Standardised Expanded Nutrition Survey

FINAL REPORT

Makpandu Refugee Settlement

Western Equatoria

South Sudan

Survey conducted: 15th-30th November,2021

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ACRONYMS AND ABBREVIATIONS

CMAM	Community Management of Acute Malnutrition
CSB	Corn-Soya Blend
ENA	Emergency Nutrition Assessment
EPI	Expanded Programme on Immunization
Epi Info	Name of CDC software for epidemiological investigations
GAM	Global Acute Malnutrition
GFR	General Food Ration
GFD	General Food Distribution
HAZ	Height-for-Age z-score
HDDS	Household Diversity Score
HH	Household
irHIS	Integrated Refugee Health Information System
IYCF	Infant and Young Child Feeding
KCAL	Kilocalorie
MAM	Moderate Acute Malnutrition
MOH	Ministry of Health
MUAC	Middle Upper Arm circumference
OTP	Out-patient Therapeutic Programme
PLW	Pregnant and Lactating Women
ProGres	UNHCR registration database for refugees
SAM	Severe Acute Malnutrition
SC	Stabilization Centre
SD	Standard Deviation
SFP	Supplementary Feeding Programme
SMART	Standardised Monitoring & Assessment of Relief & Transitions
SSP	South Sudanese Pound
TFP	Therapeutic Feeding Programme
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Funds
WASH	Water Sanitation and Hygiene Promotion
WAZ	Weight-for-Age z-score
WFH	Weight-for-height
WHZ	Weight-for-Height z-score
WFP	World Food Programme
WHO	World Health Organization
WVI	World Vision International

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Finally, sincerely thank goes to the refugee population who gave up their time to participate and allowed us to measure their children and, most importantly, to the children themselves. A complete list of key individuals involved can be found at **Appendix 1**.

EXECUTIVE SUMMARY

UNHCR and WVI carried out a nutrition survey in Makpandu from 15th -30th November 2021. The overall aim of this survey was to assess the general nutrition and health status of refugee population and formulate workable recommendations for appropriate nutritional and public health interventions.
The survey was based on the UNHCR Standardized Expanded Nutrition Survey (SENS) guidelines for refugee populations (version 3, 2019) http://sens.unhcr.org/. Five SENS modules including i. demography, ii. anthropometric and health, iii. Anaemia, iv. IYCF, and v. Food Security were carried out. WASH and Malaria component was not included because there was a separate WASH assessment that took place along side SENS and also to limit the length of the questionnaire as part of Covid 19 preventive measure while conducting the SENS.

A cross-sectional survey was conducted using simple random sampling. Households were physically labelled with unique numbers per block. To reduce non-response rate and ensure results were representative of people living in the settlement at the time of the survey, empty households[1], as verified through neighbours were not labelled and thus not be included in the sampling frame. A random household sample was drawn from the actual number of physically verified household before the survey.

A total of six survey teams composed of four members each (one team leader, one haemoglobin measurer, one anthropometric measurer/translator and one anthropometric/haemoglobin measurement assistant) were included in each survey. A standardised training lasting four days was provided followed which included a standardisation test. Data collection lasted five days.
The survey teams were supported by a team of 2 supervisors and 1 coordinator who roved between the teams during the data collection.

Mobile phone questionnaires using Open Data Kit (ODK) android software for all the modules was used for data collection. Data validation was carried out daily by the survey coordinator, which allowed for daily feedback to the survey teams. Data analysis was carried out using ENA for SMART January 11th, 2020 , version for anthropometric indices and Epi info version 7.2.3.1 for all the other data.

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

[1] An empty household will be considered an abandoned and excluded from the nutrition survey if no one was present in that tent for the last one month.

<20%	Acceptable	2.5 - < 10	Low
20 – 30%	Poor	10 - < 20	Medium
30 – 39%	Serious	20 - < 30	High
>40%	Critical	≥ 30	Very high

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

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

Source: WHO (2000)

The nutrition situation in Makpandu settlement is relatively stable and has improved further with reducing trends in GAM prevelace from the results that were obtained in 2019. The 2021 GAM prevalence in Makpandu settlement was found to be 1.3% (0.4- 3.7 95% C.I) compared to 3.6% (3.3-4.0 95% C.I) in 2019, which falls under very low prevalence as per WHO classification.

The proportion of children that had Mid Upper Arm Circumference (MUAC) of < 125 mm and/or oedema was 0.8% (0.2- 3.0) 95% C.I.). Analysis of the proportion of children that were found malnourished based on both Weight for Height Z-scores (WHZ) and MUAC was 3.0%. Unlike 2019, the Global Acute Malnutrition (GAM) prevalence was 3.6%; MUAC < 125 mm and/or oedema was 5.2% and proportion of children that were found malnourished based on both WHZ and MUAC was 9.5%. Looking at the proportion of children found malnourished based on both criteria the proportion of malnourished children although not statistically significant (p>0.05) shows that there is great improvement in the nutrition status of the refugees compared to 2019 results.

The prevalence of Global stunting was found to be 30.9% (25.3-37.1) which still falls under very high category based on the WHO/UNICEF classifacition. Although there is slight reduction compared to 32.1% in 2019, stunting remains a great concern in Makpandu although some children did not have a reliable age documentation to back up these statistics.

The coverage of measles vaccination is 85.8%, which is below the target coverage of ≥95, while vitamin A supplementation was 92.3% (88.5-94.9) which is meeting the expected target. These are very impresseive figures considering that 2020 and 2021 was hit hard by COVID-19 pandemicrestrictions and several nutrition compaign settlement and programmes were affected.

A total of 18.2%% (13.9-23.4) of children 6-59 months reported to have had diarrhoea in the last two weeks prior to the survey indicating the needs to continue health services provision, and strengthening of community based preventive interventions on hygiene, sanitation and childcare practices is still of great importance if these figures are to be maintained.

Total anaemia prevalence among children aged 6 to 59 months was 47.1% (41.2-53.0) with 1% being severe anaemia which indicates a reduction compared to results for 2019 SENS which was 60.3% with 2.8% being severe cases. Although there is significant reduction in anaemia situation in Makpandu, the results are still in critical level such that there is still need to intensify anaemia reduction related services to the refugees. The prevalence of Anaemia among women aged 15-49 years (non-pregnant) was 27.3.1% classified as medium public health significance with no case of severe anaemia which shows there was no significant improvement compared to results for 2019 SENS which was 27.8%. The high prevalence of anaemia among children aged 6-59 months is of key concern. It requires to be addressed through multi-sectoral preventive and curative interventions.

Most children had a great start of early initiation of breast feeding at 98.9%% (92.8-99.8) which is excellent, however only 68.7% (41.0-87.4) of the children were exclusively breasfed for a period of 6 months. This is a disturbing figure considering the many health benefits that the child can get if they are exclusively breastfed for a period of 6 months. Consumption of iron-rich or iron-fortified foods was at 51.4% (41.6-61.1) which is still below the reconmended threshhold, probably this also explains why we are having high levels of anamia among children in Makapandu.

Under food security: 99.2% of the HHs reported that they received food assistance in form of cash (Cash Based Transfer). The results for household food consumption score (FCS) indicated that about 68.5% (59.8-76.0) of the household reported with poor food consumption score (FCS). While, 25.9% being borderline and only 5.5% with ecceptable food consumption score (FCS). This also was supported by the results for the negative copying strategies to fill for the food gap to 50% ration cut which is only 1050kcal/person/day compared to the recommended 2100kcal/person/day (translated into cash) with an average of about 80% of household reporting using negative copying strategies such as borrowed cash or food 71.6%, reduced quantity or frequency of meals 82.6%, Reduce consumption by adults so children could eat at 70.8%, Limit portion sizes at mealtime at 85.8% and Rely on less preferred and/or less expensive foods at 95.2%. Scaling up livelihood activities and providing support for agricultural activities would bridge this gap to a greater extent.

Maintenance of a comprehensive nutrition program, strengthening of preventative activities including the provision of adequate household food intake, appropriate caring practices with support and promotion of optimal Infant and Young Child Feeding (IYCF) practices, health and sanitation at household level are recommended to facilitate optimal nutrition. This to be accomplished through provision of adequate food assistance, promotion and protection of infant and young child feeding practices, improved health services, adequate water and sanitation and the expansion of livelihood activities in addition to the treatment of malnourished persons.

