-99.3)	191/192	99.5 (97.1-100.0)	192/192	100.0 (98.1-100.0)	219/220	99.6 (97.5-100.0)	
Borrow food, or rely on help from a friend or relative	224/240	93.3 (89.4-96.1)	183/192	95.3 (91.3-97.8)	179/192	93.2 (88.7-96.4)	203/220	92.3 (87.9-95.4)	
Reduce the number of meals eaten in a day	234/240	97.5 (94.6-99.1)	188/192	97.9 (94.8-99.4)	190/192	99.0 (96.3-99.9)	218/220	99.1 (96.8-99.9)	
Limit portion sizes at mealtime	236/240	98.3 (95.8-99.5)	191/192	99.5 (97.1-100.0)	187/192	97.4 (94.0-99.2)	218/220	99.1 (96.8-99.9)	
Reduce consumption by adults so children could eat	217/240	90.4 (86.0-93.8)	180/192	93.8 (89.3-96.7)	166/192	86.5 (80.8-91.0)	192/220	87.3 (82.1-91.4)	
Average rCSI (mean, SD / range)	240	22.8 (8.5) [2-46]	192	25.0 (9.1) [2-55]	192	24.0 (9.2) [2-56]	220	23.6 (9.2) [0-56]	
Food Consumption Score (FCS)									
Average FCS (mean, SD / range)	240	31.8 (14.5) [7.5-80.0]	192	32.8 (10.9) [11.0-84.5]	192	34.4 (13.4) [1.5-86.5]	220	29.7 (11.9) [7.5-71.0]	
FCS profiles									

SENS Surveys Oct-Nov 2021; Maban refugee camps, South Sudan

	Doro		Yusuf Batil		Gendrassa		Kaya		
	Number/ total	% (95% CI)	Classification of public health significance or target (where applicable)						
	October 2021		November 2021		October 2021		November 2021		
Acceptable	84/240	35.0 (29.0-41.4)	76/192	39.6 (32.6-46.9)	96/192	50.0 (42.7-57.3)	66/220	30.0 (24.0-36.5)	
Borderline	95/240	39.6 (33.4-46.1)	84/192	43.8 (36.6-51.1)	63/192	32.8 (26.2-39.9)	94/220	42.7 (36.1-49.6)	
Poor	61/240	25.4 (20.0-31.4)	32/192	16.7 (11.7-22.7)	33/192	17.2 (12.1-23.3)	60/220	27.3 (21.5-33.7)	

Interpretation of results

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

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)

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

Nutrition, health, and anaemia

- Overall, the nutrition situation among children aged 6-59 months in all camps remained at serious level based on the WHO classification. The prevalence of Global Acute Malnutrition (GAM) based on weight for height z scores showed an increasing trend as compared to 2019 in two camps of Gendrassa and Kaya (Gendrassa from 6.6% in 2019 to 11.9% while Kaya from 9.1% in 2019 to 10.6%). These changes indicate a likely deteriorating situation and is of concern. In Doro and Yusuf Batil, the prevalence of GAM showed a reducing trend (Doro from 15.0% in 2019 to 14.5% in 2021 and Yusuf Batil from 14.0% in 2019 to 10.3% in 2021). However, the prevalence didn't show a significant reduction ($p>0.05$). The prevalence of Severe Acute Malnutrition reduced in Doro (3.8% to 2.9%) and Kaya (1.5% to 0.9%) refugee camps as compared to 2019, while increased in Yusuf Batil (2.2% to 2.9%) and Gendrassa (0.6% to 1.5%). The SAM prevalence in Doro and Yusuf Batil remain above 2% (as per UNHCR classification $SAM \geq 2\%$ critical).
- The prevalence of stunting (chronic malnutrition) among children aged 6-59 months decreased and remained below 30% the critical public health significance threshold (WHO classifications) as compared to 2019 in all Maban refugee camps. This is indicated by prevalence of 12.7% in Doro, 17.0% in Yusuf Batil, 15.1% in Gendrassa, and 16.9% in Kaya. However, this prevalence is still classified as medium level public health significance, this indicates the population of young children are more vulnerable as this suggests they have been experiencing malnutrition

over a longer period possibly due to poor child feeding and care practices and poor health seeking behaviours.

- The prevalence of diarrhoea in the two weeks leading up to the survey ranged between 9.2% in Kaya refugee camp to 27.6% in Doro refugee camp. Other camps of Gendrassa and Yusuf Batil have respective prevalences of 9.4% and 13.9%. As diarrhoea is closely linked to nutritional status, the prevalence of diarrhoea in the refugee camps indicates a high morbidity caseload requiring continued provision of health and hygiene services. Compared to 2019, the proportion of affected children in three refugee camps (Doro, Gendrassa, and Kaya) showed a decrease (Doro from 30.2% to 27.6%, Gendrassa from 15.6% to 9.4%, and Kaya from 14.9% to 9.2%).
- Measles vaccination coverage with information obtained from the mothers and EPI cards for children aged 9-59 months met the expected SPHERE standard of $\geq 95\%$ (Doro 97.4%, Yusuf Batil 99.0%, Gendrassa 98.6%, and Kaya 100%). Similarly, Vitamin A supplementation coverage met the SPHERE standard of $\geq 90\%$ (Doro 97.2%, Yusuf Batil 98.8%, Gendrassa 98.0%, and Kaya 98.9%). The high coverage of Vitamin A supplementation could be attributed to campaign conducted in Sept 2021 across all camps.
- Deworming coverage among children aged 12-59 months measured by recall information from the mothers or caretakers within the past six months across all camps showed significant increase and met recommended standard of $\geq 75\%$ as compared to 2019. This is indicated by below respective camps coverages: Doro from 40.9% to 94.7%, Yusuf Batil 76.6% to 95.4%, Gendrassa 58.7% to 94.4%, and Kaya 71.2% to 94.4%. The high coverage of deworming could be attributed to campaign conducted in Sept across all camps.
- The enrolment for selective feeding programmes (OTP and TSFP enrolment) in all Maban refugee camps based on all admission criteria were below $\geq 90\%$ SPHERE standard for all camps. The enrolment ranged between 0.0% in Yusuf Batil to 40.0% in Kaya for OTP and 10.9% in Gendrassa to 26.0% in Kaya for TSFP. Yusuf Batil and Gendrassa refugee camps had the highest number of acute malnourished children who were found not enrolled in programs. The coverage rate reported from the screening at community and facility level also low with exception of OTP programmes in Gendrassa and Kaya refugee camps where coverages were $>90\%$. This could be due to using MUAC only criterion for screening after the onset of COVID-19 pandemic in 2020. This low rate of enrolment highlights the importance of active case finding and the use of weight for height among refugees.
- The enrolment coverage in the blanket supplementary feeding program for children aged 6-23 months in all Maban refugee camps is below the recommended standard of $>90\%$. Respective camps coverage is as indicated below; 72.1% in Gendrassa, 77.4% in Yusuf Batil, 79.1% in Kaya, and 83.4% in Doro refugee camps.
- Ante-natal programme coverage and iron folic acid supplementation was high. ANC coverage ranged between 90.9% to 95.7% and iron folic acid supplementation between 89.3% to 95.7%. In comparison to 2019, there is increase in ANC coverage and iron folic acid supplementation in all Maban camps.
- The prevalence of anaemia among children aged 6 to 59 months in the refugee camps of Doro, Yusuf Batil, and Gendrassa remained of high ($\geq 40\%$) public health significance (WHO classification). In Kaya refugee camp, the prevalence is of medium public health significance. Compared to 2019, the prevalence decreased significantly across all Maban refugee camps (Doro from 55.8% to 40.6%, Yusuf Batil from 55.7% to 41.1%, Gendrassa from 57.5% to 43.2%, and Kaya from 49.9% to 39.0%). Significant reduction is also showed in the prevalence of

anaemia among children aged 6-23 months as compared to 2019. However, this age group remained to be the most affected. Among non-pregnant women of reproductive age (15-49 years) the prevalence of anaemia also decreased significantly as compared to 2019. This prevalence is of low (Yusuf Batil 9.4% and Kaya 16.1%) and medium (Doro 21.3% and Gendrassa 29.7%) public health significance. In the latter camps, the prevalence is above the expected <20% UNHCR target.

- The proportion of children 0-23 months who had timely initiation of breastfeeding, exclusive breastfeeding of infants under six (6) months and continued breastfeeding at one year across all camps were >90% indicating a positive uptake of the breastfeeding messages. In contrast, in Kaya the timely initiation of breastfeeding and exclusive breastfeeding in Doro remained below 90%. The introduction of solid/semi-solid/soft foods to infants ranged from 42.1% in Doro refugee camp to 58.3% in Yusuf Batil refugee camp. The proportion of children aged 6 - 23 months that had consumed iron-rich or iron-fortified foods significantly increased across all camps as compared to 2019 with a range from 87.5% in Doro to 92.3% in Yusuf Batil. Ranged of between 0.8% in Doro to 2.7% in Yusuf Batil refugee camps of children in the camps are bottle fed, placing them at risk of illness (diarrhoeal disease) due to likelihood of contamination of the bottle and nipple.
- 100% of all surveyed households in all the refugee camps had ration cards indicating households having access to food assistance and cash provided on monthly basis. Despite receiving the general food ration, the number of days that the general food ration lasted out of 30 days ranged between 11.7 days in Doro to 14.2 days in Gendrassa refugee camp.
- The food consumption score (FCS) is used to measure the dietary diversity in household out of 12 of the food groups. The average FCS in all camps range from Kaya 29.7 to Gendrassa 34.4 which fall into the borderline category (28.5-42). Most households are classified into either borderline or poor food consumption, only less or equal to half households with acceptable food consumption (Doro - 35.0%, Yusuf Batil - 39.6%, Gendrassa - 50.0%, and Kaya - 30.0%).
- To fill the gap, most households across all the camps coped with this shortfall by relying on less preferred or less expensive foods, borrow food or rely on help from friend or relative, reduce the number of meals eaten in a day, limit portion sizes at mealtime, reduce consumption by adults so children could eat. The average reduced Coping Strategy Index (rCSI) marked from 22.8 to 25.0 out of 56.0 in four camps. Notice that this is the first time FCS and rCSI are introduced into the nutrition survey in South Sudan, which don't have a historical data from 2019, but could be compared to other food security assessments such as WFP Post-distribution monitoring (PDM).

KEY RECOMMENDATIONS AND PRIORITIES

Nutrition related

1. Maintain and strengthen regular CMAM nutrition programs in all camps.
2. Ensure early preposition of BSFP supplies for both children U2 and PLW to ensure consistent regular distribution all year round (UNHCR, WFP, and RI).
3. Resume two-stage screening of MUAC and subsequent Weight for Height (for children with MUAC at risk) through monthly screening at the BSFP distribution sites to identify and admit malnourished children in condition of Infection Prevention Control measures (RI).
4. Intensify the family-MUAC approach to identify the malnutrition cases to improve the enrollment rate.
5. Use multi-sectoral approach to strengthen IYCF program following UNHCR IYCF- framework for action (RI, UNHCR, WFP, and other partners).
6. Conduct an in-depth assessment of the causes of anaemia, which has been ongoing for more than five years now (UNHCR, RI, and CORDAID).
7. Ensure buffer stock of Vitamin A supplementation to maintain routine Expanded Program of Immunization (EPI) and campaigns in case of pipeline break or delay (UNHCR, UNICEF, and RI).
8. Provide meals to inpatients and caregivers in SC and those on HIV/TB treatments to ensure the compliance to treatment (UNHCR, WFP, RI, and CORDAID).

Food security

9. Advocate for an increase in the refugee food basket to reach the minimum daily recommended allowance (2100 kcal/person per day) of both macro and micronutrients through including fortified food (UNHCR and WFP).
10. Scale up livelihood projects through extension of various agro-nutrition sites, backyard gardening, school gardening for improvement of the household food security to bring positive impact at household level (RI, UNHCR, and WFP).

Health/WASH/Nutrition Linkages related

11. Continue implementing malaria prevention interventions including blanket long lasting insecticide treated (LLIN) mosquito net distribution and bi-yearly indoor residue spraying (UNHCR, RI, and CORDAID).
12. Strengthen the good reproductive practices through education on healthy timing and spacing of pregnancies, continued breastfeeding until 24 months, iron-folic acid supplementation to pregnant women (UNHCR, RI, and CORDAID).
13. Distribute jerrycans to ensure provision of adequate water storage containers per household (UNHCR and ACTED).
14. Improve the WASH equipment in health and school facilities (UNHCR and ACTED).
15. Support latrine construction to improve latrine coverage (UNHCR and ACTED).

1. INTRODUCTION

This report presents the results of nutrition survey conducted in Maban refugee camps from 11th Oct to 6th Nov 2021.

1.1. Background

The four refugee camps of Doro, Yusuf Batil, Gendrassa, and Kaya are situated in Maban County that lies Northeast of the Republic of South Sudan. The county is a semi-arid region with sparse vegetation, no surface water, and having harsh climate with extreme temperatures during the dry season. Rainy season in Maban starts between May or June and runs through October or November with occasional flooding experienced during rainy season. The land surface is composed of clay soil, which is impassable during the rainy season, however significant work has been carried out between and within camps through support of UNHCR to upgrade the quality of roads using marram. This ensures humanitarian work not hampered in rainy season.

The first refugee camp, Doro was established in November 2011 as a spontaneous settlement and followed by Yusuf Batil camp in May 2012. Gendrassa and Kaya refugee camps were established in July 2012 and May 2013 respectively. In 2011, there was a massive influx of refugees in Maban from Blue Nile State, Sudan following political insecurity in Sudan. Doro refugee camp hosts the biggest number of refugees followed by Batil, Kaya, and Gendrassa.

Main ethnic groups in the four camps are Ingassana who are settled in three camps of Batil, Gendrassa, and Kaya while in Doro refugee camp main ethnic groups are Uduk. Two religions practiced within these four refugee camps include Islam and christianity. Islam is the dominant religion in three camps of Gendrassa, Yusuf Batil, and Kaya while Christianity is largely practiced in Doro refugee camp.

In the last quarter of 2020, Maban county experienced a deteriorating security situation that spilled over to 2021. This impacted the delivery of health and nutrition services and other programs run by various humanitarian agencies.

In Maban, UNHCR plays a vital coordination role to ensure either through direct implementation or partners that food security, nutrition, health services, protection, education, water and sanitation, shelter, and other basic non-food items of the refugees are adequately provided. WFP has continued to ensure the provision of the GFD and provision of nutrition supplies for TSFP for moderate acute malnourished (MAM) children 6-59 months (U5), PLW, and patients with HIV or TB (PLWHIV/TB); and BSFP for children 6-23 months (U2) and PLW. UNICEF in collaboration with UNHCR provides support to the nutrition programme of outpatient therapeutic program (OTP) and stabilization center (SC) for severely acute malnourished children U5. Main partners involve in implementation of health, nutrition, and food security programmes include RI and CORDAID (health and nutrition programmes), SP and ACTED (GFD). MSF-B provided health and nutrition services in Doro camp as operational partner but by the end of Sept 2021, they exited service provision in Doro camp with focus on host community.

Description of these population

As of 31st July, total population was 167,295 individuals with 33,125 households and 32,841 children under 5 years (*source; UNHCR ProGres*). Children less than 5 years accounted for 19.5%, 20.5%, 18.7%, and 19.0% of the population in Doro, Batil, Gendrassa, and Kaya refugee camps respectively. This figure has slightly increased to 171,640 as of 31st October. See below details per camp

Table 2. Maban refugee camps population

Camp/Site	Population	HH	U5 children	Average HH size	% of U5 children
Doro	68643	14229	13404	4.8	19.5%
Yusuf Batil	52394	9533	10720	5.5	20.5%
Gendrassa	19985	4013	3735	5.0	18.7%
Kaya	26273	5350	4982	4.9	19.0%

Food security situation

Both the host and refugees in Maban have limited access to additional sources of income. Host communities depend mainly through sale of wild vegetables and forest products including animals. While in camps, most of the refugees are largely dependent on the general food distribution (GFD) in a hybrid of in-kind and cash from World Food Programme (WFP) which is provided on monthly basis. Small scale agriculture is practiced by both host and the refugees in the area. Each camp has an established market area which is accessible by refugees and nearby host. Besides there are two main markets located in Bunj town and Batil (Southwest of the county) that serve the people in Maban. The markets are run by the local community, some refugees, businesspeople from Sudan, Ethiopia, and Uganda.

Delivery and distribution of GFD 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). In 2021, an average coverage of >95% registered refugees in the four camps monthly have been receiving GFD through the hybrid cash and in-kind food assistance model introduced in 2019. From Jan to March 2021, the food ration was at a 70% scale (1470 kcal vs. 2100 kcal/p/d) following the 30% reduction since August 2015 due to funding constraints. In April 2021, it was further cut to 50% ration (only 1050 kcal vs. 2100 kcal/p/d) across all four camps. It's to be mentioned that fortified food (supercereal) excluded from the food basket in South Sudan. There are six GFD sites across all four camps, with at least one site per camp (Doro 2, Yusuf Batil 2, Gendrassa 1, and Kaya 1).

The GFD food basket consists of cereals (sorghum) provided at in-kind, pulses and cooking oil provided mix of in-kind and cash, while salt and milling assistance provided at cash. No pipeline break was noted in 2021 for all commodities. However, delay in commodities prepositioning due to poor road network was noted as the road network between Maban and Renk where most commodities are transported became inaccessible especially during the rainy season (between August and Nov).

Table 3. GFD basket and cash provided by months in 2021

Ration in g/p/d	Std	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cereals	500g	350	350	350	250	250	250	250	250	250	250	250	250
Pulses in kind (75%)	50g	26	26	26	18	18	18	18	18	18	18	18	18
Pulses in cash (25%)	SSP	430	338	355	256	170	230	230	209	223	289	361	285
Veg oil in kind (50%)	35g	10.5	10.5	10.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Veg oil in cash (50%)	SSP	800	882	756	338	400	420	410	414	414	498	552	690
Salt in kind	5g	0	0	0	0	0	0	0	0	0	0	0	0

Salt in cash (100%)	SSP	100	100	88	60	80	80	80	90	80	80	80	80
Milling	SSP	450	0	450	450	400	450	530	521	533	532	531	532
Kcal from in-kind	2100 kcal	1372	1372	1372	971	971	971	971	971	971	971	1364	971
% Of standard		65.3	65.3	65.3	46.2	46.2	46.2	46.2	46.2	46.2	46.2	65	46.2
Total cash distributed in SSP		1780	1330	1650	1100	1050	1180	1250	1230	1250	1400	1520	1590

Two rounds of Post Distribution Monitoring (PDM) in May and November, and Joint Assessment Mission (JAM) were conducted within in 2021. The JAM report has been finalized with Joint Plan of Action been agreed. Second round of PDM report is still pending. Regular food basket monitoring (FBM) is conducted every month during GFD. The outcome of this monitoring suggests that some person of concern (PoC) use either part of their ration or cash in exchange for transportation cost from GFD sites to their households during distribution. This implies the expected calories of 971Kcal from in-kind distribution provided for consumption is likely to be reduce further.

Health situation

All Maban refugee camps have at least one health care facility with breakdown as below: Doro four (2 PHCCs and 2 PHCUs), Kaya two (PHCC and PHCU), Yusuf Batil two (PHCC and PHCU), and Gendrassa one (PHCC) owing to its smaller population. There is one secondary health facility (Bunj hospital) run by CORDAID and Gentil PHCC+ run by RI that act as referral hospital and support management of cases that cannot be attended to at the respective refugee camps PHCCs and PHCUs. The two referral facilities are fully operational 24/7 hours with support of both technical and incentives staff.

Within primary health care facilities, some are fully operational with 24 hours medical services supported by either technical and incentive staff or incentive staff only especially at night. Where there is heightened insecurity and disastrous flooding as it occasionally happens in Maban, services are mainly provided by incentives staff from the respective refugee communities with remote technical support from qualified staff where possible.

Primary health care services provided include treatment of common illnesses, antenatal care (ANC) and post-natal care (PNC), immunization (EPI), TSFP and OTP. In all refugee camps, the health partners through UNHCR support and other donations have made significant improvements in terms of expanding the scope of health care services, infrastructures development, staff capacity building, coordination with various stakeholders to help cater much greater population.

At community level, RI runs a Care Group Model that comprises of Behaviour Change and Communication (BCC) Officers, promoters, lead mothers, and neighbour women. This structure is used for implementation of both health and nutrition activities. The Care Group Model structure works in collaboration with health and nutrition sectorial committees in each camp and these structures form the backborn of community health and nutrition program.

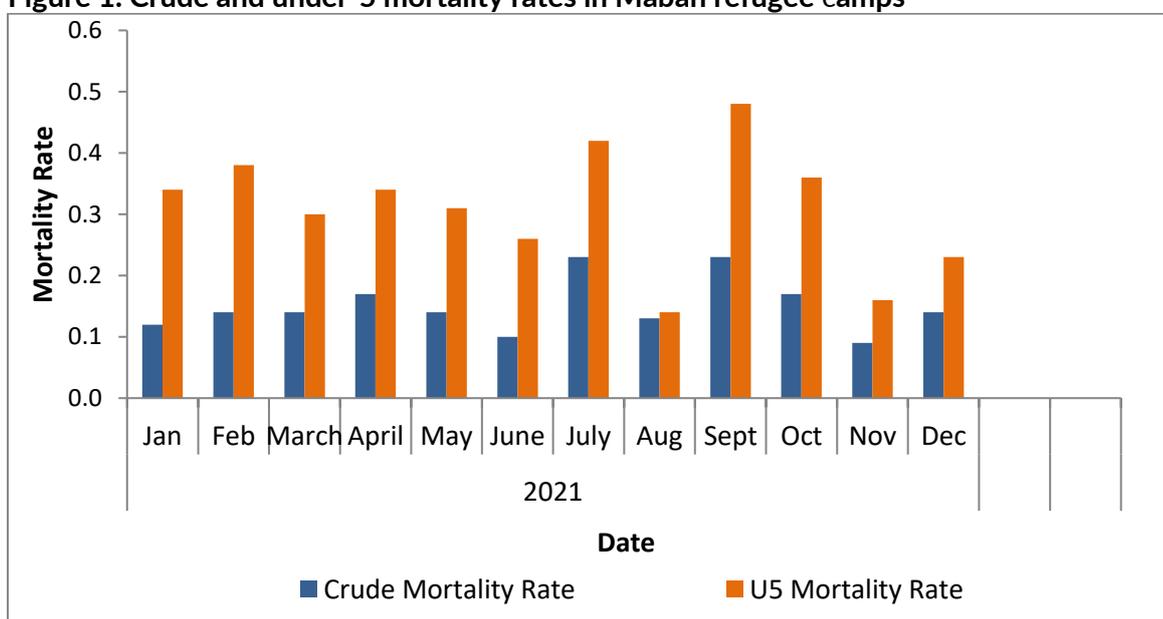
Malaria prevention, vector control including indoor residual spraying (IRS), larval source management, messaging on proper use of mosquito net programmes have also been conducted in the camps by Mentor Initiative in 2021. In each camp, one round of IRS was conducted in the first half of 2021. No blanket Long Lasting Insecticide treated mosquito Net (LLIN) distribution was done within the year. Current ongoing mosquito net distribution is targeted to pregnant women during first ANC visit in health facilities.

With the outbreak of COVID-19 pandemic, the refugee camps registered COVID-19 positive cases in 2021. The pandemic has greatly impacted the delivery of both health and nutrition services as some

adaptations had to be put in place to prevent infection and ensure continuity of service delivery. No other diseases outbreak is recorded in camps in 2021. The National Immunization Days campaign, a government led programme in coordination with WHO and UNICEF supported one integrated campaign in March 2021 for polio, deworming, and Vitamin A supplementation. An average coverage of >90% for vitamin A and deworming was achieved in the refugee camps. In September 2021, with support of Maban County Health department and UNHCR, RI conducted the second round of deworming and Vitamin A supplementation campaign in all camps. An average coverage of 94% for deworming and 88% for Vitamin A supplementation was achieved.

Top main causes of morbidities among children U5 in four refugee camps include RTIs, acute watery diarrhoea, eye infections, skin infection, and malaria. The average Crude Mortality Rate (CMR) and Under Five Mortality Rate (U5 MR) across Maban refugee camps were 0.15/1000/month and 0.31/1000/month respectively. These rates remained within the standard thresholds of 0.75/1000/month for CMR and 1.5/1000/month for U5 MR.

Figure 1. Crude and under-5 mortality rates in Maban refugee camps



Nutrition situation

Nutrition status in Maban refugee camps remain to be a big concern and beyond the average nationwide level of refugees. Trends in prevalence of Global Acute Malnutrition (GAM) showed a steady increase in 2019 with one camp hitting emergency threshold, one at serious level, and two at poor label according to WHO classification. Total anaemia prevalence in children 6-59 months in Maban refugee camps has remained very high well above 40% label of public health significance (WHO classification). For women of reproductive age 15-49 years (non-pregnant), the prevalence of anaemia was of medium public health significance and is above the expected <20% UNHCR target.

Current nutrition services and activities

In all camps nutrition services are 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), and Maternity. Nutrition services and activities conducted include preventive and curative interventions which are key elements of UNHCR’s global public health nutrition programme.

Preventive interventions

1. Community mobilization and active case finding through regular (routine and quarterly) nutrition screening, detection, and referral at facility and community levels.
2. Follow-up of cured cases from nutrition programmes and provision of nutritional support to avoid relapse also conducted.
3. Nutrition education both at community and facility level
4. Growth monitoring at EPI unit during visits.
5. Maternal/Infant and Young Child nutrition/feeding (MIYCN or IYCF) support and promotion programme provided at both facility and community level by the facility and Care Group staff.
6. Cooking demonstrations to mothers and caretakers of children U5 at facility and community level.
7. Blanket Supplementary Feeding Programme (BSFP) for children aged 6 - 23 months and pregnant and lactating women.
8. Promotion of kitchen (small-scale homestead) gardening programme at household to mothers and caretakers of children U5.
9. Biannual Vitamin A supplementation and deworming campaign for children U5
10. Screening of children aged 6-59 months and pregnant/lactating women for anaemia in health facilities.

Curative interventions

1. Targeted Supplementary Feeding Programme (TSFP) for moderately malnourished children U5, pregnant/lactating women (PLW), and patients with chronic illnesses such as TB and HIV,
2. Outpatient Therapeutic Feeding Programme (OTP) for management of severely acute malnourished children aged 6-59 months without medical complications
3. Inpatient Therapeutic Feeding Programme (SC based in certain health facilities) for management of severely acute malnourished children U5 with medical complications.
4. Treatment of individuals with severe anaemia at the health facilities using iron/folic acid tablet/syrup as per recommendations.

Nutrition services are provided at 11 nutrition sites supported by RI except one by CORDAID. The sites include Gentil PHCC+ and Bunj hospital stabilization centres run by RI and CORDAID respectively. OTP and TSFP sites are attached to the eight primary health facilities in camps. In each camp PHCC, there is Nutrition Assessment, Counselling, and Support (NACS) programme for patients with TB/HIV/Kalazer. Commodities used in the TSFP are RUSF (PlumpySup) for children U5 and Corn Soya Blend Plus Plus (CSB++) for PLW and PLWHIV/TB/Kalazer provided by WFP, while RUTF (PlumpyNut) for OTP and F-75/F-100/ReSoMol for SC are provided by UNICEF.

With support of WFP for commodities, six rounds of BSFP double distribution for children aged 6-23 months and PLW were conducted in 2021. Supplies provided include Lipid based Nutrient Supplements (LNS-MQ) for children 6-23 months that was introduced in April 2021 and CSB++ for PLW, which used to be given to children 6-23 months before LNS-MQ.

Active case finding through routine programming have been conducted both at community and health facility level at different point of contacts. From Jan to Dec 2021, four rounds of mass Mid-Upper Arm Circumstance (MUAC) screening were conducted targeting children U5 and PLW. The proportion of children U5 that had MUAC <12.5cm is as per below table. Quarter 2 had the highest proportion of acutely malnourished children U5 defined by MUAC.

Table 4. 2021 Quarterly Mass MUAC and/or Oedema screening trend for U5; Maban refugee camps

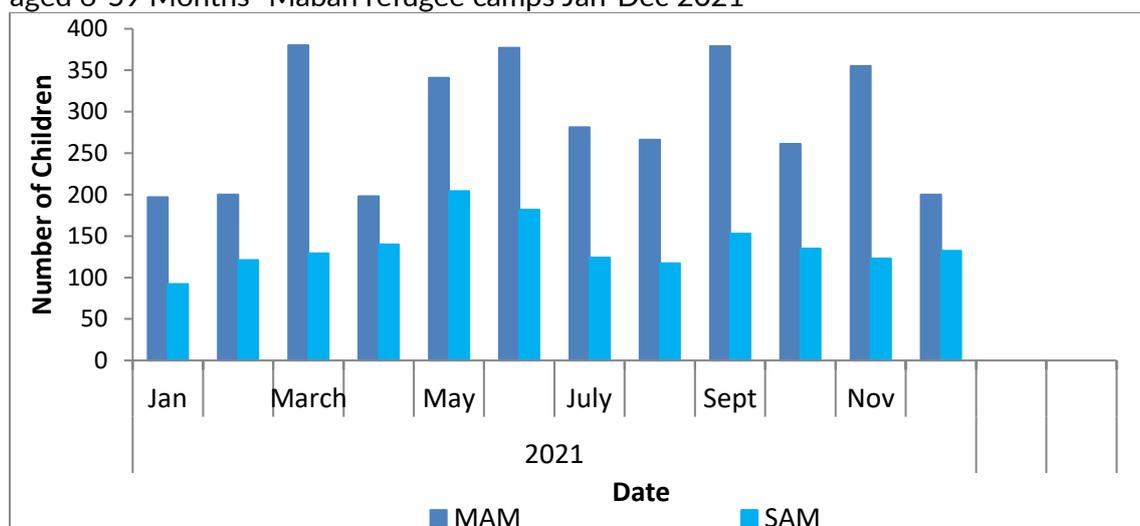
	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Average Maban MUAC <12.5cm and/ or Oedema prevalence	2.6%	3.5%	2.3%	3.3%

A total admission of 3435 and 1652 children U5 were admitted into the TSFP and OTP/SC nutrition programs respectively in all Maban refugee camps from Jan to Dec 2021. The total admission is consistent with 2020, but much lower than the level of 2019 which is before COVID-19 pandemic. Admissions trends had a peak in the months of March, June, and Sept 2021. This could be due to mass MUAC screening conducted across camps within these periods, upsurge of acute watery diarrhoea and respiratory tract infections.

Table 5. Number of children 6-59 months admitted to TSFP and OTP/SC in 2021

	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
2021 TSFP	197	200	380	198	341	377	281	266	379	261	355	200	3435
2021 OTP/SC	92	121	129	140	204	182	124	117	153	135	123	132	1652

Figure 2. Admissions to Treatment Programmes for MAM (TSFP) and SAM (OTP/SC) among Children aged 6-59 Months -Maban refugee camps Jan-Dec 2021



WASH situation

Main WASH partner in Maban refugee camps is ACTED. WASH services and activities conducted across all the four refugee camps in Maban in 2021 include rehabilitation of the WASH facilities, decommissioning of latrines, flushing of water wells, support to construction of household and institutional latrines, hygiene promotion, and routine provision of soap for jerrycan cleaning.

The supply of water is through underground source. There are 34 motorized boreholes across all camps (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 2021. The motorized submersible pumps (boreholes) are operated using solar power and fuel systems. With these water sources, 100% of the households across all four refugee camps collect water from protected/treated sources. The different water

sources facilitate the provision of average daily potable water per capita at 11.6 per person per day across refugee camps (Yusuf Batil 12.7, Doro 9.5, Gendrassa 15.2, and Kaya 8.9). This is low as compared to the SPHERE standard and 2020 data. Main contributing reasons for this include unexpected borehole failure, an increased cloud coverage leading to reduced capacity of the solar systems, and reduced amount of available fuel to power the generator due to poor road network to Maban. The percentage of households with at least 10 litres/person portable water storage capacity was as low as 32%. This is too low as compared to 2020 which was 94%. Regular water quality monitoring is conducted by UNHCR partner ACTED by checking the free residual chlorine (FRC) and turbidity levels.

The average percentage of households with either household or shared latrines/toilets in Maban refugee camps stand at 70% with 81% of the households reporting using/defecating in the latrines/toilets. **However, greatest level of open defecation (29%) was shown in Doro refugee camp compared to 3% in Gendrassa, 1% in Kaya, and 0% in Yusuf Batil refugee camps.** With flooding experienced in 2021, some parts of the refugee camps were affected which had negative impact on the water and sanitation services across camps. Across the four refugee camps an average of 36% households have showed good hygiene practices. This is attributed to limited access to and expensive soap for hygiene promotion at the household level. In every month distribution, each PoC received only 250g tablet/bar of 70% fatty acid soap which is less to meet the huge hygiene needs. Solid waste disposal facilities remained a concern across the refugee camps. An average of 62% have access to a waste pit in public location but the location remained far as stated by the PoC.

1.2. Survey Objectives

Primary objectives

1. To determine the demographic profile of the population.
2. To determine the age dependency ratio.
3. To measure the prevalence of acute malnutrition among children 6-59 months
4. To measure the prevalence of stunting among children 6-59 months
5. To determine the coverage of measles vaccination among children 9-59 months
6. To determine the coverage of vitamin A supplementation in the last six months among children 6-59 months
7. To determine the two-week period prevalence of diarrhoea among children 6-59 months.
8. To measure the prevalence of anaemia among children 6-59 months and women of reproductive aged 15-49 years (non-pregnant).
9. To investigate IYCF practices among children 0-23 months.
10. To determine the populations' overall ability to meet their food needs with assistance.
11. To determine the duration of the general in-kind food distribution for recipient households.
12. To determine the extent to which negative coping strategies are used by households.
13. To assess household food consumption (quantity and quality).
14. To establish recommendations on actions to be taken to address the situation

Secondary objectives:

1. To determine the enrollment rate into the targeted supplementary (TSFP) and therapeutic (OTP/SC) nutrition programmes for children aged 6-59 months.

2. To determine enrollment rate into the blanket supplementary feeding programme (BSFP) for children aged 6-23 months.
3. To determine the coverage of deworming with mebendazole or albendazole in the last six months among young children (12-59m).
4. To determine enrollment into the blanket supplementary feeding programme (BSFP) for pregnant women and lactating women with an infant less than 6 months aged 15-49 years.
5. To determine enrolment into Antenatal Care clinic and coverage of iron-folic acid supplementation in pregnant women.

2. METHODOLOGY

A cross-sectional survey was conducted in all Maban refugee camps in which a systematic simple random sampling was used to identify the households to be surveyed in all camps. The survey was designed in accordance with UNHCR Standardised Expanded Nutrition Survey (SENS) version 3, 2019 guidelines (<http://sens.unhcr.org/>). Data was collected using Mobile Data Collection tools.

2.1. Sample size

The sample sizes for the four camps were calculated using UNHCR SENS version 3, 2019 guidelines and Standardised Monitoring and Assessments of Relief and Transitions (ENA for SMART) version Jan 11th, 2020 software (<https://smartmethodology.org/>) considering the respective camps upper confidence interval (CI) GAM prevalence from the 2019 nutrition survey, percentage of children under-5, average household size, children U5 population derived from the UNHCR ProGres database, and a non-response rate of 10%.

See table below for more details

Table 6. Parameter used to calculate sample size

Location	Doro	Batil	Gendrassa	Kaya
Total camp population (UNHCR ProGres July 2021)	68643	52394	19985	26273
% Population of U5 (UNHCR ProGres July 2021)	19.5	20.5	18.7	19.0
Estimated GAM prevalence (upper CI SENS 2019) (%)	18.0	17.2	7.1	11.8
± Desired precision (%)	4.0	4.0	3	3.5
Non-response rate (%)	10	10	10	10
Average household size	4.8	5.5	5.0	4.9
Number of children (ENA)	354	342	282	326
Number of households for Anthropometry and health	467	374	372	433
Number of households for children anaemia	467	374	372	433
Number of households for IYCF	467	374	372	433
Number of households for women anaemia (half of HHs as per SENS guidelines)	234	187	186	217
Number of households for food security (half of HHs as per SENS guidelines)	234	187	186	217

As the population of children U5 was less than 10,000 in Gendrassa and Kaya camps and more than 10,000 in Doro and Batil camps, a correction factor was used to calculate the sample size in ENA for SMART software during sample size calculation to account for small size population. The household sample size for anthropometry and health was used for IYCF, children anaemia, and demography modules. 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 details in above table.

2.2. Sampling Procedure; selecting households and individuals

Systematic random sampling was used to identify the surveyed households. The camps were divided into Zones in Doro camp and Blocks in the three refugee camps of Gendrassa, Kaya, and Yusuf Batil. Under the Zones and Blocks, all households were physically labelled with unique numbers per zone/block 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 houses were excluded from 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.

Using the UNHCR SENS guidelines, all the eligible children aged 6-59 months from all selected households were included in the child anthropometry and health, anaemia, and children 0-23 months for IYCF modules, whilst half of the selected households were selected for the Food Security and Women of reproductive age (15-49 years) questionnaire (including anaemia). All households selected were included for Demography.

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 individual or entire selected household, the teams revisited the household during the day. In unsuccessful attempt, the individual or household was recorded as absent and was not replaced. If an individual or selected household refused to participate, it was considered 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 other relevant questions except for anthropometric measurement. If it was determined that a selected household did not have any eligible children or women, other relevant questionnaires were administered to the household.

2.3. Questionnaire and measurement methods

The full questionnaire is 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 or Arabic language by the enumerators. The questionnaires were pre-tested before the survey. Four independent questionnaires were designed for different targeting group based on five standard SENS modules to provide information on the relevant indicators of the different target groups as indicated in the survey objectives. The five modules covered the following areas and the following measurements:

Module 1: Demography - this included question on information on demographic profile of the surveyed population

Module 2: Anthropometry and Health – this included questions and measurements of children aged 6-59 months. Information was collected on anthropometric status, oedema, and enrollment in selective feeding programmes, immunization (measles), Vitamin A supplementation, deworming, and morbidity from diarrhoea in past two weeks before the survey.

Module 3: Anaemia - this included measurement of levels of haemoglobin in children aged 6 – 59 months and women of childbearing age (15 – 49 years) who are not pregnant. Further information collected from women was pregnancy status, enrolment in ANC, coverage of iron-folic acid pills.

Module 4: IYCF - this included question on infant and young child feeding for children aged 0- 23 months.

Module 5: Food security - this included question on access and use of the GFD ration, negative coping mechanisms used by household members and household dietary diversity.

Measurement methods

Household-level indicators

Demography: Demographic variables are assessed using interviews through questionnaire designed from SENS Version 3 (2019).

Food security: Food security variables are assessed using interviews through questionnaire designed from SENS Version 3 (2019). The list of food items/commodities were adjusted to the locally available type in consultation with community nutrition workers.

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 (e.g., plumpysup, plumpynuts, CSB++)

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: IYCF indicators are assessed using interviews with mothers or the main caregiver of young children through questionnaire designed

from SENS Version 3 (2019). The list of food items/commodities were adjusted to the locally available type in consultation with community nutrition workers.

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

Household: in household surveys, a household is typically defined as a group of people who live together and routinely eat out of the same pot.

Head of household: The person responsible for making the decisions for the household as a whole.

Age dependency ratio: According to the United Nations Population Division and the World Bank, the age dependency ratio is defined as the 'ratio of dependents --people younger than 15 (aged 0-14 years) or older than 64 (65+ years)--to the working-age population--those aged 15-64.'

Age dependency ratio = Number of people aged 0 - 14 years and those aged 65 years and over/Number of people aged 15-64 years

Non-response rate: in sample surveys, the failure to obtain information from a designated individual or household for any reason (e.g. absence, refusal) is called a non-response. The proportion of non-responders (individuals or households) over the planned sample size is the non-response rate.

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 7. 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 8. 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
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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 9. 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 10. 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):

$$\text{Coverage of SFP programme (\%)} = \frac{\text{No. of surveyed children with MAM according to SFP criteria who reported being registered in SFP}}{\text{No. of surveyed children with MAM according to SFP admission criteria}} \times 100$$

$$\text{Coverage of OTP programme (\%)} = \frac{\text{No. of surveyed children with SAM according to OTP criteria who reported being registered in OTP}}{\text{No. of surveyed children with SAM according to OTP admission criteria}} \times 100$$

Child enrolment in blanket supplementary feeding programme

$$\text{Enrollment into BSFP (\%)} = \frac{\text{No. of surveyed children in the eligible age range who reported being registered in BSFP}}{\text{No. of surveyed children in the eligible age range}} \times 100$$

Woman enrolment in blanket supplementary feeding programme

$$\text{Enrollment into BSFP (\%)} = \frac{\text{No. of surveyed women in the eligible category (e.g. PLW) who reported being registered in BSFP}}{\text{No. of surveyed women in the eligible category (e.g. PLW)}} \times 100$$

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 3, 2019) 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

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

Children 20-23 months of age

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

Children 6-23 months of age who received an iron-rich food or a food that was specially designed for infants and young children and was fortified with iron, or a food that was

fortified in the home with a product that included iron during the previous day

Children 6-23 months of age

Bottle feeding: Proportion of children 0-23 months of age who are fed with a bottle

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

Children 0-23 months of age

Anaemia in children 6-59 months and women of reproductive age: 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 11. 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

Food security: Food security were assessed based on the UNHCR SENS Food Security module (Version 3, 2019) in which FCS and rCSI indicators are based on WFP and UNICEF recommendations (2016).

General food distribution: Duration of the food from GFD is adjusted to the food assistance cycle (30 days cycle).

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 12. 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 13. 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 14. 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)

Table 15. 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 ¹	≥30	20-<30	10-<20	2.5-<10	<2.5
Label	Critical	Serious	Poor	Acceptable	
Low weight-for-age ²	≥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 16. Performance indicators for selective feeding programmes (UNHCR Strategic Plan for Nutrition and Food Security 2008-2012) *

	Recovery	Case fatality	Defaulter rate	Coverage		
				Rural areas	Urban areas	Camps
SFP	>75%	<3%	<15%	>50%	>70%	>90%
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 17. Classification of public health significance (WHO 2000)

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

Food consumption score: the Food Consumption Score (FCS) is a proxy measure of household food access using dietary diversity and food frequency. Focusing on the seven days before the interview, it records how many days nine categories of foods (including super cereals) were eaten by anyone in the

¹ WHO/UNICEF categorization, prevention of malnutrition threshold-children under 5 years of age, December 2018

² WHO (1995) Physical Status: The Use and Interpretation of Anthropometry and WHO (2000) The Management of Nutrition in Major Emergencies

household. It is therefore a household variable and does not measure food frequency or diversity for any single individual in the household. Each food category is given a weight based on the energy and the macro- and micronutrient content of the food/food group. This weight is multiplied by the number of days in the preceding week each food category was eaten. The sub-scores for each food group are then summed up to produce a composite FCS. The FCS also provides a measure of dietary diversity.

Table 18. Thresholds to determine food consumption profiles (WFP 2016)

Threshold	Profiles	Thresholds with oil and sugar eaten on a daily basis (~7 days per week)
0 - 21	Poor food consumption	0 - 28
21.5 - 35	Borderline food consumption	28.5 - 42
>35	Acceptable food consumption	>42

2.6. Training, coordination, and supervision

The survey was coordinated by UNHCR Sub Office, Maban Senior Nutrition and Food Security Associate-Maban and Associate Nutrition and Food Security Officer-Juba, UNHCR, Bunj Sub Office management, and supervision assistance from RI and CORDIAD staff.

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 set to conduct the survey. A total of seven (7) in Doro and twelve (12) survey teams in the three camps of Yusuf Batil, Gendrassa, and Kaya each comprised of four members (anthropometry measurer, anthropometric assistant, HB data collector and team leader/interviewer). Survey teams are composed of community health/nutrition workers from respective camps, and other qualified refugees.

Three sets of trainings for one for supervisors and two for enumerators were conducted. The supervisors training was conducted for two days (11th to 12th Oct) and enumerators trainings each lasting for five days were conducted in Doro from 13th to 18th Oct and Gendrassa from 20th to 25th Oct. Prior to the trainings, survey training topics and other materials were shared with RI and CORDAID key nutrition focal persons. During all trainings, emphasis was made on data collection techniques, familiarization with the questionnaires, interviewing skills, teamwork, interpretation of calendar of events and age determination, and data collection using the smartphone. This was to ensure high quality information is collected from respondents. Practical sessions on anthropometric and haemoglobin measurements blood sample taking, including two standardization and pilot test were conducted. The practical session on anthropometric measurements involved volunteer children for practice as well as a standardisation test. The practical session on haemoglobin measurements involved the trainees and trainers themselves as well as a standardisation test. For the pilot test, seven households were selected for each of the teams who administered the questionnaires and took the required measurements. The data collection tools were then reviewed based on the feedback from the field pilot test.

2.7. Data collection

Data collection was conducted from 20th Oct through to 6th Nov 2021 with an average of three days in Gendrassa, Yusuf Batil, and Kaya refugee camps. In Doro refugee camp, data collection took six days

as seven teams were set for the camp. Sundays were taken as break to allow the survey teams of enumerators, supervisors, and the coordinators to rest. Data collection was conducted using smartphone with pre-installed Open Data Kit facility (ODK) and recording on paper for key measurements conducted made for cross checking the data and retain backup where need be to verify. Field visits during data collection by the survey teams were supported by two coordinators from UNHCR and by a team of 8 supervisors from RI and CORDAID who roved between the teams during the survey exercise.

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, consistency with paper based data controlling sheet on key measurements, and range of data before exporting the data from the smartphones to the server. Feedback was provided to teams every morning in terms of the issues flagged from the daily check. Some data which are unclear are marked and the teams asked to returned to the particular households for correction or confirmation the following day. This feedback enabled the teams to learn the importance of accuracy and being keen in recording the measurements and responses. The ODK exported data were downloaded from the server each evening as csv files. All data files were cleaned before analysis and entries were double checked one after the other with the original questionnaire to ensure there were no data entry errors and duplicate entries.

Analysis was performed using ENA for SMART Jan 11th 2020 version and Epi Info software version 7.2.4.0. The SMART plausibility report was generated for each complete set of survey data in order to check the quality of the anthropometric data and 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 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 3, 2019) 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 Jan 11th, 2020, version. Epi Info version 7.2.4.0 was used to analyse all the other data.

3. RESULTS

3.1. FROM DORO REFUGEE CAMP, SOUTH SUDAN

A percentage coverage of 129% of the targeted children 6-59 months in Doro refugee camp were surveyed (target 354 and surveyed 458). All the children who participated in the survey were considered using either available official age documentation or age estimation from local context calendar of event developed to estimate the age. Of the total surveyed children 6-59 months in Doro refugee camp, 75% had official age documentation.

Table 19. Distribution of age and sex of sample - Doro refugee camp.

AGE (mo)	Boys		Girls		Total		Ratio
	no.	%	no.	%	no.	%	Boy:girl
6-17	72	49.7	73	50.3	145	31.7	1.0
18-29	47	53.4	41	46.6	88	19.2	1.1
30-41	57	52.8	51	47.2	108	23.6	1.1
42-53	42	48.8	44	51.2	86	18.8	1.0
54-59	15	48.4	16	51.6	31	6.8	0.9
Total	233	50.9	225	49.1	458	100.0	1.0

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

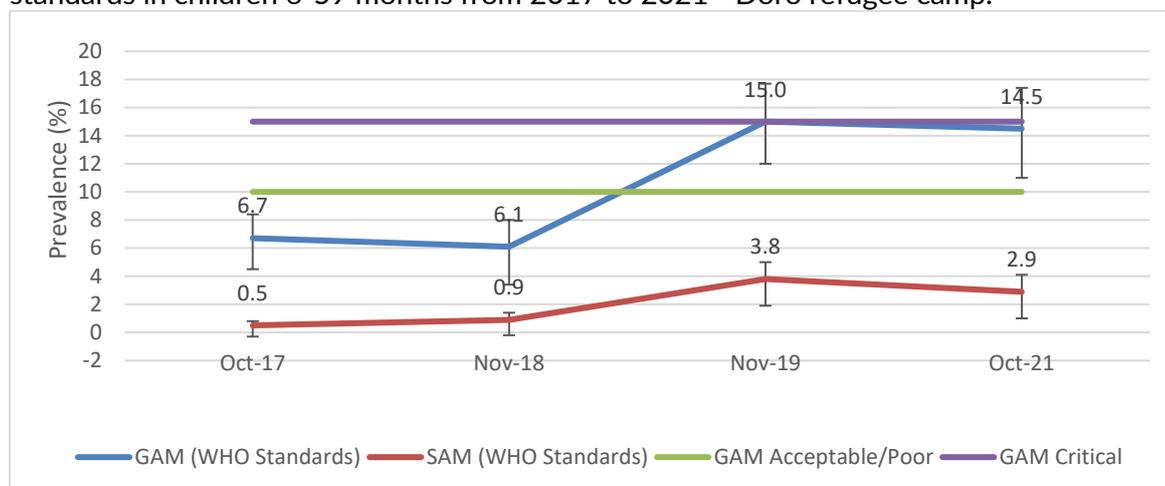
3.1.1. Anthropometry

Table 20. Prevalence of acute malnutrition based on weight-for-height z-scores and/or oedema and by sex - Doro refugee camp.

	All n = 455	Boys n = 233	Girls n = 222
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(66) 14.5 % (11.6 - 18.0 95% C.I.)	(32) 13.7 % (9.9 - 18.7 95% C.I.)	(34) 15.3 % (11.2 - 20.6 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(53) 11.6 % (9.0 - 14.9 95% C.I.)	(24) 10.3 % (7.0 - 14.9 95% C.I.)	(29) 13.1 % (9.3 - 18.1 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(13) 2.9 % (1.7 - 4.8 95% C.I.)	(8) 3.4 % (1.7 - 6.6 95% C.I.)	(5) 2.3 % (1.0 - 5.2 95% C.I.)

The prevalence of oedema was 0.0% and the data excluded SMART flags. Prevalence of acute malnutrition based on WFH z-score and/or oedema and by sex, shows no significant difference based on the C.I. indicated. Boys and girls were equally wasted.

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 2021 - Doro refugee camp.

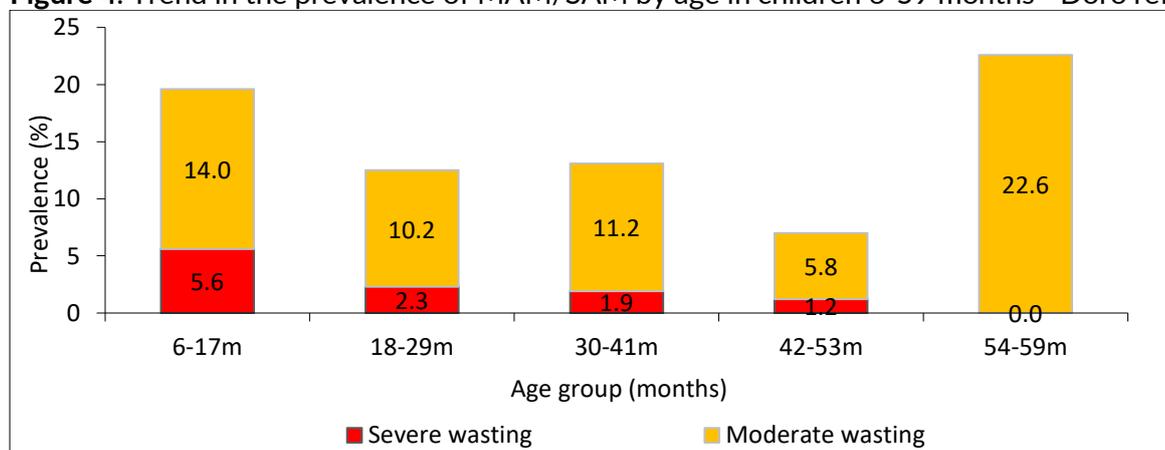


The prevalence of global and severe acute malnutrition based on WHO Growth standards in children 6-59 month in 2021 improved slightly as compared to 2019 in Doro refugee camp. However, the prevalence did not show significant reduction.

Table 21. Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema - Doro refugee camp.

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	143	8	5.6	20	14.0	115	80.4	0	0.0
18-29	88	2	2.3	9	10.2	77	87.5	0	0.0
30-41	107	2	1.9	12	11.2	93	86.9	0	0.0
42-53	86	1	1.2	5	5.8	80	93.0	0	0.0
54-59	31	0	0.0	7	22.6	24	77.4	0	0.0
Total	455	13	2.9	53	11.6	389	85.5	0	0.0

Figure 4. Trend in the prevalence of MAM/SAM by age in children 6-59 months - Doro refugee camp.

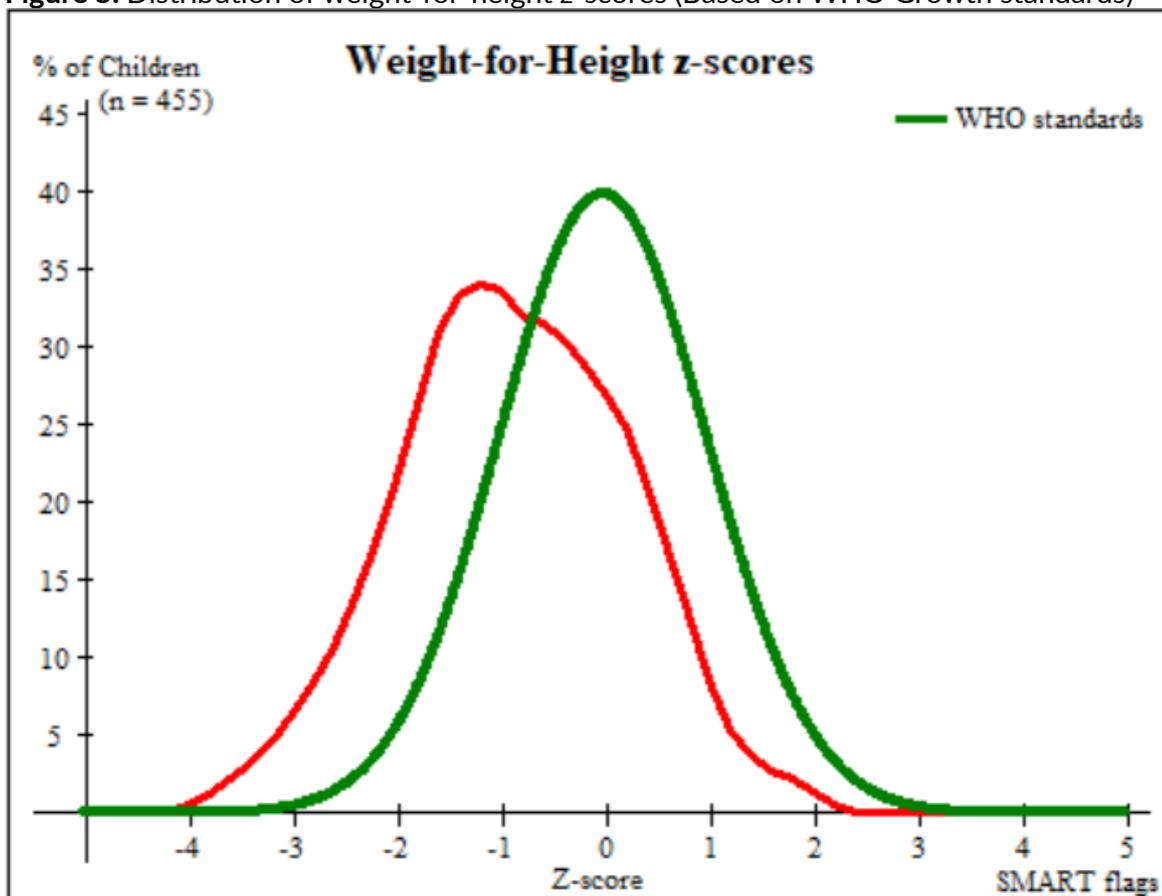


Children 6-17 and 54-59 are the most affected age groups by wasting in Doro refugee camp indicating higher vulnerability of these age categories. The SAM cases showed a negative association with age, indicating young children are more vulnerable to SAM.

Table 22. Distribution of acute malnutrition and oedema based on weight-for-height z-scores - Doro refugee camp.

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor. 0 (0.0 %)	Kwashiorkor. 0 (0.0 %)
Oedema absent	Marasmic No. 15 (3.3 %)	Not severely malnourished. 443 (96.7 %)

Figure 5. Distribution of weight-for-height z-scores (Based on WHO Growth standards)



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

Table 23. Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex - Doro refugee camp.

	All n = 458	Boys n = 233	Girls n = 225
Prevalence of global malnutrition (< 125 mm and/or oedema)	(19) 4.1 % (2.7 - 6.4 95% C.I.)	(4) 1.7 % (0.7 - 4.3 95% C.I.)	(15) 6.7 % (4.1 - 10.7 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(15) 3.3 % (2.0 - 5.3 95% C.I.)	(4) 1.7 % (0.7 - 4.3 95% C.I.)	(11) 4.9 % (2.8 - 8.5 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(4) 0.9 % (0.3 - 2.2 95% C.I.)	(0) 0.0 % (0.0 - 1.6 95% C.I.)	(4) 1.8 % (0.7 - 4.5 95% C.I.)

Girls are the most affected compared to boys by the acute malnutrition defined by MUAC.

MUAC is being used in the community to monitor malnutrition trends and for admissions and discharge in the therapeutic and supplementary feeding nutrition programmes. It's a good indicator of risk of mortality in children under five and is easy to do. However, comparing to the GAM/SAM prevalence defined by weight-for-height, the MUAC results are much lower, which indicate the potential leave-out of children by using only MUAC as the admission criterion.

Table 24. Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema - Doro refugee camp.

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	145	4	2.8	13	9.0	128	88.3	0	0.0
18-29	88	0	0.0	2	2.3	86	97.7	0	0.0
30-41	108	0	0.0	0	0.0	108	100.0	0	0.0
42-53	86	0	0.0	0	0.0	86	100.0	0	0.0
54-59	31	0	0.0	0	0.0	31	100.0	0	0.0
Total	458	4	0.9	15	3.3	439	95.9	0	0.0

The number of cases of severe and moderate wasting based on MUAC cut offs are higher in the younger age groups particularly in the 6-17 months age.

Table 25. Prevalence of under-weight based on weight-for-age z-scores by sex - Doro refugee camp.

	All n = 457	Boys n = 233	Girls n = 224
Prevalence of underweight (<-2 z-score)	(92) 20.1 % (16.7 - 24.0 95% C.I.)	(49) 21.0 % (16.3 - 26.7 95% C.I.)	(43) 19.2 % (14.6 - 24.9 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(73) 16.0 % (12.9 - 19.6 95% C.I.)	(38) 16.3 % (12.1 - 21.6 95% C.I.)	(35) 15.6 % (11.5 - 21.0 95% C.I.)

Prevalence of severe underweight (<-3 z-score)	(19) 4.2 % (2.7 - 6.4 95% C.I.)	(11) 4.7 % (2.7 - 8.3 95% C.I.)	(8) 3.6 % (1.8 - 6.9 95% C.I.)
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Boys and girls tend to be equally affected by underweight.

Table 26. Prevalence of underweight by age, based on weight-for-age z-scores - Doro refugee camp.

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	145	7	4.8	27	18.6	111	76.6	0	0.0
18-29	88	2	2.3	12	13.6	74	84.1	0	0.0
30-41	107	8	7.5	19	17.8	80	74.8	0	0.0
42-53	86	1	1.2	9	10.5	76	88.4	0	0.0
54-59	31	1	3.2	6	19.4	24	77.4	0	0.0
Total	457	19	4.2	73	16.0	365	79.9	0	0.0

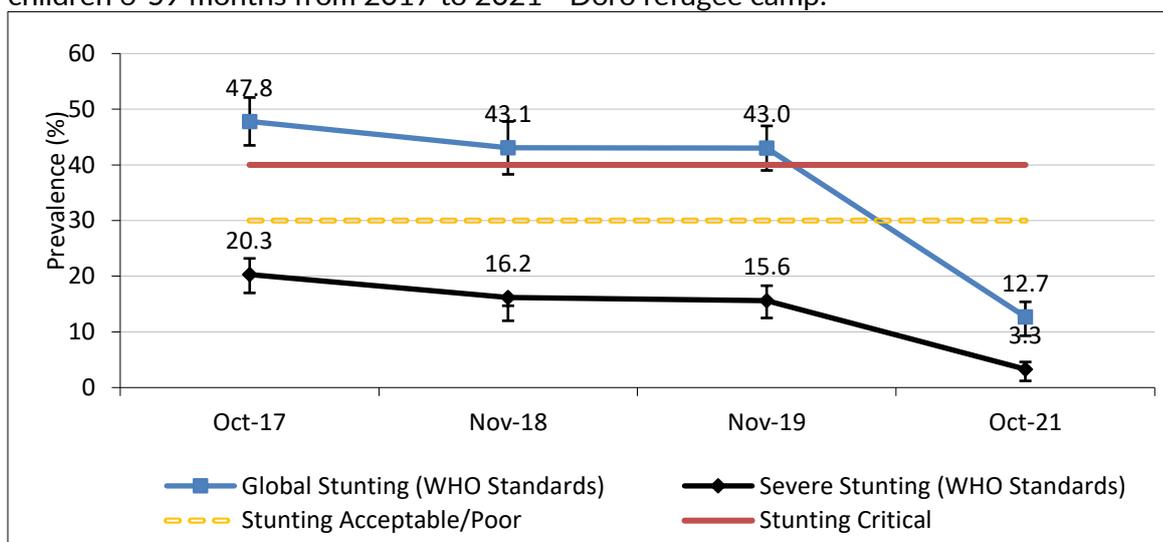
The highest proportion of severe and moderate underweight occur in the age groups of children 30-41 and 6-17 months.

Table 27. Prevalence of stunting based on height-for-age z-scores and by sex - Doro refugee camp.

	All n = 455	Boys n = 232	Girls n = 223
Prevalence of stunting (<-2 z-score)	(58) 12.7 % (10.0 - 16.1 95% C.I.)	(34) 14.7 % (10.7 - 19.8 95% C.I.)	(24) 10.8 % (7.3 - 15.5 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(43) 9.5 % (7.1 - 12.5 95% C.I.)	(24) 10.3 % (7.1 - 14.9 95% C.I.)	(19) 8.5 % (5.5 - 12.9 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(15) 3.3 % (2.0 - 5.4 95% C.I.)	(10) 4.3 % (2.4 - 7.8 95% C.I.)	(5) 2.2 % (1.0 - 5.1 95% C.I.)

Boys and girls were equally stunted. However, boys are the most affected by stunting than girls.

Figure 6. Trends in the prevalence of global and severe stunting based on WHO Growth standards in children 6-59 months from 2017 to 2021 - Doro refugee camp.

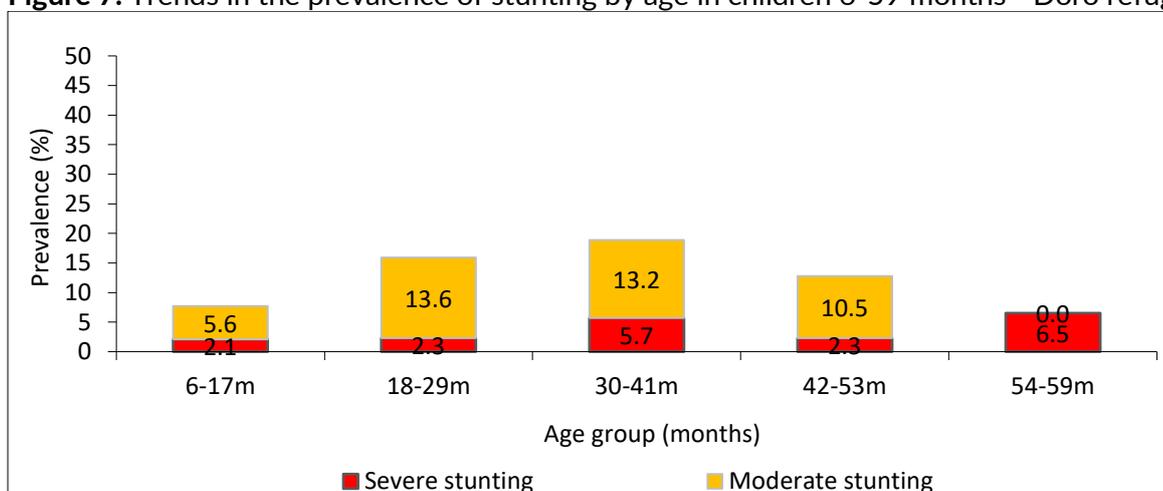


Significant reduction in stunting prevalence was noted in 2021 in Doro refugee camp as compared to 2019, and it has dropped into the poor range level.

Table 28. Prevalence of stunting by age based on height-for-age z-scores - Doro refugee camp.

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	144	3	2.1	8	5.6	133	92.4
18-29	88	2	2.3	12	13.6	74	84.1
30-41	106	6	5.7	14	13.2	86	81.1
42-53	86	2	2.3	9	10.5	75	87.2
54-59	31	2	6.5	0	0.0	29	93.5
Total	455	15	3.3	43	9.5	397	87.3

Figure 7. Trends in the prevalence of stunting by age in children 6-59 months - Doro refugee camp.



Children aged 54-59 months were most affected by severe stunting followed by children aged 30-41 months. However, overall children aged 30-41 months are the most affected by severe and moderate stunting

Table 29. Prevalence of overweight based on weight for height cut offs and by sex (no oedma) - Doro refugee camp.

	All n = 455	Boys n = 233	Girls n = 222
Prevalence of overweight (WHZ > 2)	(0) 0.0 % (0.0 - 0.8 95% C.I.)	(0) 0.0 % (0.0 - 1.6 95% C.I.)	(0) 0.0 % (0.0 - 1.7 95% C.I.)
Prevalence of severe overweight (WHZ > 3)	(0) 0.0 % (0.0 - 0.8 95% C.I.)	(0) 0.0 % (0.0 - 1.6 95% C.I.)	(0) 0.0 % (0.0 - 1.7 95% C.I.)

There were no overweight children detected in this survey.

Table 30. Mean z-scores, Design Effects and excluded subjects – Doro refugee camp

Indicator	N	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	455	-0.88±1.08	1.00	0	3
Weight-for-Age	457	-1.23±0.94	1.00	0	1
Height-for-Age	455	-1.10±0.91	1.00	0	3

* contains for WHZ and WAZ the children with edema.

3.1.2. Feeding Programme Enrollment Coverage

Selective feeding programme

Table 31. Nutrition treatment programme enrolment rate based on all admission criteria (weight-for-height, MUAC, oedema) - Doro refugee camp.

	Number/total	% (95% CI)
Proportion of children aged 6-59 months with severe acute malnutrition currently enrolled in therapeutic feeding programme*	2/14	14.3% (1.8-42.8)
Proportion of children aged 6-59 months with moderate acute malnutrition currently enrolled in supplementary feeding programme*	8/61	13.1% (5.8-24.2)

Table 32. Nutrition treatment programme enrolment rate based on MUAC and oedema only - Doro refugee camp.

	Number/total	% (95% CI)
Proportion of children aged 6-59 months with severe acute malnutrition currently enrolled in therapeutic feeding programme	2/4	50.0% (6.8-93.2)
Proportion of children aged 6-59 months with moderate acute malnutrition currently enrolled in therapeutic feeding programme	8/15	53.3% (26.6-78.7)

The OTP and TSFP enrolment rate based on both all admission criteria and using MUAC and Oedema in Doro refugee camp were very low and did not meet the recommended standard of $\geq 90\%$. The enrolment rate by only MUAC and Oedema were higher than all admission criteria indicated more children enrolled in the program were identified by MUAC only.

Table 33. BSFP enrollment coverage for children 6-23 months - Doro refugee camps

	Number/total	% (95% CI)
Blanket feeding programme enrolment	161/193	83.4% (77.4-88.4)
Product name	Lipid based Nutrient Supplements-MQ	
Target age group	6-23 months	

The BSFP enrolment coverage for children aged 6-23 months in Doro refugee camp was 83.4%.

3.1.3. Measles, Vitamin A, Diarrhoea, and Deworming

Measles vaccination coverage results

Table 34. Measles vaccination coverage for children aged 9-59 months (N=423) - Doro refugee camp.

	Number/total	% (95% CI)
Measles vaccination with card	287/423	67.9% (63.3-72.1)
Measles vaccination with card or confirmation from mother	412/423	97.4% (95.4-98.5)

Measles vaccination coverage in Doro refugee camp met the recommended standard of $\geq 95\%$.

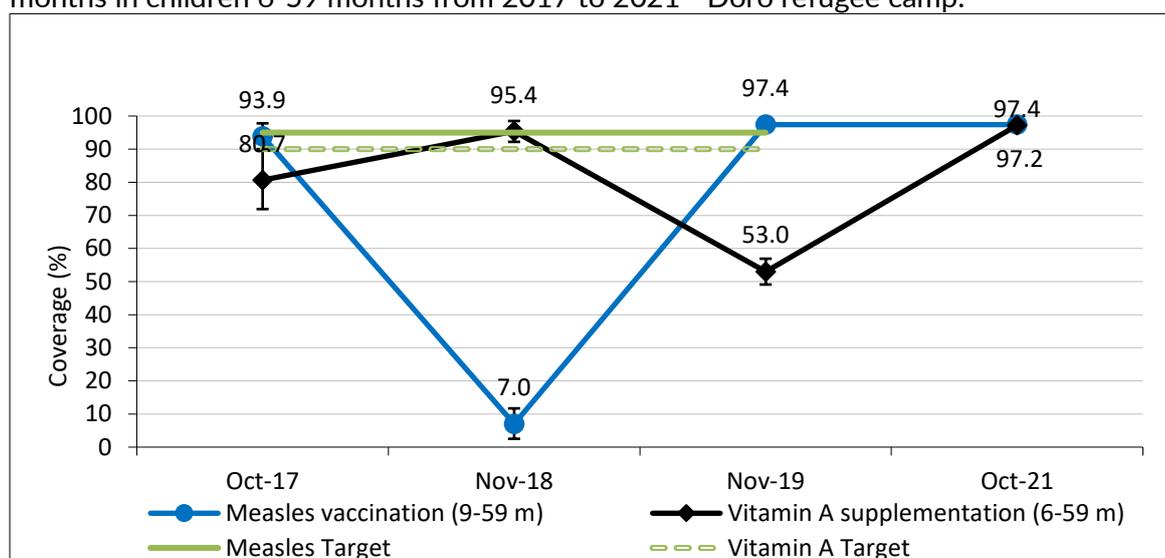
Vitamin A supplementation coverage results

Table 35. Vitamin A supplementation for children aged 6-59 months within past 6 months (N=461) - Doro refugee camp.

	Number/total	% (95% CI)
Vitamin A supplementation in the last 6 months with card	50/461	10.9% (8.3-14.0)
Vitamin A supplementation in the last 6 months with card or confirmation from mother	448/461	97.2% (95.2-98.3)

Vitamin A coverage supplementation in Doro refugee camp met 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 2021 - Doro refugee camp.



Diarrhoea Results

Table 36. Period prevalence of diarrhea - Doro refugee camp.

	Number/total	% (95% CI)
Diarrhoea in the last two weeks	127/460	27.6% (23.7-31.9)

27.6% of surveyed children had diarrhoea episode in the last two weeks.

Table 37. Use of ORS and Zinc during diarrhoea episode - Doro refugee camp.

	Number/total	% (95% CI)
ORS use during diarrhoea episode	105/123	85.4% (77.9-91.1)
Zinc tablet or syrup use during diarrhoea episode	97/123	78.9% (70.6-85.7)

More than 75% of the surveyed children who had diarrhoea episode in the last two weeks received treatment either using ORS, Zinc, or both.

Deworming

Table 38. Deworming coverage - Doro refugee camp.

	Number/total	% (95% CI)
Children who received deworming tablet within the past 6 months	355/375	94.7% (91.9-96.5)

94.9% of children 12-59 months received a deworming tablet in last 6 months prior to the survey and this showed a coverage within recommended target of $\geq 75\%$.

3.1.4. Anaemia Children 6 - 59 months

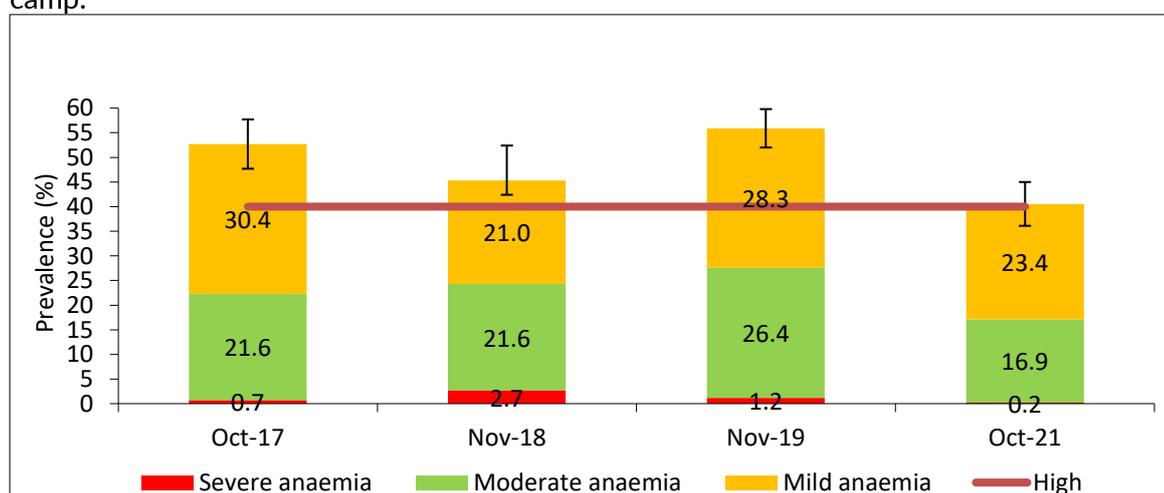
The total anaemia prevalence among children 6 to 59 months was 40.6% (36.2-45.1, 95% C.I.) which is of high public health significance. Children 6 to 23 months were the most affected (57.7%) compared to the 24-59 months age group (28.1%).

Table 39. Prevalence of total anaemia, anaemia categories, and mean haemoglobin concentration in children 6-59 months of age and by age group - Doro refugee camp.

	6-59 months	6-23 months	24-59 months
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	n = 461	n=194	n=267
Total Anaemia (Hb<11.0 g/dL)	(187) 40.6% (36.2-45.1, 95% CI)	(112) 57.7% (50.5-64.8)	(75) 28.1% (22.8-33.9)
Mild Anaemia (Hb 10.0-10.9 g/dL)	(108) 23.4% (19.8-27.5, 95% CI)	(56) 28.9% (22.6-35.8)	(52) 19.5% (14.9-24.7)
Moderate Anaemia (7.0-9.9 g/dL)	(78) 16.9% (13.8-20.6, 95% CI)	(56) 28.9% (22.6-35.8)	(22) 8.2% (5.2-12.2)
Severe Anaemia (<7.0 g/dL)	(1) 0.2% (0.0-1.2)	(0) 0.0% (0.0-0.0)	(1) 0.4% (0.0-2.1)
Mean Hb (g/dL) (SD / 95% CI) [range]	11.1 (1.3) [7.3-14.3]	10.6 (1.3) [7.3-13.4]	11.5 (1.1) [7.5-14.3]

Figure 9. Trends in Anaemia Categories in Children 6-59 Months from 2017 to 2021 - Doro refugee camp.

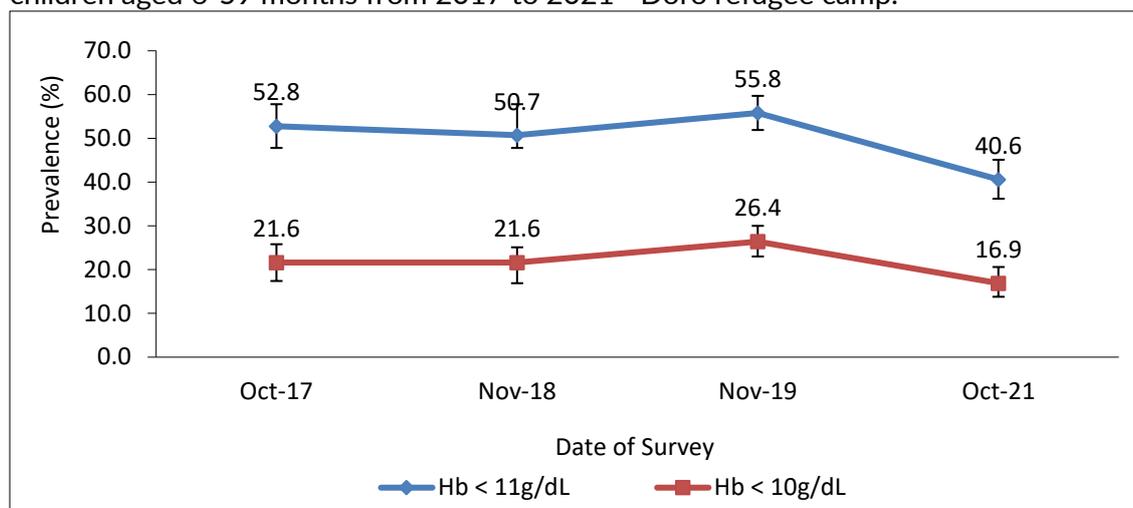


The proportion of both moderate, mild, and severe anaemia indicated a decreasing trend in 2021 compared to the 2019 in Doro refugee camp.

Table 40. Prevalence of moderate and severe anaemia in children 6-59 months of age and by age group - Doro refugee camp.

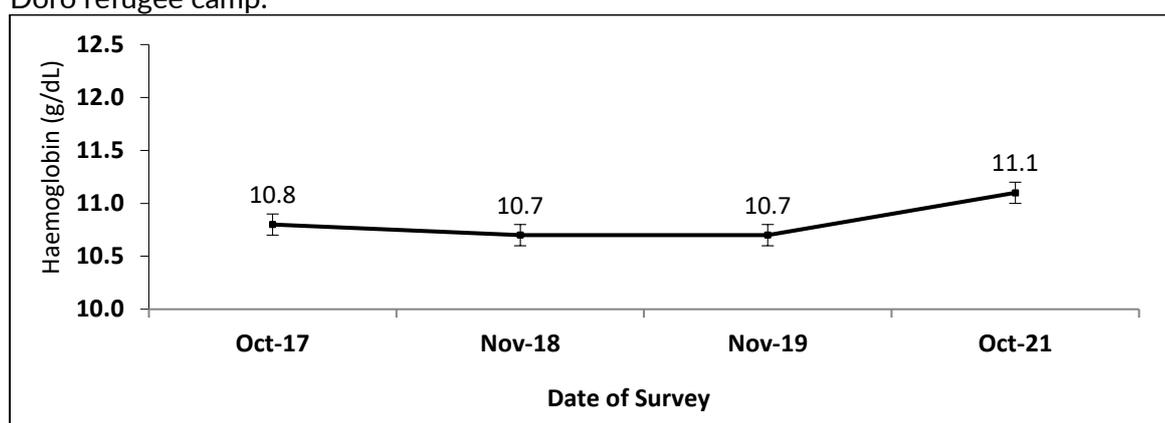
	6-59 months n = 461	6-23 months n= 194	24-59 months n= 267
Moderate and Severe Anaemia (Hb<10.0 g/dL)	(79) 17.1% (14.0-20.8, 95% C.I.)	(56) 28.9% (22.6-35.8, 95% C.I.)	(23) 8.6% (5.5-12.7, 95% C.I.)

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 2021 - Doro refugee camp.



There is an indication of a decreasing total and moderate anaemia trends in 2021 compared to 2019 in Doro refugee camp.

Figure 11. Trend in mean haemoglobin concentration in children 6-59 months from 2017 to 2021 - Doro refugee camp.