TABLE 1 SUMMARY OF KEY FINDINGS

	Number/total	% (95% CI)	Classification of public health significance or target (where applicable)
CHILDREN 6-59 months % [95% CI]			
Acute Malnutrition (WHO 2006 Growth Standards)			
Global Acute Malnutrition (GAM)	3/237	1.3% (0.4- 3.7)	Very high/critical if ≥ 15% (WHO-UNICEF) UNHCR Target of < 10%
Moderate Acute Malnutrition (MAM)	3/237	1.3% (0.4- 3.7)	
Severe Acute Malnutrition (SAM)	0/237	0.0% (0.0- 1.6)	UNHCR Target of < 2%
Oedema	0/269	0.0%	
Mid Upper Arm Circumference (MUAC)			
MUAC <125 mm and/or oedema	2/237	0.8% (0.2- 3.0)	
MUAC 115-124 mm-MAM	2/237	0.8% (0.2- 3.0)	
MUAC <115 mm and/or oedema-SAM	0/272	0.0%	
Stunting (WHO 2006 Growth Standards)			
Total Stunting	71/230	30.9% (25.3-37.1)	Very high/critical if ≥ 30% (WHO-UNICEF)
Severe Stunting	27/230	11.1% (8.2-16.5)	
Programme coverage and enrolment			
Measles vaccination with card or recall (9-59 months)	237/276	85.8% (81.2-89.5)	Target of ≥ 95%
Vitamin A supplementation within past the 6 months with card or recall	255/276	92.3% (88.5-94.9)	Target of ≥ 90%
Therapeutic Feeding Program (OTP) (based on all admission criteria WHZ, oedema and MUAC)	1/9	11.1%	

	Number/total	% (95% CI)	Classification of public health significance or target (where applicable)
Enrolled in BSFP programme	15/174	8.6% (5.2-13.8)	
Targeted Supplementary Feeding Program (TSFP) (based on all admission criteria WHZ and MUAC)	3/10	30 %	
Deworming coverage within past 6 months (12-59 months)	150/223	67.2% **(60.8- 73.1)**	
Diarrhoea			
Diarrhoea in the last 2 weeks	47/269	18.2%% (13.9-23.4)	
Anaemia children 6-59 months			
Total, Anaemia (Hb < 11 g/dl)	130/276	47.1%% (41.2-53.0)	High if ≥ 40% Target of < 20%
Mild (Hb 10-10.9)	51/276	18.4% (14.3-23.5)	
Moderate (Hb 7-9.9)	76/276	27.5% (22.5-33.1)	
Severe (Hb < 7)	3/276	1.0% (0.3-3.3)	
Prevalence of Moderate and Severe Anaemia underfive Children By Age Group	**6-59 months** n = 276	**6-23 months** n=101	**24-59 months** n=159
Moderate and Severe Anaemia (Hb<10.0 g/dL)		(42) 35.6% (26.8-45.5 95% CI)	(44) 27.0% (20.6-34.5 95% CI)
CHILDREN 0-23 months % [95% CI]			
IYCF indicators			
Timely initiation of breastfeeding	95/96	98.9%% (92.8-99.8)	UNHCR Target of ≥ 85%
Exclusive breastfeeding under 6 months	11/16	68.7% (41.0-87.4)	UNHCR Target of ≥ 75%
Consumption of iron-rich or iron-fortified foods	52/101	51.4% (41.6-61.1)	UNHCR Target of ≥ 60%
Bottle feeding	1/117	0.8%% (1.1-5.9)	UNHCR Target of < 5%
WOMEN 15-49 years % [95% CI]			

	Number/total	% (95% CI)	Classification of public health significance or target (where applicable)
Anaemia (non-pregnant)			
Total, Anaemia (Hb <12 g/dl)	41/150	27.3.1% (20.7-35.0)	High if ≥ 40% (WHO) UNHCR Target of < 20%
Mild (Hb 11-11.9)	35/150	23.3% (17.2-30.8)	
Moderate (Hb 8-10.9)	6/150	4% (1.7-8.6)	
Severe (Hb <8)	0/150	0% (0.0-0)	
Programme enrolment/coverage pregnant women			
Pregnant women currently enrolled in the ANC	17/24	70.8% (48.9-86)	
Pregnant women currently receiving Iron-folic acid pills	16/24	66.6% (44.9-83)	
DEMOGRAPHY % [95% CI]			
Household size and Composition			
Average household size (mean, SD / range)		5.4 (2.4) [4.9-5.8]	
Percent of children U2	125/1298	9.6%	
Percent of children U5	289/1298	22.2.0%	
Percent of pregnant women	37/1298	2.8%	
Household Head Profile			
Female headed households	78/240	32.5% (26.8-38.7)	
Male headed households	162/240	67.5% (61.2-73.1)	
Children headed households	2/240	0.8% (0.2-3.2)	
Age dependency ratio			
Average age dependency ratio (mean, SD / range)		1.1 (1.0) [0.0-6.0]	
FOOD SECURITY % [95% CI]			
Proportion of households receiving a food	126/127	99.21%	

	Number/total	% (95% CI)	Classification of public health significance or target (where applicable)
assistance (food vouchers)		(94.5-99.8)	
Food voucher			
Proportion of households receiving food vouchers to cover basic food needs	126/127	99.2% (94.5-99.8)	
Average number of days general food ration lasts out of [insert cycle] days (mean, SD or range)	126	6.5 (5.4) [1-21]	
Negative household coping strategies			
Proportion of households reporting using the following coping strategies over the past 7 days:			
Rely on less preferred and/or less expensive foods	121/127	95.2% (90.2-98.3)	
Borrow food, or rely on help from a friend or relative	91/127	71.6% (63.1-78.8)	
Reduce the number of meals eaten in a day	105/127	82.6% (75.0-88.3)	
Limit portion sizes at mealtime	109/127	85.8% (78.5-90.9)	
Reduce consumption by adults so children could eat	90/127	70.8% (62.3-78.1)	
Average CSI (mean, SD / range)		13.4 [12.1-14.7]	
Food Consumption Score (FCS)			
Average FCS (mean, SD / range)		19.8 [18.2- 21.3]	
FCS profiles:			
Acceptable	7/127	5.5% (2.6-11.1)	
Borderline	33/127	25.9% (19.0-34.3)	
Poor	87/127	68.5% (59.8-76.0)	

Recommendations and priorities

Nutrition related

- Maintain a comprehensive Community based Management of Acute Malnutrition (CMAM) program providing both therapeutic and supplementary feeding programs to facilitate the rehabilitation of identified acute malnourished children, pregnant and lactating women, people living with HIV/AIDS, and TB patients on treatment. This to include active case finding and community mobilization. (UNHCR, UNICEF, WFP and WVI)

- Active case finding and referral of all identified children aged 6-59 months children with a MUAC less than 125mm for management of acute malnutrition through community outreach follow up at household level (WVI).

- Conduct a two-step MUAC and WHZ scores (for children with MUAC at risk) screening monthly at all the health facility contact points including the EPI, triage and BSFP sites to ensure both high MUAC and WHZ score coverage (WVI).

- Maintain blanket supplementary feeding programme for children 6-23 months, pregnant and lactating women using a fortified blended food or lipid-based supplement to prevent malnutrition and to cover the nutrient gap these vulnerable groups face considering their predominant grain based general food diet (UNHCR, WFP and WVI).

- Continue strengthening the capacity of the nutrition program, in terms of provision of adequate staff and training to ensure quality provision of both curative and preventative components (UNHCR, WFP, UNICEF and WVI).

- Awareness creation, protection, and promotion of appropriate IYCF practices (using the UNHCR multisectoral framework for action in refugee situations approach) to further improve breastfeeding practices and to strengthen complementary feeding practices (UNHCR, UNICEF and WVI)

- Expand and strengthen the prevention of malnutrition components including community outreach information, education and communication and diverse diet utilization aspects to stop malnutrition from occurring in the first place. (UNHCR, UNICEF, WFP and WVI).

- Conduct quarterly mass MUAC screening to monitor the evolution of the nutrition situation in Makpandu settlement. This to target children aged 6-59 months and PLWs (WVI)

- Prioritise implementation of the refugee micronutrient reduction strategy to curb the high anaemia prevalence (WVI)

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

- Undertake a follow up annual nutrition survey to analyze trends and facilitate program impact evaluation. (UNHCR, WVI, WFP and UNICEF)

Food security related

- Provision of cash assistance and continue to advocate for provision of the minimum dietary requirements (2100kcal/person/day). (UNHCR, WVI and WFP).

- Continue the routine joint monthly food basket monitoring on site and ensure Makpandu inclusion in the country post distribution monitoring at the household level (UNHCR, WVI and WFP).

- Expand the coverage of sustainable food security and livelihood solutions in Makpandu settlement to complement the provided food assistance (UNHCR, WFP and WVI).

Health related

- Maintain and strengthen the provision of comprehensive primary health care programme for refugees and host populations in Makpandu. (UNHCR and WVI)

- UNICEF, WVI and UNHCR to ensure that Expanded Programme on Immunization (EPI), Vitamin A supplementation and de-worming settlementaigns and routine programmes are strengthened to increase coverage to acceptable standards.

- Adequate (>15 litres/p/p/day while UNHCR's standard is 20l/p/p/day) clean water provision to be maintained at all cost. In addition to this, hygiene promotion and latrine coverage strengthening to reduce the diarrhoea caseload to be ensured. (UNHCR and WVI)

1.0.INTRODUCTION

This report presents the results of nutrition survey conducted in Makpandu settlement. The survey was carried out from 15 -30th November 2021.
This report is divided into the following sections:

- *Background:* This section sets out background information related to the health, nutrition, food security or Makpandu settlement.
- *Methodology;*
- *Results:* presents the findings of five SENS modules including i. demography, ii. anthropometric and health, iii. Anaemia, iv. IYCF, and v. Food Security;
- *Discussion; and*
- *Recommendations.*

1.0.BACKGROUND INFORMATION

Makpandu refugee settlement has an estimated refugee population of 6,827 who are mainly from DRC and CAR, and a few from Sudan and Eritrea.

Health data from Makpandu settlement Settlement usually reported low levels of acute malnutrition but will continually require attention. The 2019 SEN survey data shows that the GAM prevalence in Makpandu settlement was found to be [3.6 (3.3-4.0 95% C.I.)] which falls under low prevalence.

The proportion of children that had Mid Upper Arm Circumference (MUAC) (< 125 mm and/or oedema) was 5.2% (4.7 - 5.7 95% C.I.) in 2019. Analysis of the proportion of children that were found malnourished based on both Weight for Height Z-scores (WHZ) and MUAC was 9.5% (24/252). In 2018 the Global Acute Malnutrition (GAM) prevalence was 5.3%; MUAC < 125 mm and/or oedema was 3.5% and proportion of children that were found malnourished based on both WHZ and MUAC was 5.8%. Looking at the trend of malnutrition from 2018 to 2019, there was significant improvement of the nutrition situation of Makpandu, however, a follow up nutrition survey was recommended to evaluate the impact of the on-going interventions and confirm if indeed there is further improvement from the 2019 SENS results.

Key partners in terms of the provision of the health, nutrition and food security services include UNHCR, WFP, UNICEF and World Vision International (WVI). UNHCR is mainly involved in coordinating services offered to the refugees through the partners. WFP's main role is to ensure that the refugee's food security is adequately addressed through the provision of the general food assistance once per month. In addition to this, WFP supports the supplementary feeding program targeting vulnerable groups. UNICEF in collaboration with UNHCR provides support to the management of severe acute malnutrition and IYCF programmes. WVI implements the health, nutrition, and food security programme.

1.1. Demography

At the end of June 2021, the total population in Makpandu was 6,827 individuals (2,022 households) according to UNHCR ProGress. 18.3% of these were children less than five years (1,297). The average household size was 2.8

1.2. Food Security

Refugees in the Makpandu settlement are mainly dependent on the WFP provided food assistance using Cash Based Transfer approach and have limited access to additional sources of food/income. From January to October 2021, the Refugees were given cash ranging between SSP 3,910 to SSP 4,480 (depending on food basket market rate) for pulses, oil, and salt. Galaxy International is the financial service provider contracted to carry out the cash-component of the GFD, while the WVI remains responsible for the distribution for the NFIs. The daily food basket provided didn't met the recommended 2100 kcal per person, and refugees faced food ration cuts ranges between 13-52%.

Table 2: General food ration provision by month – Makpandu refugee settlement, Yambio, 2021

Ration provided at the distribution in g/p/d	**Food basket 2100 kcal/p/d**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**
Cash in SSP for Cereals, Pulses, oil, salt		4480	3690	4560	3910	4410	4420	4420	3750	4300	4300
	% of standard met	87	59	58	48	51	49	53	57	65	65

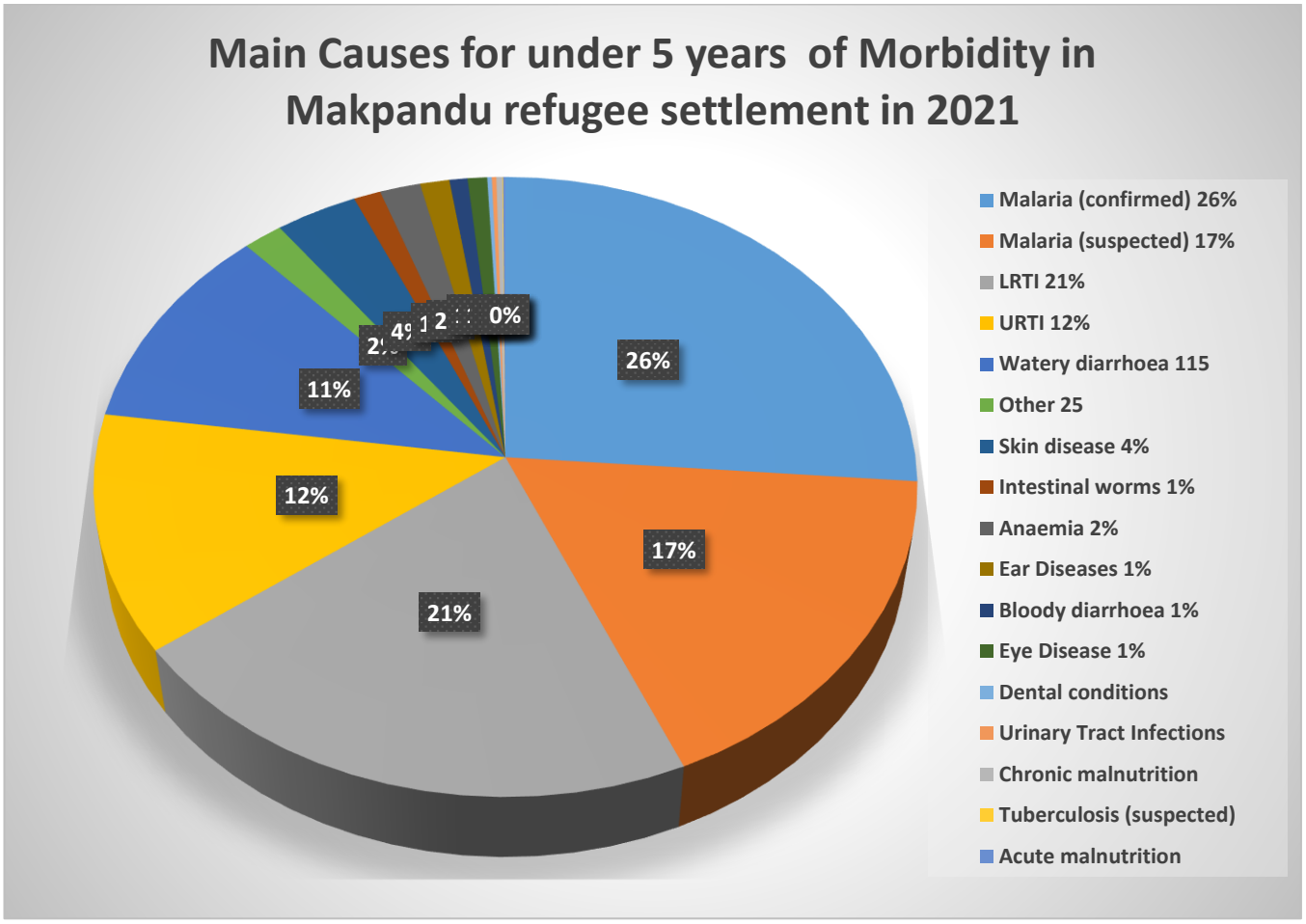
1.3. Health situation

Makpandu refugee settlement has one Primary Health Care Centre (PHCC).

The overall crude mortality rate for Makpandu settlement from the UNHCR Integrated Refugee Health Information System (iRHIS) from January to December 2021 was 0.03/1000/month while under-five mortality rate was 0/1000/month, which was below the emergency threshold of <0.75 and <2 respectively. This is a great improvement from 2019 SENS report and indicates a stable population.

The main causes of illness in 2021 were malaria, respiratory tract infections, watery diarrhoea, skin disease, intestinal worms, and chronic diseases. This was the same pattern in 2019.