3.1.5. Infant and Young Child Feeding (IYCF)

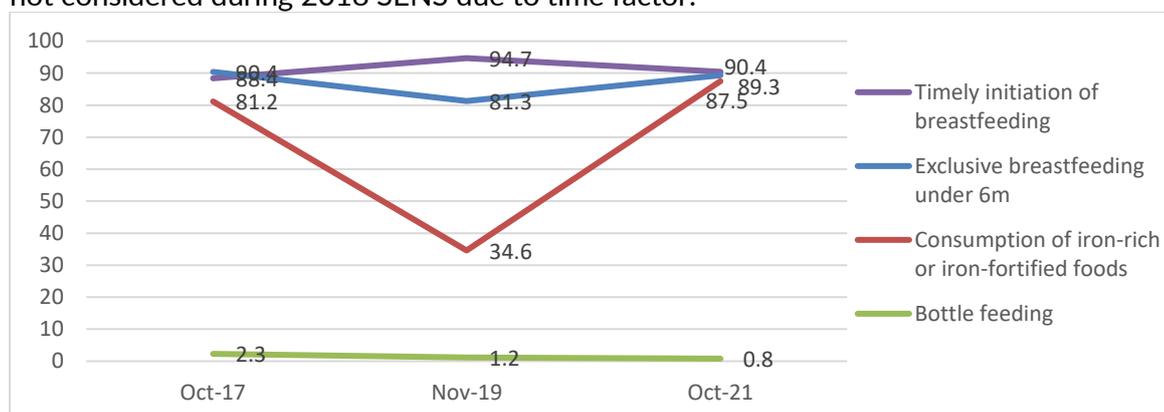
Key IYCF indicators

Table 41. Prevalence of Infant and Young Child Feeding Practices Indicators - Doro refugee camp.

Indicator	Age range	Number/ total	Prevalence (%)	95% CI
Timely initiation of breastfeeding	0-23 months	226/250	90.4	(86.1-93.8)
Exclusive breastfeeding under 6 months	0-5 months	50/56	89.3	(78.1-96.0)
Continued breastfeeding at 1 year	12-15 months	43/46	93.5	(82.1-98.6)
Continued breastfeeding at 2 years	20-23 months	19/26	73.1	(52.2-88.4)

Introduction of solid, semi-solid or soft foods	6-8 months	16/38	42.1	(26.3-59.2)
Consumption of iron-rich or iron-fortified foods	6-23 months	168/192	87.5	(82.0-91.8)
Bottle feeding	0-23 months	2/250	0.8	(0.1-2.9)

Figure 12. Key IYCF indicators from 2017 to 2021 - Doro refugee camp. Note: IYCF indicators were not considered during 2018 SENS due to time factor.



Consumption of iron rich foods increased significantly in 2021 compared to 2019.

Prevalence of Intake

Infant Formula

Table 42. Infant formula intake in children aged 0-23 months – Doro refugee camp.

	Number/total	% (95% CI)
Proportion of children aged 0-23 months who receive infant formula (fortified or non-fortified)	4/251	1.6% (0.4-4.0)

Table 43. Fortified Blended Foods (CSB+) intake in children aged 6-23 months – Doro refugee camp.

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive CSB+	1/194	0.5% (0.01-2.8)

Table 44. Fortified blended foods (CSB++) intake in children aged 6-23 months – Doro refugee camp.

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive CSB++	66/194	34.0% (27.4-41.2)

Table 45. Lipid based Nutrient Supplements intake in children aged 6-23 months – Doro refugee camp.

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive LNS	146/193	75.7% (67.0-81.5)

Table 46. Micronutrient powder intake in children aged 6-23 months – Doro refugee camp.

	Number/total	% (95% CI)

Proportion of children aged 6-23 months who receive MNP	1/192	0.5% (0.0-2.9)
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3.1.6. Anaemia Women 15-49 Years

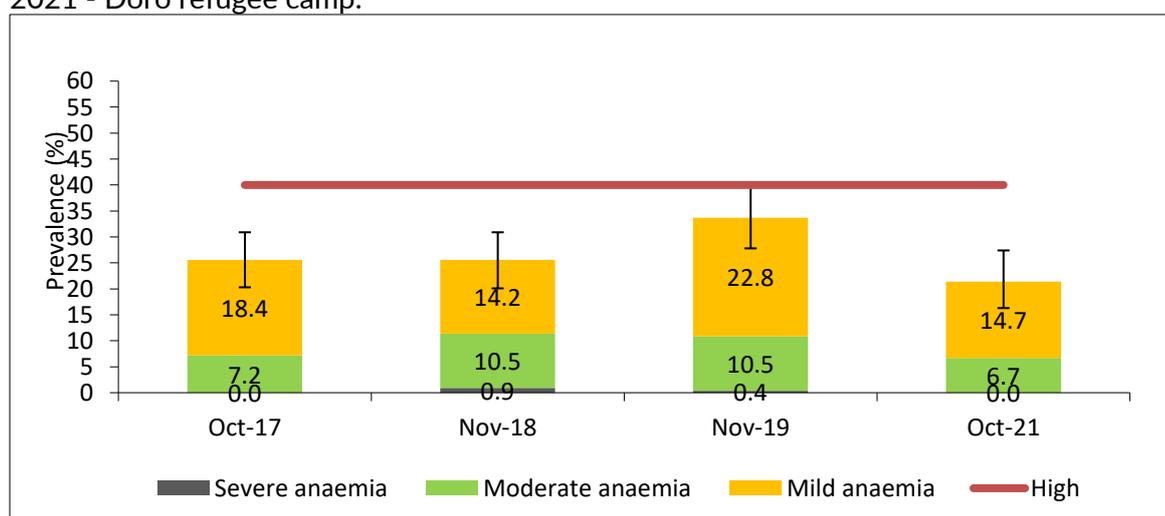
Table 47. Women Physiological Status and Age - Doro refugee camp.

Physiological status	Number/total	% of sample
Non-pregnant	112/282	39.7% (34.0-45.7, 95% CI)
Pregnant	22/279	7.9% (5.0-11.7, 95% CI)
Mean age (range)	29.4 years (9.3) [15.0-49.0]	

Table 48. Prevalence of anaemia and haemoglobin concentration in non-pregnant women of reproductive age (15-49 years) - Doro refugee camp.

Anaemia in non-pregnant women of reproductive age (15-49 years)	All n = 225
Total Anaemia (<12.0 g/dL)	(48) 21.3% (16.2-27.3)
Mild Anaemia (11.0-11.9 g/dL)	(33) 14.7% (10.3-20.0)
Moderate Anaemia (8.0-10.9 g/dL)	(15) 6.7% (3.8-10.8)
Severe Anaemia (<8.0 g/dL)	(0) 0.0% (0.0-0.0)
Mean Hb (g/dL) (SD) [range]	12.9 (1.3) [8.8-15.9]

Figure 13. Trends in anaemia categories in women of reproductive age (non-pregnant) from 2017 to 2021 - Doro refugee camp.



The proportion of both mild and moderate anaemia indicated a decreasing trend in 2021 as compared to 2019.

Table 49. ANC Enrolment and Iron-Folic Acid Pills Coverage among Pregnant Women (15-49 Years) - Doro refugee camp.

	Number /total	% (95% CI)
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Currently enrolled in ANC programme	20/22	90.9% (70.8-98.9)
Currently receiving iron-folic acid pills	20/22	90.9% (70.8-98.9)

Table 50. BSFP enrollment coverage among pregnant and lactating women (15-49 years) – Doro refugee camp

	Number /total	% (95% CI)
Blanket feeding programme enrollment	45/54	83.3% (70.1-92.1)

3.1.7. Demography

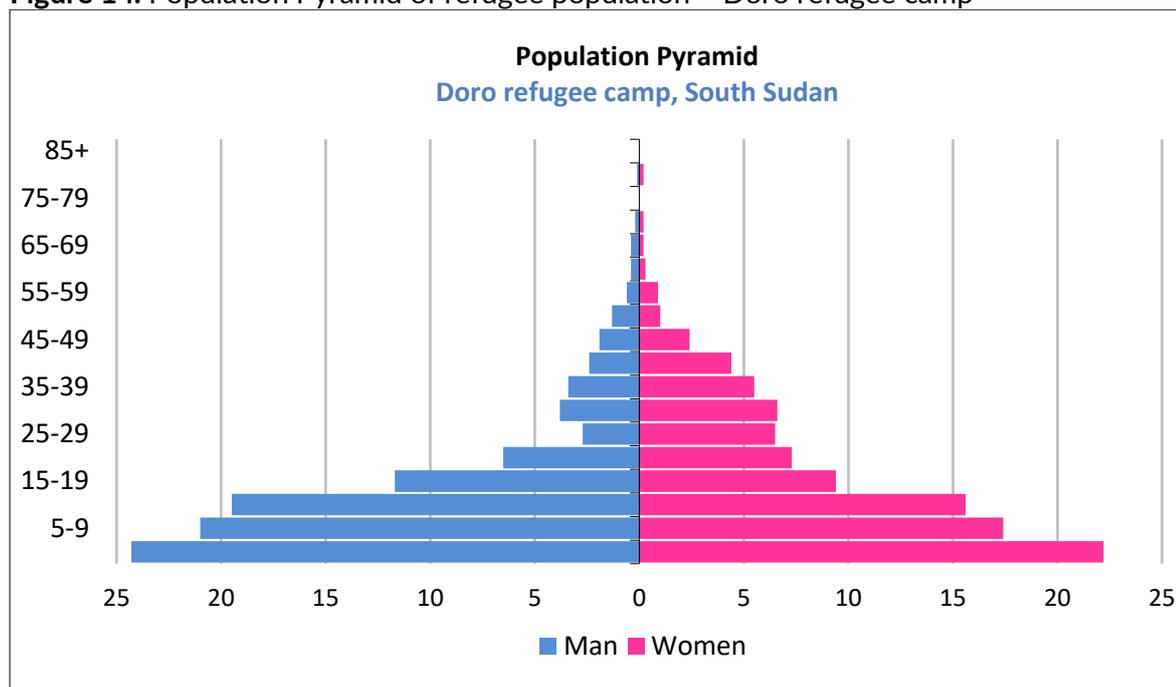
Household size and composition

Table 51. Demographic characteristics, household size and composition of the surveyed population – Doro refugee camp

Household size and composition		Results
Population size – Total persons (ProGres 31st July 2021)		68,643
Total population surveyed – Total persons (all ages)		2,633
Total U2 surveyed		299
Total U5 surveyed		610
Average household size		5.7
Household size categories	1-4 person(s)	37.4%
	5-6 persons	26.1%
	7-9 persons	27.6%
	≥ 10 persons	8.9%
Household composition	Children under two	0.7
	Children under five	1.3
	Children aged 5-14 years	2.1
	Members aged 15-64 years	2.3
	Members aged 65 years and above	0.0
Percent of children U2	%	11.4%
Percent of children U5	%	23.2%
Percent pregnant women (15-49 years)	%	2.1%
Percent of elders (65 years and above)	%	0.5%
Sex ratio	Male/Female	0.91

There are more women than men investigated, and the average household size is 5.7.

Figure 14. Population Pyramid of refugee population – Doro refugee camp



The population pyramid is strongly lean to children under 15 years old. Among children and teenagers up to 19 years old, males are more than females. However, among refugees from 20 to 59 years old, there were more females than males.

Household head profile

Table 52. Household head profile – Doro refugee camp

	Number/total	% (95% CI)
Female headed households (working age 15-64 years)	344/459	75.0% (70.8-78.7)
Male headed households (working age 15-64 years)	104/459	22.7% (19.1-26.7)
Children headed households (under 15 years)	3/459	0.7% (0.2-1.9)
Elderly headed households (65 years and above)	8/459	1.7% (0.9-3.4)
Mean age of household head in years (SD) [range]	35.6 (11.4) [14.0-81.0]	

Third quarters of the household are headed by female and small portions headed by children or elderly.

Age dependency ratio

Table 53. Age dependency ration categories by household – Doro refugee camp

Age dependency categories		Age dependency ratio	Number / Total	% (95% CI)
Category I	1 dependent or less per non-dependent member	≤ 1	172/453	38.0% (33.6-42.5)
Category II	Up to 3 dependents per 2 non-dependent members	1.1-1.5	50/453	11.0% (8.5-14.3)

Category III	Up to 2 dependents per non-dependent members (1.5<DR<=2)	1.6-2.0	88/453	19.4% (16.1-23.3)
Category IV	More than 2 dependents per non-dependent members (DR>2)	≥2.1	143/453	31.6% (27.5-36.0)
Mean age dependency ration		Mean (SD) [range]	453	1.9 (1.4) [0.0-7.0]

There are 31.6% households had more than 2 dependents per non-dependent members, which is a high proportion.

3.1.8. Food security

Access to food assistance

Table 54. Food assistance ration card and cash coverage – Doro refugee camp

	Number/total	% (95% CI)
Proportion of households with a ration card	240/240	100% (98.5-100, 95% CI)
Proportion of households receiving cash grants	240/240	100% (98.5-100, 95% CI)

All the surveyed households in Doro refugee camp had ration cards and have been receiving food assistance and cash grants.

Table 55. Reported duration of general food ration – Doro refugee camp

	Number/total	% (95% CI)
Average number of days general food ration lasts out days (SD) [range]	237	11.7 (6.8) [1-28]

The food received from GFD was reported to last 11.7 days out of the distribution cycle of 30 days.

Table 56. Description of utilisation of cash assistance – Doro refugee camp

Proportion of households that use cash grants for:	Number/total	% (95% CI)
Food	221/239	92.5% (88.4-95.5)
Water	2/239	0.8% (0.1-3.0)
Hygiene items, clothes, shoes	102/239	42.7% (36.3-49.2)
Health costs (including medicines)	3/239	1.3% (0.3-3.6)
Rent, shelter repair, household items (e.g mattress, blankets, jerrycan), utilities and bills (e.g. electricity, water bills, phone calling credit)	35/239	14.6% (10.4-19.8)
Firewood / fuel for cooking or heating	67/239	28.0% (22.4-34.2)
Assets for a livelihood activity (e.g. seeds, tools, farming, fishing, petty trade, etc.)	12/239	5.0% (2.6-8.6)
Debts repayment	35/239	14.6% (10.4-19.8)
Saved some money, gave some to other family members, relatives,	21/239	8.8% (5.5-13.1)

friends		
Education (e.g. school fees, uniform, books)	2/239	0.8% (0.1-3.0)
Other	0/239	0.0% (0.0-1.5)

Most families reported that they spent money received from cash grants on food, followed by hygiene items (e.g., cloths), fuel for cooking, rent or shelter repairing, and debts repayment.

Coverage of basic needs

Table 57. Description of basic needs not met by the households – Doro refugee camp

Basic needs not met by the households:	Number/total	% (95% CI)
Food	210/240	87.5% (82.6-91.4)
Water	3/240	1.3% (0.3-3.6)
Hygiene items, clothes, shoes	164/240	68.3% (62.0-74.2)
Health costs (including medicines)	7/240	2.9% (1.2-5.9)
Rent, shelter repair, household items (e.g. mattress, blankets, jerrycan), utilities and bills (e.g. electricity, water bills, phone calling credit)	74/240	30.8% (25.1-37.1)
Firewood / fuel for cooking or heating	42/240	17.5% (12.9-22.9)
Assets for a livelihood activity (e.g. seeds, tools, farming, fishing, petty trade, etc.)	37/240	15.4% (11.1-20.6)
Debts repayment	16/240	6.7% (3.9-10.6)
Saved some money, support other family members, relatives, friends	14/240	5.8% (3.2-9.6)
Education (e.g. school fees, uniform, books)	8/240	3.3% (1.5-6.5)
Other	0/240	0.0% (0.0-1.5)

The category of basic needs cannot be met reported the most are: food, hygiene items, rent/shelter repair/household items, fuel for cooking, and assets for livelihood activity.

Table 58. Households by categories of coverage of basic needs – Doro refugee camp

Proportion of households in each category of coverage of basic needs	Number/total	% (95% CI)
All basic needs are met (100%)	0/240	0.0% (0.0-1.5)
More half basic needs are met (>50%)	239/240	99.6% (97.7-100.0)
Few basic needs are met (<50%)	1/240	0.4% (0.0-2.3)
Basic needs are not met (0%)	0/240	0.0% (0.0-1.5)

No families reported can meet all basic needs, with almost all households reported more than half of their basic needs are met.

Negative household coping strategies

From April 2021, GFD ration was reduced to 50% in all refugees in Maban camps. Food basket consists of cereals provided at 100% in kind, lentils at 75% as inkind and 25% cash, cooking oil at 50% each as inkind and cash, and cash for milling and salt at 100%. The cash transfer value varies from one month

to other depending on market assessment conducted report from the prices of commodities prior to the GFD. To fill the food gaps, some refugees in the camp had to use the below coping strategies.

Table 59. Coping strategies used by the surveyed population over the past month – Doro refugee camp

	Number/total	% (95% CI)
Proportion of households reporting using the following coping strategies over the past month*:		
Rely on less preferred and/or less expensive foods	235/240	97.9% (95.2-99.3)
Borrow food, or rely on help from a friend or relative	224/240	93.3% (89.4-96.1)
Reduce the number of meals eaten in a day	234/240	97.5% (94.6-99.1)
Limit portion sizes at mealtime	236/240	98.3% (95.8-99.5)
Reduce consumption by adults so children could eat	217/240	90.4% (86.0-93.8)
Average rCSI (mean, SD / range)	240	22.8 (8.5) [2-46]
Proportion of households reporting using none of the negative coping strategies over the past month	5/240	2.1% (0.7-4.8)

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

Only 2.1% 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.

Food Consumption Score (FCS)

During the survey, Sept 2021 GFD cycle was considered the last general food distribution prior to the survey. The survey was carried when Oct 2021 GFD cycle was ongoing. The survey was conducted during the annual harvest season, during which the overall food availability is better than other times. It is hence likely that the food consumption score is higher than it would be e.g., lean season.

Table 60. Food consumption score by category and average FCS – Doro refugee camp

FCS profiles	Number/total	% (95% CI)
Acceptable (FCS > 35)	84/240	35.0% (29.0-41.4)
Borderline (21.5≤FCS≤35)	95/240	39.6% (33.4-46.1)
Poor (FCS≤21)	61/240	25.4% (20.0-31.4)
Average FCS (SD) [range]	240	31.8 (14.5) [7.5-80.0]

*Maximum FCS is 112.

The average FCS among refugees in Doro camp was 31.8 out of total score of 112, which falls into the borderline category. This is echoed by the majority of households had a FCS score classified as borderline.

Table 61. Consumption frequency categories of each nutrient rich food groups (FCS-N) – Doro refugee camp

Nutrient rich food groups	Consumption frequency categories	Number/total	% (95% CI)
Vitamin A rich foods	Never	5/240	2.1% (0.7-4.8)
	Sometimes	103/240	42.9% (36.6-49.4)
	At least daily	132/240	55.0% (48.5-61.4)
Protein rich foods	Never	29/240	12.1% (8.2-16.9)
	Sometimes	135/240	56.3% (49.7-62.6)
	At least daily	76/240	31.7% (25.8-38.0)
Haem iron rich foods	Never	135/240	56.3% (49.7-62.6)
	Sometimes	84/240	35.0% (29.0-41.4)
	At least daily	21/240	8.8% (5.5-13.1)

In terms of the nutrient rich food, 97.9% households reported consumed Vitamin A rich foods (sometimes or daily), 88.0% reported consumed protein rich foods, while only 43.8% reported consumed Haem iron rich foods.

Table 62. Food acquisition sources – Doro refugee camp

Food acquisition sources	Number/total	% (95% CI)
Purchase (using cash grants and/or with their own cash)	125/240	52.1% (45.6-58.6)
Own production (crops, livestock, fishing/ hunting, gathering)	27/240	11.3% (7.6-15.9)
Traded goods/services, barter	45/240	18.8% (14.0-24.3)
Borrowed (loan/credit from traders)	43/240	17.9% (13.3-23.4)
Received as gift (from family relatives or friends/neighbour)	0/240	0.0% (0.0-1.5)
In-kind or voucher based food assistance	0/240	0.0% (0.0-1.5)
Other	0/240	0.0% (0.0-1.5)

The main source for food reported was purchasing (52.1%), followed by traded goods and borrowed.

The trend analysis is not available for rCSI and FCS, because this is the first year these indicators are used in the nutrition survey in South Sudan.

3.2. RESULTS FROM YUSUF BATIL REFUGEE CAMP, SOUTH SUDAN

A percentage coverage of 127% of the targeted children 6-59 months in Yusuf Batil refugee camp were surveyed (target 324 and surveyed 411). All the children who participated in the survey were considered using either available official age documentation or age estimation from local context calendar of event developed to estimate the age. Of the total surveyed children 6-59 months in Yusuf Batil refugee camp, 86% had official age documentation.

Table 63. Distribution of age and sex of sample - Yusuf Batil refugee camp.

AGE (mo)	Boys		Girls		Total		Ratio
	no.	%	no.	%	no.	%	Boy:girl
6-17	54	52.9	48	47.1	102	24.9	1.1
18-29	42	52.5	38	47.5	80	19.6	1.1
30-41	57	54.8	47	45.2	104	25.4	1.2
42-53	42	48.8	44	51.2	86	21.0	1.0
54-59	19	51.4	18	48.6	37	9.0	1.1
Total	214	52.3	195	47.7	409	100.0	1.1

The overall sex ratio of boys: girls was 1.1 indicating that both sexes were equally represented in the survey.

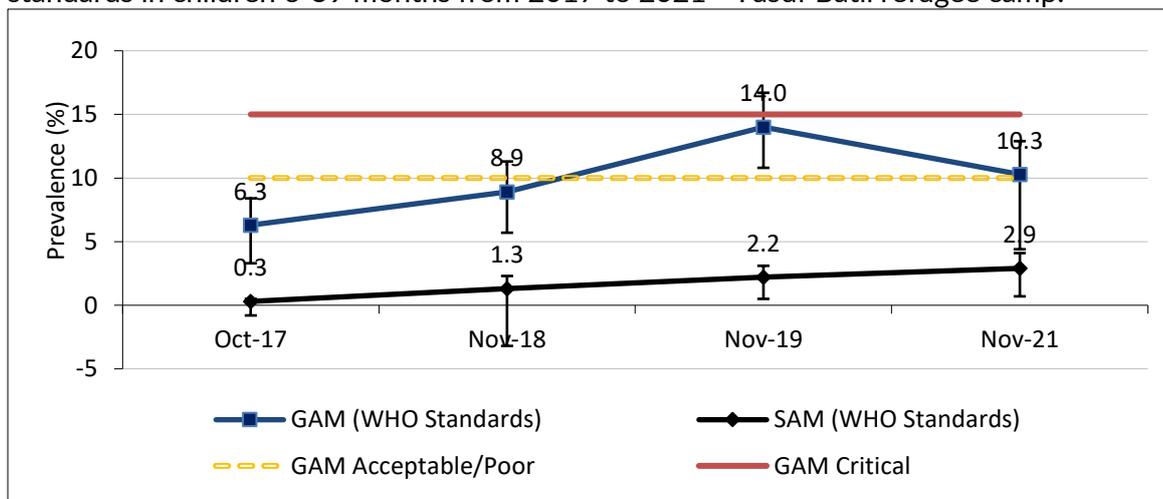
3.2.1. Anthropometry

Table 64. Prevalence of acute malnutrition based on weight-for-height z-scores and/or oedema and by sex - Yusuf Batil refugee camp.

	All n = 409	Boys n = 214	Girls n = 195
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(42) 10.3 % (7.7 - 13.6 95% C.I.)	(19) 8.9 % (5.8 - 13.4 95% C.I.)	(23) 11.8 % (8.0 - 17.1 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(30) 7.3 % (5.2 - 10.3 95% C.I.)	(13) 6.1 % (3.6 - 10.1 95% C.I.)	(17) 8.7 % (5.5 - 13.5 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(12) 2.9 % (1.7 - 5.1 95% C.I.)	(6) 2.8 % (1.3 - 6.0 95% C.I.)	(6) 3.1 % (1.4 - 6.5 95% C.I.)

The prevalence of oedema was 0.0% and the data excluded SMART flags. Prevalence of acute malnutrition based on WFH z-score and/or oedema and by sex, showed girls more affected compared to boys.

Figure 15. Trends in the prevalence of global and severe acute malnutrition based on WHO Growth standards in children 6-59 months from 2017 to 2021 - Yusuf Batil refugee camp.

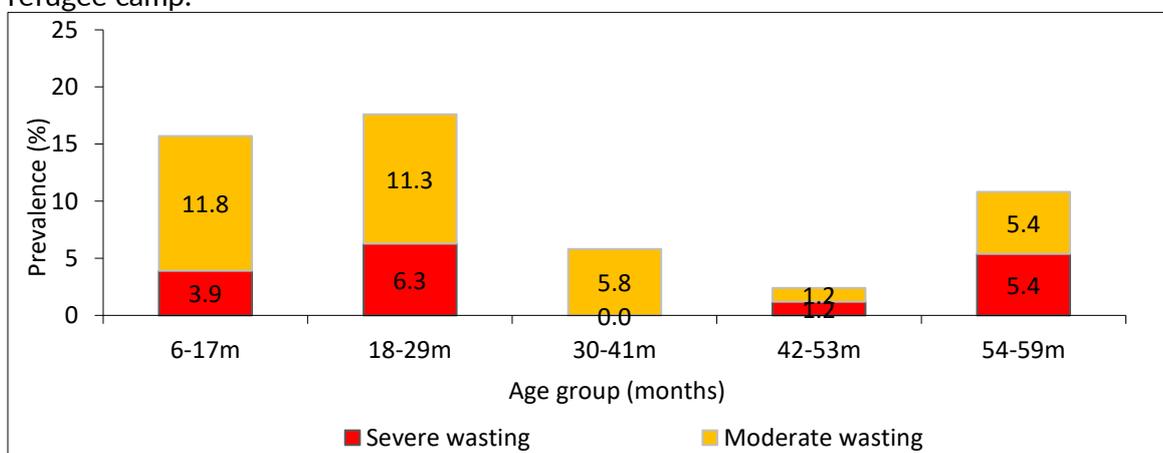


The prevalence of global acute malnutrition based on WHO Growth standards in children 6-59 months showed a reducing trend as compared to 2019.

Table 65. Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema - Yusuf Batil refugee camp.

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	102	4	3.9	12	11.8	86	84.3	0	0.0
18-29	80	5	6.3	9	11.3	66	82.5	0	0.0
30-41	104	0	0.0	6	5.8	98	94.2	0	0.0
42-53	86	1	1.2	1	1.2	84	97.7	0	0.0
54-59	37	2	5.4	2	5.4	33	89.2	0	0.0
Total	409	12	2.9	30	7.3	367	89.7	0	0.0

Figure 16. Trend in the prevalence of MAM and SAM by age in children 6-59 months - Yusuf Batil refugee camp.

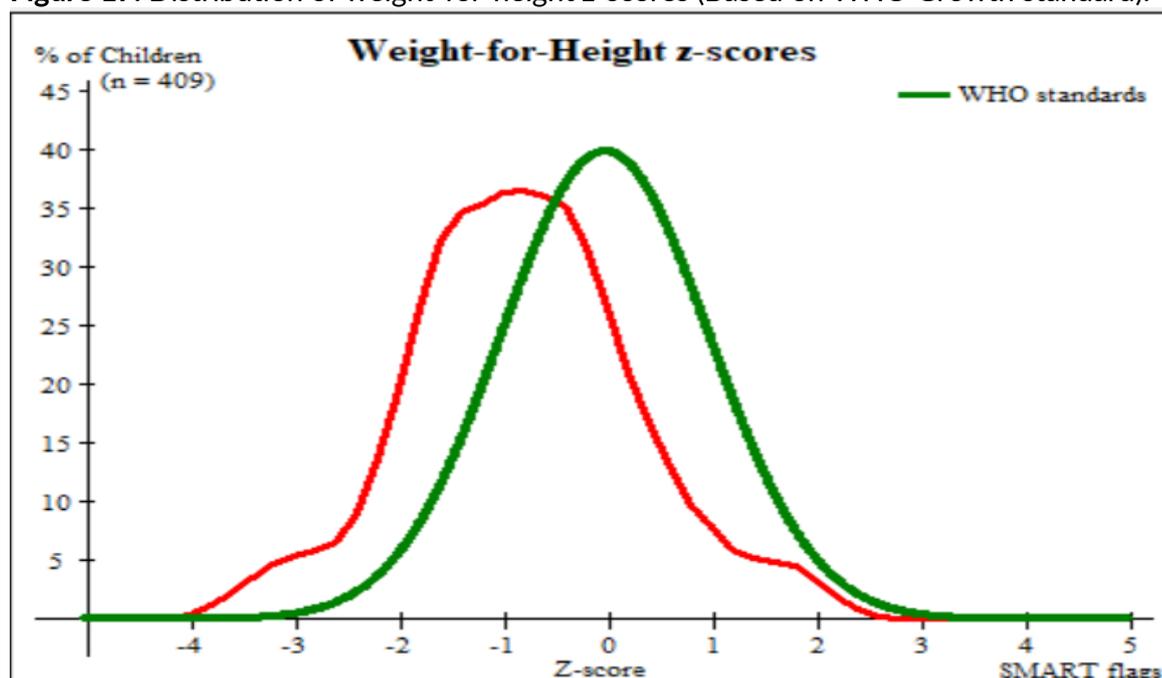


Children between age groups of 18-29 and 6-17 months are the most affected age groups by wasting in Yusuf Batil refugee camp.

Table 66. Distribution of acute malnutrition and oedema based on weight-for-height z-scores - Yusuf Batil refugee camp.

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor. 0 (0.0 %)	Kwashiorkor. 0 (0.0 %)
Oedema absent	Marasmic No. 12 (2.9 %)	Not severely malnourished. 397 (97.1 %)

Figure 17. Distribution of weight-for-height z-scores (Based on WHO Growth standard).



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

Table 67. Prevalence of acute malnutrition based on MUAC cut off's and/or oedema and by sex - Yusuf Batil refugee camp.

	All n = 409	Boys n = 214	Girls n = 195
Prevalence of global malnutrition (< 125 mm and/or oedema)	(10) 2.4 % (1.3 - 4.4 95% C.I.)	(5) 2.3 % (1.0 - 5.4 95% C.I.)	(5) 2.6 % (1.1 - 5.9 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(8) 2.0 % (1.0 - 3.8 95% C.I.)	(4) 1.9 % (0.7 - 4.7 95% C.I.)	(4) 2.1 % (0.8 - 5.2 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(2) 0.5 % (0.1 - 1.8 95% C.I.)	(1) 0.5 % (0.1 - 2.6 95% C.I.)	(1) 0.5 % (0.1 - 2.8 95% C.I.)

Boys and girls were equally affected by acute malnutrition as defined by MUAC.

MUAC is being used in the community to monitor malnutrition trends and for admissions and discharge in the therapeutic and supplementary feeding nutrition programmes. It's a good indicator of risk of mortality in children under five and is easy to do. However, comparing the results from the table above to the GAM/SAM prevalence defined by weight-for-height, the MUAC results are much lower, which indicate the potential leave-out of children by using only MUAC as the admission criterion.

Table 68. Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema - Yusuf Batil refugee camp.

		Severe wasting (< 115 mm)		Moderate wasting (≥ 115 mm and < 125 mm)		Normal (≥ 125 mm)		Oedema	
Age (mo)	Total no.	No.	%	No.	%	No.	%	No.	%
6-17	102	1	1.0	6	5.9	95	93.1	0	0.0
18-29	80	0	0.0	2	2.5	78	97.5	0	0.0
30-41	104	1	1.0	1	0.0	103	99.0	0	0.0
42-53	86	0	0.0	0	0.0	86	100.0	0	0.0
54-59	37	0	0.0	0	0.0	37	100.0	0	0.0
Total	409	2	0.5	8	2.0	399	97.6	0	0.0

The number of cases of severe wasting based on MUAC cut offs are higher in the younger age group of children 6-17 months.

Table 69. Prevalence of underweight based on weight-for-age z-scores by sex - Yusuf Batil refugee camp.

	All n = 407	Boys n = 213	Girls n = 194
Prevalence of underweight (< -2 z-score)	(71) 17.4 % (14.1 - 21.4 95% C.I.)	(36) 16.9 % (12.5 - 22.5 95% C.I.)	(35) 18.0 % (13.3 - 24.1 95% C.I.)
Prevalence of moderate underweight (< -2 z-score and ≥ -3 z-score)	(61) 15.0 % (11.8 - 18.8 95% C.I.)	(32) 15.0 % (10.8 - 20.4 95% C.I.)	(29) 14.9 % (10.6 - 20.6 95% C.I.)
Prevalence of severe underweight (< -3 z-score)	(10) 2.5 % (1.3 - 4.5 95% C.I.)	(4) 1.9 % (0.7 - 4.7 95% C.I.)	(6) 3.1 % (1.4 - 6.6 95% C.I.)

Boys and girls were equally underweight.

Table 70. Prevalence of underweight by age, based on weight-for-age z-scores - Yusuf Batil refugee camp.

		Severe underweight (< -3 z-score)		Moderate underweight (≥ -3 and < -2 z- score)		Normal (≥ -2 z score)		Oedema	
Age (mo)	Total no.	No.	%	No.	%	No.	%	No.	%

6-17	101	3	3.0	19	18.8	79	78.2	0	0.0
18-29	80	4	5.0	12	15.0	64	80.0	0	0.0
30-41	103	2	1.9	17	16.5	84	81.6	0	0.0
42-53	86	0	0.0	9	10.5	77	89.5	0	0.0
54-59	37	1	2.7	4	10.8	32	86.5	0	0.0
Total	407	10	2.5	61	15.0	336	82.6	0	0.0

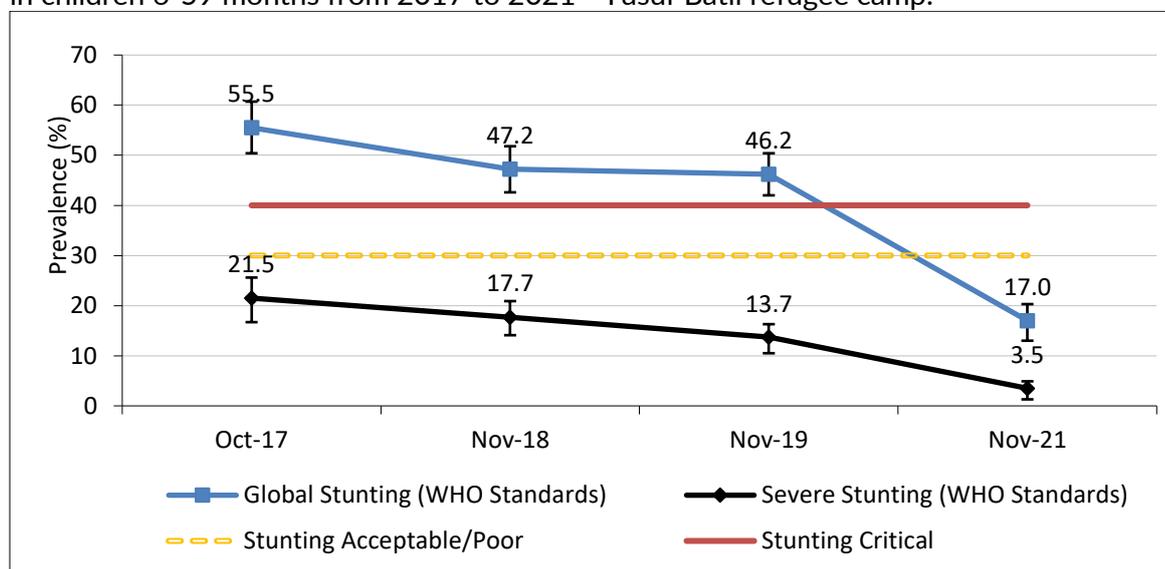
The highest proportion of severe and moderate underweight cases occur in the age groups of children 6-17 and 18-29 months.

Table 71. Prevalence of stunting based on height-for-age z-scores and by sex - Yusuf Batil refugee camp.

	All n = 405	Boys n = 213	Girls n = 192
Prevalence of stunting (<-2 z-score)	(69) 17.0 % (13.7 - 21.0 95% C.I.)	(41) 19.2 % (14.5 - 25.1 95% C.I.)	(28) 14.6 % (10.3 - 20.3 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(55) 13.6 % (10.6 - 17.3 95% C.I.)	(34) 16.0 % (11.7 - 21.5 95% C.I.)	(21) 10.9 % (7.3 - 16.1 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(14) 3.5 % (2.1 - 5.7 95% C.I.)	(7) 3.3 % (1.6 - 6.6 95% C.I.)	(7) 3.6 % (1.8 - 7.3 95% C.I.)

Boys are the most affected by stunting than girls in Yusuf Batil camp.

Figure 18. Trends in the prevalence of global and severe stunting based on WHO Growth standards in children 6-59 months from 2017 to 2021 - Yusuf Batil refugee camp.



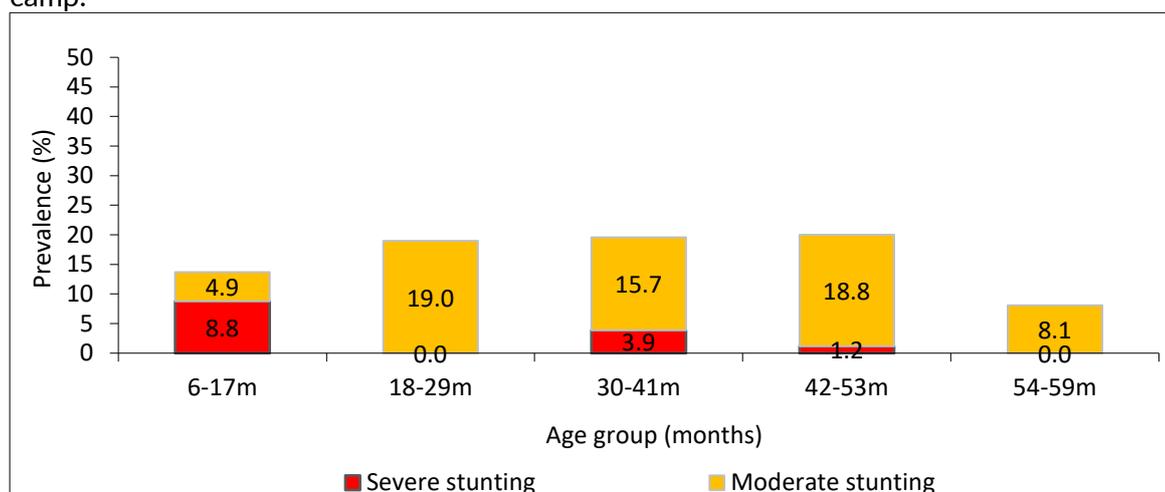
Significant reduction in stunting was noted in 2021 in Yusuf Batil camp as compared to 2019 and it has dropped to the poor range level.

Table 72. Prevalence of stunting by age based on height-for-age z-scores - Yusuf Batil refugee camp.

	Severe stunting (<-3 z-score)	Moderate stunting (>= -3 and <-2 z-score)	Normal (>= -2 z score)

Age (mo)	Total no.	No.	%	No.	%	No.	%
6-17	102	9	8.8	5	4.9	88	86.3
18-29	79	0	0.0	15	19.0	64	81.0
30-41	102	4	3.9	16	15.7	82	80.4
42-53	85	1	1.2	16	18.8	68	80.0
54-59	37	0	0.0	3	8.1	34	91.9
Total	405	14	3.5	5.5	13.6	336	83.0

Figure 19. Trends in the Prevalence of Stunting by Age in Children 6-59 Months - Yusuf Batil refugee camp.



Children aged 6-17 and 30-41 months were most affected by severe stunting. However, overall, children aged 42-53 and 30-41 months are the most affected by stunting.

Table 73. Prevalence of overweight based on weight for height cut offs and by sex (no oedma) - Yusuf Batil refugee camp.

	All n = 409	Boys n = 214	Girls n = 195
Prevalence of overweight (WHZ > 2)	(2) 0.5 % (0.1 - 1.8 95% C.I.)	(2) 0.9 % (0.3 - 3.3 95% C.I.)	(0) 0.0 % (0.0 - 1.9 95% C.I.)
Prevalence of severe overweight (WHZ > 3)	(0) 0.0 % (0.0 - 0.9 95% C.I.)	(0) 0.0 % (0.0 - 1.8 95% C.I.)	(0) 0.0 % (0.0 - 1.9 95% C.I.)

Table 74. Prevalence of overweight by age, based on weight for height (no oedema) - Yusuf Batil refugee camp.