Figure 1: Under-five proportional morbidity from January to November 2021; Makpandu, Yambio settlement (UNHCR irHIS)



1.4.Nutrition Situation

The 2019 SEN survey data indicated that the GAM prevalence in Makpandu settlement is currently at 3.6 (3.3-4.0 95% C.I.)] which falls under low prevalence. The proportion of children that had Mid Upper Arm Circumference (MUAC) (< 125 mm and/or oedema) was 5.2% (4.7 - 5.7 95% C.I.) in 2019. Analysis of the proportion of children that were found malnourished based on both Weight for Height Z-scores (WHZ) and MUAC was 9.5% (24/252). In 2018 the Global Acute Malnutrition (GAM) prevalence was 5.3%; MUAC < 125 mm and/or oedema was 3.5% and proportion of children that were found malnourished based on both WHZ and MUAC was 5.8%. Looking at the trend of malnutrition from 2018 to 2019, there was significant improvement of the nutrition situation of Makpandu, however, a follow up nutrition survey was recommended to evaluate the impact of the on-going interventions and confirm if indeed there is further improvement from the 2019 SENS results.

Nutrition services and activities in the settlement at the time of the survey included:

- Targeted Supplementary Feeding Programmes (TSFP) for moderately acute malnourished children aged 6-59 months using Plumpy'Sup or Corn Soya Blend Plus (CSB++).
- Outpatient and inpatient therapeutic feeding programmes for severely acute malnourished children.
- Blanket Supplementary Feeding Program (BSFP) targeting children 6 to 23 months and Pregnant and Lactating Women (PLW). Both children and PLW receive 200g/person/day of CSB++.
- Basic infant and young child feeding support and promotion programme. At the facility level this is integrated into the primary health care components i.e., Ante Natal Care (ANC), Post-Natal Care (PNC) Maternity and Nutrition. At the community level, community structures are used and include Community Health Promoters (CHPs
- Community outreach MUAC screening referral and follow up.

From January to December 2021 there were 146 (children aged 6-59) admissions of which 37 were admitted to the OTP and 109 to the TSFP. At the end of October 2021 there were 134 children aged 6-59 months enrolled in both the OTP and TSFP program. There were no severe acute malnutrition cases with medical complication admitted within this period.

Malnutrition among pregnant and lactating women were assessed during the quarterly mass MUAC screening. Unfortunately, due to revised CMAM guidelines in the face of COVID-19 pandemic it was not allowed to continue with community based MUAC screening. Most cases were identified at facility level. From January to December 2021, 59 malnourished PLWs were admitted to the TSFP program.

WASH situation

According to the WASH KAP survey which was conducted in Makapandu settlement in 2020, the average per capita water consumption at household level indicated to be 14.15liters per person per day. And it was also noted 32% of HHs had 10liters per person of water storage containers. Most of the refugees were collecting water from protected sources like 57.8% of the HHs collected water from tap stands, 65.1% of the HHs collected water from hand pump fitted wells and 2.75% of the HHs collected water from springs and open sources. Up to 32% of households had 10liters per person of water storage containers for which 63.3% of water containers were covered and clean. The survey also revealed that 58.7% of the HHs reported/used latrines for defecating, 33.94% of HHs used shared latrines for defecation 5.50% of the HHs reported the use of communal latrines and 0.92% of the HHs used open defecation. In terms of handwash practices, 89.9% of HHs reported that they used soap and water during hand washing, and 61.4% of households wash their hand at least during three critical times of hand washing practice needs. On another note, 30.2% of households reported that diarrheal cases were noted in their household members two weeks prior to the survey.

2.0.SURVEY OBJECTIVES

2.1.Specific primary objectives of the survey

a. To measure the prevalence of acute malnutrition among children 6-59 months.
b. To measure the prevalence of stunting among children 6-59 months.
c. To determine the coverage of measles vaccination among children 9-59 months.
d. To determine the coverage of vitamin A supplementation in the last six months among children 6-59 months.
e. To determine the coverage of de-worming in the last six months among children 12-59 months.
f. To determine the two-week period prevalence of diarrhoea among children 6-59 months
g. To measure the prevalence of anaemia among children 6-59 months and women of reproductive aged 15-49 years (non-pregnant).
h. To investigate IYCF practices among children 0-23 months
i. To determine the coverage of ration cards and the duration the GFD ration lasts for recipient households
j. To determine the extent to which negative coping strategies are used by households
k. To assess household dietary diversity
l. To establish recommendations on actions to be taken to address the situation

2.2.Secondary objectives:

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

3.0.METHODOLOGY

3.1.Survey population and sample size

The sample size was calculated using the Emergency Nutrition Assessment (ENA) for Standardized Monitoring and Assessment of Relief and Transitions (SMART) software version January 11th, 2020, following UNHCR SENS guidelines version 3, 2019 http://sens.unhcr.org/. The GAM prevalence estimate was based on the likely scenario using the 2019 nutrition survey results. The higher confidence interval was used for the estimated prevalence. The total population and percentage of under-5 was derived from the UNHCR ProGres data xx month/xxxx year. The average household size was based on UNHCR ProGres and household listing data. A non-response rate of 10% was used in both settlements as household listing was carried out right before the survey data collection.

Table 3: Sample size calculation: Anthropometry in Makpandu settlement

	Makpandu
Estimated prevalence (%)	4.0
± Desire precision (%) (UNHCR SENS guidelines)	4
Average household size (ProGres)	5
<5 population (%) (ProGres)	18.3
Nonresponse households (%)	10
Total settlement population (ProGres)	6827
Households to be included for Anthropometry and Health module (ENA for SMART)	271 (not less than 201 children)

As the population of children under five, was less than 10,000, a correction factor was used while calcuating the sample size in ENA for SMART. The sample size for anthropometry and health was used for the IYCF and child anaemia. Half the sample size of anthropometry (every other household) was used as the sample size for women anaemia and food security modules. This translated to not less than 111 households for the women anaemia and food security module.

3.2. Sampling procedure and questionnaire administration

3.2.1. Selecting households and individuals

A cross-sectional survey was conducted using simple random sampling. Households were physically labelled with unique numbers per block using the survey household definition. To reduce non-response rate and ensure results were representative of people living in the settlement at the time of the survey, empty households[2], as verified through neighbours were not labelled and thus not be included in the sampling frame. Following the listing and sample size calculation a random household sample was drawn from the actual number of physically verified household before the survey.

All the eligible household members were included in the survey; that is all children 6 to 59 months / (0-23 months for IYCF) and women 15 to 49 years in a sampled household. The interview was conducted in most cases with the mother in the household or in her absence with an adult member of the household who was knowledgeable with the everyday running of the household. The survey defined a household as the number of people who regularly stay together and eat from the same pot. 266 of the listed households of the 529 listed were surveyed. Each team was allocated a number of households. Block locations and boundaries was discussed during the training to ensure all teams knew where to go.

If a child was absent, the teams were instructed to revisit the household one more time. If they were unsuccessful after this, the child was recorded as absent, and they were not replaced with another child. If the household refused to participate then it was considered a refusal and the household was not replaced with another. If a selected child was living with a disability or a physical deformity preventing certain anthropometric measurements the child was still included in the assessment of the other indicators. If it was determined that a selected household did not have any eligible children, the questionnaire was not administered, and the team moved to the next household.

3.2.2. Questionnaires

Mobile phone questionnaires using Open Data Kit (ODK) android software was used for data collection. See **Appendix 3.**

The questionnaires were prepared in English language. Following the survey training, revisions were adapted. The questionnaires were translated to the local dialect via the enumerators where necessary during data collection. The translation was practiced during training.

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

[2] An empty household will be considered an abandoned and excluded from the nutrition survey if no one was present in that tent for the last one month.

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

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

Women 15-49 years- These included questions and measurements of women aged 15 – 49 years. Information was collected on women's pregnancy status, coverage of iron-folic acid pills and ANC attendance for pregnant women, and haemoglobin status for non-pregnant women.

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

3.3. Measurement methods

3.3.1. Household-level indicators

Food security: The questionnaire used was from UNHCR's Standardized Expanded Nutrition Survey (SENS) Guidelines for Refugee Populations Version 3 (2019).

3.3.2. ***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 phone. If the child's age could not be determined by using a local events calendar or by probing, the child's length/height was used for inclusion; the child had to measure between 65 cm and 110 cm.

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

Weight of children 6-59 months: measurements were taken to the closest 100 grams using an electronic scale (SECA scale). All children were weighed without clothes. The double-weighing technique was used to weigh young children unable to stand on their own or unable to understand instructions not to move while on the scale.

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

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

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

Child enrolment in selective feeding programme for children 6-59 months: selective feeding programme coverage was assessed for the outpatient therapeutic programme and for the supplementary feeding programme. This was verified by card or by showing images of the products given at the different programs

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

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

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

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

Diarrhoea in last 2 weeks in children 6-59 months: an episode of diarrhoea is defined as three loose stools or more in 24 hours. Caregivers were asked if their child had suffered episodes of diarrhoea in the past two weeks prior to the survey.