Age (mo)	Total no.	Overweight (WHZ > 2)		Severe Overweight (WHZ > 3)	
		No.	%	No.	%
6-17	102	1	1.0	0	0.0
18-29	80	1	1.3	0	0.0
30-41	104	0	0.0	0	0.0
42-53	86	0	0.0	0	0.0
54-59	37	0	0.0	0	0.0

Total	409	2	0.5	0	0.0
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Table 75. Mean z-scores, Design Effects and excluded subjects - Yusuf Batil refugee camp.

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	409	-0.81±1.08	1.00	0	0
Weight-for-Age	407	-1.23±0.90	1.00	0	2
Height-for-Age	405	-1.21±0.91	1.00	0	4

* contains for WHZ and WAZ the children with edema.

3.2.2. Feeding Programme Enrollment Coverage

Selective feeding programme

Table 76. Nutrition treatment programme enrolment rate based on all admission criteria (weight-for-height, MUAC, oedema) - Yusuf Batil refugee camp.

	Number/total	% (95% CI)
Proportion of children aged 6-59 months with severe acute malnutrition currently enrolled in therapeutic feeding programme*	0/14	0.0% (0.0-0.0)
Proportion of children aged 6-59 months with moderate acute malnutrition currently enrolled in supplementary feeding programme*	5/37	13.5% (4.5-28.8)

Table 77. Nutrition treatment programme enrolment rate based on MUAC and oedema only - Yusuf Batil refugee camp.

	Number/total	% (95% CI)
Proportion of children aged 6-59 months with severe acute malnutrition currently enrolled in therapeutic feeding programme	0/2	0.0% (0.0-0.0)
Proportion of children aged 6-59 months with moderate acute malnutrition currently enrolled in therapeutic feeding programme	4/8	50.0% (15.7-84.3)

The OTP and TSFP enrolment rate based on both all admission criteria and using MUAC and Oedema in Doro refugee camp were very low and did not meet the recommended standard of ≥90%. The enrolment rate by only MUAC and Oedema were higher than all admission criteria especially for TSFP. This indicated more children enrolled in the program were identified by MUAC only.

Table 78. BSFP enrollment coverage for children 6-23 months - Yusuf Batil refugee camp

	Number/Total	% (95% CI)
Blanket feeding programme enrolment	113/146	77.4% (69.8-83.9)
Product name	Lipid based Nutrient Supplements-MQ	
Target age group	6-23 months	

The BSFP enrollment coverage for children 6-23 months in Yusuf Batil camp was 77.4%.

3.2.3. Measles, Vitamin A, Diarrhoea, and Deworming

Measles vaccination coverage results

Table 79. Measles vaccination coverage for children aged 9-59 months (N=387) – Yusuf Batil refugee camp

	Number/total	% (95% CI)
Measles vaccination with card	270/387	69.8% (65.0-74.1)
Measles vaccination with card or confirmation from mother	383/387	99.0% (97.4-99.6)

Measles vaccination coverage in Yusuf Batil was 99.0% and this met the standard of ≥95%.

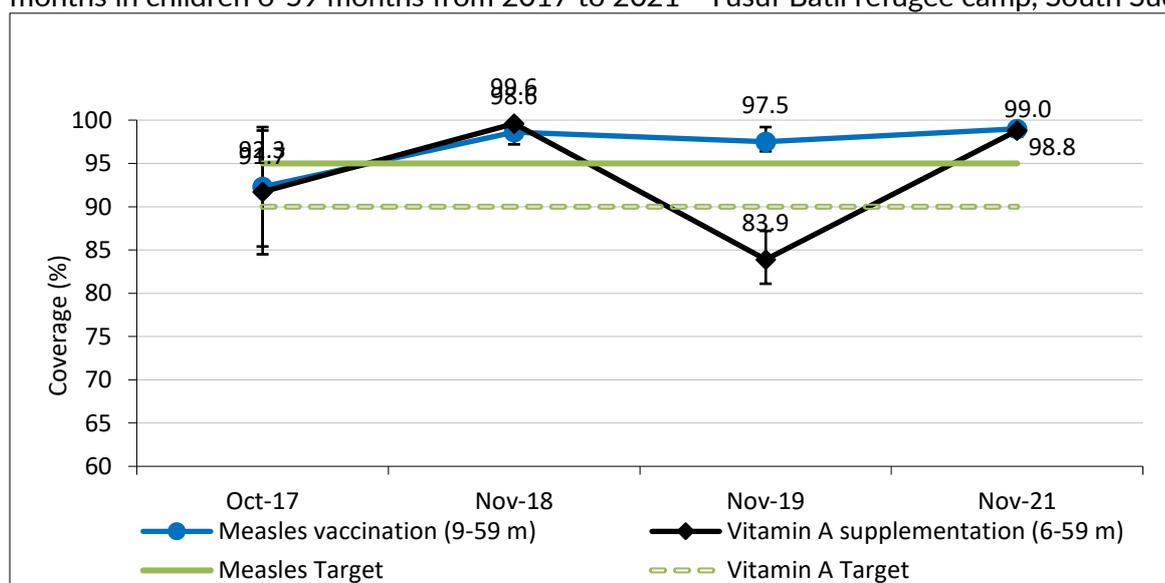
Vitamin A supplementation coverage results

Table 80. Vitamin A supplementation for children aged 6-59 months within past 6 months (N= 411) – Yusuf Batil refugee camp

	Number/total	% (95% CI)
Vitamin A supplementation in the last 6 months with card	26/411	6.3% (4.4-9.1)
Vitamin A supplementation in the last 6 months with card or confirmation from mother	406/411	98.8% (97.2-99.5)

Vitamin A coverage supplementation in Yusuf Batil refugee camp met the standard of >90%

Figure 20. Trends in the coverage of measles vaccination and vitamin A supplementation in last 6 months in children 6-59 months from 2017 to 2021 - Yusuf Batil refugee camp, South Sudan.



Diarrhoea Results

Table 81. Period prevalence of diarrhea – Yusuf Batil refugee camp.

	Number/total	% (95% CI)
Diarrhoea in the last two weeks	57/410	13.9% (10.9-17.6)

13.9% of the surveyed children had diarrhoea episode in the last two weeks in Yusuf Batil camp.

Table 82. use of ORS and Zinc during diarrhoea episode – Yusuf Batil refugee camp.

	Number/total	% (95% CI)
ORS use during diarrhoea episode	54/57	94.7% (85.4-98.9)
Zinc tablet or syrup use during diarrhoea episode	54/57	94.7% (85.4-98.9)

94.7% of all children who had diarrhoea episode were treated using either ORS or Zinc.

Deworming**Table 83. Deworming coverage – Yusuf Batil refugee camp.**

	Number/total	% (95% CI)
Deworming within the past 6 months	335/351	95.4% (92.7-97.2)

95.4% of children 12-59 months received a deworming tablet in last 6 months prior to the survey. This met the recommended standard of $\geq 75\%$.

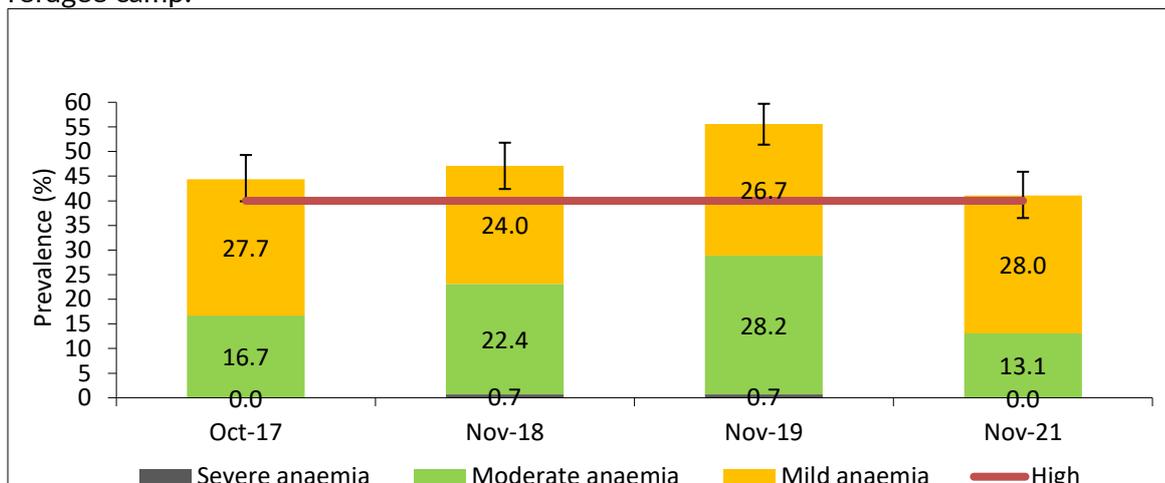
3.2.4. Anaemia children 6-59 months

The total anaemia prevalence among children 6 to 59 months was 41.1% (36.5-45.9; 95% C.I) which is of high public health significance. Children 6 to 23 months were the most affected (58.9%) compared compared to the 24-59 months age group (31.3%).

Table 84. 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.

	6-59 months n = 411	6-23 months n=146	24-59 months n=265
Total Anaemia (Hb <11.0 g/dl)	(169) 41.1% (36.5-45.9; 95% CI)	(86) 58.9% (50.5-67.0; 95% CI)	(83) 31.3% (25.8-37.3; 95% CI)
Mild Anaemia (Hb 10.0-10.9 g/dl)	(115) 28.0% (23.9-32.5; 95% CI)	(57) 39.0% (31.1-47.5; 95% CI)	(58) 21.9% (17.1-27.4; 95% CI)
Moderate Anaemia (Hb 7.0-9.9 g/dl)	(54) 13.1% (10.2-16.8; 95% CI)	(29) 19.9% (13.7-27.3; 95% CI)	(25) 9.4% (6.2-13.6; 95% CI)
Severe Anaemia (Hb <7.0 g/dl)	(0) 0.0% (0.0-0.0; 95% CI)	(0) 0.0% (0.0-0.0; 95% CI)	(0) 0.0% (0.0-0.0; 95% CI)
Mean Hb (g/dl) (SD / 95% CI) [range]	11.2 (1.2) [7.0-14.6]	10.7 (1.0) [7.0-13.8]	11.5 (1.2) [8.0-14.6]

Figure 21. Trends in Anaemia Categories in Children 6-59 Months from 2017 to 2021 - Yusuf Batil refugee camp.

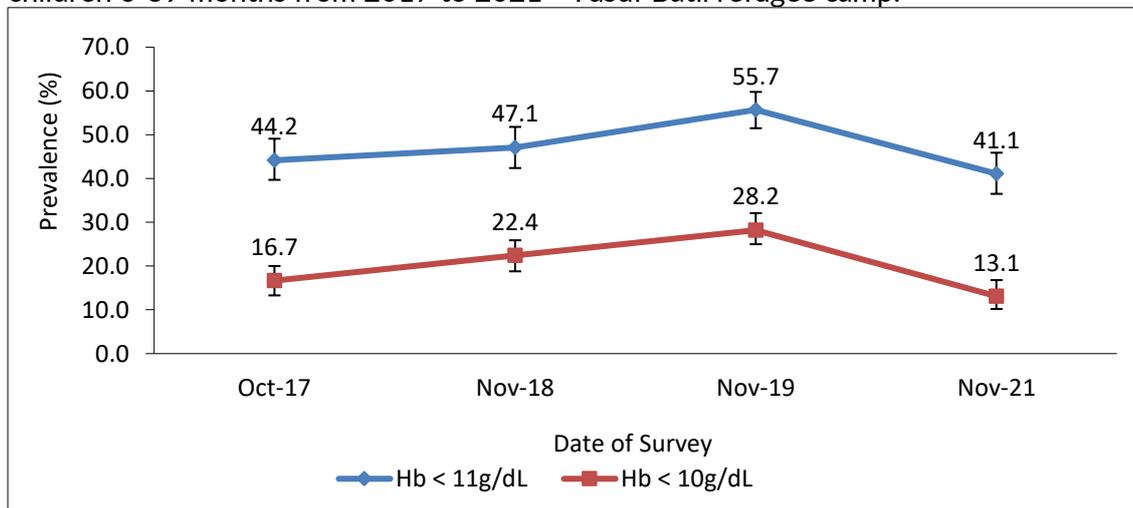


The proportion of severe and moderate anaemia indicated a decreasing trend in 2021 as compared to 2019 in Yusuf Batil refugee camp.

Table 85. 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.

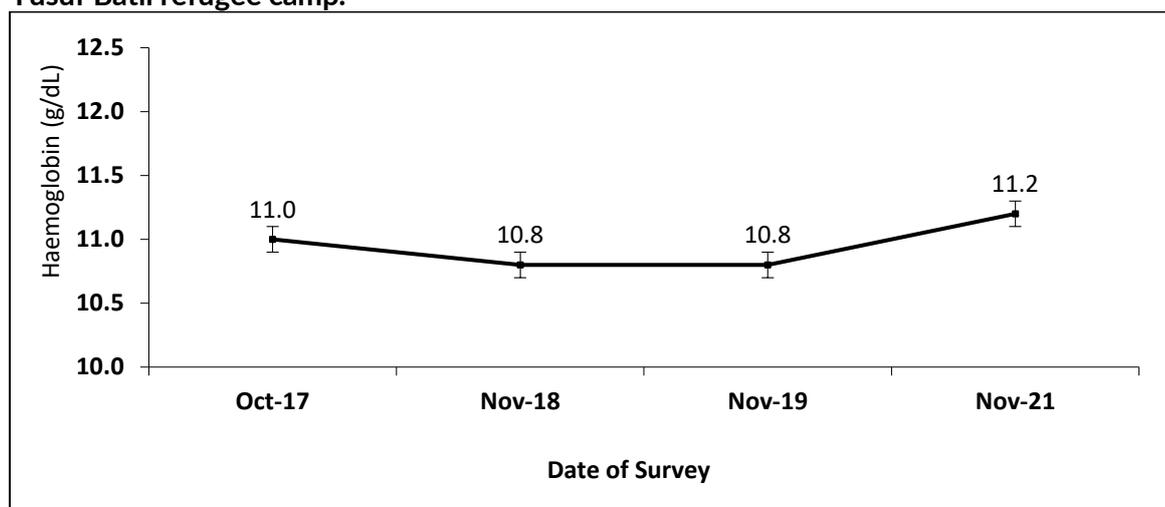
	6-59 months n = 411	6-23 months n= 146	24-59 months n= 265
Moderate and Severe Anaemia (Hb<10.0 g/dL)	(54) 13.1% (10.2-16.8; 95% CI)	(29) 19.9% (13.7-27.3; 95% CI)	(25) 9.4% (6.2-13.6; 95% CI)

Figure 22. Trend in total anaemia (<11 g/dl), and moderate and severe anaemia (<10 g/dl) among children 6-59 months from 2017 to 2021 - Yusuf Batil refugee camp.



Anaemia prevalence decreased in 2021 compared to 2019 in Yusuf Batil camp.

Figure 23. Trend in mean haemoglobin concentration in children 6-59 months from 2017 to 2021 - Yusuf Batil refugee camp.



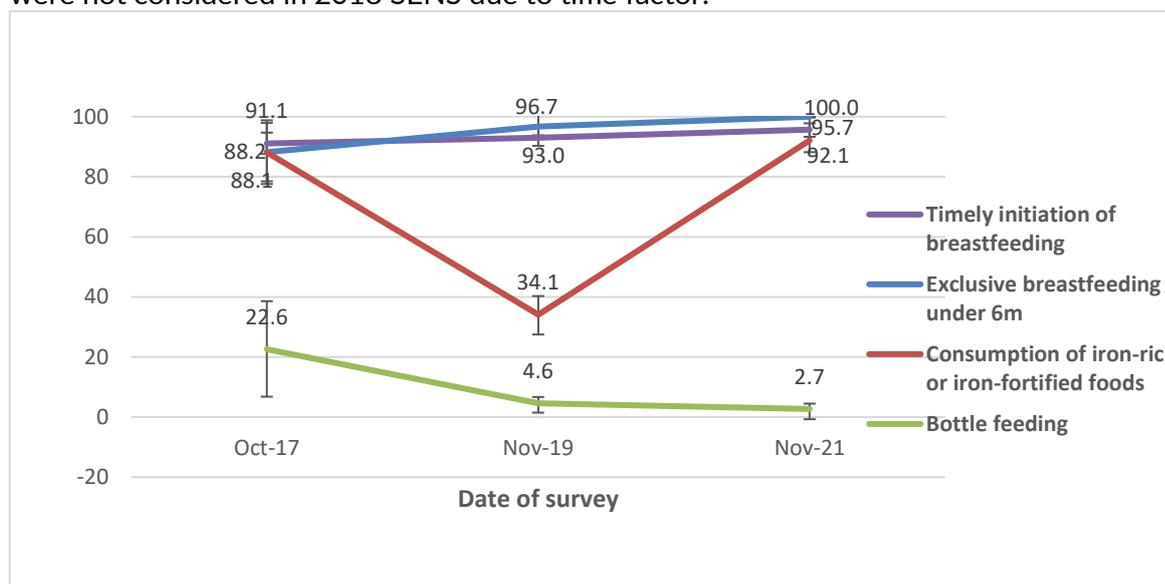
3.2.5. Infant and Young Child Feeding (IYCF)

Key IYCF indicators

Table 86. Prevalence of Infant and Young Child Feeding Practices Indicators - Yusuf Batil refugee camp.

Indicator	Age range	Number/ total	Prevalence (%)	95% CI
Timely initiation of breastfeeding	0-23 months	179/187	95.7	(91.7-98.1)
Exclusive breastfeeding under 6 months	0-5 months	41/41	100.0	(91.4-100.0)
Continued breastfeeding at 1 year	12-15 months	28/29	96.6	(82.2-99.9)
Continued breastfeeding at 2 years	20-23 months	22/26	84.6	(65.1-95.6)
Introduction of solid, semi-solid or soft foods	6-8 months	14/24	58.3	(36.6-77.9)
Consumption of iron-rich or iron-fortified foods	6-23 months	131/142	92.3	(86.6-96.1)
Bottle feeding	0-23 months	5/187	2.7	(0.9-6.1)

Figure 24. Key IYCF indicators from 2017 to 2021 - Yusuf Batil refugee camp. Note: IYCF indicators were not considered in 2018 SENS due to time factor.



Timely initiation of breastfeeding, exclusive breastfeeding and, and consumption of iron rich food increased in 2021 compared to 2019. The proportion of children being bottle fed reduced in 2021.

Prevalence of Intake

Infant Formula

Table 87. Infant formula intake in children aged 0-23 months - Yusuf Batil refugee camp.

	Number/total	% (95% CI)
Proportion of children aged 0-23 months who receive infant formula (fortified or non-fortified)	0/187	0.0% (0.0-0.0)

Table 88. Fortified Blended Foods (CSB+) intake in children aged 6-23 months - Yusuf Batil refugee camp.

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive CSB+	0/146	0.0% (0.0-0.0)

Table 89. Fortified Blended Foods (CSB++) Intake in Children aged 6-23 Months - Yusuf Batil refugee camp.

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive CSB++	27/145	18.6% (12.6-25.9)

Table 90. Lipid based Nutrient Supplements intake in children 6-23 months - Yusuf Batil refugee camp.

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive LNS	126/146	86.3% (79.6-91.4)

Table 91. Micronutrient powder intake in children 6-23 months- Yusuf Batil refugee camp.

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive MNP	6/145	4.1% (1.5-8.8)

3.2.6. Anaemia Women 15-49 Years

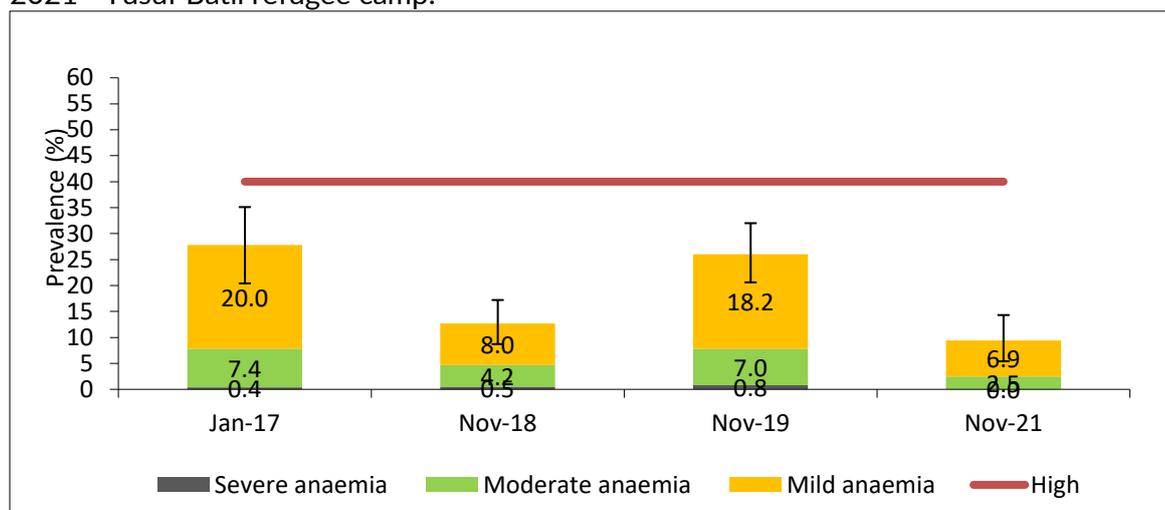
Table 92. Women Physiological Status and Age - Yusuf Batil refugee camp.

Physiological status	Number/total	% of sample
Non-pregnant	100/230	43.5% (37.0-50.1)
Pregnant	28/230	12.2% (8.2-17.1)
Mean age (range)	28.4 (9.6) [15.0-49.0]	

Table 93. Prevalence of anaemia and haemoglobin concentration in non-pregnant women of reproductive age (15-49 years) - Yusuf Batil refugee camp.

Anaemia in non-pregnant women of reproductive age (15-49 years)	All n = 202
Total Anaemia (<12.0 g/dL)	(19) 9.4% (5.8-14.3; 95% CI)
Mild Anaemia (11.0-11.9 g/dL)	(14) 6.9% (3.8-11.4; 95% CI)
Moderate Anaemia (8.0-10.9 g/dL)	(5) 2.5% (0.8-5.7; 95% CI)
Severe Anaemia (<8.0 g/dL)	(0) 0.0% (0.0-0.0; 95% CI)
Mean Hb (g/dL) (SD / 95% CI) [range]	13.1 (1.0) [9.1-15.5]

Figure 25. Trends in anaemia categories in women of reproductive age (non-pregnant) from 2017 to 2021 - Yusuf Batil refugee camp.



The proportion of mild and moderate anaemia decreased in 2021 compared to 2019.

Table 94. ANC Enrolment and Iron-Folic Acid Pills Coverage among Pregnant Women (15-49 Years) - Yusuf Batil refugee camp.

	Number /total	% (95% CI)
Currently enrolled in ANC programme	26/28	92.9 (76.5-99.1)
Currently receiving iron-folic acid pills	25/28	89.3 (71.8-97.7)

Table 95. BSFP enrollment coverage among pregnant and lactating women (15-49 years) - Yusuf Batil refugee camp

	Number /total	% (95% CI)
Blanket feeding programme enrollment	36/51	70.6% (56.2-82.5)

3.2.7. Demography

Household size and composition

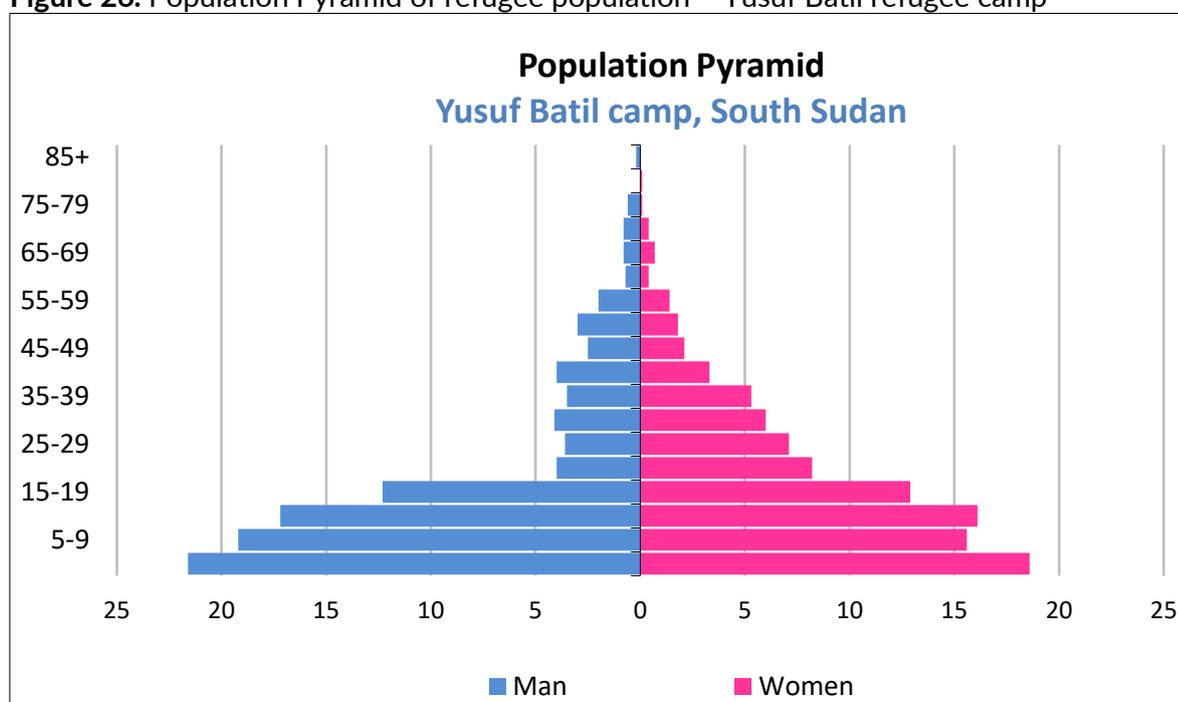
Table 96. Demographic characteristics, household size and composition of the surveyed population - Yusuf refugee camp

Household size and composition		Results
Population size – Total persons (ProGres 31st July 2021)		52394
Total population surveyed – Total persons (all ages)		2,289
Total U2 surveyed		196
Total U5 surveyed		463
Average household size		6.2
Household size categories	1-4 person(s)	24.6%
	5-6 persons	31.1%
	7-9 persons	35.7%
	≥ 10 persons	8.7%
Household composition	Children under two	0.5

	Children under five	1.3
	Children aged 5-14 years	2.1
	Members aged 15-64 years	2.7
	Members aged 65 years and above	0.1
Percent of children U2	%	8.6%
Percent of children U5	%	20.2%
Percent pregnant women (15-49 years)	%	2.1%
Percent of elders (65 years and above)	%	2.0%
Sex ratio	Male/Female	0.97

There are more women than man investigated, and the average household size is 6.2.

Figure 26. Population Pyramid of refugee population – Yusuf Batil refugee camp



The population pyramid is strongly lean to children under 15 years old. Among children and teenagers up to 19 years old, males are more than females. However, among refugees from 20 to 59 years old, there were more females than males.

Household head profile

Table 97. Household head profile – Yusuf Batil refugee camp

	Number/total	% (95% CI)
Female headed households (working age 15-64 years)	177/370	47.8% (42.8-52.9)
Male headed households (working age 15-64 years)	162/370	43.8% (38.8-48.9)
Children headed households (under 15 years)	2/370	0.5% (0.2-2.0)

Elderly headed households (65 years and above)	29/370	7.8% (5.5-11.0)
Mean age of household head in years (SD) [range]	42.2 (13.4) [12.0-94.0]	

Almost half of household are headed by either female or male with small portions headed by children or elderlys.

Age dependency ratio

Table 98. Age dependency ration categories by household – Yusuf Batil refugee camp

Age dependency categories		Age dependency ratio	Number / Total	% (95% CI)
Category I	1 dependent or less per non-dependent member	≤ 1	151/366	41.3% (36.3-46.4)
Category II	Up to 3 dependents per 2 non- dependent members	1.1-1.5	64/366	17.5% (13.9-21.7)
Category III	Up to 2 dependents per non-dependent members (1.5<DR<=2)	1.6-2.0	70/366	19.1% (15.4-23.5)
Category IV	More than 2 dependents per non- dependent members (DR>2)	≥2.1	81/366	22.1% (18.2-26.7)
Mean age dependency ration		Mean (SD) [range]	366	1.7 (1.3) [0.0-6.0]

There are 22.1% households which had more than 2 dependents per non-dependent members, which is a high proportion.

3.2.8. Food security

Access to food assistance

Table 99. Food assistance ration card and cash coverage – Yusuf Batil refugee camp

	Number/total	% (95% CI)
Proportion of households with a ration card	192/192	100% (98.5-100, 95% CI)
Proportion of households receiving cash grants	192/192	100% (98.5-100, 95% CI)

All the surveyed households in Yusuf Batil refugee camp had ration cards and have been receiving food assistance and cash grants.

Table 100. Reported duration of general food ration – Yusuf Batil refugee camp

	Number/total	% (95% CI)
Average number of days general food ration lasts out days (SD) [range]	191	14.1 (5.0) [1-28]

The food received from GFD was reported to last 14.1 days out of the distribution cycle of 30 days.

Table 101. Description of utilisation of cash assistance – Yusuf Batil refugee camp

Proportion of households that use cash grants for:	Number/total	% (95% CI)
Food	162/192	84.4% (78.5-89.2)

Water	2/192	1.0% (0.1-3.7)
Hygiene items, clothes, shoes	110/192	57.3% (50.0-64.4)
Health costs (including medicines)	3/192	1.3% (0.3-3.6)
Rent, shelter repair, household items (e.g. mattress, blankets, jerrycan), utilities and bills (e.g. electricity, water bills, phone calling credit)	13/192	6.8% (3.7-11.3)
Firewood / fuel for cooking or heating	52/192	27.1% (20.9-34.0)
Assets for a livelihood activity (e.g. seeds, tools, farming, fishing, petty trade, etc.)	3/192	1.6% (0.3-4.5)
Debts repayment	26/192	13.5% (9.0-19.2)
Saved some money, gave some to other family members, relatives, friends	0/192	0.0% (0.0-1.9)
Education (e.g. school fees, uniform, books)	1/192	0.5% (0.0-2.9)
Other	0/192	0.0% (0.0-1.9)

Most families reported that they spent money received from cash grants on food, followed by hygiene items (e.g., cloths), fuel for cooking, debt repayment, and rent or shelter repairing.

Coverage of basic needs

Table 102. Description of basic needs not met by the households – Yusuf Batil refugee camp

Basic needs not met by the households:	Number/total	% (95% CI)
Food	147/192	76.6% (69.9-82.4)
Water	1/192	0.5% (0.0-2.9)
Hygiene items, clothes, shoes	120/192	62.5% (55.2-69.4)
Health costs (including medicines)	10/192	5.2% (2.5-9.4)
Rent, shelter repair, household items (e.g. mattress, blankets, jerrycan), utilities and bills (e.g. electricity, water bills, phone calling credit)	31/192	16.2% (11.2-22.1)
Firewood / fuel for cooking or heating	19/192	9.9% (6.1-15.0)
Assets for a livelihood activity (e.g. seeds, tools, farming, fishing, petty trade, etc.)	7/192	3.7% (1.5-7.4)
Debts repayment	4/192	2.1% (0.6-5.3)
Saved some money, support other family members, relatives, friends	1/192	0.5% (0.0-2.9)
Education (e.g. school fees, uniform, books)	4/192	2.1% (0.6-5.3)
Other	4/192	2.1% (0.6-5.3)

The category of basic needs that cannot be met reported the most are: food, hygiene items, rent/shelter repair/household items, fuel for cooking, and health.

Table 103. Households by categories of coverage of basic needs – Yusuf Batil refugee camp

Proportion of households in each category of coverage of basic needs	Number/total	% (95% CI)
All basic needs are met (100%)	0/192	0.0% (0.0-1.5)
More half basic needs are met (>50%)	192/192	100.0% (98.1-100.0)
Few basic needs are met (<50%)	0/192	0.0% (0.0-1.5)
Basic needs are not met (0%)	0/192	0.0% (0.0-1.5)

All households reported more than half of their basic needs are met.

Negative household coping strategies

From April 2021, GFD ration was reduced to 50% in all refugees in Maban camps. Food basket consists of cereals provided at 100% in kind, lentils at 75% as inkind and 25% cash, cooking oil at 50% each as inkind and cash, and cash for milling and salt at 100%. The cash transfer value varies from one month to other depending on market assessment conducted report from the prices of commodities prior to the GFD. To fill the food gaps, some refugees in the camp had to use the below coping strategies.

Table 104. Coping strategies used by the surveyed population over the past month.

	Number/total	% (95% CI)
Proportion of households reporting using the following coping strategies over the past month*:		
Rely on less preferred and/or less expensive foods	191/192	99.5 (97.1-100.0)
Borrow food, or rely on help from a friend or relative	183/192	95.3 (91.3-97.8)
Reduce the number of meals eaten in a day	188/192	97.9 (94.8-99.4)
Limit portion sizes at mealtime	191/192	99.5 (97.1-100)
Reduce consumption by adults so children could eat	180/192	93.8 (89.3-96.7)
Average rCSI (mean, SD / range)	192	25.0 (9.1) [2-55]
Proportion of households reporting using none of the negative coping strategies over the past month	1/192	0.5% (0.0-2.9)

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

Only 0.5% 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.

Food Consumption Score (FCS)

During the survey, Sept 2021 GFD cycle was considered the last general food distribution prior to the survey. The survey was carried when Oct 2021 GFD cycle has just been completed in Yusuf Batil refugee camp. The survey was conducted during the annual harvest season, during which the overall

food availability is better than other times. It is hence likely that the food consumption score is higher than it would be e.g., lean season.

Table 105. Food consumption score by category and average FCS – Yusuf Batil refugee camp

FCS profiles	Number/total	% (95% CI)
Acceptable (FCS > 35)	76/192	39.6% (32.6-46.9)
Borderline (21.5≤FCS≤35)	84/192	43.8% (36.6-51.1)
Poor (FCS≤21)	32/192	16.7% (11.7-22.7)
Average FCS (SD) [range]	192	32.8 (10.9) [11.0-84.5]

*Maximum FCS is 112.

The average FCS among refugees in Yusuf Batil camp was 32.8 out of total score of 112, which falls into the borderline category. This is echoed by the majority of households had a FCS score classified as borderline.

Table 106. Consumption frequency categories of each nutrient rich food groups (FCS-N) – Yusuf Batil refugee camp

Nutrient rich food groups	Consumption frequency categories	Number/total	% (95% CI)
Vitamin A rich foods	Never	8/192	4.2% (1.8-8.0)
	Sometimes	88/192	45.8% (38.6-53.2)
	At least daily	96/192	50.0% (42.7-57.3)
Protein rich foods	Never	6/192	3.1% (1.2-6.7)
	Sometimes	106/192	55.2% (47.9-62.4)
	At least daily	80/192	41.7% (34.6-49.0)
Haem iron rich foods	Never	55/192	28.7% (22.4-35.6)
	Sometimes	132/192	68.8% (61.9-75.2)
	At least daily	5/192	2.6% (0.9-6.0)

In terms of the nutrient rich food, 95.8% households reported consumed Vitamin A rich foods (sometimes or daily), 96.9% reported consumed protein rich foods, while only 71.4% reported consumed Haem iron rich foods.

Table 107. Food acquisition sources – Yusuf Batil refugee camp

Food acquisition sources	Number/total	% (95% CI)
Purchase (using cash grants and/or with their own cash)	91/192	47.4% (40.2-54.7)
Own production (crops, livestock, fishing/ hunting, gathering)	18/192	9.4% (5.7-14.4)
Traded goods/services, barter	48/192	25.0% (19.0-31.7)
Borrowed (loan/credit from traders)	29/192	15.1% (10.4-21.0)
Received as gift (from family relatives or friends/neighbour)	6/192	3.1% (1.2-6.7)
In-kind or voucher based food assistance	0/192	0.0% (0.0-1.9)

Other	0/192	0.0% (0.0-1.9)
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The main source for food reported was purchasing (47.4%), followed by traded goods (25.0%) and borrowed (15.1%).

The trend analysis is not available for rCSI and FCS, because this is the first year these indicators are used in the nutrition survey in South Sudan.

3.3. FROM GENDRASSA REFUGEE CAMP, SOUTH SUDAN

A percentage coverage of 140% of the targeted children 6-59 months in Doro refugee camp were surveyed (target 282 and surveyed 394). All the children who participated in the survey were considered using either available official age documentation or age estimation from local context calendar of event developed to estimate the age. Of the total surveyed children 6-59 months in Gendrassa refugee camp, 85% had official age documentation.

Table 108. Distribution of age and sex of sample - Gendrassa refugee camp.

AGE (mo)	Boys		Girls		Total		Ratio
	no.	%	no.	%	no.	%	Boy:girl
6-17	57	53.8	49	46.2	106	26.9	1.2
18-29	35	53.8	30	46.2	65	16.5	1.2
30-41	50	46.7	57	53.3	107	27.2	0.9
42-53	46	54.8	38	45.2	84	21.3	1.2
54-59	15	46.9	17	53.1	32	8.1	0.9
Total	203	51.5	191	48.5	394	100.0	1.1

The overall sex ratio of boys: girls was 1.1 indicating both sexes were equally represented.

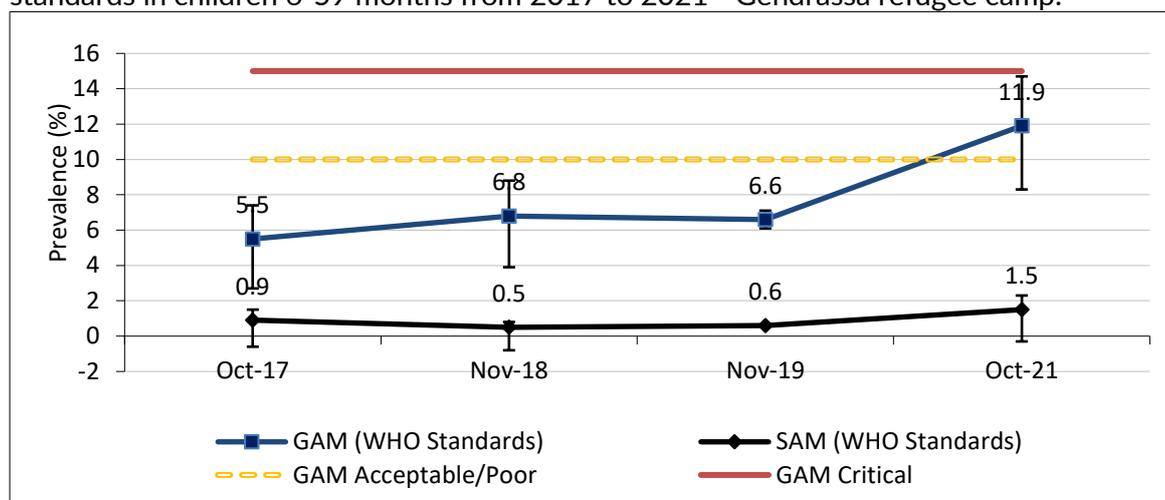
3.3.1. Anthropometry

Table 109. Prevalence of acute malnutrition based on weight-for-height z-scores and/or oedema and by sex - Gendrassa refugee camp.

	All n = 394	Boys n = 203	Girls n = 191
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(47) 11.9 % (9.1 - 15.5 95% C.I.)	(21) 10.3 % (6.9 - 15.3 95% C.I.)	(26) 13.6 % (9.5 - 19.2 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(41) 10.4 % (7.8 - 13.8 95% C.I.)	(20) 9.9 % (6.5 - 14.7 95% C.I.)	(21) 11.0 % (7.3 - 16.2 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(6) 1.5 % (0.7 - 3.3 95% C.I.)	(1) 0.5 % (0.1 - 2.7 95% C.I.)	(5) 2.6 % (1.1 - 6.0 95% C.I.)

The prevalence of oedema was 0.0% and the data excluded SMART flags. The prevalence of acute malnutrition based on WFH z-score and/or oedema and by sex, showed no significant difference based on the C.I indicated between boys and girls. Boys and girls were equally wasted.

Figure 27. Trends in the prevalence of global and severe acute malnutrition based on WHO Growth standards in children 6-59 months from 2017 to 2021 - Gendrassa refugee camp.