ANC enrolment and iron and folic acid pills coverage: if the surveyed woman was pregnant, it was assessed whether she was enrolled in the ANC programme and was receiving iron-folic acid pills. An iron-folic acid pill image was shown to the pregnant woman when asked to recall.

Infant and young child feeding practices in children 0-23 months*: i*nfant and young child feeding practices was assessed based on UNHCR Standardized Expanded Nutrition Survey (SENS) Guidelines for Refugee Populations version 2 (2013).

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

3.3.3. Case definitions and calculations

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

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

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

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

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

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

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

Categories of underweight	Z-scores (WHO Growth Standards 2006)
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 7: 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):

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

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

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

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

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

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

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

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

Continued breastfeeding at 2 years:
Proportion of children 20–23 months of age who are fed breast milk
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 8: Definition of anaemia (WHO 2000)

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

3.3.4. 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 settlement, 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 9: Classification of public health significance for children under 5 years of age

Prevalence %[3]	**Very low**	**Low**	**Medium**	**High**	**Very high**
Low weight-for-height	<2.5	2.5-<5	5-<10	10-<15	>=15
Low height-for-age	<2.5	2.5-<10	10-<20	20-<30	>=30

Prevalence %	**Critical**	**Serious**	**Poor**	**Acceptable**
Low weight-for-age[4]	≥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

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

programmes according to UNHCR Strategic Plan for Nutrition and Food Security 2008-2012 (same as Sphere Standards).

Table 10: 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	Settlements
SFP	>75%	<3%	<15%	>50%	>70%	>90%
TFP	>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 settlement, 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 11: Classification of public health significance (WHO 2000)

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

3.4. Training, coordination, and supervision

The survey and Enumerator trainings were coordinated and conducted by Maria Chidumu, UNHCR Associate Nutrition and Food Security and by UNHCR Yambio Office in collaboration with the WVI team including Godfrey Otobi, Chan Gatluak and Arnold Walter Ochan.

The surveys were undertaken by six teams. Each team was composed of four members each (one team leader, one haemoglobin measurer, one anthropometric measurer/translator and one anthropometric/haemoglobin measurement assistant). The team leaders/questionnaire enumerators were health/nutrition staff, while the anthropometric measurers were community outreach workers.

A four day training was carried out from 15th to 19th November 2021. UNHCR and WVI facilitated the training. The training focused on: the purpose and objectives of the survey, roles and responsibilities of each team member, familiarization with the questionnaires by reviewing the purpose of each question; interviewing skills and recording of data; interpretation of calendar of events and age determination; how to take anthropometric measurements, common errors and data recording. A standardisation exercise on anthropometric measurements and pilot test was also carried out for practice. Post the training the data collection tools were reviewed based on the feedback from the team

3.5. Data collection, entry, and analysis

Data collection lasted for 5 days from 22nd to 30th November 2021. Each survey team explained the purpose of the survey and issues of confidentiality and obtained verbal consent before proceeding with the survey in the selected households. The informed consent form is shown in **Appendix 2**. The survey teams were supported by a team of 1 coordinator (UNHCR Associate Nutrition and Food Security Officer) and 2 supervisors (WVI) who roved between the teams during the data collection.

Data was collected using the ODK for Android platform using six Samsung phones. An addition two phones were also provided on standby as back up. At the end of each day's data collection, each questionnaire was checked for completeness before being finalised on the phones. Once the questionnaires were finalised, they were sent to the server for synchronisation and exporting. After exporting the data, the anthropometric data plausibility check was conducted on daily basis to identify areas and teams that need more supervision or to be strengthened. Practical feedback to ensure accuracy and thoroughness in gaps identified was provided each morning. The final SMART plausibility report with a summary of the key quality criteria is shown in **Appendix 1**.

The ODK exports data in csv format, for cleaning and analysis the data was saved in Microsoft Excel 2007 format. The nutritional indices were cleaned using flexible cleaning criteria from the observed mean (also known as SMART flags in the ENA for SMART software), rather than the reference mean (also known as WHO flags in the ENA for SMART software). This flexible cleaning approach is recommended in the UNHCR SENS Guidelines (Version 2, 2013) in accordance with SMART recommendations. For the weight-for-height index, a cleaning window of +/- 3 SD value contained in the SMART for ENA software was used.

Anthropometry indices were analysed using the ENA for SMART January 11th, 2020 version. Epi Info version 7 was used to analyse all the other data.

4.0.RESULTS FROM MAKPANDU

4.1. Demography

Household size and composition

Table 12. Demographic characteristics, household size and composition of the surveyed population – Makpandu refugee settlement

Household size and composition		Results
Population size – Total persons (ProGres 31st July 2021)		6827
Total population surveyed – Total persons (all ages)		1298
Total U2 surveyed		125
Total U5 surveyed		289
Average household size		5.4
Household size categories	1-4 person(s)	46.4%
	5-6 persons	22.8%
	7-9 persons	17.8%
	≥ 10 persons	12.8%
Household composition	Children under two	0.5
	Children under five	1.1
	Children aged 5-14 years	1.6
	Members aged 15-64 years	2.4
	Members aged 65 years and above	0.08
Percent of children U2	%	9.6%%
Percent of children U5	%	22.2%
Percent pregnant women (15-49 years)	%	2.8%
Percent of elders (65 years and above)	%	1.5%
Sex ratio	Male/Female	0.91

There are more women than man investigated, and the average household size is 5.4.

Household head profile

Table 13. Household head profile – Makpandu refugee settlement

	Number/total	% (95% CI)
Female headed households (working age 15-64 years)	151/224	67.5% (60.9-73.2)
Male headed households (working age 15-64 years)	73/224	32.5% (26.7-39.0)
Children headed households (under 15 years)	0/224	0%
Elderly headed households (65 years and above)	0/224	0%
Mean age of household head in years (SD) [range]	38.9 (13.3) [17.0-75.0]	

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

Age dependency ratio

Table 1. Age dependency ration categories by household – Makpandu refugee settlement

Age dependency categories		Age dependency ratio	Number / Total	% (95% CI)
Category I	**1 dependent or less per non-dependent member**	≤ 1	138/241	57.0% (50.9-63.3)
Category II	**Up to 3 dependents per 2 non- dependent members**	1.1-1.5	23/241	9.5.0% (6.4-13.9)
Category III	**Up to 2 dependents per non-dependent members (1.5<DR<=2)**	1.6-2.0	8/241	3.3% (1.6-6.5)
Category IV	**More than 2 dependents per non-dependent members (DR>2)**	≥2.1	72/241	29.8% (24.4-35.9)
Mean age dependency ration		Mean (SD) [range]	241	1.2 (1.1) [0.0-5.0]

There are 30% households had more than 2 dependents per non-dependent members, which is a high proportion.

4.2. CHILDREN 6-59 MONTHS INDICATORS, Makpandu settlement, Yambio, South Sudan (November 2021)

Table 14 shows the total number of children who were sampled.

Table 14: Actual number of children captured during the survey Makpandu settlement versus target, (November 2021)

Target group	Target population	Subjects measured/interviewed during the survey	% of the target covered
Children 6-59 months	201	277	>100%

The targeted number of the children to be surveyed was within the recommended standard of >80%.

Table 15: Distribution of age and sex of sample-Makpandu settlement, Yambio, South Sudan (November 2021)

	Boys		Girls		Total		Ratio
AGE (mo)	**no.**	**%**	**no.**	**%**	**no.**	**%**	**Boy:girl**
6-17	40	58.0	29	42.0	69	28.5	1.4
18-29	27	52.9	24	47.1	51	21.1	1.1
30-41	30	52.6	27	47.4	57	23.6	1.1
42-53	25	50.0	25	50.0	50	20.7	1.0
54-59	6	40.0	9	60.0	15	6.2	0.7
Total	128	52.9	114	47.1	242	100.0	1.1

The overall sex ratio was 1.1 (sex ratio should be between 0.8-1.2), which confirms that both sexes were equally distributed.

Table 16: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex- Makpandu settlement, Yambio, South Sudan (November 2021)

	All n = 237	**Boys** n = 124	**Girls** n = 113
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(3) 1.3 % (0.4 - 3.7 95% C.I.)	(2) 1.6 % (0.4 - 5.7 95% C.I.)	(1) 0.9 % (0.2 - 4.8 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(3) 1.3 % (0.4 - 3.7 95% C.I.)	(2) 1.6 % (0.4 - 5.7 95% C.I.)	(1) 0.9 % (0.2 - 4.8 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(0) 0.0 % (0.0 - 1.6 95% C.I.)	(0) 0.0 % (0.0 - 3.0 95% C.I.)	(0) 0.0 % (0.0 - 3.3 95% C.I.)

The prevalence of oedema is 0 %. Data excludes SMART flags

There was slight difference between boys and girls in the prevalence of acute malnutrition (p>0.05) with1.6% and 0.9% respectively

Table 17: Prevalence of acute malnutrition by age, based on weight-for-height z-scores Makpandu settlement, Yambio, South Sudan (November 2021)

		Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	66	0	0.0	2	3.0	64	97.0	0	0.0
18-29	50	0	0.0	0	0.0	50	100.0	0	0.0
30-41	56	0	0.0	0	0.0	56	100.0	0	0.0
42-53	50	0	0.0	1	2.0	49	98.0	0	0.0
54-59	15	0	0.0	0	0.0	15	100.0	0	0.0
Total	237	0	0.0	3	1.3	234	98.7	0	0.0

Children aged 6-17 months were the most affected by acute malnutrition.

Figure 4 : Trends in the prevalence of global and severe acute malnutrition based on WHO growth standards in children aged 6-59 months from 2017-2021 – Makpandu settlement, Yambio, South Sudan (November,2021).

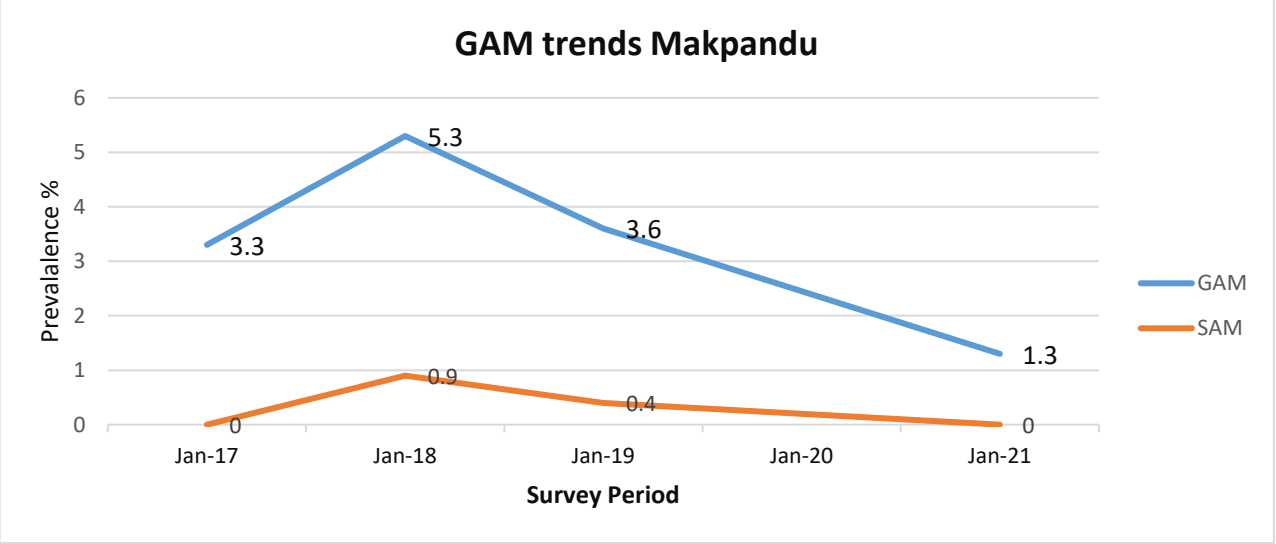
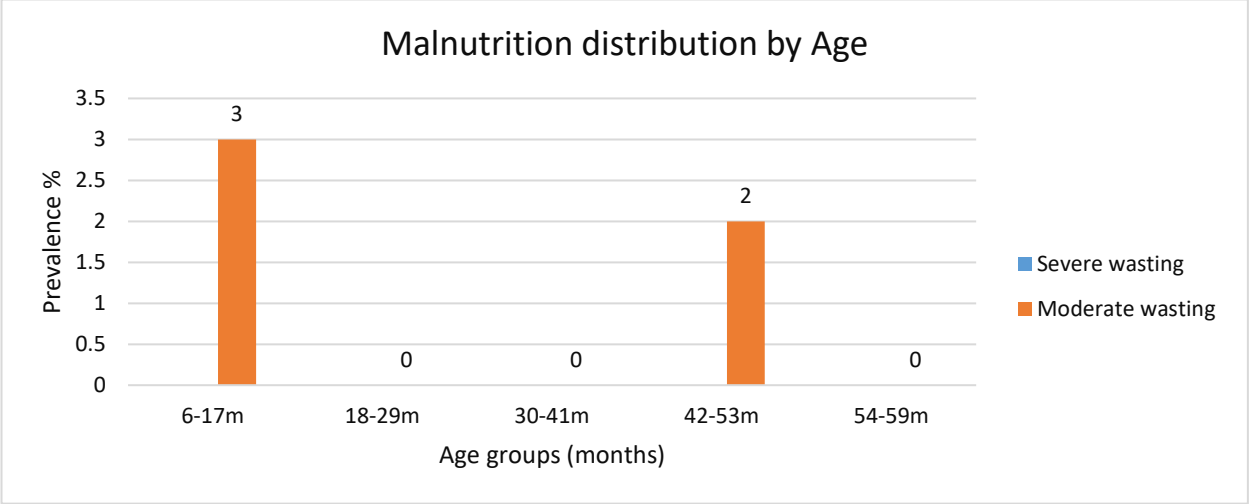


Figure 5: Prevalence of wasting by age in children 6-59 months- Makpandu settlement, Yambio, South Sudan (November 2021)



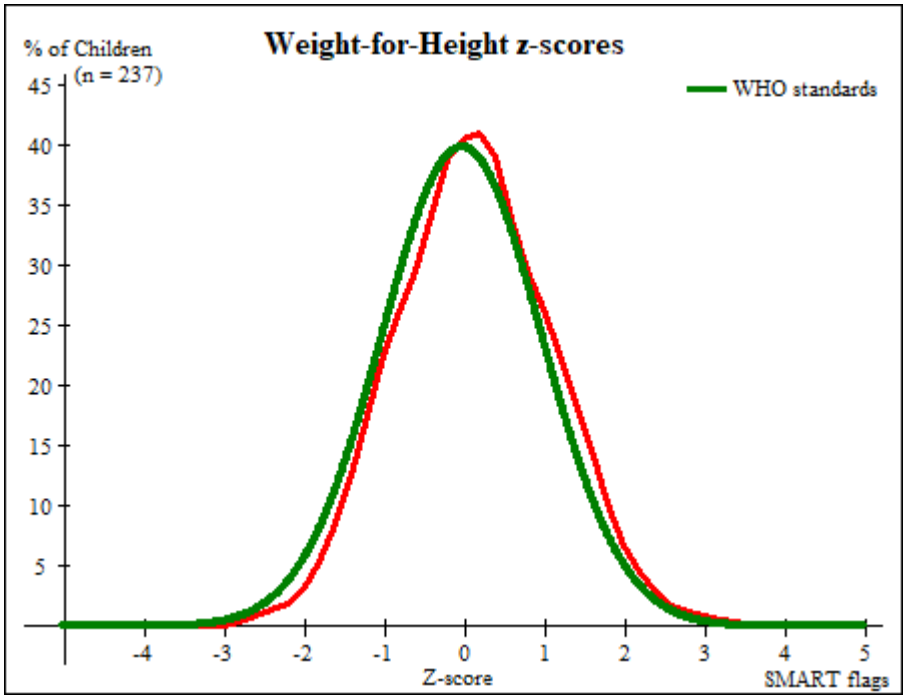
Children in the age groups 6-17 and 42-53 months tend to be the most affected by wasting as compared to the other age groups.

Table 18: Distribution of severe acute malnutrition and oedema based on weight-for-height z-scores- Makpandu settlement, Yambio, South Sudan (November 2021)

	<-3 z-score	**>=-3 z-score**
Oedema present	Marasmic kwashiorkor. 0 (0.0 %)	Kwashiorkor. 0 (0.0 %)
Oedema absent	Marasmic No. 3 (1.2 %)	Not severely malnourished. 239 (98.8 %)

**Includes Flags*

Figure 6: Distribution of weight-for-height z-scores (based on WHO Growth Standards; the reference population is shown in green) of survey population compared to reference population- Makpandu settlement, Yambio, South Sudan (November 2021)



The figure shows that malnutrition is not generalized in the population as the weight-for-height z-score distribution is mostly not shifted to the left. However, there are some cases of malnutrition that need to be addressed.