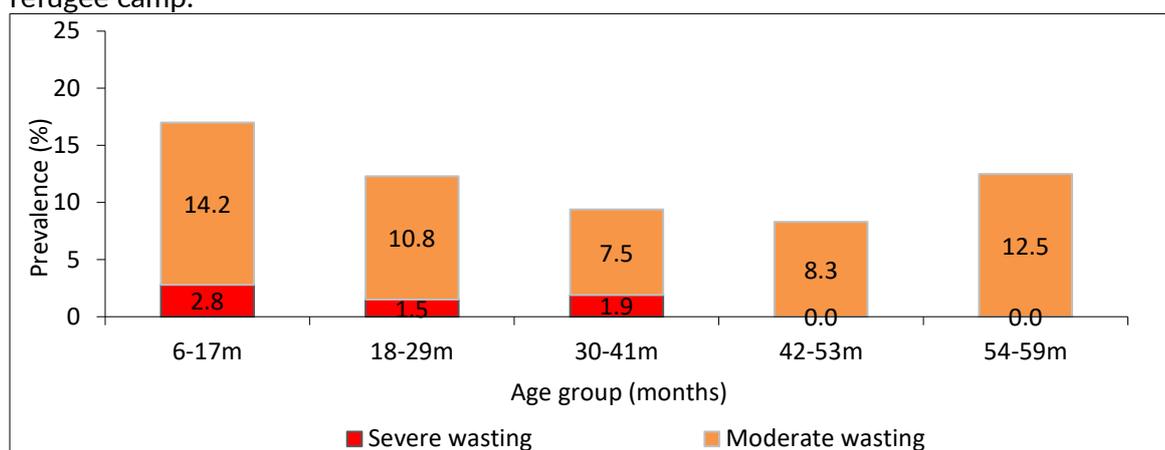


The prevalence of Global and Severe Acute Malnutrition in Gendrassa refugee camp has showed an increase in 2021 as compared to 2019. The increase indicates a deteriorating trend in the camp.

Table 110. Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema - Gendrassa refugee camp.

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	106	3	2.8	15	14.2	88	83.0	0	0.0
18-29	65	1	1.5	7	10.8	57	87.7	0	0.0
30-41	107	2	1.9	8	7.5	97	90.7	0	0.0
42-53	84	0	0.0	7	8.3	77	91.7	0	0.0
54-59	32	0	0.0	4	12.5	28	87.5	0	0.0
Total	394	6	1.5	41	10.4	347	88.1	0	0.0

Figure 28. Trend in the Prevalence of MAM and SAM by age in Children 6-59 Months - Gendrassa refugee camp.

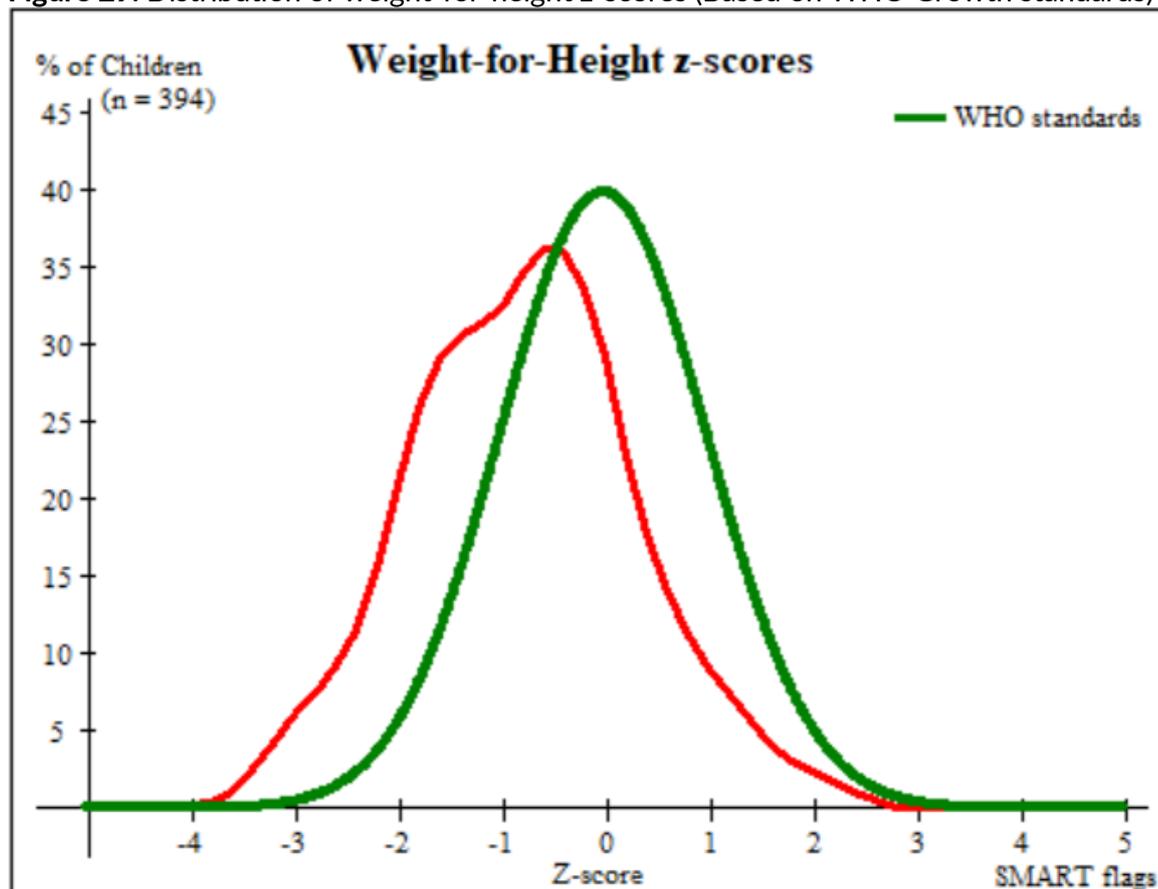


Children aged 6-17 are the most affected age groups by wasting in Gendrassa refugee camp indicating higher vulnerability of these age categories. The SAM cases showed a negative association with age, indicating young children are more vulnerable to SAM.

Table 111. Distribution of acute malnutrition and oedema based on weight-for-height z-scores - Gendrassa refugee camp

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor. 0 (0.0 %)	Kwashiorkor. 0 (0.0 %)
Oedema absent	Marasmic No. 6 (1.5 %)	Not severely malnourished. 388 (98.5 %)

Figure 29. Distribution of weight-for-height z-scores (Based on WHO Growth standards)



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

Table 112. Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex - Gendrassa refugee camp.

	All n = 394	Boys n = 203	Girls n = 191
Prevalence of global malnutrition (< 125 mm and/or oedema)	(10) 2.5 % (1.4 - 4.6 95% C.I.)	(2) 1.0 % (0.3 - 3.5 95% C.I.)	(8) 4.2 % (2.1 - 8.0 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(9) 2.3 % (1.2 - 4.3 95% C.I.)	(2) 1.0 % (0.3 - 3.5 95% C.I.)	(7) 3.7 % (1.8 - 7.4 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(1) 0.3 % (0.0 - 1.4 95% C.I.)	(0) 0.0 % (0.0 - 1.9 95% C.I.)	(1) 0.5 % (0.1 - 2.9 95% C.I.)

Girls were the most affected compared to boys by the acute malnutrition as defined by MUAC.

MUAC is being used in the community to monitor malnutrition trends and for admissions and discharge in the therapeutic and supplementary feeding nutrition programmes. It's a good indicator of risk of mortality in children under five and is easy to do. However, as seen from the above table, comparing

to the GAM/SAM prevalence defined by weight-for-height, the MUAC results are much lower, which indicate the potential leave-out of children by using only MUAC as the admission criterion.

Table 113. Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by age - Gendrassa refugee camp.

		Severe wasting (< 115 mm)		Moderate wasting (≥ 115 mm and < 125 mm)		Normal (≥ 125 mm)		Oedema	
Age (mo)	Total no.	No.	%	No.	%	No.	%	No.	%
6-17	106	0	0.0	8	7.5	98	92.5	0	0.0
18-29	65	0	0.0	0	0.0	65	100.0	0	0.0
30-41	107	1	0.9	0	0.0	106	99.1	0	0.0
42-53	84	0	0.0	0	0.0	84	100.0	0	0.0
54-59	32	0	0.0	1	3.1	31	96.9	0	0.0
Total	394	1	0.3	9	2.3	384	97.5	0	0.0

The number of cases of severe and moderate wasting based on MUAC cut offs are higher in children aged 6-17 months.

Table 114. Prevalence of underweight based on weight-for-age z-scores by sex - Gendrassa refugee camp.

	All n = 392	Boys n = 202	Girls n = 190
Prevalence of underweight (< -2 z-score)	(60) 15.3 % (12.1 - 19.2 95% C.I.)	(30) 14.9 % (10.6 - 20.4 95% C.I.)	(30) 15.8 % (11.3 - 21.6 95% C.I.)
Prevalence of moderate underweight (< -2 z-score and ≥ -3 z-score)	(51) 13.0 % (10.0 - 16.7 95% C.I.)	(24) 11.9 % (8.1 - 17.1 95% C.I.)	(27) 14.2 % (10.0 - 19.9 95% C.I.)
Prevalence of severe underweight (< -3 z-score)	(9) 2.3 % (1.2 - 4.3 95% C.I.)	(6) 3.0 % (1.4 - 6.3 95% C.I.)	(3) 1.6 % (0.5 - 4.5 95% C.I.)

Boys and girls tend to be equally affected by underweight.

Table 115. Prevalence of underweight by age, based on weight-for-age z-scores - Gendrassa refugee camp.

		Severe underweight (< -3 z-score)		Moderate underweight (≥ -3 and < -2 z- score)		Normal (≥ -2 z score)		Oedema	
Age (mo)	Total no.	No.	%	No.	%	No.	%	No.	%
6-17	105	2	1.9	14	13.3	89	84.8	0	0.0
18-29	65	1	1.5	7	10.8	57	87.7	0	0.0
30-41	106	2	1.9	16	15.1	88	83.0	0	0.0
42-53	84	2	2.4	11	13.1	71	84.5	0	0.0
54-59	32	2	6.3	3	9.4	27	84.4	0	0.0

Total	392	9	2.3	51	13.0	332	84.7	0	0.0
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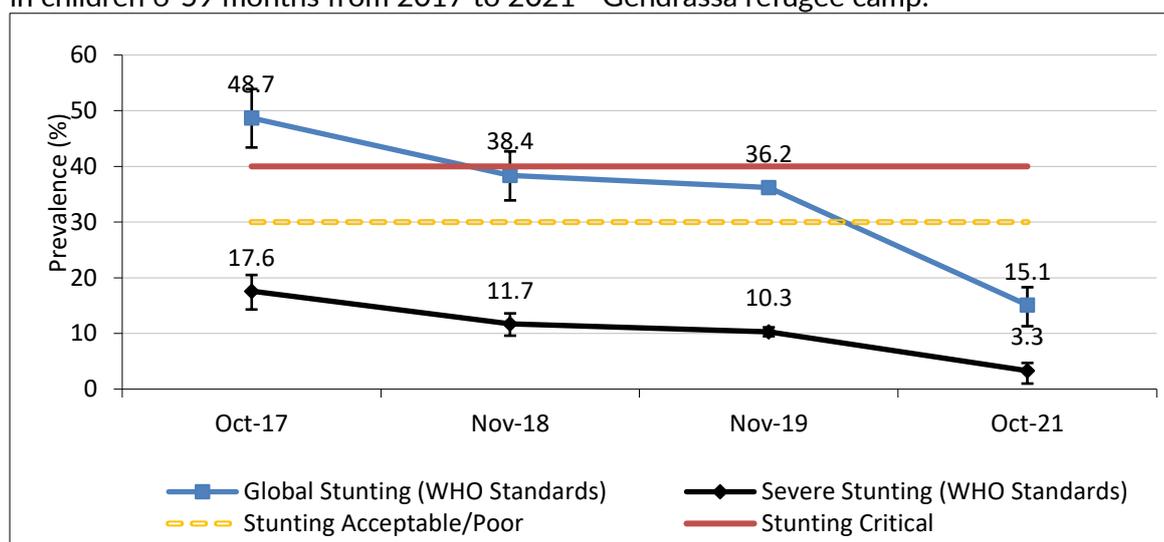
Children in the age groups of 30-41 and 54-59 months are the most underweight.

Table 116. Prevalence of stunting based on height-for-age z-scores and by sex - Gendrassa refugee camp.

	All n = 392	Boys n = 201	Girls n = 191
Prevalence of stunting (<-2 z-score)	(59) 15.1 % (11.9 - 18.9 95% C.I.)	(40) 19.9 % (15.0 - 26.0 95% C.I.)	(19) 9.9 % (6.5 - 15.0 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(46) 11.7 % (8.9 - 15.3 95% C.I.)	(30) 14.9 % (10.7 - 20.5 95% C.I.)	(16) 8.4 % (5.2 - 13.2 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(13) 3.3 % (1.9 - 5.6 95% C.I.)	(10) 5.0 % (2.7 - 8.9 95% C.I.)	(3) 1.6 % (0.5 - 4.5 95% C.I.)

Boys are the most affected by stunting than girls.

Figure 30. Trends in the prevalence of global and severe stunting based on WHO Growth standards in children 6-59 months from 2017 to 2021 - Gendrassa refugee camp.



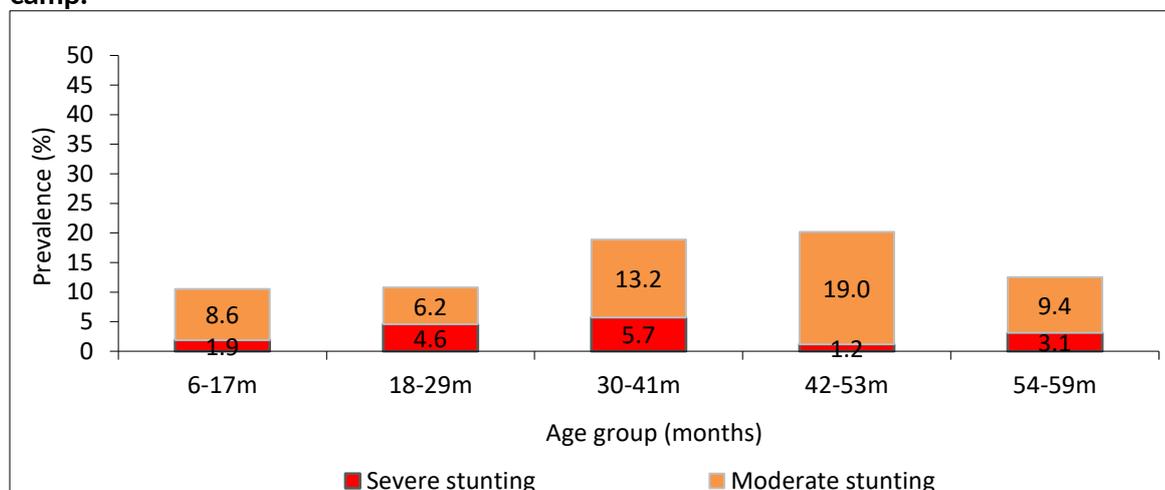
Significant reduction in stunting was noted in 2021 in Gendrassa refugee camp as compared to 2019 and it has dropped into the poor range level.

Table 117. Prevalence of stunting by age based on height-for-age z-scores - Gendrassa refugee camp.

		Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (>= -2 z score)	
Age (mo)	Total no.	No.	%	No.	%	No.	%
6-17	105	2	1.9	9	8.6	94	89.5
18-29	65	3	4.6	4	6.2	58	89.2
30-41	106	6	5.7	14	13.2	86	81.1
42-53	84	1	1.2	16	19.0	67	79.8
54-59	32	1	3.1	3	9.4	28	87.5

Total	392	13	3.3	46	11.7	333	84.9
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Figure 31. Trends in the prevalence of stunting by age in children 6-59 months - Gendrassa refugee camp.



Children aged 42-53 months are the most affected by stunting.

Table 118. Prevalence of overweight based on weight for height cut offs and by sex (no oedma) - Gendrassa refugee camp.

	All n = 394	Boys n = 203	Girls n = 191
Prevalence of overweight (WHZ > 2)	(4) 1.0 % (0.4 - 2.6 95% C.I.)	(2) 1.0 % (0.3 - 3.5 95% C.I.)	(2) 1.0 % (0.3 - 3.7 95% C.I.)
Prevalence of severe overweight (WHZ > 3)	(0) 0.0 % (0.0 - 1.0 95% C.I.)	(0) 0.0 % (0.0 - 1.9 95% C.I.)	(0) 0.0 % (0.0 - 2.0 95% C.I.)

Table 119. Prevalence of overweight by age, based on weight for height (no oedema) - Gendrassa refugee camp.

Age (mo)	Total no.	Overweight (WHZ > 2)		Severe Overweight (WHZ > 3)	
		No.	%	No.	%
6-17	106	0	0.0	0	0.0
18-29	65	0	0.0	0	0.0
30-41	107	3	2.8	0	0.0
42-53	84	1	1.2	0	0.0
54-59	32	0	0.0	0	0.0
Total	394	4	1.0	0	0.0

Table 120. Mean z-scores, Design Effects and excluded subjects - Gendrassa refugee camp.

Indicator	N	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	394	-0.78±1.08	1.00	0	0
Weight-for-Age	392	-1.13±0.88	1.00	0	2

Height-for-Age	392	-1.07±0.96	1.00	0	2
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* contains for WHZ and WAZ the children with edema.

3.3.2. Feeding Programme Enrollment Coverage

Selective feeding programme

Table 121. Nutrition treatment programme enrolment rate based on all admission criteria (weight-for-height, MUAC, oedema) - Gendrassa refugee camp.

	Number/total	% (95% CI)
Proportion of children aged 6-59 months with severe acute malnutrition currently enrolled in therapeutic feeding programme*	1/6	16.7% (0.4-64.1; 95% CI)
Proportion of children aged 6-59 months with moderate acute malnutrition currently enrolled in supplementary feeding programme*	5/46	10.9% (3.6-23.6; 95% CI)

Table 122. Nutrition treatment programme enrolment rate based on MUAC and oedema only - Gendrassa refugee camp.

	Number/total	% (95% CI)
Proportion of children aged 6-59 months with severe acute malnutrition currently enrolled in therapeutic feeding programme	1/1	100% (2.5-100.0; 95% CI)
Proportion of children aged 6-59 months with moderate acute malnutrition currently enrolled in therapeutic feeding programme	5/9	55.6% (21.2-86.3; 95% CI)

The OTP and TSFP enrolment rate based on both all admission criteria and using MUAC and Oedema in Gendrassa refugee camp were very low and did not meet the recommended standard of $\geq 90\%$. The enrolment rate by only MUAC and Oedema were higher than all admission criteria especially for both OTP and TSFP. This indicated more children enrolled in the program were identified by MUAC only.

Table 123. BSFP enrollment coverage for children 6-23 months - Gendrassa refugee camp

	Number/Total	% (95% CI)
Blanket feeding programme enrolment	101/140	72.1% (63.9-79.4)
Product name	Lipid based Nutrient Supplements-MQ	
Target age group	6-23 months	

The BSFP enrollment coverage for children aged 6-23 months in Gendrassa refugee camp was 72.1%.

3.3.3. Measles, Vitamin A, Diarrhoea, and Deworming

Measles vaccination coverage results

Table 124. Measles vaccination coverage for children aged 9-59 months (N=366) - Gendrassa refugee camp.

	Number/total	% (95% CI)
Measles vaccination with card	237/366	64.8% (59.8-69.5)
Measles vaccination with card or	361/366	98.6% (96.8-99.4)

confirmation from mother		
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Measles vaccination coverage in Gendrassa refugee camp was 98.6% and this met the recommended standard of $\geq 95\%$.

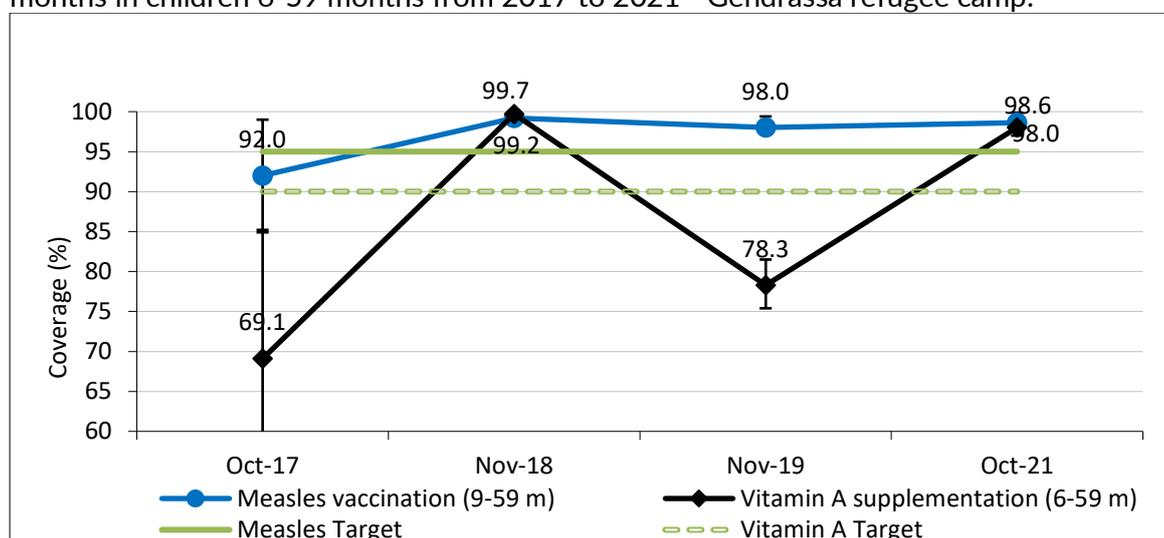
Vitamin A supplementation coverage results

Table 125. Vitamin A supplementation for children aged 6-59 months within past 6 months (N= 394) - Gendrassa refugee camp.

	Number/total	% (95% CI)
Vitamin A supplementation in the last 6 months with card	41/394	10.4% (7.8-13.8)
Vitamin A supplementation in the last 6 months with card or confirmation from mother	386/394	98.0% (96.1-99.0)

Vitamin A supplementation coverage in Gendrassa refugee camp met the standard of $>90\%$

Figure 32. Trends in the coverage of Measles vaccination and Vitamin A supplementation in last 6 months in children 6-59 months from 2017 to 2021 - Gendrassa refugee camp.



Diarrhoea Results

Table 126. Period Prevalence of Diarrhoea - Gendrassa refugee camp.

	Number/total	% (95% CI)
Diarrhoea in the last two weeks	37/393	9.4% (6.9-12.7)

Table 127. Use of ORS and Zinc during diarrhoea episode - Gendrassa refugee camp

	Number/total	% (95% CI)
ORS use during diarrhoea episode	31/37	83.8% (68.0-93.8)
Zinc tablet or syrup use during diarrhoea episode	34/37	91.9% (78.1-98.3)

Deworming

Table 128. Deworming coverage - Gendrassa refugee camp.

	Number/total	% (95% CI)
Children received a deworming tablet in the last six months (12-59 months)	319/338	94.4% (91.4-96.4)

94.4% of children 12-59 months received a deworming tablet in last 6 months prior to the survey in Gendrassa refugee camp. The coverage met the standard of ($\geq 75\%$).

3.3.4. Anaemia Children 6 - 59 months

The total anaemia prevalence among children aged 6 to 59 months is of high public health significance 43.2% (38.4-48.1; 95% CI). Children of 6 to 23 months were the most affected (55.7%) compared to the 24-59 months age category (36.2%).

Table 129. Prevalence of total anaemia, anaemia categories, and mean haemoglobin concentration in children 6-59 months of age and by age group - Gendrassa refugee camp.

	6-59 months n= 394	6-23 months n=140	24-59 months n=254
Total Anaemia (Hb<11.0 g/dL)	(170) 43.2% (38.4-48.1 95% CI)	(78) 55.7% (47.1-64.1; 95% CI)	(92) 36.2% (30.3-42.5; 95% CI)
Mild Anaemia (Hb 10.0-10.9 g/dL)	(87) 22.1% (18.3-26.4 95% CI)	(43) 30.7% (23.2-39.1; 95% CI)	(44) 17.3% (12.9-22.6; 95% CI)
Moderate Anaemia (7.0-9.9 g/dL)	(80) 20.3% (16.6-24.6 95% CI)	(34) 24.3% (17.4-32.3; 95% CI)	(46) 18.1% (13.6-23.4; 95% CI)
Severe Anaemia (<7.0 g/dL)	(3) 0.8% (0.3-2.2 95% CI)	(1) 0.7% (0.0-3.9; 95% CI)	(2) 0.8% (0.1-2.8; 95% CI)
Mean Hb (g/dL) (SD / 95% CI) [range]	11.0 (1.5) [6.0-14.5]	10.6 (1.4) [6.6-13.6]	11.2 (1.5) [6.0-14.5]

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

Figure 33. Trends in anaemia categories in children 6-59 months from 2017 to 2021 - Gendrassa refugee camp.

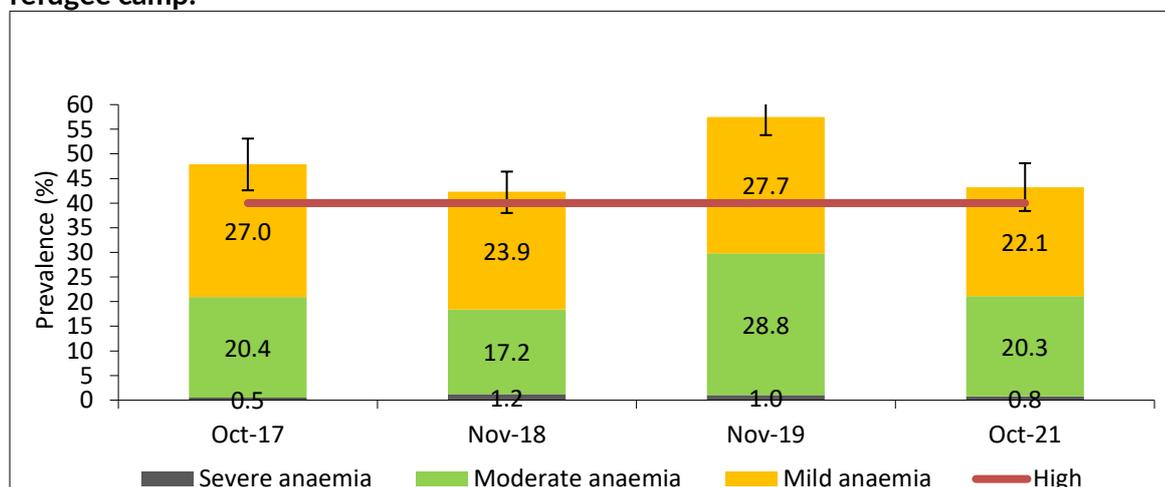
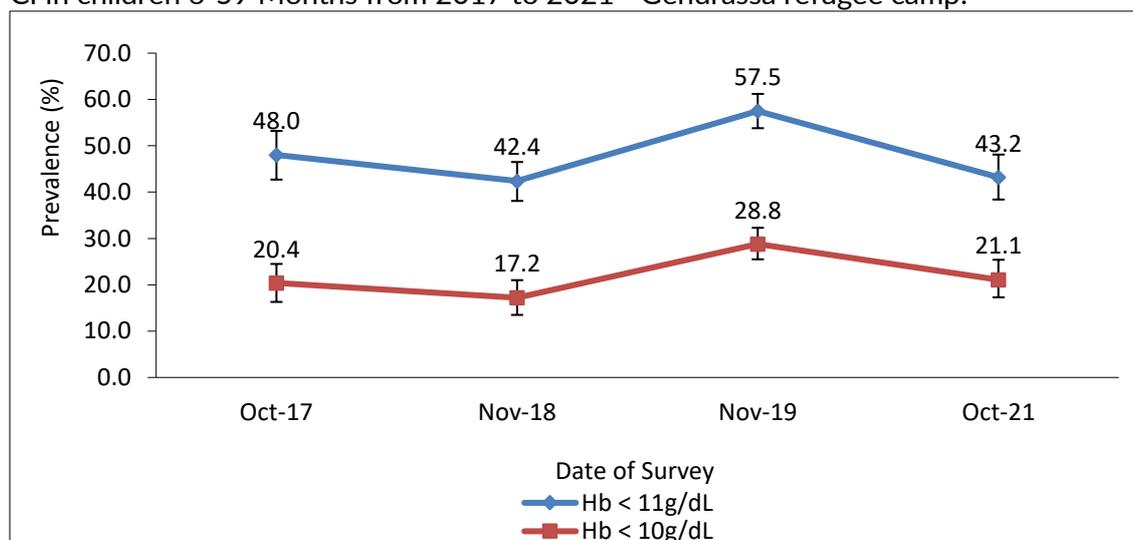


Table 130. Prevalence of moderate and severe anaemia in children 6-59 months of age and by age group - Gendrassa refugee camp.

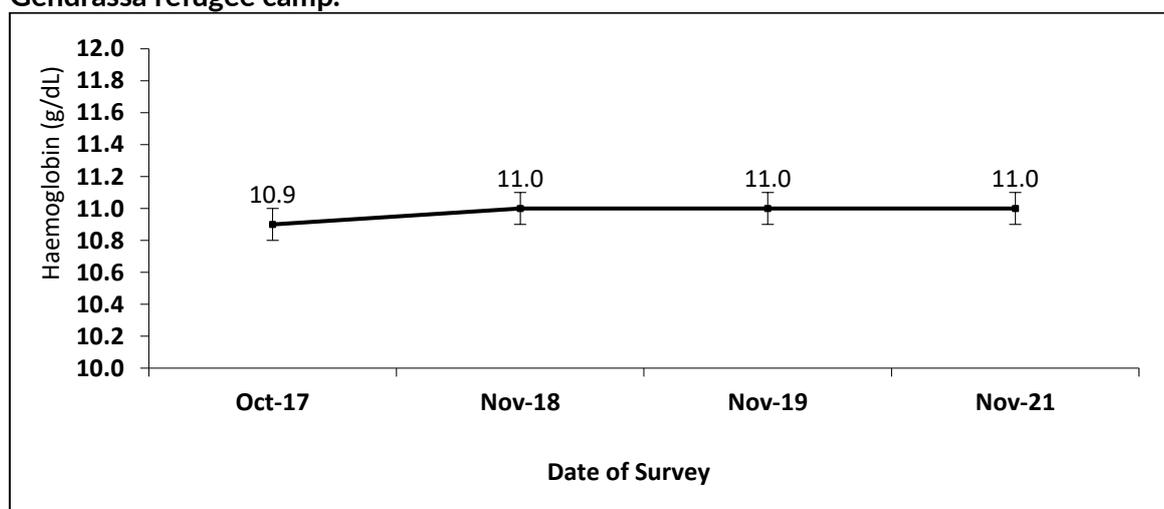
	6-59 months n = 394	6-23 months n=140	24-59 months n= 254
Moderate and Severe Anaemia (Hb<10.0 g/dL)	(83) 21.1% (17.3-25.4; 95% CI)	(35) 25.0% (18.1-33.0; 95% CI)	(48) 18.9% (14.3-24.3; 95% CI)

Figure 34. Trend in total anaemia (<11 g/dl), and moderate and severe anaemia (<10 g/dl) with 95% CI in children 6-59 Months from 2017 to 2021 - Gendrassa refugee camp.



There was a significant decrease in anaemia prevalence in 2021 compared to 2019 in Gendrassa refugee camp.

Figure 35. Trend in mean haemoglobin concentration in children 6-59 months from 2017 to 2021 - Gendrassa refugee camp.



3.3.5. Infant and Young Child Feeding (IYCF)

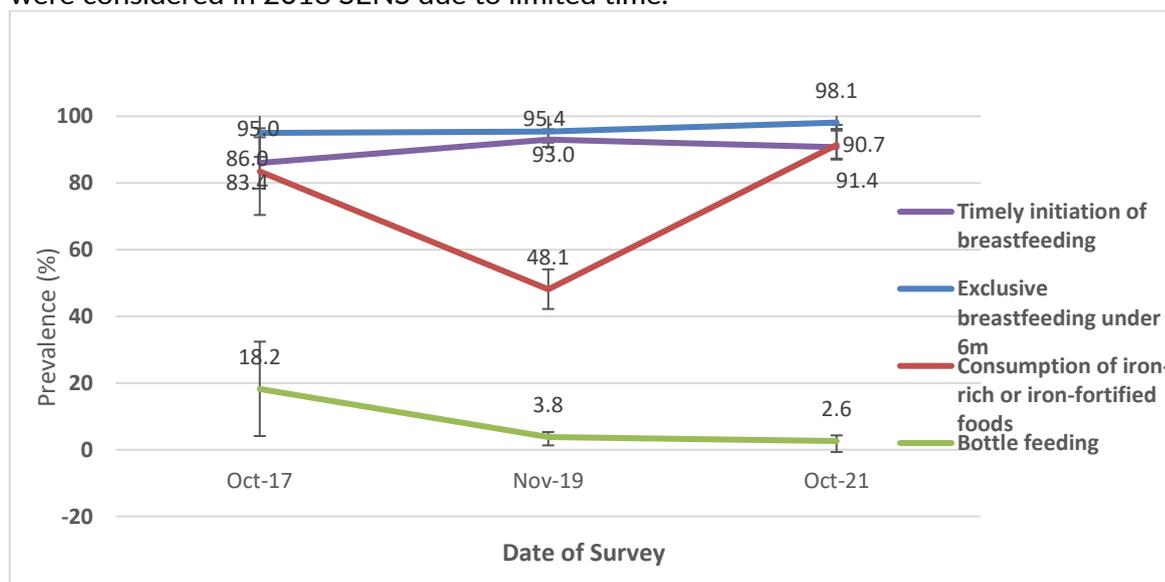
IYCF key indicators

Table 131. Prevalence of Infant and Young Child Feeding Practices Indicators - Gendrassa refugee camp.

Indicator	Age range	Number/ total	Prevalence (%)	95% CI
Timely initiation of breastfeeding	0-23 months	175/193	90.7	(85.7-94.4)

Exclusive breastfeeding under 6 months	0-5 months	52/53	98.1	(89.9-100)
Continued breastfeeding at 1 year	12-15 months	34/36	94.4	(81.3-99.3)
Continued breastfeeding at 2 years	20-23 months	12/21	57.1	(34.0-78.2)
Introduction of solid, semi-solid or soft foods	6-8 months	14/28	50.0	(30.7-69.4)
Consumption of iron-rich or iron-fortified foods	6-23 months	127/139	91.4	(85.4-95.5)
Bottle feeding	0-23 months	5/193	2.6	(0.9-5.9)

Figure 36. Key IYCF indicators from 2017 to 2021 - Gendrassa refugee camp. Note: no IYCF indicators were considered in 2018 SENS due to limited time.



Timely initiation of breastfeeding, exclusive breastfeeding, and consumption of iron rich foods remained within acceptable range. Bottle feeding reduced in 2021 compared to 2019.

Prevalence of Intake

Infant Formula

Table 132. Infant formula intake in children aged 0-23 months - Gendrassa refugee camp.

	Number/total	% (95% CI)
Proportion of children aged 0-23 months who receive infant formula (fortified or non-fortified)	6/193	3.1% (1.2-6.6)

Table 133. Fortified Blended Foods (CSB+) intake in children aged 6-23 months -Gendrassa refugee camp.

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive CSB+	2/140	1.4% (0.2-5.1)

Table 134. Fortified Blended Foods (CSB++) Intake in Children Aged 6-23 Months - Gendrassa refugee camp.

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive CSB++	33/139	23.7% (16.9-31.7)

Table 135. Lipid based Nutrient Supplements intake in children aged 6-23 months - Gendrassa refugee camp.

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive LNS	111/140	79.3% (71.6-85.7)

Table 136. Micronutrient powder intake in children aged 6-23 months - Gendrassa refugee camp.

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive MNP	14/140	10.0% (5.6-16.2)

3.3.6. Anaemia Women 15-49 Years

Table 137. Women Physiological Status and Age - Gendrassa refugee camp.

Physiological status	Number/total	% of sample
Non-pregnant	128/244	52.5% (46.0-58.9; 95% CI)
Pregnant	23/244	9.4% (6.1-13.8; 95% CI)
Mean age (range)	27.3 years (9.2) [15.0-49.0]	

Table 138. Prevalence of anaemia and haemoglobin concentration in non-pregnant women of reproductive age (15-49 years) - Gendrassa refugee camp.

Anaemia in non-pregnant women of reproductive age (15-49 years)	All n = 219
Total Anaemia (<12.0 g/dL)	(65) 29.7% (23.7-36.2; 95% CI)
Mild Anaemia (11.0-11.9 g/dL)	(43) 19.6% (14.6-25.5; 95% CI)
Moderate Anaemia (8.0-10.9 g/dL)	(20) 9.1% (5.7-13.8; 95% CI)
Severe Anaemia (<8.0 g/dL)	(2) 0.9% (0.1-3.3)
Mean Hb (g/dL) (SD / 95% CI) [range]	12.6 (1.4) [6.8-15.6]

Figure 37. Trends in anaemia categories in women of reproductive age (non-pregnant) from 2017 to 2021 - Gendrassa refugee camp.

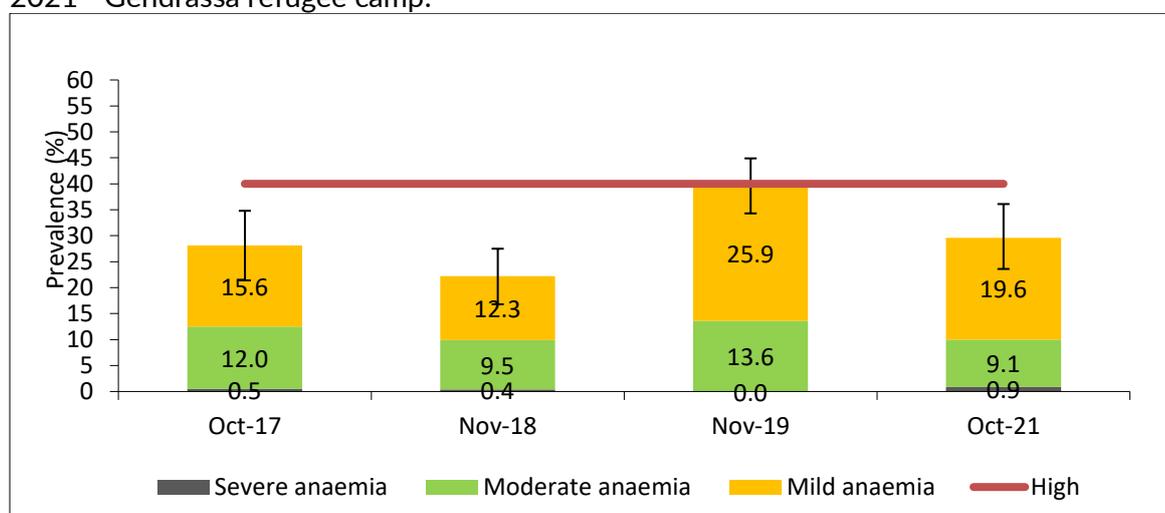


Table 139. ANC Enrolment and Iron-Folic Acid Pills Coverage among Pregnant Women (15-49 Years) - Gendrassa refugee camp.