Table 19: Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex - Makpandu settlement, Yambio, South Sudan (November 2021)

	All n = 242	**Boys** n = 128	**Girls** n = 114
Prevalence of global malnutrition (< 125 mm and/or oedema)	(2) 0.8 % (0.2 - 3.0 95% C.I.)	(2) 1.6 % (0.4 - 5.5 95% C.I.)	(0) 0.0 % (0.0 - 3.3 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(2) 0.8 % (0.2 - 3.0 95% C.I.)	(2) 1.6 % (0.4 - 5.5 95% C.I.)	(0) 0.0 % (0.0 - 3.3 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(0) 0.0 % (0.0 - 1.6 95% C.I.)	(0) 0.0 % (0.0 - 2.9 95% C.I.)	(0) 0.0 % (0.0 - 3.3 95% C.I.)

There was difference in the proportion of boys and girls that had MUAC < 125 mm and/or oedema. All children that had <125mm were male children

Table 20: Prevalence of underweight based on weight-for-age z-scores by sex- Makpandu settlement, Yambio, South Sudan (November 2021)

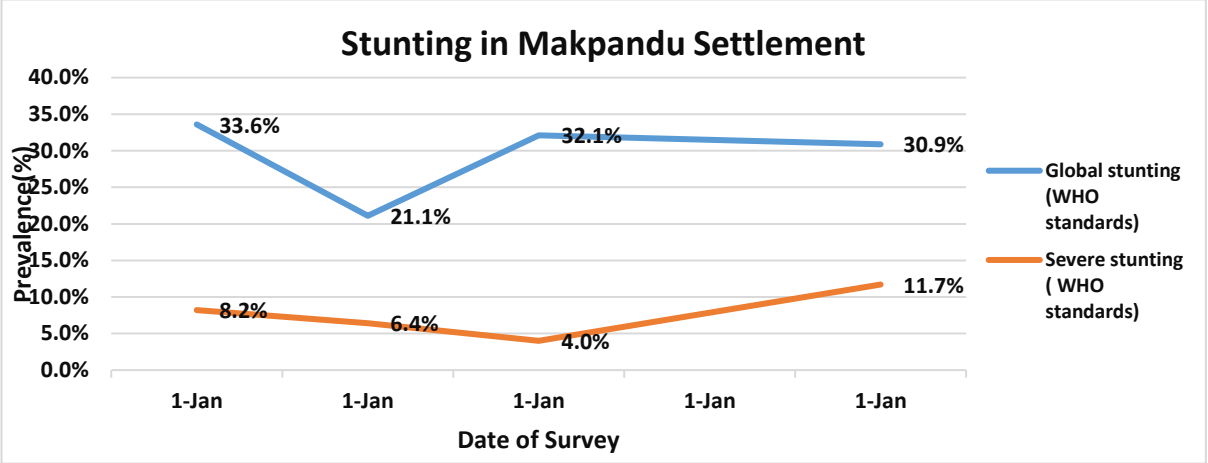
	All n = 240	**Boys** n = 126	**Girls** n = 114
Prevalence of underweight (<-2 z-score)	(23) 9.6 % (6.5 - 14.0 95% C.I.)	(14) 11.1 % (6.7 - 17.8 95% C.I.)	(9) 7.9 % (4.2 - 14.3 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(22) 9.2 % (6.1 - 13.5 95% C.I.)	(14) 11.1 % (6.7 - 17.8 95% C.I.)	(8) 7.0 % (3.6 - 13.2 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(1) 0.4 % (0.1 - 2.3 95% C.I.)	(0) 0.0 % (0.0 - 3.0 95% C.I.)	(1) 0.9 % (0.2 - 4.8 95% C.I.)

Table 21: Prevalence of stunting based on height-for-age z-scores and by sex- Makpandu settlement, Yambio, South Sudan (November 2021)

	All n = 230	**Boys** n = 121	**Girls** n = 109
Prevalence of stunting (<-2 z-score)	(71) 30.9 % (25.3 - 37.1 95% C.I.)	(38) 31.4 % (23.8 - 40.1 95% C.I.)	(33) 30.3 % (22.4 - 39.5 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(44) 19.1 % (14.6 - 24.7 95% C.I.)	(25) 20.7 % (14.4 - 28.7 95% C.I.)	(19) 17.4 % (11.5 - 25.6 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(27) 11.7 % (8.2 - 16.5 95% C.I.)	(13) 10.7 % (6.4 - 17.5 95% C.I.)	(14) 12.8 % (7.8 - 20.4 95% C.I.)

Boys tend to be more stunted than girls; $p<0.05$.

Figure 7 : Trends in the prevalence of global and severe stunting based on WHO growth standards in children 6-59 months from 2017-2021, - Makpandu settlement, Yambio, South Sudan (November, 2021)



Global stunting has slightly reduced in 2021 compared to 2019; p>0.05.

Table 22: Prevalence of stunting by age based on height-for-age z-scores- Makpandu settlement, Yambio, South Sudan (November 2021)

		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	63	9	14.3	11	17.5	43	68.3
18-29	49	4	8.2	14	28.6	31	63.3
30-41	53	7	13.2	10	18.9	36	67.9
42-53	50	4	8.0	5	10.0	41	82.0
54-59	15	3	20.0	4	26.7	8	53.3
Total	230	27	11.7	44	19.1	159	69.1

Children in the age groups 18-29 months tend to be the most affected by stunting as compared to the other age groups.

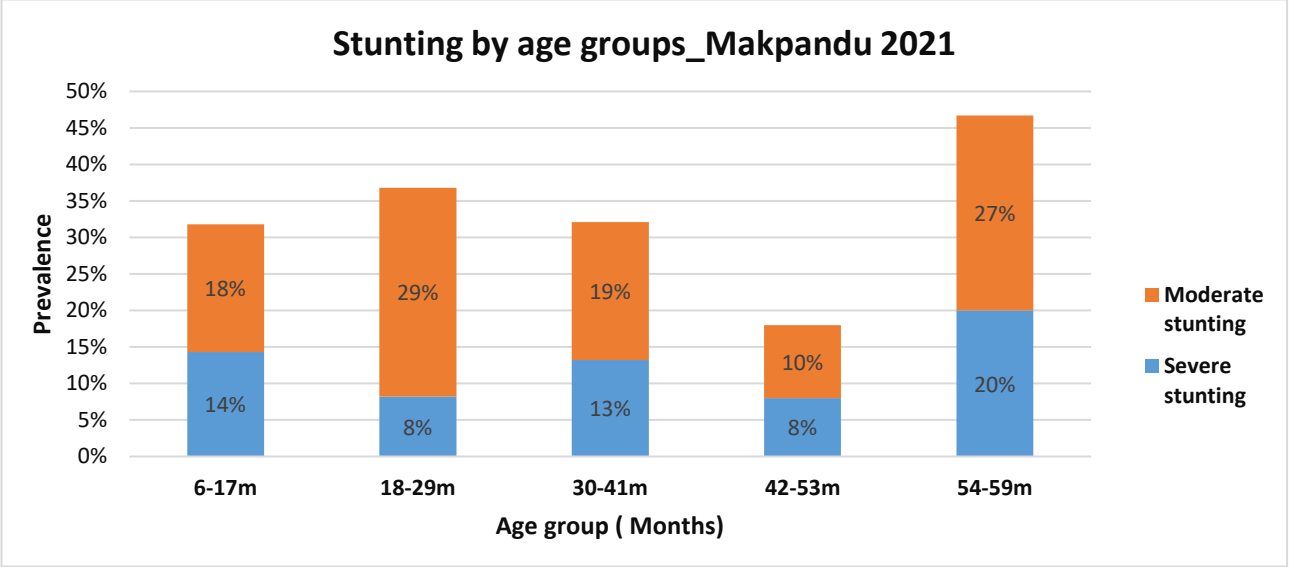


Figure 8: Distribution of height-for-age z-scores (based on WHO Growth Standards; the reference population is shown in green) of survey population compared to reference population-Makpandu settlement, Yambio, South Sudan (November 2021)