	Number /total	% (95% CI)
Currently enrolled in ANC programme	22/23	95.7 (78.1-99.9)
Currently receiving iron-folic acid pills	22/23	95.7 (78.1-99.9)

Table 140. BSFP enrollment coverage among pregnant and lactating women (15-49 years) - Gendrassa refugee camp

	Number /total	% (95% CI)
Blanket feeding programme enrollment	42/51	82.4% (69.1-91.6)

3.3.7. Demography

Household size and composition

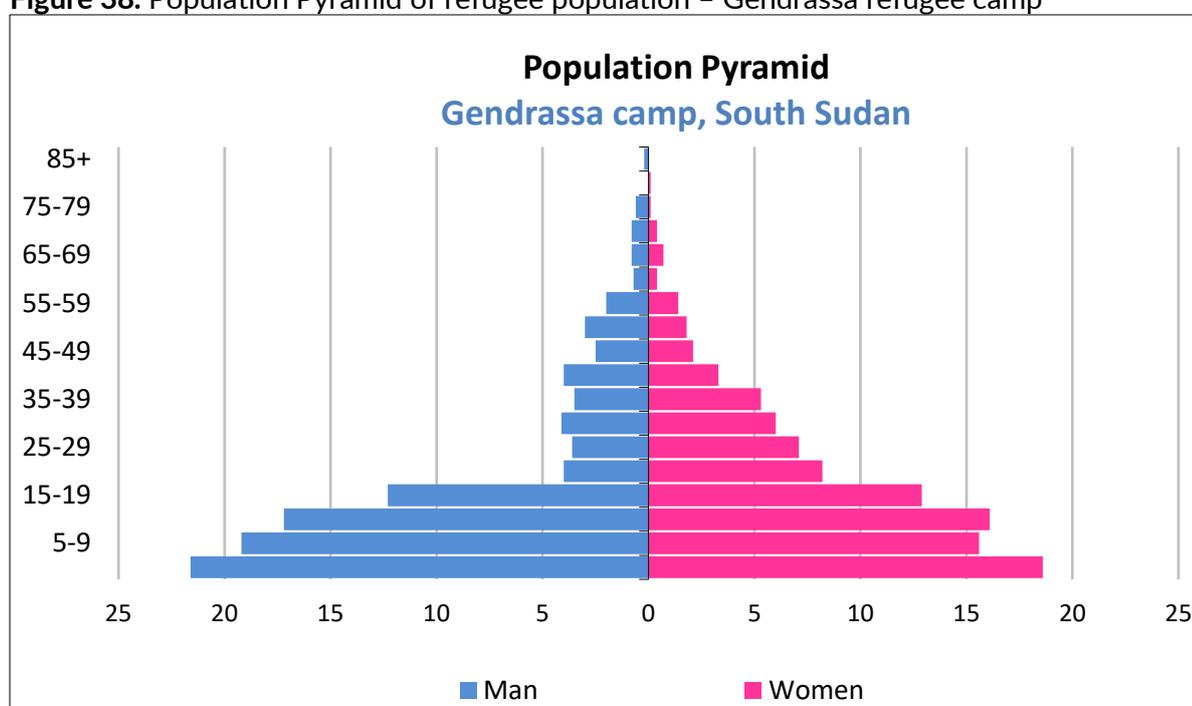
Table 141. Demographic characteristics, household size and composition of the surveyed population - Gendrassa refugee camp

Household size and composition		Results
Population size – Total persons (ProGres 31st July 2021)		19985
Total population surveyed – Total persons (all ages)		2,239
Total U2 surveyed		197
Total U5 surveyed		448
Average household size		5.9
Household size categories	1-4 person(s)	31.4%
	5-6 persons	29.8%
	7-9 persons	28.0%
	≥ 10 persons	10.8%
Household composition	Children under two	0.5

	Children under five	1.2
	Children aged 5-14 years	2.0
	Members aged 15-64 years	2.6
	Members aged 65 years and above	0.1
Percent of children U2	%	8.8%
Percent of children U5	%	20.0%
Percent pregnant women (15-49 years)	%	1.9%
Percent of elders (65 years and above)	%	1.8%
Sex ratio	Male/Female	0.94

There are more women than men investigated, and the average household size is 5.9.

Figure 38. Population Pyramid of refugee population – Gendrassa refugee camp



The population pyramid is strongly lean to children under 15 years old. Among children and teenagers up to 19 years old, males are more than females. However, among refugees from 20 to 59 years old, there were more females than males.

Household head profile

Table 142. Household head profile – Gendrassa refugee camp

	Number/total	% (95% CI)
Female headed households (working age 15-64 years)	191/379	50.4% (45.4-55.4)
Male headed households (working age 15-64 years)	162/379	42.7% (37.9-47.8)
Children headed households (under 15 years)	0/379	0.0% (0.0-0.0)

Elderly headed households (65 years and above)	26/379	6.9% (4.7-9.9)
Mean age of household head in years (SD) [range]	40.8 (13.2) [20.0-79.0]	

Half of the household are headed by female, followed by male, and with small portions headed by elderly.

Age dependency ratio

Table 143. Age dependency ration categories by household – Gendrassa refugee camp

Age dependency categories		Age dependency ratio	Number / Total	% (95% CI)
Category I	1 dependent or less per non-dependent member	≤ 1	155/375	41.3% (36.5-46.4)
Category II	Up to 3 dependents per 2 non- dependent members	1.1-1.5	67/375	17.9% (14.3-22.1)
Category III	Up to 2 dependents per non-dependent members (1.5<DR<=2)	1.6-2.0	72/375	19.2% (15.5-23.5)
Category IV	More than 2 dependents per non- dependent members (DR>2)	≥2.1	81/375	21.6% (17.7-26.0)
Mean age dependency ration		Mean (SD) [range]	375	1.6 (1.2) [0.0-6.0]

There are 21.6% households which had more than 2 dependents per non-dependent members, which is a high proportion.

3.3.8. Food security

Access to food assistance

Table 144. Food assistance ration card and cash coverage – Gendrassa refugee camp

	Number/total	% (95% CI)
Proportion of households with a ration card	192/192	100% (98.1-100, 95% CI)
Proportion of households receiving cash grants	192/192	100% (98.1-100, 95% CI)

All the surveyed households in Gendrassa refugee camp had ration cards and have been receiving food assistance and cash grants.

Table 145. Reported duration of general food ration – Gendrassa refugee camp

	Number/total	% (95% CI)
Average number of days general food ration lasts out days (SD) [range]	192	14.2 (5.1) [3-28]

The food received from GFD was reported to last 14.2 days out of the distribution cycle of 30 days.

Table 146. Description of utilisation of cash assistance – Gendrassa refugee camp

Proportion of households that use cash grants for:	Number/total	% (95% CI)
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Food	162/192	84.4% (78.5-89.2)
Water	2/192	1.0% (0.1-3.7)
Hygiene items, clothes, shoes	110/192	57.3% (50.0-64.4)
Health costs (including medicines)	29/192	15.1% (10.4-21.0)
Rent, shelter repair, household items (e.g mattress, blankets, jerrycan), utilities and bills (e.g. electricity, water bills, phone calling credit)	9/192	4.7% (2.2-8.7)
Firewood / fuel for cooking or heating	60/192	31.3% (24.8-38.3)
Assets for a livelihood activity (e.g. seeds, tools, farming, fishing, petty trade, etc.)	7/192	3.7% (1.5-7.4)
Debts repayment	27/192	14.1% (9.5-19.8)
Saved some money, gave some to other family members, relatives, friends	1/192	0.5% (0.0-2.9)
Education (e.g. school fees, uniform, books)	5/192	2.6% (0.9-6.0)
Other	2/192	1.0% (0.1-3.7)

Most families reported that the spent money received from cash grants on food, followed by hygiene items (e.g., cloths), fuel for cooking, health, and debts repayment.

Coverage of basic needs

Table 147. Description of basic needs not met by the households – Gendrassa refugee camp

Basic needs not met by the households:	Number/total	% (95% CI)
Food	131/192	68.2% (61.1-74.8)
Water	0/192	0.0% (0.0-1.9)
Hygiene items, clothes, shoes	122/192	63.5% (56.3-70.4)
Health costs (including medicines)	12/192	6.3% (3.3-10.7)
Rent, shelter repair, household items (e.g. mattress, blankets, jerrycan), utilities and bills (e.g. electricity, water bills, phone calling credit)	29/192	15.1% (10.4-21.0)
Firewood / fuel for cooking or heating	32/192	16.8% (11.7-22.7)
Assets for a livelihood activity (e.g. seeds, tools, farming, fishing, petty trade, etc.)	16/192	8.3% (4.8-13.2)
Debts repayment	11/192	5.7% (2.9-10.0)
Saved some money, support other family members, relatives, friends	5/192	2.6% (0.9-6.0)
Education (e.g. school fees, uniform, books)	5/192	2.6% (0.9-6.0)
Other	10/192	5.2% (2.5-9.4)

The category of basic needs that cannot be met reported the most are: food, hygiene items, fuel for cooking, and rent/shelter repair/household items.

Table 148. Households by categories of coverage of basic needs – Gendrassa refugee camp

Proportion of households in each category of coverage of basic needs	Number/total	% (95% CI)
All basic needs are met (100%)	0/192	0.0% (0.0-1.5)
More half basic needs are met (>50%)	192/192	100.0% (98.1-100.0)
Few basic needs are met (<50%)	0/192	0.0% (0.0-1.5)
Basic needs are not met (0%)	0/192	0.0% (0.0-1.5)

All households reported more than half of their basic needs are met.

Negative household coping strategies

From April 2021, GFD ration was reduced to 50% in all refugees in Maban camps. Food basket consists of cereals provided at 100% in kind, lentils at 75% as inkind and 25% cash, cooking oil at 50% each as inkind and cash, and cash for milling and salt at 100%. The cash transfer value varies from one month to other depending on market assessment conducted report from the prices of commodities prior to the GFD. To fill the food gaps, some refugees in the camp had to use the below coping strategies.

Table 149. Coping strategies used by the surveyed population over the past month – Gendrassa refugee camp

	Number/total	% (95% CI)
Proportion of households reporting using the following coping strategies over the past month*:		
Rely on less preferred and/or less expensive foods	192/192	100.0% (98.1-100)
Borrow food, or rely on help from a friend or relative	179/192	93.2% (88.7-96.4)
Reduce the number of meals eaten in a day	190/192	99.0% (96.3-99.9)
Limit portion sizes at mealtime	187/192	97.4% (94.0-99.1)
Reduce consumption by adults so children could eat	166/192	86.5% (80.8-91.0)
Average rCSI (mean, SD / range)	192	24.0 (9.2) [2-56]
Proportion of households reporting using none of the negative coping strategies over the past month	0/192	0.0% (0.0-1.9)

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

All surveyed households were 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.

Food Consumption Score (FCS)

During the survey, Sept 2021 GFD cycle was considered the last general food distribution prior to the survey. The survey was carried when Oct 2021 GFD cycle has just been completed in Gendrassa refugee camp. The survey was conducted during the annual harvest season, during which the overall

food availability is better than other times. It is hence likely that the food consumption score is higher than it would be e.g., lean season.

Table 150. Food consumption score by category and average FCS – Gendrassa refugee camp

FCS profiles	Number/total	% (95% CI)
Acceptable (FCS > 35)	96/192	50.0% (42.7-57.3)
Borderline (21.5≤FCS≤35)	63/192	32.8% (26.2-39.9)
Poor (FCS≤21)	33/192	17.2% (12.1-23.3)
Average FCS (SD) [range]	192	34.4 (13.4) [1.5-86.5]

*Maximum FCS is 112.

The average FCS among refugees in Gendrassa camp was 34.4 out of total score of 112, which falls into the borderline category. This is echoed by the majority of households had a FCS score classified as borderline.

Table 151. Consumption frequency categories of each nutrient rich food groups (FCS-N) – Gendrassa refugee camp

Nutrient rich food groups	Consumption frequency categories	Number/total	% (95% CI)
Vitamin A rich foods	Never	10/192	5.2% (2.5-9.4)
	Sometimes	88/192	45.8% (38.6-53.2)
	At least daily	94/192	49.0% (41.7-56.3)
Protein rich foods	Never	18/192	9.4% (5.7-14.4)
	Sometimes	78/192	40.6% (33.6-47.9)
	At least daily	96/192	50.0% (42.7-57.3)
Haem iron rich foods	Never	55/192	28.7% (22.4-35.6)
	Sometimes	127/192	66.2% (59.0-72.8)
	At least daily	10/192	5.2% (2.5-9.4)

In terms of the nutrient rich food, 94.8% households reported consumed Vitamin A rich foods (sometimes or daily), 90.6% reported consumed protein rich foods, while 71.4% reported consumed Haem iron rich foods.

Table 152. Food acquisition sources – Gendrassa refugee camp

Food acquisition sources	Number/total	% (95% CI)
Purchase (using cash grants and/or with their own cash)	98/192	51.0% (43.7-58.3)
Own production (crops, livestock, fishing/ hunting, gathering)	20/192	10.4% (6.5-15.6)
Traded goods/services, barter	37/192	19.3% (14.0-25.6)
Borrowed (loan/credit from traders)	30/192	15.6% (10.8-21.6)
Received as gift (from family relatives or friends/neighbour)	6/192	3.1% (1.2-6.7)
In-kind or voucher based food	1/192	0.5% (0.0-2.9)

assistance		
Other	0/192	0.0% (0.0-1.9)

3.4. FROM KAYA REFUGEE CAMP, SOUTH SUDAN

A percentage coverage of 133% of the targeted children 6-59 months in Kaya refugee camp were surveyed (target 326 and surveyed 433). All the children who participated in the survey were considered using either available official age documentation or age estimation from local context calendar of event developed to estimate the age. Of the total surveyed children 6-59 months in Doro refugee camp, 79% had official age documentation.

Table 153. Distribution of age and sex of sample - Kaya refugee camp.

AGE (mo)	Boys		Girls		Total		Ratio
	no.	%	no.	%	no.	%	Boy:girl
6-17	44	38.9	69	61.1	113	26.1	0.6
18-29	47	49.5	48	50.5	95	21.9	1.0
30-41	39	40.2	58	59.8	97	22.4	0.7
42-53	51	53.1	45	46.9	96	22.2	1.1
54-59	19	59.4	13	40.6	32	7.4	1.5
Total	200	46.2	233	53.8	433	100.0	0.9

The overall sex ratio of boys: girls was 0.9 indicating that both sexes were equally represented.

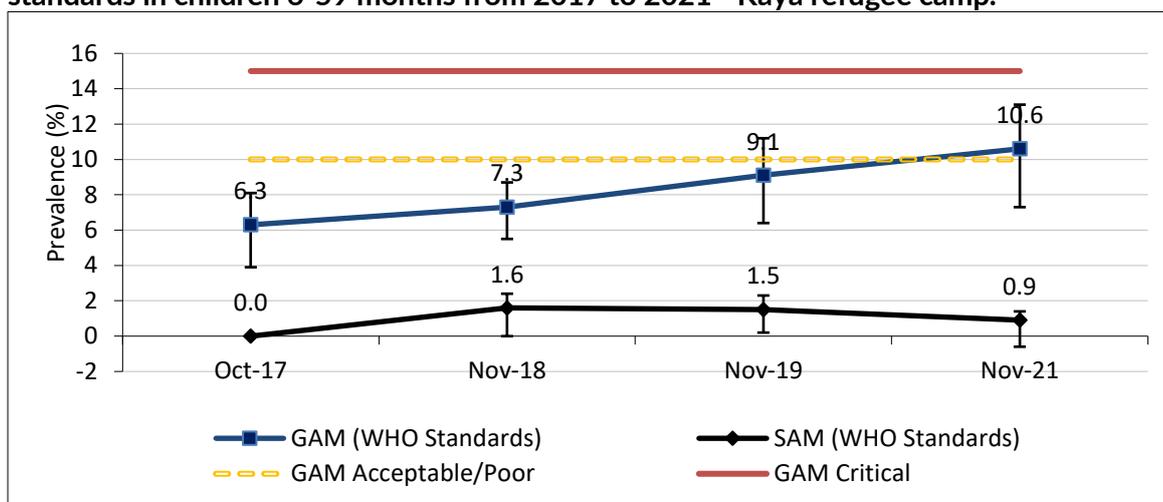
3.4.1. Anthropometry

Table 154. Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex - Kaya refugee camp.

	All n = 433	Boys n = 200	Girls n = 233
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(46) 10.6 % (8.1 - 13.9 95% C.I.)	(19) 9.5 % (6.2 - 14.4 95% C.I.)	(27) 11.6 % (8.1 - 16.3 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(42) 9.7 % (7.3 - 12.9 95% C.I.)	(19) 9.5 % (6.2 - 14.4 95% C.I.)	(23) 9.9 % (6.7 - 14.4 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(4) 0.9 % (0.4 - 2.4 95% C.I.)	(0) 0.0 % (0.0 - 1.9 95% C.I.)	(4) 1.7 % (0.7 - 4.3 95% C.I.)

The prevalence of oedema was 0.0% and the data excluded SMART flags. The prevalence of acute malnutrition based on WFH z-score and/or oedema and by sex, showed no significant difference based on the C.I indicated between boys and girls. Both sexes were equally wasted.

Figure 39. Trends in the prevalence of global and severe acute malnutrition based on WHO Growth standards in children 6-59 months from 2017 to 2021 - Kaya refugee camp.

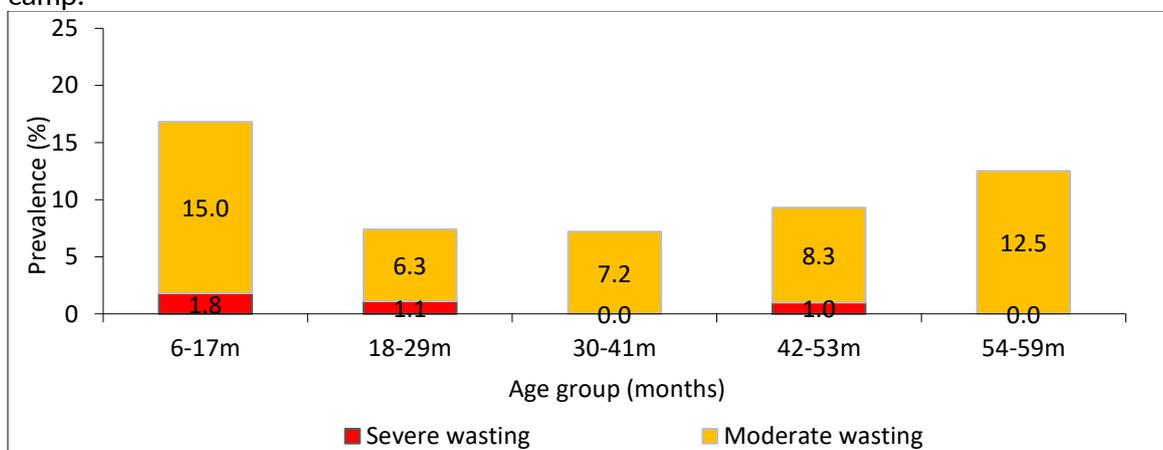


The prevalence of Global and severe Acute Malnutrition in Kaya refugee camp has showed slight increase in 2021 as compared to 2019. However, the increase being statistically insignificant but indicating a deteriorating trend.

Table 155. Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema - Kaya refugee camp.

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	113	2	1.8	17	15.0	94	83.2	0	0.0
18-29	95	1	1.1	6	6.3	88	92.6	0	0.0
30-41	97	0	0.0	7	7.2	90	92.8	0	0.0
42-53	96	1	1.0	8	8.3	87	90.6	0	0.0
54-59	32	0	0.0	4	12.5	28	87.5	0	0.0
Total	433	4	0.9	42	9.7	387	89.4	0	0.0

Figure 40. Trend in the prevalence of MAM and SAM by age in children 6-59 months - Kaya refugee camp.

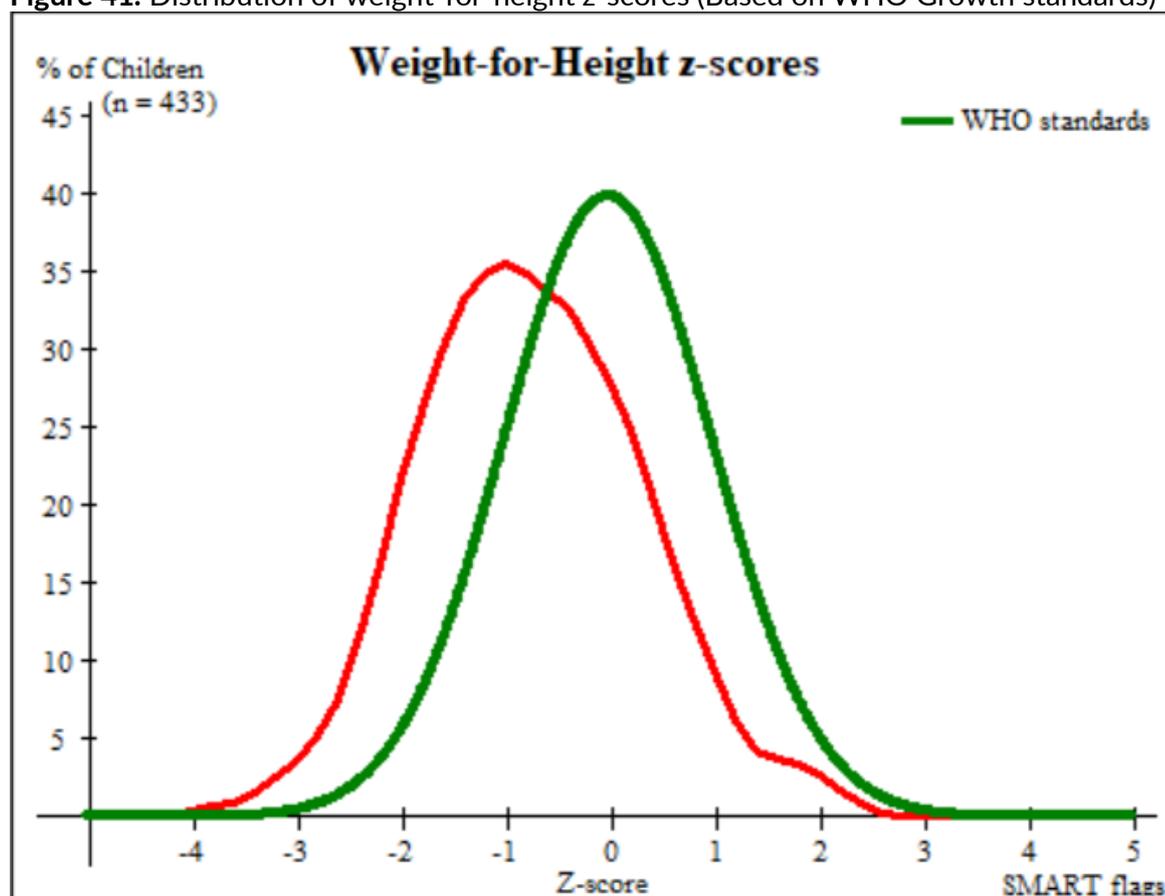


Children 6-17 months are the most affected age group by wasting indicating higher vulnerability in this age category.

Table 156. Distribution of acute malnutrition and oedema based on weight-for-height z-scores - Kaya refugee camp.

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor. 0 (0.0 %)	Kwashiorkor. 0 (0.0 %)
Oedema absent	Marasmic No. 4 (0.9 %)	Not severely malnourished. 429 (99.1 %)

Figure 41. Distribution of weight-for-height z-scores (Based on WHO Growth standards)



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

Table 157. Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex - Kaya refugee camp.

	All n = 433	Boys n = 200	Girls n = 233
Prevalence of global malnutrition (< 125 mm and/or oedema)	(15) 3.5 % (2.1 - 5.6 95% C.I.)	(3) 1.5 % (0.5 - 4.3 95% C.I.)	(12) 5.2 % (3.0 - 8.8 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(14) 3.2 % (1.9 - 5.4 95% C.I.)	(2) 1.0 % (0.3 - 3.6 95% C.I.)	(12) 5.2 % (3.0 - 8.8 95% C.I.)

Prevalence of severe malnutrition (< 115 mm and/or oedema)	(1) 0.2 % (0.0 - 1.3 95% C.I.)	(1) 0.5 % (0.1 - 2.8 95% C.I.)	(0) 0.0 % (0.0 - 1.6 95% C.I.)
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Girls are the most affected compared to boys by the acute malnutrition defined by MUAC.

MUAC is being used in the community to monitor malnutrition trends and for admissions and discharge in the therapeutic and supplementary feeding nutrition programmes. It's a good indicator of risk of mortality in children under five and is easy to do. However, as seen from the above table comparing to the GAM/SAM prevalence defined by weight-for-height, the MUAC results are much lower, which indicate the potential leave-out of children by using only MUAC as the admission criterion.

Table 158. Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema - Kaya refugee camp.

		Severe wasting (< 115 mm)		Moderate wasting (≥ 115 mm and < 125 mm)		Normal (≥ 125 mm)		Oedema	
Age (mo)	Total no.	No.	%	No.	%	No.	%	No.	%
6-17	113	1	0.9	13	11.5	99	87.6	0	0.0
18-29	95	0	0.0	1	1.1	94	98.9	0	0.0
30-41	97	0	0.0	0	0.0	97	100.0	0	0.0
42-53	96	0	0.0	0	0.0	96	100.0	0	0.0
54-59	32	0	0.0	0	0.0	32	100.0	0	0.0
Total	433	1	0.2	14	3.2	418	96.5	0	0.0

Children 6-17 months are the most affected by wasting measured by MUAC.

Table 159. Prevalence of underweight based on weight-for-age z-scores by sex - Kaya refugee camp.

	All n = 432	Boys n = 199	Girls n = 233
Prevalence of underweight (< -2 z-score)	(88) 20.4 % (16.8 - 24.4 95% C.I.)	(48) 24.1 % (18.7 - 30.5 95% C.I.)	(40) 17.2 % (12.9 - 22.5 95% C.I.)
Prevalence of moderate underweight (< -2 z-score and ≥ -3 z-score)	(77) 17.8 % (14.5 - 21.7 95% C.I.)	(43) 21.6 % (16.5 - 27.8 95% C.I.)	(34) 14.6 % (10.6 - 19.7 95% C.I.)
Prevalence of severe underweight (< -3 z-score)	(11) 2.5 % (1.4 - 4.5 95% C.I.)	(5) 2.5 % (1.1 - 5.7 95% C.I.)	(6) 2.6 % (1.2 - 5.5 95% C.I.)

Table 160. Prevalence of underweight by age, based on weight-for-age z-scores - Kaya refugee camp.

		Severe underweight (< -3 z-score)		Moderate underweight (≥ -3 and < -2 z- score)		Normal (≥ -2 z score)		Oedema	
Age (mo)	Total no.	No.	%	No.	%	No.	%	No.	%
6-17	112	7	6.3	15	13.4	90	80.4	0	0.0
18-29	95	2	2.1	19	20.0	74	77.9	0	0.0

30-41	97	0	0.0	20	20.6	77	79.4	0	0.0
42-53	96	2	2.1	16	16.7	78	81.3	0	0.0
54-59	32	0	0.0	7	21.9	25	78.1	0	0.0
Total	432	11	2.5	77	17.8	344	79.6	0	0.0

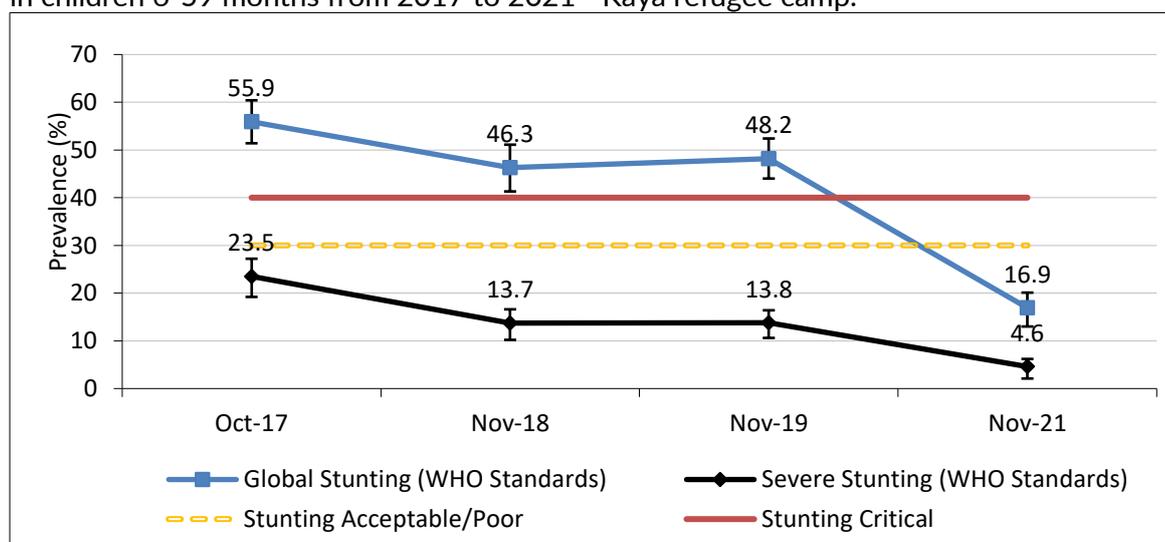
Children in age group of 18-29 months are the most underweight.

Table 161. Prevalence of stunting based on height-for-age z-scores and by sex - Kaya refugee camp.

	All n = 431	Boys n = 198	Girls n = 233
Prevalence of stunting (< -2 z-score)	(73) 16.9 % (13.7 - 20.8 95% C.I.)	(42) 21.2 % (16.1 - 27.4 95% C.I.)	(31) 13.3 % (9.5 - 18.3 95% C.I.)
Prevalence of moderate stunting (< -2 z-score and ≥ -3 z-score)	(53) 12.3 % (9.5 - 15.7 95% C.I.)	(29) 14.6 % (10.4 - 20.2 95% C.I.)	(24) 10.3 % (7.0 - 14.9 95% C.I.)
Prevalence of severe stunting (< -3 z-score)	(20) 4.6 % (3.0 - 7.1 95% C.I.)	(13) 6.6 % (3.9 - 10.9 95% C.I.)	(7) 3.0 % (1.5 - 6.1 95% C.I.)

Boys are the most affected by stunting than girls.

Figure 42. Trends in the prevalence of global and severe stunting based on WHO Growth standards in children 6-59 months from 2017 to 2021 - Kaya refugee camp.



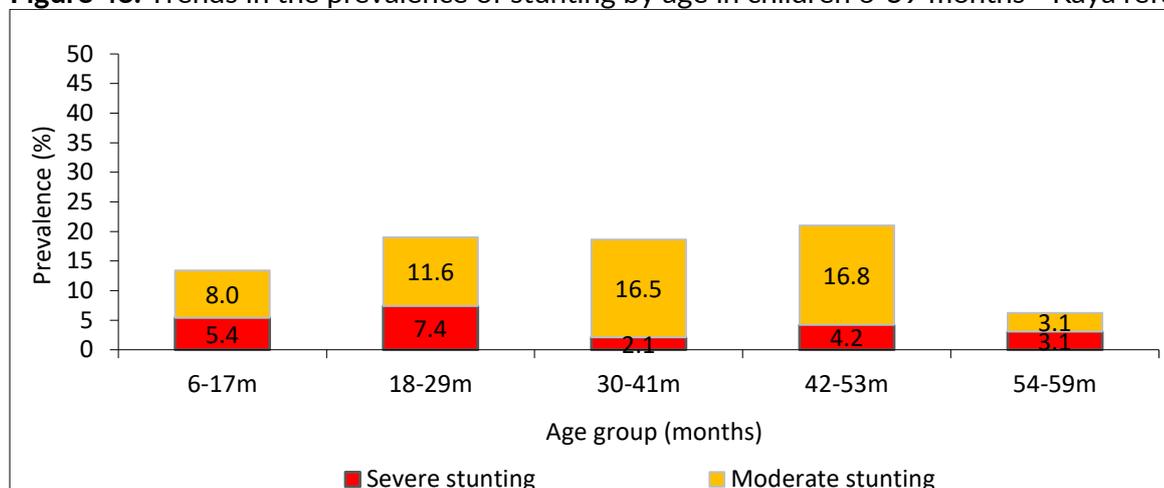
Significant reduction in global stunting was noted in 2021 in Kaya refugee camp as compared to 2019 and it has dropped to the poor range level.

Table 162. Prevalence of stunting by age based on height-for-age z-scores - Kaya refugee camp.

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	112	6	5.4	9	8.0	97	86.6
18-29	95	7	7.4	11	11.6	77	81.1
30-41	97	2	2.1	16	16.5	79	81.4

42-53	95	4	4.2	16	16.8	75	78.9
54-59	32	1	3.1	1	3.1	30	93.8
Total	431	20	4.6	53	12.3	358	83.1

Figure 43. Trends in the prevalence of stunting by age in children 6-59 months - Kaya refugee camp.



Children in age group of 42-53 months are the most affected by stunting and followed by children age group of 18-29 months.

Table 163. Prevalence of overweight based on weight for height cut offs and by sex (no oedma) - Kaya refugee camp.

	All n = 433	Boys n = 200	Girls n = 233
Prevalence of overweight (WHZ > 2)	(3) 0.7 % (0.2 - 2.0 95% C.I.)	(1) 0.5 % (0.1 - 2.8 95% C.I.)	(2) 0.9 % (0.2 - 3.1 95% C.I.)
Prevalence of severe overweight (WHZ > 3)	(0) 0.0 % (0.0 - 0.9 95% C.I.)	(0) 0.0 % (0.0 - 1.9 95% C.I.)	(0) 0.0 % (0.0 - 1.6 95% C.I.)

Table 164. Prevalence of overweight by age, based on weight for height (no oedema) - Kaya refugee camp.

Age (mo)	Total no.	Overweight (WHZ > 2)		Severe Overweight (WHZ > 3)	
		No.	%	No.	%
6-17	113	2	1.8	0	0.0
18-29	95	1	1.1	0	0.0
30-41	97	0	0.0	0	0.0
42-53	96	0	0.0	0	0.0
54-59	32	0	0.0	0	0.0
Total	433	3	0.7	0	0.0

Table 165. Mean z-scores, design effects and excluded subjects - Kaya refugee camp.

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	433	-0.76±1.05	1.00	0	0
Weight-for-Age	432	-1.21±0.93	1.00	0	1
Height-for-Age	431	-1.22±0.92	1.00	0	2

* contains for WHZ and WAZ the children with edema.

3.4.2. Feeding Programme Enrollment Coverage

Selective feeding programme

Table 166. Nutrition treatment programme enrolment rate based on all admission criteria (weight-for-height, MUAC, oedema) - Kaya refugee camp.

	Number/total	% (95% CI)
Proportion of children aged 6-59 months with severe acute malnutrition currently enrolled in therapeutic feeding programme*	2/5	40% (5.3-85.3)
Proportion of children aged 6-59 months with moderate acute malnutrition currently enrolled in supplementary feeding programme*	13/50	26.0% (14.6-40.3)

Table 167. Nutrition treatment programme enrolment rate based on MUAC and oedema only - Kaya refugee camp.

	Number/total	% (95% CI)
Proportion of children aged 6-59 months with severe acute malnutrition currently enrolled in therapeutic feeding programme	1/1	100% (2.5-100%)
Proportion of children aged 6-59 months with moderate acute malnutrition currently enrolled in therapeutic feeding programme	11/14	78.6% (49.2-95.3)

The OTP and TSFP enrolment rate based on both all admission criteria did not meet the standard of ≥ 90% while using MUAC and Oedema the enrolment rate was within standard in the OTP. However, in general, the enrolment rate by only MUAC and Oedema were higher than all admission criteria indicated more children enrolled in the program were identified by MUAC only.

Table 168. BSFP enrollment coverage for children 6-23 months - Kaya refugee camp.

	Number/Total	% (95% CI)
Blanket feeding programme enrolment	129/163	79.1% (72.1-85.1)
Product name	Lipid based Nutrient Supplements-MQ	
Target age group	6-23 months	

The BSFP enrollment coverage for children aged 6-23 months in Kaya refugee camp was 79.1%.

3.4.3. Measles, Vitamin A, Diarrhoea, and Dworming

Measles vaccination coverage results

Table 169. Measles vaccination coverage for children aged 9-59 months (N=406) - Kaya refugee camp.

	Number/total	% (95% CI)
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Measles vaccination with card	262/406	64.5% (59.8-69.0)
Measles vaccination with card or confirmation from mother	406/406	100.0% (100)

Measles vaccination coverage in Kaya refugee camp was 100.0% and this met the standard of $\geq 95\%$.

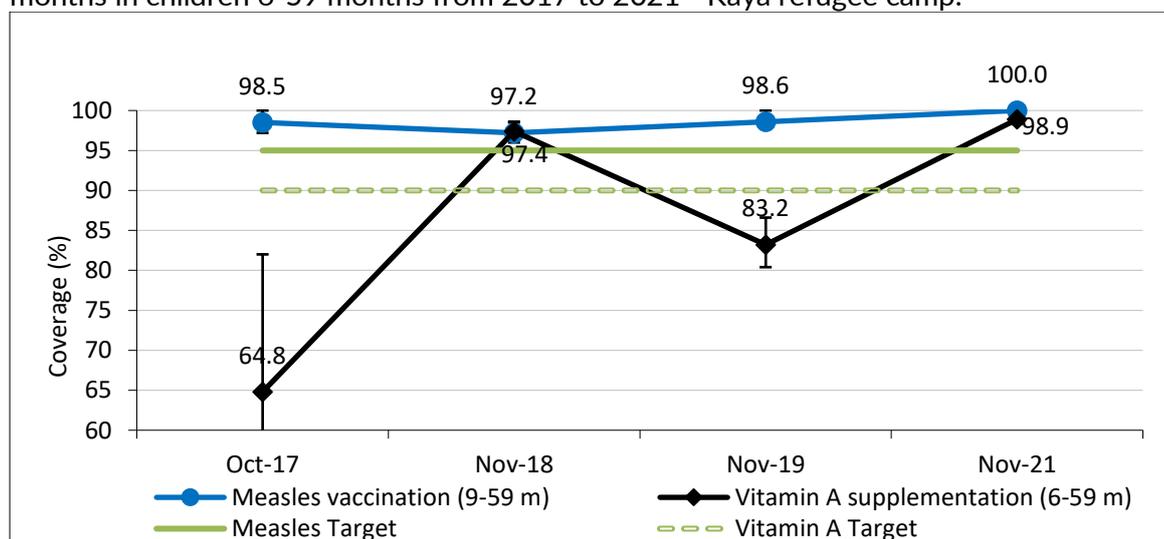
Vitamin A supplementation coverage results

Table 170. Vitamin A supplementation for children aged 6-59 months within past 6 months (N= 433) - Kaya refugee camp.

	Number/total	% (95% CI)
Vitamin A supplementation in the last 6 months with card	43/433	9.3% (7.5-13.1)
Vitamin A supplementation in the last 6 months with card or confirmation from mother	428/433	98.9% (97.3-99.5)

Vitamin A supplementation coverage in Kaya refugee camp met the standard of $>90\%$

Figure 44. Trends in the coverage of measles vaccination and Vitamin A supplementation in last 6 months in children 6-59 months from 2017 to 2021 - Kaya refugee camp.



Diarrhoea Results

Table 171. Period Prevalence of Diarrhoea - Kaya refugee camp.

	Number/total	% (95% CI)
Diarrhoea in the last two weeks	40/433	9.2% (6.7-12.3)

Table 172. Use of ORS and Zinc during diarrhoea episode - Kaya refugee camp

	Number/total	% (95% CI)
ORS use during diarrhoea episode	38/40	95.0% (83.1-99.4)
Zinc tablet or syrup use during diarrhoea episode	38/40	95.0% (83.1-99.4)

Deworming

Table 173. Deworming coverage - Kaya refugee camp.

	Number/total	% (95% CI)
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Children received a deworming tablet in the last six months (12-59 months)	356/377	94.4% (91.6-96.3)
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94.7% of children 12-59 months received a deworming tablet in last 6 months prior to the survey in Kaya refugee camp. The coverage met the standard of ($\geq 75\%$).

3.4.4. Anaemia Results Children 6 - 59 months

The total anaemia prevalence among children 6 to 59 months in Kaya refugee camp is of medium public health significance at 39.0% (34.6-43.7 95% CI). Children aged 6 to 23 months are the most affected compared to the 24-59 months age group.

Table 174. 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.

	6-59 months n = 433	6-23 months n=163	24-59 months n=270
Total Anaemia (Hb<11.0 g/dL)	(169) 39.0% (34.6-43.7 95% CI)	(100) 61.4% (53.4-68.9; 95% CI)	(69) 25.6% (20.5-31.1; 95% CI)
Mild Anaemia (Hb 10.0-10.9 g/dL)	(105) 24.3% (20.5-28.5 95% CI)	(53) 32.5% (25.4-40.3; 95% CI)	(52) 19.3% (14.7-24.5; 95% CI)
Moderate Anaemia (7.0-9.9 g/dL)	(63) 14.6% (11.5-18.2 95% CI)	(46) 28.2% (21.5-35.8; 95% CI)	(17) 6.3% (3.7-9.9; 95% CI)
Severe Anaemia (<7.0 g/dL)	(1) 0.2% (0.04-1.3 95% CI)	(1) 0.6% (0.0-3.4)	(0) 0.0% (0.0-0.0; 95% CI)
Mean Hb (g/dL) (SD / 95% CI) [range]	11.2 (1.3) [6.0-14.5]	10.6 (1.3) [6.0-13.6]	11.6 (1.1) [7.8-14.5]

Figure 45. Trends in anaemia categories in children 6-59 months from 2017 to 2021 - Kaya refugee camp.

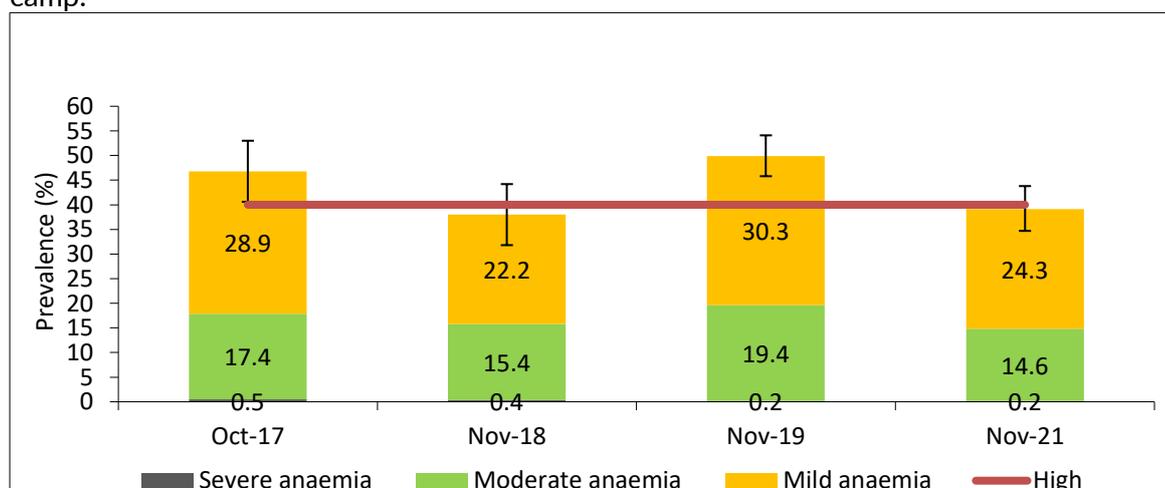
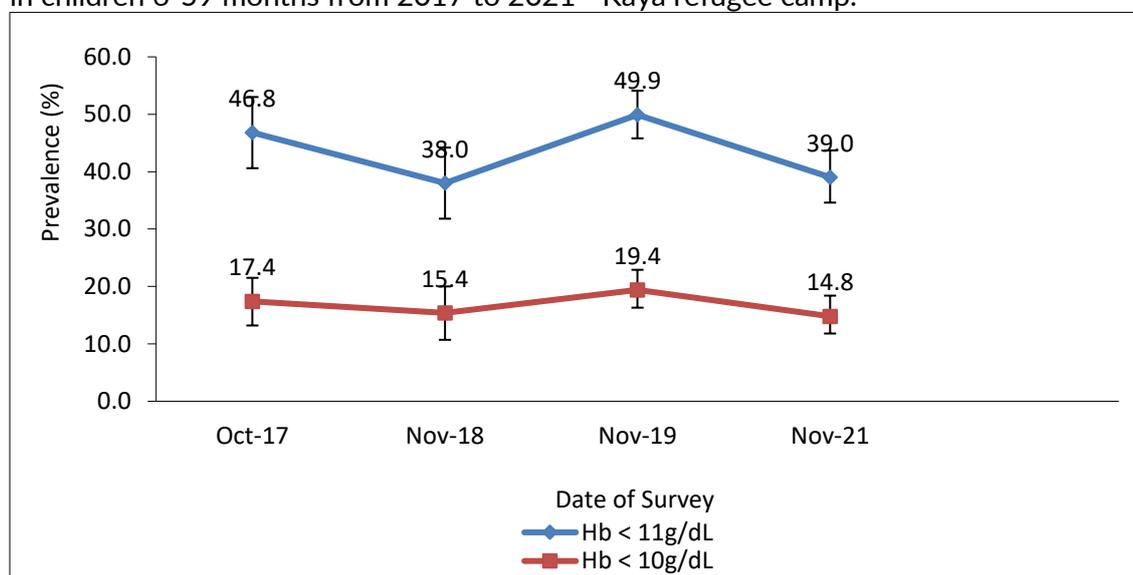


Table 175. Prevalence of moderate and severe anaemia in children 6-59 months of age and by age group - Kaya refugee camp.

	6-59 months	6-23 months	24-59 months
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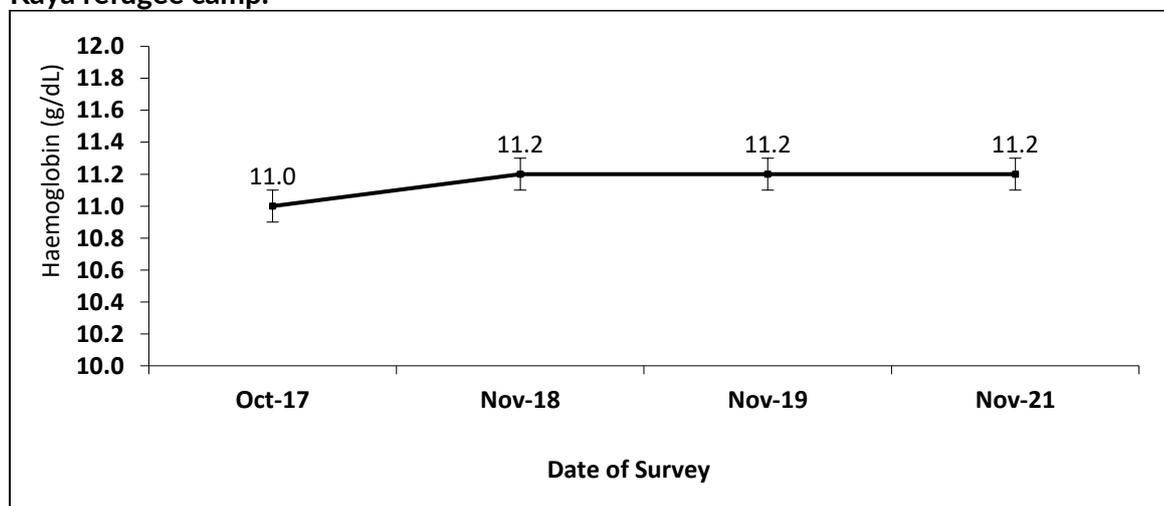
	n = 433	n= 163	n= 270
Moderate and Severe Anaemia (Hb<10.0 g/dL)	(64) 14.8% (11.8-18.4; 95% CI)	(47) 28.8% (22.0-36.4; 95% CI)	(17) 6.3% (3.7-9.9; 95% CI)

Figure 46. Trend in total anaemia (<11 g/dl), and moderate and severe anaemia (<10 g/dl) with 95% ci in children 6-59 months from 2017 to 2021 - Kaya refugee camp.



The anaemia prevalence in 2021 decreased significantly as compared to 2019.

Figure 47. Trend in Mean Haemoglobin Concentration in Children 6-59 Months from 2017 to 2021 - Kaya refugee camp.



3.4.5. Infant and Young Child Feeding (IYCF)

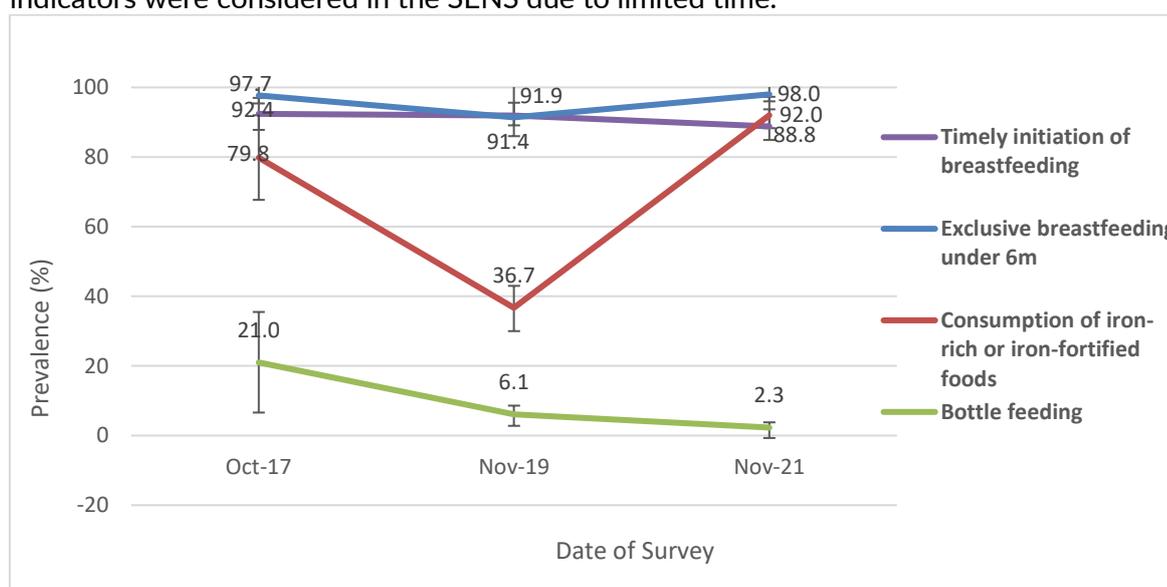
Key IYCF indicators

Table 176. Prevalence of Infant and Young Child Feeding Practices Indicators - Kaya refugee camp.

Indicator	Age range	Number/ total	Prevalence (%)	95% CI
Timely initiation of breastfeeding	0-23 months	191/215	88.8	(88.9-92.7)

Exclusive breastfeeding under 6 months	0-5 months	50/51	98.0	(89.6-100)
Continued breastfeeding at 1 year	12-15 months	32/33	97.0	(84.2-99.9)
Continued breastfeeding at 2 years	20-23 months	23/35	65.7	(47.8-80.9)
Introduction of solid, semi-solid or soft foods	6-8 months	15/27	55.6	(35.3-74.5)
Consumption of iron-rich or iron-fortified foods	6-23 months	150/163	92.0	(86.8-95.7)
Bottle feeding	0-23 months	5/215	2.3	(0.8-5.3)

Figure 48. Key IYCF indicators from 2017 to 2021 - Kaya refugee camp. Note: in 2018 no IYCF indicators were considered in the SENS due to limited time.



Prevalence of Intake

Infant Formula

Table 177. Infant formula intake in children aged 0-23 months - Kaya refugee camp.

	Number/total	% (95% CI)
Proportion of children aged 0-23 months who receive infant formula (fortified or non-fortified)	7/215	3.3% (1.3-6.6)

Table 178. Fortified Blended Foods (CSB+) intake in children aged 6-23 months - Kaya refugee camp.

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive CSB+	0/140	0

Table 179. Fortified Blended Foods (CSB++) intake in children aged 6-23 months - Kaya refugee camp.

	Number/total	% (95% CI)
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Proportion of children aged 6-23 months who receive CSB++	43/163	26.4% (19.8-33.8)
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Table 180. Lipid based Nutrient Supplements intake in children aged 6-23 months - Kaya refugee camp.

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive LNS	145/163	89.0% (83.1-93.3)

Table 181. Micronutrient powder intake in children aged 6-23 months - Kaya refugee camp.

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive MNP	14/162	8.6% (4.8-14.1)

3.4.6. Anaemia Women 15-49 Years

Table 182. Women Physiological Status and Age - Kaya refugee camp.

Physiological status	Number/total	% of sample
Non-pregnant	159/283	56.2% (50.2-62.1)
Pregnant	29/283	10.3% (7.0-14.4)
Mean age (range)	27.3 years (9.4) [15.0-49.0]	

Table 183. Prevalence of anaemia and haemoglobin concentration in non-pregnant women of reproductive age (15-49 years) - Kaya refugee camp.

Anaemia in non-pregnant women of reproductive age (15-49 years)	All n =254
Total Anaemia (<12.0 g/dL)	(41) 16.1% (11.8-21.3; 95% CI)
Mild Anaemia (11.0-11.9 g/dL)	(27) 10.6% (7.1-15.1; 95% CI)
Moderate Anaemia (8.0-10.9 g/dL)	(14) 5.5% (3.1-9.1; 95% CI)
Severe Anaemia (<8.0 g/dL)	(0) 0.0% (0.0-0.0; 95% CI)
Mean Hb (g/dL) (SD / 95% CI) [range]	13.2 (1.2) [9.5-16.2]

Figure 49. Trends in anaemia categories in women of reproductive age (non-pregnant) from 2017 to 2021 - Kaya refugee camp.

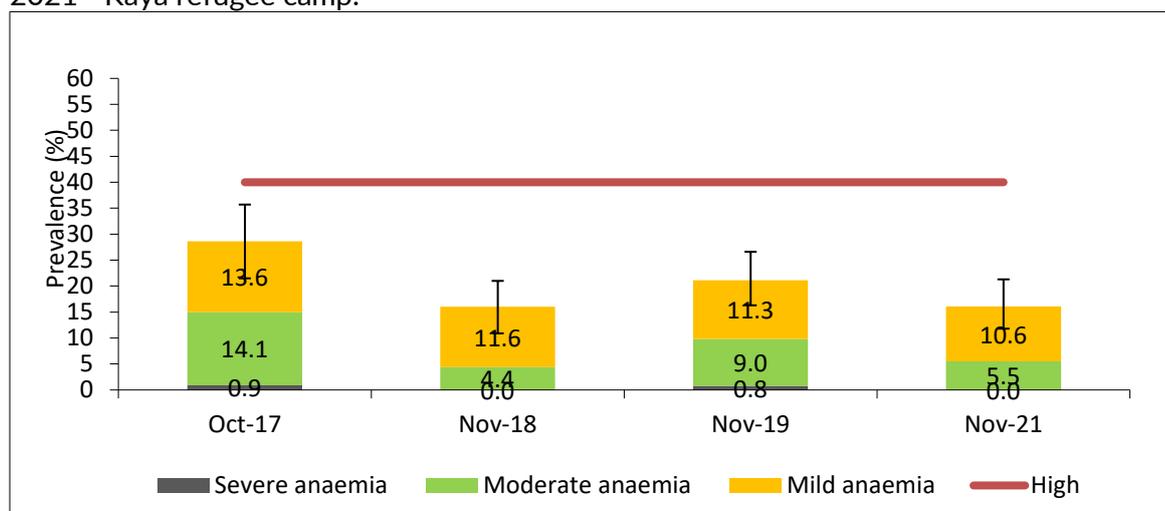


Table 184. ANC Enrolment and Iron-Folic Acid Pills Coverage among Pregnant Women (15-49 Years) - Kaya refugee camp.

	Number /total	% (95% CI)
Currently enrolled in ANC programme	27/29	93.1% (77.2-99.2; 95% CI)
Currently receiving iron-folic acid pills	27/29	93.1% (77.2-99.2; 95% CI)

Table 185. BSFP enrollment coverage among pregnant and lactating women (15-49 years) - Kaya refugee camp

	Number /total	% (95% CI)
Blanket feeding programme enrollment	41/50	82.0% (68.6-91.4)

3.4.7. Demography

Household size and composition

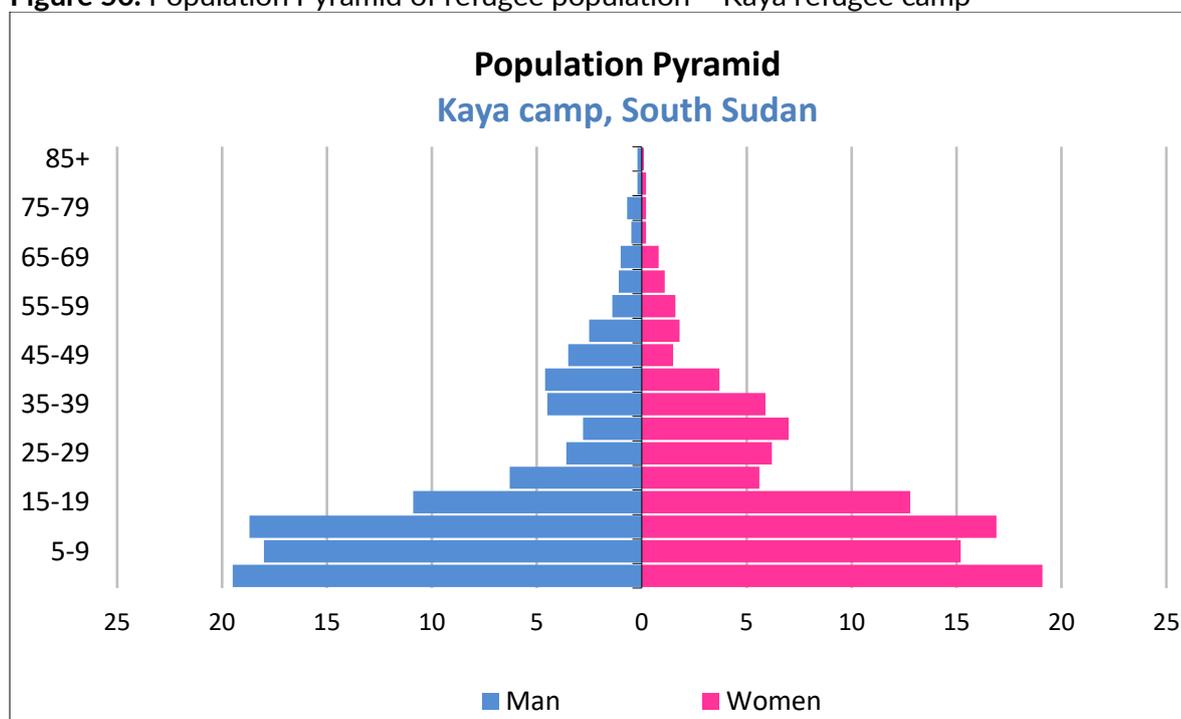
Table 186. Demographic characteristics, household size and composition of the surveyed population - Kaya refugee camp

Household size and composition		Results
Population size – Total persons (ProGres 31st July 2021)		26273
Total population surveyed – Total persons (all ages)		2,540
Total U2 surveyed		220
Total U5 surveyed		491
Average household size		5.9
Household size categories	1-4 person(s)	30.5%
	5-6 persons	27.9%
	7-9 persons	34.0%
	≥ 10 persons	7.6%

Household composition	Children under two	0.5
	Children under five	1.1
	Children aged 5-14 years	2.0
	Members aged 15-64 years	2.6
	Members aged 65 years and above	0.1
Percent of children U2	%	8.7%
Percent of children U5	%	19.3%
Percent pregnant women (15-49 years)	%	1.7%
Percent of elders (65 years and above)	%	2.0%
Sex ratio	Male/Female	0.94

There are more women than men investigated, and the average household size is 5.9.

Figure 50. Population Pyramid of refugee population – Kaya refugee camp



The population pyramid is strongly lean to children under 15 years old. Among children and teenagers up to 19 years old, males are more than females. However, among refugees from 20 to 59 years old, there were more females than males.

Household head profile

Table 187. Household head profile – Kaya refugee camp

	Number/total	% (95% CI)
Female headed households (working age 15-64 years)	208/433	48.0% (43.4-52.7)
Male headed households (working age 15-64 years)	193/433	44.6% (40.0-49.3)

Children headed households (under 15 years)	1/433	0.2% (0.0-1.3)
Elderly headed households (65 years and above)	31/433	7.2% (5.1-10.0)
Mean age of household head in years (SD) [range]	42.0 (13.8) [8.0-89.0]	

Half of the household are headed by either female or male with small portions headed by elderly.

Age dependency ratio

Table 188. Age dependency ration categories by household – Kaya refugee camp

Age dependency categories		Age dependency ratio	Number / Total	% (95% CI)
Category I	1 dependent or less per non-dependent member	≤ 1	194/425	45.7% (41.0-50.4)
Category II	Up to 3 dependents per 2 non- dependent members	1.1-1.5	73/425	17.2% (13.9-21.1)
Category III	Up to 2 dependents per non-dependent members (1.5<DR<=2)	1.6-2.0	68/425	16.0% (12.8-19.8)
Category IV	More than 2 dependents per non- dependent members (DR>2)	≥2.1	90/425	21.2% (17.6-25.3)
Mean age dependency ration		Mean (SD) [range]	425	1.5 (1.2) [0.0-8.0]

There are 21.2% households which had more than 2 dependents per non-dependent members, which is a high proportion.

3.4.8. Food security

Access to food assistance

Table 189. Food assistance ration card and cash coverage – Kaya refugee camp

	Number/total	% (95% CI)
Proportion of households with a ration card	220/220	100% (98.3-100, 95% CI)
Proportion of households receiving cash grants	220/220	100% (98.3-100, 95% CI)

All the surveyed households in Kaya refugee camp had ration cards and have been receiving food assistance and cash grants.

Table 190. Reported duration of general food ration – Kaya refugee camp

	Number/total	% (95% CI)
Average number of days general food ration lasts out days (SD) [range]	220	13.3 (5.1) [3-30]

The food received from GFD was reported to last 13.3 days out of the distribution cycle of 30 days.

Table 191. Description of utilisation of cash assistance – Kaya refugee camp

Proportion of households that use cash grants for:	Number/total	% (95% CI)
Food	195/219	89.0% (84.1-92.9)
Water	2/219	0.9% (0.1-3.3)
Hygiene items, clothes, shoes	88/219	40.2% (33.6-47.0)
Health costs (including medicines)	31/219	14.2% (9.8-19.5)
Rent, shelter repair, household items (e.g. mattress, blankets, jerrycan), utilities and bills (e.g. electricity, water bills, phone calling credit)	9/219	4.1% (1.9-7.7)
Firewood / fuel for cooking or heating	62/219	28.3% (22.5-34.8)
Assets for a livelihood activity (e.g. seeds, tools, farming, fishing, petty trade, etc.)	3/219	1.4% (0.3-4.0)
Debts repayment	27/219	12.3% (8.3-17.4)
Saved some money, gave some to other family members, relatives, friends	3/219	1.4% (0.3-4.0)
Education (e.g. school fees, uniform, books)	0/219	0.0% (0.0-1.7)
Other	0/219	0.0% (0.0-1.7)

Most families reported that they spent money received from cash grants on food, followed by hygiene items (e.g., cloths), fuel for cooking, health, and debts repayment.

Coverage of basic needs

Table 192. Description of basic needs not met by the households – Kaya refugee camp

Basic needs not met by the households:	Number/total	% (95% CI)
Food	169/220	76.8% (70.7-82.2)
Water	0/220	0.0% (0.0-1.7)
Hygiene items, clothes, shoes	159/220	72.3% (65.9-78.1)
Health costs (including medicines)	25/220	11.4% (7.5-16.3)
Rent, shelter repair, household items (e.g. mattress, blankets, jerrycan), utilities and bills (e.g. electricity, water bills, phone calling credit)	36/220	16.4% (11.7-21.9)
Firewood / fuel for cooking or heating	33/220	15.0% (10.6-20.4)
Assets for a livelihood activity (e.g. seeds, tools, farming, fishing, petty trade, etc.)	24/220	10.9% (7.1-15.8)
Debts repayment	10/220	4.6% (2.2-8.2)
Saved some money, support other family members, relatives, friends	4/220	1.8% (0.5-4.6)
Education (e.g. school fees, uniform, books)	6/220	2.7% (1.0-5.8)
Other	8/220	3.6% (1.6-7.0)

The category of basic needs that cannot be met reported the most are: food, hygiene items, rent/shelter repair/household items, fuel for cooking, and assets for livelihood activity.

Table 193. Households by categories of coverage of basic needs – Kaya refugee camp

Proportion of households in each category of coverage of basic needs	Number/total	% (95% CI)
All basic needs are met (100%)	0/220	0.0% (0.0-1.5)
More half basic needs are met (>50%)	218/220	99.1% (96.8-99.9)
Few basic needs are met (<50%)	2/220	0.9% (0.1-3.3)
Basic needs are not met (0%)	0/220	0.0% (0.0-1.5)

All households reported more than half of their basic needs are met.

Negative household coping strategies

From April 2021, GFD ration was reduced to 50% in all refugees in Maban camps. Food basket consists of cereals provided at 100% in kind, lentils at 75% as inkind and 25% cash, cooking oil at 50% each as inkind and cash, and cash for milling and salt at 100%. The cash transfer value varies from one month to other depending on market assessment conducted report from the prices of commodities prior to the GFD. To fill the food gaps, some refugees in the camp had to use the below coping strategies.

Table 194. Coping strategies used by the surveyed population over the past month – Doro refugee camp

	Number/total	% (95% CI)
Proportion of households reporting using the following coping strategies over the past month*:		
Rely on less preferred and/or less expensive foods	219/220	99.6% (97.5-100)
Borrow food, or rely on help from a friend or relative	203/220	92.3% (87.9-95.4)
Reduce the number of meals eaten in a day	218/220	99.1% (96.8-99.9)
Limit portion sizes at mealtime	218/220	99.1% (96.8-99.9)
Reduce consumption by adults so children could eat	192/220	87.3% (82.1-91.4)
Average rCSI (mean, SD / range)	220	23.6 (9.2) [0-56]
Proportion of households reporting using none of the negative coping strategies over the past month	1/220	0.5% (0.0-2.5)

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

Only 0.5% of the 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.

Food Consumption Score (FCS)

During the survey, Sept 2021 GFD cycle was considered the last general food distribution prior to the survey. The survey was carried when Oct 2021 GFD has just been completed. The survey was conducted during the annual harvest season, during which the overall food availability is better than

other times. It is hence likely that the food consumption score is higher than it would be e.g., lean season.

Table 195. Food consumption score by category and average FCS – Kaya refugee camp

FCS profiles	Number/total	% (95% CI)
Acceptable (FCS > 35)	66/220	30.0% (24.0-36.5)
Borderline (21.5≤FCS≤35)	94/220	42.7% (36.1-49.6)
Poor (FCS≤21)	60/220	27.3% (21.5-33.7)
Average FCS (SD) [range]	220	29.7 (11.9) [7.5-71.0]

*Maximum FCS is 112.

The average FCS among refugees in Kaya camp was 29.7 out of total score of 112, which falls into the borderline category. This is echoed by the majority of households had a FCS score classified as borderline.

Table 196. Consumption frequency categories of each nutrient rich food groups (FCS-N) – Kaya refugee camp

Nutrient rich food groups	Consumption frequency categories	Number/total	% (95% CI)
Vitamin A rich foods	Never	35/220	15.9% (11.3-21.4)
	Sometimes	97/220	44.1% (37.4-50.9)
	At least daily	88/220	40.0% (33.5-46.8)
Protein rich foods	Never	27/220	12.3% (8.3-17.4)
	Sometimes	113/220	51.4% (44.6-58.1)
	At least daily	80/220	36.4% (30.0-43.1)
Haem iron rich foods	Never	88/220	40.0% (33.5-46.8)
	Sometimes	127/220	57.7% (50.9-64.3)
	At least daily	5/220	2.3% (0.7-5.2)

In terms of the nutrient rich food, 84.1% households reported consumed Vitamin A rich foods (sometimes or daily), 87.8% reported consumed protein rich foods, while only 60.0% reported consumed Haem iron rich foods.

Table 197. Food acquisition sources – Kaya refugee camp

Food acquisition sources	Number/total	% (95% CI)
Purchase (using cash grants and/or with their own cash)	118/220	53.6% (46.8-60.4)
Own production (crops, livestock, fishing/ hunting, gathering)	8/220	3.6% (1.6-7.0)
Traded goods/services, barter	40/220	18.2% (13.3-23.9)
Borrowed (loan/credit from traders)	42/220	19.1% (14.1-24.9)
Received as gift (from family relatives or friends/neighbour)	6/220	2.7% (1.0-5.8)
In-kind or voucher based food assistance	5/220	2.3% (0.7-5.2)

Other	1/220	0.5% (0.0-2.5)
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The main source for food reported was purchasing (53.6%), followed by borrowed, and traded goods.

The trend analysis is not available for rCSI and FCS, because this is the first year these indicators are used in the nutrition survey in South Sudan.

4. LIMITATIONS

Birth notification cards and documentation; the age documentation coverage ranged between 75%-86% in all the camps. Confirmation using the event calendar was done to ascertain the age given by the mother or caregiver is accurate. This may impact on the reliability or interpretation of the stunting and underweight results. Therefore, caution is needed as z-scores for height-for-age and weight-for-age requires accurate ages.

Selective feeding programme enrolment rate: the SENS methodology provides an enrolment rate for TSFP/OTP based on the identified number of children enrolled in the nutrition programmes. The results should be interpreted with caution and only should be used as enrolment rate instead of coverage. A proper coverage assessment should be conducted to get accurate coverage and contributing factors affecting low coverages where needed.

Maban camps dynamics; Due to the dynamics of Doro camp against the other three camps based on ethnicity, two sets of surveys teams had to be trained separately as the two groups could not be mixed due to 2017 conflict among the refugees. This increased the training duration to two weeks instead of one, and the data consistency among camps.

Infant and Young Child Feeding indicators: Due to small survey sample size for some IYCF indicators such as the exclusive breastfeeding “introduction of solid, semi-solid or soft foods” and the “continued breastfeeding at 2 years” and “bottle feeding” results need to be interpreted with caution.

Demography: The sampling size is based on the anthropometry for children instead of a concremented demography survey, the results need to be used in caution. The definition of household used in this survey is different from what it's in ProGres (per registration group). Therefore, the household size and composition will be different from what is reflected from ProGres database.

Food security indicators: Many indicators within food security module are newly used as per the SENS version 3 guidelines (2019). These indicators including duration of food assistance, all cash indicators, basic needs, rCSI, and FCS. Therefore, there are no trend analysis, and data from this year should be used as the baseline for future survey.

5. DISCUSSION

Nutritional Status of Young Children

Overall, boys and girls are equally represented in the survey across all Maban camps as indicated by age sex ratio of the anthropometric data between 0.9-1.1 for boys and girls of all ages.

The nutrition status of young children in all Maban refugee camps is at high or serious level (GAM prevalence between 10 – 14.9%) based on the WHO classification with respective camps prevalence of GAM as indicated; Doro 14.5%, Yusuf Batil 10.3%, Gendrassa 11.9%, and Kaya 10.6%. Though slight reduction in prevalence was noted in Yusuf Batil and Doro refugee camps (Doro from 15.0% in 2019 to 14.5% in 2021 and Yusuf Batil from 14.0% in 2019 to 10.3% in 2021), the prevalence did not show a significant reduction ($p>0.05$). In Gendrassa and Kaya refugee camps in comparison to 2019 SENS, the prevalence showed an increasing trend as indicated below: Gendrassa from 6.6% in 2019 to 11.9% while Kaya from 9.1% in 2019 to 10.6%. This trend shows a deteriorating nutrition situation.

Similarly, the prevalence of SAM remains at critical level (>2%) as per UNHCR classification though there has been reduction in prevalence in Doro (3.8% to 2.9%) and Kaya (1.5% to 0.9%) refugee camps and improvements in the camps of Yusuf Batil and Gendrassa compared to 2019.

Possible contributing factors for the high level and increase in prevalence could be the reduced GFD ration to 50% from April, high morbidity among children U5, limited coverage of community mobilization activities where most of the acute malnourished children identified were not in programme, low uptake of family planning, poor care practice for children, and negative impacts of COVID-19 on service delivery, socio-economic and livelihood. Considering that malnutrition is making children more vulnerable to severe diseases, urgent efforts are needed to reduce the high and increasing prevalence of GAM. Severely acute malnourished children have a nine times higher risk of death from common childhood illness such as diarrhoea, pneumonia, and malaria compared with normal children. Moderate malnourished children have a four times elevated risk of death compared with normal children.

Stunting (chronic malnutrition) prevalence among children 6-59 months in 2021 in all Maban refugee camps showed a decreasing trend as compared to 2019 and all below WHO acceptable standard of (40%). This is indicated by prevalence of 12.7% in Doro, 17.0% in Yusuf Batil, 15.1% in Gendrassa, and 16.9% in Kaya. All year round BSFP distribution for children U2 and strengthened nutrition activities in the communities could be possible contributing factors for this drop in prevalence. Though overall prevalence of stunting is of medium public health significance across all camps, the population of young children are more vulnerable, and this suggests they have been experiencing malnutrition over a longer period possibly due to either poor child feeding practices during and after breastfeeding is stopped, poor maternal and infant nutrition, inadequate infant, and young child feeding practice, or infections. Stunting is an outcome of long-term insufficient nutrient intake and or infections especially in the first 1000 days of a child's life. Given that stunting is irreversible after the age of 2 years, more efforts needed to focus and strengthen appropriate interventions of high impact that improve nutrition in the first 1000 days.

Morbidity

Diarrhoea is closely linked to nutritional status and the interaction between the two is cyclic with each exacerbating the other. The prevalence of diarrhoea in the two weeks leading up to the survey ranged from 9.2% in Kaya refugee camp to 27.6% in Doro refugee camp. Other camps of Gendrassa and Yusuf Batil have respective prevalence's of 9.4% and 13.9%. In comparison to 2019, the proportion of affected children in the three refugee camps of Doro, Gendrassa, and Kaya showed a decrease (Doro from 30.2% to 27.6%, Gendrassa from 15.6% to 9.4%, and Kaya from 14.9% to 9.2%). Poor sanitation, poor hygiene, and care practices are possible contributing factors to the spread of diarrhoea, all of which are problems identified in camps. Interventions such as hygiene promotion, provision of safe drinking water, and hand washing facilities both at facility and community level are key interventions and need to be strengthened. Addressing the top morbidities such as RTIs, acute watery diarrhoea, eye and skin infection, and malaria within the refugee camps also is vital to reduce diarrhoea burden.

Programme Coverage

Measles vaccination and Vitamin A supplementation; Disease prevention through vaccination and strengthening immunity through Vitamin A supplementation are critical in densely populated areas

such as the refugee camps. Measles vaccination coverage with information obtained from the mothers and with EPI cards for children 9-59 months met the expected Sphere standard of $\geq 95\%$ (Doro 97.4%, Yusuf Batil 95.0%, Gendrassa 98.6%, and Kaya 100%). Similarly, Vitamin A supplementation coverage met the Sphere recommended standard of $\geq 90\%$ (Doro 97.2%, Yusuf Batil 98.8%, Gendrassa 98.0%, and Kaya 98.9%). Efforts to maintain the acceptable measles and Vitamin A supplementation coverages need to be strengthened in 2022.

Deworming coverage: 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. Therefore, 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. Routine deworming at the health facility level and during bi yearly National Immunisation Days (NIDs) is advised at various refugee camps. In 2021, deworming coverage among children aged 12-59 month measured by recall information from the mothers or caretakers within the past six months across all camps has showed significant increase and met recommended standard of $\geq 75\%$ as compared to 2019. This is indicated by below respective camps coverages; Doro from 40.9% to 94.9%, Yusuf Batil 76.6% to 95.4%, Gendrassa 58.7% to 94.4%, and Kaya 71.2% to 94.7%. Efforts to maintain the acceptable measles and Vitamin A supplementation coverages need to be strengthened in 2022.

Selective feeding programmes enrolment coverages: the enrolment rate results based on all admission criterion across all camps, for selective feeding programmes (OTP and TSFP) were below $\geq 90\%$ SPHERE standard for the camps. Rates ranged from 0.0% in Yusuf Batil to 40.0% in Kaya for OTP and 10.9% in Gendrassa to 26.0% in Kaya for TSFP. Yusuf Batil and Gendrassa refugee camps had the highest number of acute malnourished children who were found not enrolled in programs. However, these results should be used with caution to allow meaningful conclusions to be drawn due to the small sample size obtained. OTP and TSFP coverage measure the enrolment efficacy of the nutrition programs. The coverages for both programmes were lower in all camps than 2019 with exception of OTP programmes in Gendrassa and Kaya where coverages were $>90\%$ based on MUAC and/or oedema only.

Due to the COVID-19 pandemic, the two-stage screening from community was changed into MUAC and Oedema only, with the MUAC criterion of <12.5 cm. The quarterly mass screening was suspended in 2020 but resumed in 2021 with the stability of COVID-19 within camps. Family MUAC was roll-out in camps as a complement to the impact on screening. Training of mothers/caregivers of children 6-59 months to measure MUAC of children U5 was conducted by Community Health Promoters and technical nutrition staff. After training, MUAC tapes were distributed to families. However, the effectiveness of it was sub-optimal, mainly due to the low literacy level of mothers/caregivers, high rate of MUAC tape lost and damage reported. The fear to COVID-19 also hinder some caregivers to bring their children to health facility to seek the help. This indicates that mass screening, active case finding, and referral need to be strengthened.

BSFP coverage

Blanket Supplementary Feeding Programme is part of the preventive measures of malnutrition to ensure that children under two years of age and pregnant and lactating women receive adequate nutrients to bridge the nutrient gap in the food ration. The enrolment coverages in the blanket

supplementary feeding program for children aged 6–23 months ranged between 72.1% in Gendrassa, 77.4% in Yusuf Batil, 79.1% in Kaya, and 83.4% in Doro refugee camps. Across all refugee camps, the coverage is less than 90% which is expected. Out of camp movement of PoC during distributions could be one contributing factor for the low enrollment. Improvements in coverage need to be addressed.

Programme coverage in women

Ante-natal Care coverage and iron folic acid supplementation; ANC coverages ranged between 90.9% to 95.7% while iron folic acid supplementation coverage from 89.3% to 95.7%. Compared to 2019, there is increase in ANC coverage and iron acid supplementation in all camps. Efforts to maintain the enrolment into ANC and coverage of iron folic acid need to be strengthen in 2022.

Anaemia in Children 6-59 Months and Women

Anaemia in children 6-59 months; 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. In 2021, the prevalence of anaemia among children aged 6 to 59 months in the refugee camps of Doro, Yusuf Batil, and Gendrassa remained above the 40% threshold of public health significance (WHO classification). In Kaya refugee camp, the prevalence remained below the 40% threshold which indicates a medium public health significance. This high prevalence could be explained by the low percentage of households reported consuming hemo iron rich food as shown in the FCS-N result. The high morbidity of malaria also contributed to the high anaemia.

Compared to 2019, the prevalence decreased significantly across all camps (Doro from 55.8% to 40.4%, Yusuf Batil from 55.7% to 41.1%, Gendrassa from 57.5% to 43.2%, and Kaya from 49.9% to 39.0%). The most affected age category are children 6-23 months with prevalence as high 61.4% compared to the older age group of 24-59 months. This improvement could be explained by the high intake of iron rich foods by children as indicated by a range of rate between 87.3% to 92.1%, as a result of consistent implementation of BSFP, IYCF intervention in all camps and strengthened nutrition linkages with livelihoods.

In order to further improve the anaemia outcome, we need to strengthen the prevention interventions. A strategy to address anaemia and micronutrient deficiency disease was developed in 2017 and updated in 2021. Actions in this strategy needs to be implemented and evaluated. A concrete research on the cause of high anaemia is also needed to identify the underlying reason to the persistent high level of anaemia.

Anaemia in women (15-49 years); Among non-pregnant women of reproductive age (15-49 years) the prevalence of anaemia decreased significantly in 2021 as compared to 2019. This prevalence is of low (Yusuf Batil 9.4% and Kaya 16.1%) and medium (Doro 21.3% and Gendrassa 29.7%) public health significance. In the latter camps, the prevalence is above the expected <20% UNHCR target.

IYCF indicators

Early initiation to breastmilk: 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. 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. 2021 SENS results showed that the rate of timely initiation of breastfeeding met the recommended standard of >90% in the three camps except Kaya refugee camp (Doro 90.4%, Yusuf Batil 95.7%, Gendrassa 90.7%, and Kaya 88.8%). Interventions to ensuring all delivered children receive timely initiation of breastfeeding should be strengthened.

Exclusive breastfeeding: 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. The rate of exclusive breastfeeding in all four camps for the first six months of life met the UNHCR standard of ≥75% with respective camps rate as shown below (89.3% in Doro, 100% in Yusuf Batil, 98.1% in Gendrassa, and 98.0% in Kaya) refugee camps.

Continued breastfeeding at one year in all refugee camps was good >90% (93.5% in Doro, 96.6% in Yusuf Batil, 94.4% in Gendrassa, and 97.0% in Kaya). However, continued breastfeeding rate at 2 years was below with ranged between 57.1% to 84.6%. These could be due high birth rate and short birth intervals. Multi-sectoral approaches need to be applied to IYCF in accordance with the UNHCR IYCF-emergency (IYCF-E) framework. There is need to strengthen integration between nutrition and reproductive health unit across the facilities where key IYCF messages such as continued breastfeeding into the second year and birth spacing are passed on to mothers in the maternity ward and during ANC visits.

The rate of introduction of solid/semi-solid/soft foods to infants ranged between 42.1% to 58.3% in the refugee camps. The proportion of children aged 6 -23 months that had consumed iron-rich or iron-fortified foods significantly increased (ranged between 87.5% in Doro to 92.3% in Yusuf Batil) across all camps in comparison to 2019. After six months of age, the nutrition needs of children 6-23 months increase and therefore, breast milk or fluid alone is not adequate for them. Timely introducing complementary feeding become necessary to complement breastmilk to meet the energy and other nutrient requirements of the infant. In addition, IYCF messaging on complementary feeding needs to be strengthened especially in Kaya and Gendrassa camps where the proportions are very low as this has direct impact on stunting outcomes.

Bottle feeding; Ranged of between 0.8% in Doro to 2.7% in Yusuf Batil refugee camps of the surveyed children in the camps are bottle fed. Bottle feeding place them at high risk of illness (diarrhoeal disease) due to likelihood contamination of the bottle and nipple. All efforts to support all women to achieve early initiation and exclusive breastfeeding for the first six complete months and the continuation of breastfeeding into the second year of life to provide the best chance of survival for infants and young children is necessary.

Some of the IYCF results needs careful and cautious interpretation as the sample was small to draw statistically reliable 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.

The main source of food in all Maban refugee camps is the WFP provided general food ration at both in-kind and cash format. Expected full ration is to provide the minimum 2100 kcal/p/day. Since 2017 until March 2021, the food ration was provided at 70% providing 1492 kcal/p/d. In April 2021, there has been further ratio reduction to 50% with 971 kcal/p/d (46.2%) provided from the in-kind ration given, and the rest (79 kcal were provided in cash).

The proportion of households with ration cards was 100% in all the refugee camps indicating households having access to the provided food assistance and cash on monthly basis. Despite receiving the assistance, average food ration provided last between 11.7 (in Doro) to 14.2 (in Gendrassa) days a month in the camps. The average FCS among refugees in all camps ranged between 29.7 (Kaya) to 34.4 (Gendrassa) out of total score of 112, which falls into the borderline category. This is echoed by the majority of households had a FCS score classified as borderline. To fill the gaps, most households across all the camps reported relying on less preferred or less expensive foods, borrowing food or relying on help from friend or relative, reducing the number of meals eaten in a day, limiting portion sizes at mealtime, and reducing consumption by adults so children could eat as coping strategies.

Conclusion

The prevalence of GAM across all Maban camps remained at high or serious level with noted increase in prevalence in Gendrassa and Kaya refugee camps. Multisectoral effort should be made and strengthened where existing to mitigate the impact on children. Anaemia prevalence among children 6-59 months remains a major public health concern being above 40% of public health significance in all the camps. Interventions focusing on the prevention and reduction of anaemia should be strengthened.

Ahead to be face by the refugees is the April 2021 GFD ration cut couple with the below standard Kcal of provided ration and limited livelihood options. Expansion of agriculture and livelihood activities should be prioritized to meet the needs of the persons of concern.

6. RECOMMENDATION AND PRIORITIES

Recommendation

Nutrition related

1. Maintain and strengthen the implementation of Community based Management of Acute Malnutrition (CMAM) program across all Maban refugee camps. This is 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, RI, and CORDAID).

2. Maintain nutrition surveillance through routine and quarterly mass MUAC screening. This is to improve coverage and targeting of the most vulnerable children in the refugee camps (UNHCR and RI).
3. Maintain annual joint nutrition surveys in all Maban refugee camps to analyze trends, assess program impact and facilitate evidence-based recommendations for nutrition programming (UNHCR, WFP, UNICEF, RI, and CORDAID).
4. Continue implementation of BSFP to children aged 6-23 months and pregnant and lactating women to prevent malnutrition and cover nutrient gap. It is important for UNHCR and WFP to work on early preposition of BSFP supplies for children U2 and PLW to ensure consistent regular distribution all year round (UNHCR, WFP, and RI)
5. Reume two-stage screening of MUAC and subsequent Weight for Height (for children with MUAC at risk) through monthly screening at the BSFP distribution sites to identify and admit malnourished children timely and in the appropriate programs (RI).
6. Use multisectoral approach to strengthen IYCF program following UNHCR IYCF- framework for action (RI, UNHCR, UNHCR, and other partners).
7. Intensify the family-MUAC approach to identify the malnutrition cases to improve the enrollment rate.
8. Conduct an in-depth assessment of the causes of anaemia, which has been ongoing for more than five years now (UNHCR, RI, and CORDAID).
9. Ensure buffer stock of Vitamin A supplementation to maintain routine Expanded Program of Immunization (EPI) and campaigns in case of pipeline break or delay (UNHCR, UNICEF, and RI).
10. Provide meals to inpatients and caregivers in SC and HIV/TB treatment to ensure the compliance to treatment (UNHCR, WFP, RI, and CORDAID).
11. Nutrition and health staff and community workers capacity development through trainings to be strengthened to facilitate quality provision of both curative and preventative components of nutrition (UNHCR, WFP, UNICEF, RI, and CORDAID).
12. Maintain regular supervision, monitoring, quarterly joint monitoring, and yearly program performance evaluations in all camps to assess performance progress and formulate recommendations for any identified gaps (UNHCR, WFP, UNICEF, and RI).
13. Implementation of the Nutrition Assessment, Counselling and Support for HIV/AIDS and TB patients to be strengthened (UNHCR, WFP, RI, and CORDAID).

Food security

14. Advocate for an increase in the refugee food basket to reach the minimum daily recommended allowance (2100 kcal/person per day) of both macro and micronutrients through including fortified food (UNHCR and WFP).
15. Scale up livelihood projects through extension of various agro-nutrition sites, backyard gardening, school gardening for improvement of the household food security to bring positive impact at household level (RI, UNHCR, and WFP).

Health/WASH/Nutrition Linkages related

16. Promote malaria prevention interventions including blanket long lasting insecticide treated (LLIN) mosquito net distribution and bi-yearly indoor residue spraying (UNHCR, RI, and CORDAID).
17. Strengthen the good reproductive practices through education on healthy timing and spacing of pregnancies, continued breastfeeding until 24 months, iron-folic acid supplementation to pregnant women (UNHCR, RI, and CORDAID).
18. Distribute jerrycan to ensure provision of adequate water storage containers per household (UNHCR and ACTED).
19. Improve the WASH equipment in health and school facilities (UNHCR and ACTED).
20. Promote support on latrine construction to improve latrine coverage (UNHCR and ACTED).

7. APPENDICES

APPENDIX 1: SURVEY TEAMS

Survey coordination, team supervision and operational support		
UNHCR		
Abe John M KIRI	Senior Nutrition and Food Security Associate	UNHCR-Bunj
Heqian Kuang	Associate Nutrition and Food Security Officer	UNHCR-Juba
Maria Chidumu	Associate Nutrition and Food Security Officer	UNHCR-Juba
WFP		
Dassan Hategekimana	Nutrition Officer	WFP-Juba
RI		
Michael Eida	Nutrition Officer	Maban
Ramadan Lal	BCC Officer	Maban
Akwero Christine	MIYCN Officer	Maban
Thomas Roba	OTP Nurse	Maban
Alier Peter	BCC Officer	Maban
Lovister Ange	MIYCN Officer	Maban
Amacara Pausto	OTP Nurse	Maban
Turo Patrick	Health and Nutrition Coordinator	Maban
Data Stanley	Health Program Manager	Maban
CORDAID		
Wani James	Nutrition Officer	Maban
Data Analysis		
Abe John M Kiri	Senior Nutrition and Food Security Associate	UNHCR-Maban
Heqian Kuang	Associate Nutrition and Food Security Officer	UNHCR-Juba
Health information system and WASH data consolidation		
Sebit Mustafa	Senior Public Health Associate	UNHCR-Juba
Joseph WANI	WASH Associate	UNHCR-Bunj
Joseph John Chol	Senior Public Health Associate	UNHCR-Bunj
Report writing		
Abe John M Kiri	Senior Nutrition and Food Security Associate	UNHCR-Maban
Heqian Kuang	Associate Nutrition and Food Security Officer	UNHCR-Juba

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 (% of out of range subjects)	Incl	%	0-2.5 0	>2.5-5.0 5	>5.0-7.5 10	>7.5 20	0 (0.7 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	0 (p=0.709)
Age ratio(6-29 vs 30-59) (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	4 (p=0.034)
Dig pref score - weight	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	0 (4)
Dig pref score - height	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	2 (10)
Dig pref score - MUAC	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	2 (9)
Standard Dev WHZ .	Excl	SD	<1.1 and 0	<1.15 and 5	<1.20 and 10	>=1.20 or <=0.80 20	0 (1.08)
Skewness WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	0 (-0.04)
Kurtosis WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	1 (-0.32)
Poisson dist WHZ-2	Excl	p	>0.05 0	>0.01 1	>0.001 3	<=0.001 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.

Yusuf Batil refugee camp

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	Score
Flagged data (% of out of range subjects)	Incl	%	0-2.5 0	>2.5-5.0 5	>5.0-7.5 10	>7.5 20	0 (0.0 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	0 (p=0.347)
Age ratio(6-29 vs 30-59)	Incl	p	>0.1	>0.05	>0.001	<=0.001	

SENS Surveys Oct-Nov 2021; Maban refugee camps, South Sudan

(Significant chi square)			0	2	4	10		0 (p=0.557)
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		4 (13)
Dig pref score - MUAC	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10		2 (8)
Standard Dev WHZ	Excl	SD	<1.1 and >0.9 0	<1.15 and >0.85 5	<1.20 and >0.80 10	>=1.20 or <=0.80 20		0 (1.08)
Skewness WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5		0 (0.14)
Kurtosis WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5		1 (0.21)
Poisson dist WHZ-2	Excl	p	>0.05 0	>0.01 1	>0.001 3	<=0.001 5		0 (p=)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25		7 %

The overall score of this survey is 7 %, this is excellent.

Gendrassa refugee camp

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	Score
Flagged data (% of out of range subjects)	Incl	%	0-2.5 0	>2.5-5.0 5	>5.0-7.5 10	>7.5 20	0 (0.0 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	0 (p=0.545)
Age ratio(6-29 vs 30-59) (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	0 (p=0.311)
Dig pref score - weight	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	0 (4)
Dig pref score - height	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	2 (12)
Dig pref score - MUAC	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	2 (8)
Standard Dev WHZ .	Excl	SD	<1.1 and 0	<1.15 and 5	<1.20 and 10	>=1.20 or 20	0 (1.08)
Skewness WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	0 (0.12)
Kurtosis WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	0 (-0.09)
Poisson dist WHZ-2	Excl	p	>0.05 0	>0.01 1	>0.001 3	<=0.001 5	0 (p=)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	4 %

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

Kaya refugee camp**Overall data quality**

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	Score
Flagged data (% of out of range subjects)	Incl	%	0-2.5 0	>2.5-5.0 5	>5.0-7.5 10	>7.5 20	0 (0.0 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	0 (p=0.113)
Age ratio(6-29 vs 30-59) (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	0 (p=0.383)
Dig pref score - weight	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	0 (4)
Dig pref score - height	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	2 (12)
Dig pref score - MUAC	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	2 (9)
Standard Dev WHZ .	Excl	SD	<1.1 and 0	<1.15 and 5	<1.20 and 10	>=1.20 or <=0.80 20	0 (1.05)
Skewness WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	0 (0.16)
Kurtosis WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	0 (-0.08)
Poisson dist WHZ-2	Excl	p	>0.05 0	>0.01 1	>0.001 3	<=0.001 5	0 (p=)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	4 %

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

APPENDIX 3: SURVEY QUESTIONNAIRES

Greeting and reading rights

UNHCR Standardised Expanded Nutrition Survey (SENS) Questionnaire

(SENS) المفوضية الموحد مسح التغذية الموسعة
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 تقرأ قبل المقابلة لريرة الأسرة أو إذا ما غاب أو عضو آخر البالغين من البيت. تعريف سكان لبيت مجموعة من الناس الذين يعيشون معا ويأكلون بشكل روتيني في قدر أو (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 أصل 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 اختياري. 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 أسرته أو ما تلقي المساعدات لك.
- إذا كنت توافق على المشاركة، وسوف أسألك بعض الأسئلة عن عائلتك وسوف أيضا قياس الوزن والطول للأطفال كل في الأسرة الذين هم أكبر سنا من 6 أشهر والذين تقل أعمارهم عن 5 سنوات بالإضافة إلى هذه التقييمات، سيتم اختبار كمية صغيرة من الدم من الأصبع من الأطفال والنساء لمعرفة إذا كان لديهم فقر الدم.
- قبل أن نبدأ أن نطلب منك أي أسئلة أو اتخاذ أي قياسات، سوف نطلب منك موافقتك على الدولة هذا النموذج. التأكيد من أن أي وستبقى المعلومات التي سوف تقدم في سرية تامة.
- يمكنك أن تسأل أي سؤال لي أن لديك حول هذا المسح قبل أن تقرر المشاركة أم لا.
- إذا كنت لا تفهم المعلومات أو إذا لم تكن الإجابة على الأسئلة الخاصة بك لالارتياح الخاص بك، لا تعلن موافقتك على هذا النموذج.

شكرا لك

No	QUESTION	ANSWER
SECTION DM1: Household Head Information		
THESE QUESTIONS NEED TO BE ASKED TO THE HEAD OF THE HOUSEHOLD OR, IF THEY ARE ABSENT, ANOTHER ADULT MEMBER OF THE HOUSEHOLD.		
DM1A	Was consent given for conducting the interview? ENSURE THAT YOU HAVE INTRODUCED THE TEAM AND INFORMED THEM ABOUT THE INTERVIEW.	Yes No Absent
DM1B	Was consent given for conducting the interview using Mobile Data Collection (use of smartphone or tablet)? ENSURE THAT YOU HAVE INTRODUCED THE TEAM AND INFORMED THEM ABOUT THE INTERVIEW.	Yes No Absent
DM2	What is the sex of the household head? THE HOUSEHOLD HEAD IS THE PERSON RESPONSIBLE FOR MAKING THE DECISIONS FOR THE HOUSEHOLD AS A WHOLE. USE THE TERM AGREED UPON DURING THE TRAINING.	Male Female
DM3	What is the age of the household head (years)? YOU DO NOT NEED TO SEE PROOF OF AGE.	_____ _____ years
DM4	What is the total number of household members?	_____ _____ people
SECTION DM2: Household Member Information		
ASK INTERVIEWEE IF THOSE ARE ALL THE MEMBERS IN THE HOUSEHOLD AND THAT NO ONE IS MISSING.		
THESE QUESTIONS NEED TO BE COMPLETED FOR EACH HH MEMBER WHO LIVES IN THE HOUSEHOLD.		
DM5	Name of household member ONLY WRITE FIRST NAME.	
DM6	What is the sex of the household member?	Male Female
DM7	What is the age of the household member (years)? YOU DO NOT NEED TO SEE PROOF OF AGE.	
DM8	Is the household member currently pregnant?	Yes No Don't know

Child and infant questionnaire		
No	QUESTION	ANSWER
SECTION CHILD1: Details of the Child 0-59 months or 6-59 months		
THIS SECTION IS TO BE ADMINISTERED TO ALL CHILDREN IN THE SELECTED HOUSEHOLDS BETWEEN 0-59 MONTHS OR 6-59 MONTHS: DEPENDING ON WHICH SENS MODULE IS INCLUDED.		
THESE QUESTIONS NEED TO BE ASKED TO THE MOTHER OR THE MAIN CAREGIVER.		
CH1	Was consent given for conducting the interview and the measurements?	Yes No
CH2	Name of the child ONLY WRITE FIRST NAME.	
CH3	Sex of [NAME OF CHILD]?	Male Female

CH4	Do you have an official age documentation for [NAME OF CHILD]?	Yes No
CH5	[NAME OF CHILD]'s date of birth THE EXACT BIRTH DATE SHOULD ONLY BE TAKEN FROM AN AGE DOCUMENTATION SHOWING DAY, MONTH AND YEAR OF BIRTH.	Day/Month/Year
CH6	When did [NAME OF CHILD] born? ONLY ASK WHEN THERE IS NO AGE DOCUMENTATION, ESTIMATE AGE USING A LOCAL EVENTS CALENDAR.	_____ _____ months
SECTION CHILD3: Nutrition, Health and Anaemia Status of the Child 6-59 months THIS SECTION IS TO BE ADMINISTERED TO ALL CHILDREN BETWEEN 6 AND 59 MONTHS OF AGE. EXCLUDE HB MEASUREMENTS IF SENS MODULE 2 (ANAEMIA MODULE) IS NOT INCLUDED. IN MDCS SURVEYS, THIS SECTION IS AUTOMATICALLY SKIPPED FOR THE CHILDREN NOT ELIGIBLE BASED ON AGE (<6 MONTHS).		
CH7	Is [NAME OF CHILD] currently present in the household?	Yes No
CH8	[NAME OF CHILD]'s weight in kilograms (± 0.1 kg)	_____ _____ kg
CH9	[NAME OF CHILD]'s length/height in cm (± 0.1 cm)	_____ _____ cm
CH10	Was [NAME OF CHILD] measured lying down or standing up?	Child lying down Child standing up
CH11	Clinical examination: Does [NAME OF CHILD] present bilateral pitting oedema?	Yes No
CH12	[NAME OF CHILD]'s middle upper arm circumference (MUAC) in mm (± 1 mm) or cm (± 0.1 cm)	
CH13	Is [NAME OF CHILD] currently being treated in SC/OTP/TSFP for malnutrition? SHOW COMMODITY PROVIDED IN TSFP AND OTP/SC.	Yes TSFP Yes OTP/SC No Don't know
CH14	Is [NAME OF CHILD] currently enrolled in the BSFP? SHOW COMMODITY/PACKAGING PROVIDED IN BSFP.	Yes No Don't know
CH15	Has [NAME OF CHILD] been vaccinated against measles? CHECK VACCINATION CARD (ONLY FOR CHILDREN OLDER THAN 9 MONTHS).	Yes, card Yes, recall No Don't know
CH16	Has [NAME OF CHILD] received a vitamin A capsule in the past six months? CHECK VACCINATION/HEALTH CARD AND SHOW CAPSULE.	Yes, card Yes, recall No Don't know
CH17	Was [NAME OF CHILD] given any drug for intestinal worms in the last six months? SHOW TABLET.	Yes No Don't know
CH18	Has [NAME OF CHILD] had diarrhoea in the past 2 weeks? CASE DEFINITION: THREE OR MORE LOOSE OR LIQUID STOOLS DURING 24 HOURS.	Yes No Don't know
CH19	Did you give ORS to [NAME OF CHILD] when s/he had diarrhoea? SHOW ORS SACHET.	Yes No Don't know

CH20	Did you give zinc tablets or syrup to [NAME OF CHILD] when s/he had diarrhoea? SHOW ZINC TABLET OR SYRUP.	Yes No Don't know
REFER	Referral for child with signs of acute malnutrition who is not already enrolled in a nutrition programme: <ul style="list-style-type: none"> Child needs to be referred for moderate acute malnutrition Child needs to be referred for severe acute malnutrition 	
CH22	[NAME OF CHILD]'s haemoglobin (Hb) in g/dL (± 0.1 g/dL) or in g/L (± 1 g/L)	_ _ _ _ . _ _ _ g/dL or g/L
REFER	Referral for child who has severe anaemia: <ul style="list-style-type: none"> Child needs to be referred for severe anaemia (if Hb<7 Og/dL) 	
SECTION IYCF1: breastfeeding for the Child 0-23 months		
THIS SECTION IS TO BE ADMINISTERED TO THE MOTHER OR THE MAIN CAREGIVER WHO IS RESPONSIBLE FOR FEEDING THE CHILD AND THE CHILD SHOULD BE BETWEEN 0 AND 23 MONTHS OF AGE. THESE QUESTIONS NEED TO BE ASKED TO THE MOTHER OR THE MAIN CAREGIVER WHO IS RESPONSIBLE FOR FEEDING THE CHILD.		
IF1	Has [NAME OF CHILD] ever been breastfed?	Yes No Don't know
IF2	How long after birth did you first put [NAME OF CHILD] to the breast?	Less than one hour Between 1 and 23 hours More than 24 hours Don't know
IF3	Was [NAME OF CHILD] breastfed yesterday during the day or at night?	Yes No Don't know
IF4	Now I would like to ask you about liquids that [NAME OF CHILD] may have had yesterday during the day and at night. I am interested in whether your child had the item even if it was combined with other foods. Yesterday, during the day or at night, did [NAME] receive any of the following? ASK ABOUT EVERY LIQUID. EVERY QUESTION MUST HAVE AN ANSWER.	
	4A. Plain water	Yes No Don't know
	4B. Infant formula, for example [INSERT LOCALLY AVAILABLE BRAND NAMES OF INFANT FORMULA, ALL TYPES]	
	4C. Milk such as tinned, powdered, or fresh animal milk, for example [INSERT LOCALLY AVAILABLE BRAND NAMES OF TINNED AND POWDERED MILK]	
	4D. Juice or juice drinks, for example [INSERT LOCALLY AVAILABLE BRAND NAMES OF JUICE DRINKS]	
	4E. Clear broth	
	4F. Sour milk or yogurt, for example [INSERT LOCAL NAMES]	
	4G. Thin porridge, for example [INSERT LOCAL NAMES]	
	4H. Tea or coffee with milk	
	4I. Any other water-based liquids, for example [INSERT OTHER WATER-BASED LIQUIDS AVAILABLE IN THE LOCAL SETTING AND USE LOCAL NAMES] (e.g. sodas, other sweet drinks, herbal infusion, gripe water, clear tea with no milk, black coffee, ritual fluids)	

IF5	Yesterday, during the day or at night, did [NAME] eat solid or semi-solid (soft, mushy) food?	Yes No Don't know
IF6	Did [NAME OF CHILD] drink anything from a bottle with a nipple yesterday during the day or at night?	Yes No Don't know
SECTION IYCF2: Iron -fortified or Iron-rich Foods for the Child 6-23 months IN MDC SURVEYS, THIS SECTION IS AUTOMATICALLY SKIPPED FOR THE CHILDREN NOT ELIGIBLE BASED ON AGE (<6 MONTHS AND ≥24 MONTHS).		
IF7	Now I would like to ask you about some particular foods [NAME OF CHILD] may eat. I am interested in whether your child had the item even if it was combined with other foods. Yesterday, during the day or at night, did [NAME] consume any of the following? ASK ABOUT EVERY ITEM. EVERY QUESTION MUST HAVE AN ANSWER.	
	7A. [INSERT COMMON MEAT, FISH, POULTRY AND LIVER/ORGAN FLESH FOODS USED THE LOCAL SETTING] (e.g. beef, goat, lamb, mutton, pork, rabbit, chicken, duck, liver, kidney, heart)	Yes No Don't know
	7B. [INSERT CSB++ AVAILABLE IN THE LOCAL SETTING AND USE LOCAL NAMES] (e.g. CSB++)	
	7C. [INSERT RUTF PRODUCTS AVAILABLE IN THE LOCAL SETTING AND USE LOCAL NAMES] (e.g. Plumpy'Nut®) SHOW SACHET.	
	7D. [INSERT RUSF PRODUCTS AVAILABLE IN THE LOCAL SETTING AND USE LOCAL NAMES] (e.g. Plumpy'Sup®) SHOW SACHET.	
	7E. [INSERT LNS PRODUCTS AVAILABLE IN THE LOCAL SETTING AND USE LOCAL NAMES] (e.g. Plumpy'Doz®) SHOW SACHET / POT.	
	7F. [INSERT LOCALLY AVAILABLE BRAND NAMES OF IRON FORTIFIED INFANT FORMULA] (e.g. Nan, S26 infant formula)	
	7G. [INSERT ANY IRON FORTIFIED SOLID, SEMI-SOLID OR SOFT FOODS DESIGNED SPECIFICALLY FOR INFANTS AND YOUNG CHILDREN AVAILABLE IN THE LOCAL SETTING THAT ARE DIFFERENT THAN DISTRIBUTED COMMODITIES AND USE LOCALLY AVAILABLE BRAND NAMES] (e.g. Cerelac, Weetabix)	

SECTION WM2: Anthropometry, Physiological and Anaemia Status of the Woman 15-49 years THIS SECTION IS TO BE ADMINISTERED TO ALL ELIGIBLE WOMEN BETWEEN 15 AND 49 YEARS IN THE SELECTED HOUSEHOLD.		
WM1	Name of the woman ONLY WRITE FIRST NAME.	
WM2	Age of [NAME OF WOMAN] in years ONLY WOMEN BETWEEN 15 AND 49 ARE BEING INTERVIEWED.	_____ _____ years
WM3	Are you pregnant?	Yes No Don't know

WM4	Are you currently enrolled in the ANC programme?	Yes No Don't know
WM5	Are you currently receiving iron-folate pills? SHOW PILL.	Yes No Don't know
WM6	Are you currently breastfeeding?	Yes No Don't know
WM7	Is the child you are breastfeeding younger than 6 months old?	Yes No Don't know
WM8	Are you currently enrolled in the BSFP? SHOW COMMODITY/PACKAGING GIVEN IN BSFP.	Yes No Don't know
WM9	[NAME OF WOMAN]'s MUAC in mm (± 1 mm) or cm (± 0.1 cm)	_____ _____ cm
WM10	[NAME OF WOMAN]'s haemoglobin in g/dL (± 0.1 g/dL) or in g/L (± 1 g/L)	_____ . _____ g/dL or g/L
REFER	Referral for woman Who has severe anaemia: Woman needs to be referred for severe anaemia (if Hb<8. 0g/dL)	

SECTION FS1: Food assistance		
THIS QUESTIONNAIRE NEED TO BE ASKED TO THE MAIN CARETAKER WHO IS RESPONSIBLE FOR COOK- ING THE MEALS.		
FS1	Does your household receive food assistance (in-kind)?	Yes No Don't know IF YES OR DON'T KNOW, GO TO FS3
FS2	Why do you not have access to the food assistance (in-kind)?	Food voucher not given even if eligible. Not registered. Registered but determined not eligible. Other. Don't know.
FS3	How many days did the food voucher from September cycle last?	
FS4	Does your household receive a cash for general food needs?	
FS5	How did you spend the cash you received in September?	Food Water Hygiene items, clothes, shoes Health costs (including medicines) Rent, shelter repair, household items (e.g. mattress, blanket, jerrycan), utilities and bills (e.g

		<p>electricity, water bills, phone calling credit)</p> <p>Firewood/fuel for cooking or heating</p> <p>Assets for a livelihood activity (eg seeds, tools, farming, fishing, petty trade, etc)</p> <p>Debt repayment</p> <p>Save some money or gave to other family members, relatives, friends</p> <p>Education (eg school fees, uniform, books)</p> <p>Other</p> <p>Don't know</p>
FS6	<p>Which of your household's basic needs can you not meet?</p> <p>DO NOT READ THE ANSWERS. SELECT ALL THAT APPLY.</p>	<p>Food</p> <p>Water</p> <p>Hygiene items, clothes, shoes</p> <p>Health costs (including medicines)</p> <p>Rent, shelter repair, household items (eg mattress, blanket, jerrycan), utilities and bills (eg electricity, water bills, phone calling credit)</p> <p>Firewood/fuel for cooking or heating</p> <p>Assets for a livelihood activity (eg seeds, tools, farming, fishing, petty trade, etc)</p> <p>Debt repayment</p> <p>Save some money or gave to other family members, relatives, friends</p> <p>Education (eg school fees, uniform, books)</p> <p>Other</p> <p>Don't know</p>
<p>SECTION FS2: Negative coping strategy</p> <p>EXPLAIN TO THE RESPONDENT THAT THE QUESTIONS APPLY TO ALL HOUSEHOLD MEMBERS AND NOT ONLY TO HIM/HER.</p>		
FS7	<p>In the past 7 days, how many days did your household rely on less preferred and/or less expensive food due to lack of food or money to buy food?</p>	RECORD DAYS 0-7.
FS8	<p>In the past 7 days, how many days did your household borrow food or rely on help from a friend or relative due to lack of food or money to buy food?</p>	RECORD DAYS 0-7.
FS9	<p>In the past 7 days, how many days did your household reduce the number of meals eaten in a day due to lack of food or money to buy food?</p>	RECORD DAYS 0-7.
FS10	<p>In the past 7 days, how many days did your household limit portion sizes at mealtime due to lack of food or money to buy food?</p>	RECORD DAYS 0-7.
FS11	<p>In the past 7 days, how many days did your household reduce consumption by adults so children could eat, due to lack of food or money to buy food?</p>	RECORD DAYS 0-7.
<p>SECTION FS3: FCS and FCS-N</p> <p>EXPLAIN TO THE RESPONDENT THAT THE QUESTIONS APPLY TO ALL HOUSEHOLD MEMBERS AND NOT ONLY TO</p>		

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HIM/HER.	
FS12	<p>How many days over the last 7 days, did members of your household eat the following food items, prepared and/or consumed at home?</p> <p>READ THE LIST OF FOODS AND DO NOT PROBE. ONLY RECORD THE CONSUMPTION OF SIGNIFICANT QUANTITIES OF FOOD BY THE HOUSEHOLD. WRITE '0' IF NOT CONSUMED IN THE LAST 7 DAYS.</p>
	<p>1. In the past 7 days, how many days did your household eat any [INSERT CEREALS LOCALLY AVAILABLE] (e.g. <i>wheat, corn/maize, barley, buckwheat, millet, oats, rice, rye, sorghum, teff</i>) or any foods made from these such as [INSERT LOCAL FOODS] (e.g. <i>bread, porridge, noodles, ugali, nshima, pasta</i>).</p> <p>Or any [INSERT WHITE ROOTS AND TUBERS LOCALLY AVAILABLE] (e.g. <i>green bananas, lotus root, parsnip, taro, plantains, white potatoes, white yam, white cassava, white sweet potato</i>) or any foods made from roots such as [INSERT LOCAL FOODS].</p> <p>Or any [INSERT OTHER STARCHY FOODS LOCALLY AVAILABLE] (e.g. <i>green bananas, plantains</i>)</p>
	<p>Number of days eaten in past 7 days</p>
	<p>2. In the past 7 days, how many days did your household eat any [INSERT LEGUMES, NUTS AND SEEDS LOCALLY AVAILABLE] (e.g. <i>dried beans, chickpeas, lentils, nuts, seeds</i>) or any foods made from these such as [INSERT LOCAL FOODS] (e.g. <i>hummus, peanut butter</i>)</p>
	<p>Number of days eaten in past 7 days</p>
	<p>3. In the past 7 days, how many days did your household eat any [INSERT MILK AND MILK PRODUCTS LOCALLY AVAILABLE] (e.g. <i>fresh milk, sour milk, infant formula, cheese, kefir, yogurt</i>)</p>
	<p>Number of days eaten in past 7 days</p>
	<p>4. In the past 7 days, how many days did your household eat any meat, fish and eggs (e.g. <i>goat, beef, chicken, pork, blood, fish including canned tuna, snails, and/or other seafood, eggs</i>)</p>
	<p>Number of days eaten in past 7 days</p>
	<p>4.1. In the past 7 days, how many days did your household eat any [INSERT FLESH MEAT LOCALLY AVAILABLE] (e.g. <i>beef, goat, lamb, mutton, pork, rabbit, chicken, duck, cane rat, guinea pig, rat, agouti frogs, snakes, insects</i>)</p>
	<p>Number of days eaten in past 7 days</p>
	<p>4.2. In the past 7 days, how many days did your household eat any [INSERT ORGAN MEAT OR BLOOD-BASED FOODS LOCALLY AVAILABLE] (e.g. <i>liver, kidney, heart</i>)</p>
	<p>Number of days eaten in past 7 days</p>
	<p>4.3. In the past 7 days, how many days did your household eat any [INSERT FRESH, DRIED OR CANNED FISH OR SHELLFISH LOCALLY AVAILABLE] (e.g. <i>anchovies, tuna, sardines, shark, whale, roe/fish eggs, clam, crab, lobster, crayfish, mussels, shrimp, octopus, squid, sea snails</i>)</p>
	<p>Number of days eaten in past 7 days</p>
	<p>4.4. In the past 7 days, how many days did your household eat any eggs from [INSERT EGGS LOCALLY AVAILABLE] (e.g. <i>eggs from chicken, duck, guinea fowl</i>)</p>
	<p>Number of days eaten in past 7 days</p>
	<p>5. In the past 7 days, how many days did your household eat any [INSERT ANY VEGETABLES AND LEAVES LOCALLY AVAILABLE] (e.g. <i>spinach, cassava leaves, onion, carrot, lettuce, bamboo shoots, cabbage, pepper, tomato, eggplant, zucchini, etc.</i>)</p>
	<p>Number of days eaten in past 7 days</p>
	<p>5.1. In the past 7 days, how many days did your household eat any [INSERT VITAMIN A RICH VEGETABLES AND TUBERS LOCALLY AVAILABLE] (e.g. <i>carrot, pumpkin, squash, or sweet potato that are orange inside, red sweet pepper</i>)</p>
	<p>Number of days eaten in past 7 days</p>
	<p>5.2. In the past 7 days, how many days did your household eat any [INSERT DARK GREEN LEAFY VEGETABLES LOCALLY AVAILABLE INCLUDING WILD FORMS AND VITAMIN A RICH LEAVES] (e.g. <i>amaranth, arugula (rocket), cassava leaves, kale, broccoli, spinach</i>)</p>
	<p>Number of days eaten in past 7 days</p>
	<p>6. In the past 7 days, how many days did your household eat any [INSERT ANY FRUITS LOCALLY AVAILABLE INCLUDING WILD FRUITS], and 100% fruit juice made from these</p>
	<p>Number of days eaten in past 7 days</p>

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	<i>(e.g. mango, apricot, peach, apple, avocados, banana, coconut flesh, lemon, orange, etc.)</i>	
	6.1. In the past 7 days, how many days did your household eat any [INSERT VITAMIN A RICH FRUITS LOCALLY AVAILABLE], and 100% fruit juice made from these <i>(e.g. mango (ripe, fresh and dried), cantaloupe melon (ripe), apricot (fresh or dried), ripe papaya, passion fruit (ripe), dried peach)</i>	Number of days eaten in past 7 days
	7. In the past 7 days, how many days did your household eat any [INSERT OILS AND FATS LOCALLY AVAILABLE] added to food or used for cooking <i>(e.g. vegetable / nut oil made from almond, avocado, canola, coconut, cottonseed, groundnut, maize, olive, rapeseed, safflower, sesame, soybean, sunflower/walnut, ghee, butter, margarine, mayonnaise, palm oil -not red palm oil, shortenings, sour cream)</i>	Number of days eaten in past 7 days
	8. In the past 7 days, how many days did your household eat any [INSERT SWEETS, SWEETENED SODA OR JUICE DRINKS AND SUGARY FOODS LOCALLY AVAILABLE] <i>(e.g. sugar, honey, syrup, soda drinks, chocolates, candies, cookies, sweet biscuits and cakes)</i>	Number of days eaten in past 7 days
	9. In the past 7 days, how many days did your household eat any [INSERT SPICES, CONDIMENTS AND BEVERAGES LOCALLY AVAILABLE] <i>(e.g. black pepper, salt, chilies, soy sauce, hot sauce, fish powder, fish sauce, ginger, herbs, magi cubes, ketchup, mustard, coffee, tea, milk/cream in small quantities)</i>	Number of days eaten in past 7 days
	10. In the past 7 days, how many days did your household eat any [INSERT SPECIALIZED NUTRITIOUS FOODS AVAILABLE] <i>(e.g. CSB, Super Cereals)</i>	Number of days eaten in past 7 days
FS13	How was this food acquired?	Purchase (using cash grants and/or with their own cash) Own production (crops, livestock, fishing/hunting, gathering) Traded goods/ services, barter Borrowed (loan/credit from traders) Receive as gift (from family relatives or friend/neighbor) In-kind or voucher based food assistance Other Don't know

APPENDIX 4: EVENTS CALENDAR

Seasons	Religious Holidays	Other Events	Months / Years	Age (M)	Height Range
Groundnuts, simsim harvest		Global hand-washing day	October 2021	0	
1st maize and sorghum harvest			September 2021	1	
Weeding of crops, last groundnuts harvest		World breastfeeding week	August 2021	2	
Sorghum, maize, groundnuts planting continues			July 2021	3	
Rains starts, sorghum, maize, groundnuts, simsim planting		World refugee day (20 June)	June 2021	4	
		SPLA day	May 2021	5	
Land preparation start			April 2021	6	65-70 cm
Land preparation start			March 2021	7	
		The month after new year	February 2021	8	
		New year celebrations	January 2021	9	71-76 cm
	Christmas (25 Dec)	World Aid Day	December 2020	10	
Sorghum harvest, Jadar Nar	Thanks giving		November 2020	11	
Groundnuts, simsim harvest		Global hand-washing day	October 2020	12	
1st Maize and sorghum harvest,	Eid conference		September 2020	13	77-80 cm
Weeding of crops, Last groundnut harvest		World breastfeeding week	August 2020	14	
Sorghum, maize groundnut planting continues			July 2020	15	
Rain starts, Sorghum, maize groundnut, Simsim planting		World refugee day (20 June)	June 2020	16	
		SPLA day	May 2020	17	
Land preparation start			April 2020	18	
Land preparation start			March 2020	19	
		The month after new year	February 2020	20	81-86 cm
		New year celebrations	January 2020	21	
	Christmas (25 Dec)	World Aid Day	December 2019	22	
Sorghum harvest, Jadar Nar	Thanks giving		November 2019	23	
Groundnuts, simsim harvest		Global hand washing day or flooding	October 2019	24	
1st Maize and sorghum harvest	Eid conference		September 2019	25	87-90 cm
Weeding of crops, Last groundnut harvest		World breastfeeding week	August 2019	26	
Sorghum, maize groundnut planting continues			July 2019	27	
Rain starts, Sorghum, maize groundnut, Simsim planting		World refugee day (20 June)	June 2019	28	
		SPLA day	May 2019	29	
Land preparation start			April 2019	30	
Land preparation start			March 2019	31	
		The month after new year	February 2019	32	
		New year celebrations	January 2019	33	
	Christmas (25 Dec)	World Aid Day	December 2018	34	
Sorghum harvest, Jadar Nar	Thanks giving		November 2018	35	
Groundnuts, Simsim harvest		Global hand washing day	October 2018	36	
1st Maize and sorghumharvest	Eid conference		September 2018	37	91-99 cm
Weeding of crops, Last groundnut harvest		World breastfeeding week	August 2018	38	
Sorghum, maize groundnut planting continues			July 2018	39	
Rain starts, Sorghum, maize groundnut, Simsim planting		World refugee day (20 June)	June 2018	40	
		SPLA day	May 2018	41	
Land preparation start			April 2018	42	
Land preparation start			March 2018	43	
		The month after new year	February 2018	44	
		New year celebrations	January 2018	45	
	Christmas (25 Dec)	World Aid Day	December 2017	46	
Sorghum harvest, Jadar Nar	Thanks giving		November 2017	47	
Groundnuts, Simsim harvest		Global hand washing day	October 2017	48	
1st Maize harvest	Eid conference		September 2017	49	100-110 cm
Weeding of crops, Last groundnut harvest		World breastfeeding week	August 2017	50	
Sorghum, maize groundnut planting continues		SPLA day	July 2017	51	
Rain starts, Sorghum, maize groundnut, Simsim planting		World refugee day (20 June)	June 2017	52	
	Refugees conflict	SPLA day	May 2017	53	

Land preparation start			April 2017	54
Land preparation start			March 2017	55
		The month after new year	February 2017	56
		New year celebrations	January 2017	57
	Christmas (25 Dec)	World Aids Day	December 2016	58
Sorghum harvest, Jadar Nar			November 2016	59
			October 2016	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 event 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