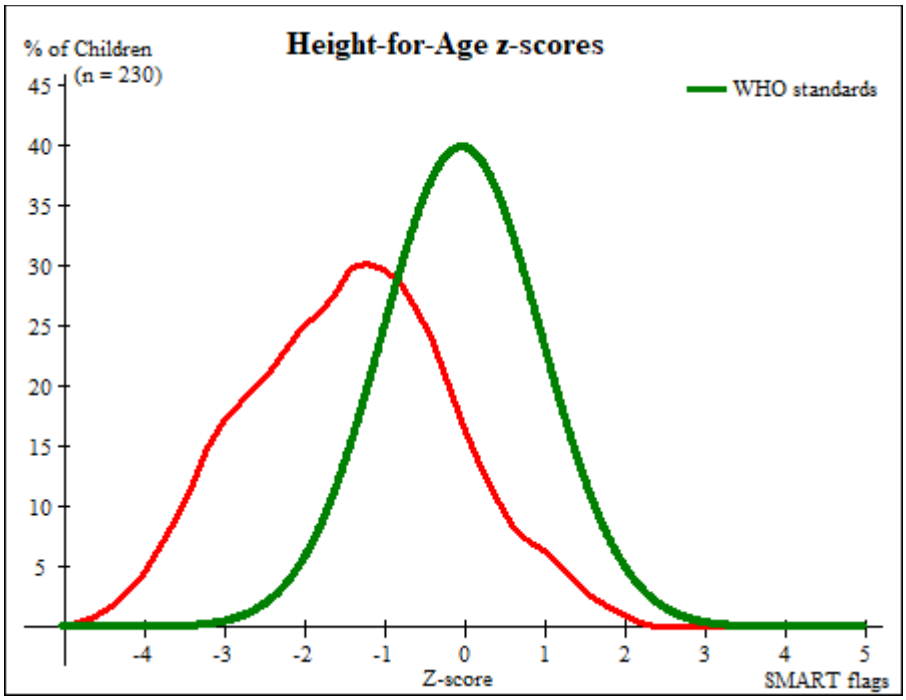


Table 23: Prevalence of overweight based on weight for height cut off's and by sex (no oedema) – Makpandu settlement, Yambio, South Sudan (November 2021)

	All n = 237	**Boys** n = 124	**Girls** n = 113
Prevalence of overweight (WHZ > 2)	(6) 2.5 % (1.2 - 5.4 95% C.I.)	(2) 1.6 % (0.4 - 5.7 95% C.I.)	(4) 3.5 % (1.4 - 8.7 95% C.I.)
Prevalence of severe overweight (WHZ > 3)	(1) 0.4 % (0.1 - 2.4 95% C.I.)	(0) 0.0 % (0.0 - 3.0 95% C.I.)	(1) 0.9 % (0.2 - 4.8 95% C.I.)

Table 24: Mean z-scores and excluded subjects - Makpandu settlement, Yambio, South Sudan (November 2021)

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	237	0.14±0.95	1.00	0	5
Weight-for-Age	240	-0.62±1.09	1.00	0	2
Height-for-Age	230	-1.40±1.24	1.00	0	12

* contains for WHZ and WAZ the children with edema.

4.3. Feeding Programme enrolment coverage

The therapeutic feeding program and supplementary feeding program enrolment coverage using both the criteria "all admission and MUAC only criterion" did not meet the recommended standard of ≥90%. See tables below with details.

Selective feeding programme

Table 25: Nutrition treatment programme enrolment coverage based on all admission criteria (weight-for-height, MUAC, oedema) – Makpandu settlement, Yambio, South Sudan (November 2021)

	Number/total	**%**
Proportion of children aged 6-59 months with severe acute malnutrition currently enrolled in therapeutic feeding programme*	0/0	0%
Proportion of children aged 6-59 months with moderate acute malnutrition currently enrolled in supplementary feeding programme*	1/16	6.3%

*WHZ flags excluded from analysis

Table 26: Nutrition treatment programme enrolment coverage based on MUAC and oedema only- Makpandu settlement, Yambio, South Sudan (November 2021)

	Number/total	% (95% CI)
Proportion of children aged 6-59 months with severe acute malnutrition currently enrolled in therapeutic feeding programme	1/9	11.1%
Proportion of children aged 6-59 months with moderate acute malnutrition currently enrolled in supplementary feeding programme	2/4	50%

4.4. Vaccination and supplementation programmes

Measles vaccination coverage

Table 26: Measles vaccination coverage for children aged 9-59 months (n= 237) - Makpandu settlement, Yambio, South Sudan (October 2019)

	Measles (With card) n=221	Measles (With card or confirmation from mother) N=237
YES	65.4% (58.3-69.2)	85.8% (81.2-89.5)

The measles vaccination coverage was below the recommended standard target of ≥ 95%.

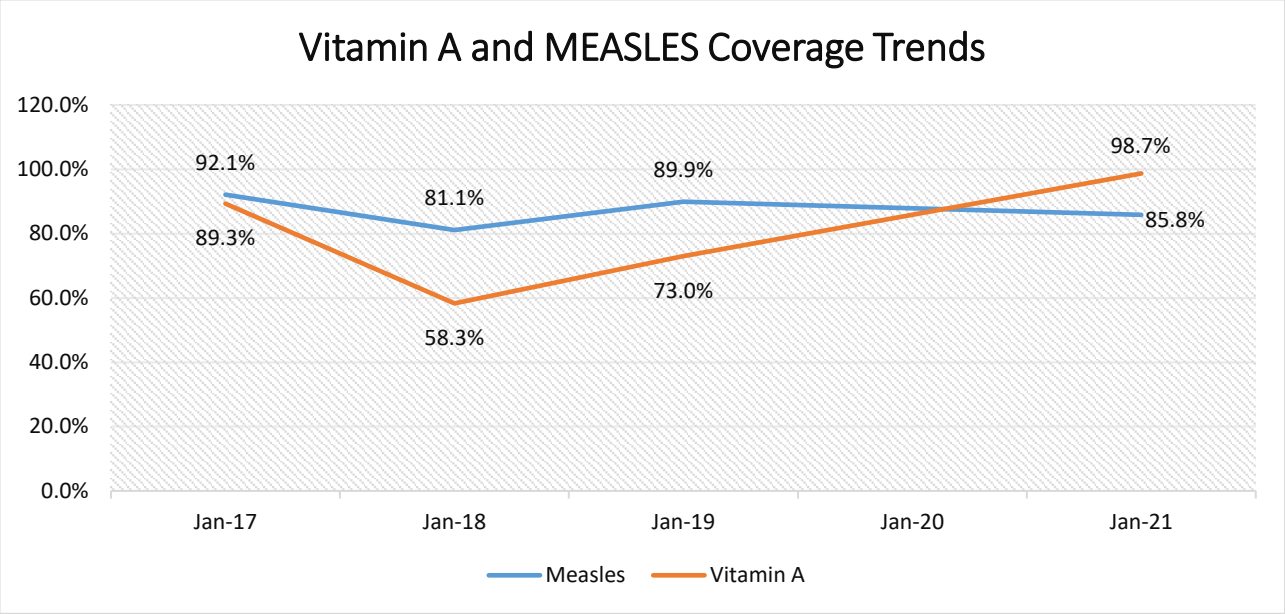
Vitamin A supplementation coverage

Table 27: Vitamin A supplementation for children aged 6-59 months within past 6 months (n=252) - Makpandu settlement, Yambio, South Sudan (November 2021)

	Vitamin A capsule (With card) n=181	Vitamin A capsule (with card or confirmation from mother) n=255
YES	70.16 (64.2-75.4)	98.07 (95.4-99.2)

The vitamin A coverage was above the recommended standard target of ≥ 90%.

Figure 9: Trend in coverage of measles vaccination and Vitamin A supplementation Makpandu settlement, Yambio, South Sudan (November 2021)



Vitamin A supplementation coverage improved in 2021 at 98.7% compared to that in 2019 which was 73%; $p<0.05$. However, Measles coverage has slightly reduced from 90% in 2019 to 85.8%

Morbidity

Only 18% of the children 6-59 months reported to have had diarrhoea two weeks prior to the survey.

Table 28: Prevalence of sickness in children 6-59 months – Makpandu settlement, Yambio, South Sudan (October 2019)

	Number/total	**%**
Children had diarrhoea in the last two weeks (6-59 months)	47/258	18.2% (13.9-23.4 95% C.I)

Deworming

67.2% of children (12-59 months) received deworming tablets in last 6 months prior to survey. This is below the recommended standard of ≥75% but great improvement compared to 46.9% results in 2019.

Table 29 : Deworming coverage

	Number/total	%
Children received a deworming tablet in the last six months (12-59 months)	150/223	67.2% **(60.8- 73.1 95% C.I)**

Anaemia Results Children 6 – 59 months

The total anaemia prevalence among children 6 to 59 months was 47.1%, a substantial reduction from 2019 results which was 60.3% but still high above the 40% of public health significance according to WHO classification. Children 6-23 tend to be more affected with 53.4%

Table 30 : Prevalence of Total Anaemia, Anaemia Categories, and Mean Haemoglobin Concentration in Children 6-59 Months of Age and By Age Group – Makpandu settlement, Yambio, South Sudan (October 2019)

	6-59 months n = 276	**6-23 months** n=101	**24-59 months** n=159
Total Anaemia (Hb<11.0 g/dL)	(130) 47.1 (41.2-53.0 95% CI)	(68) 53.4% (43.6-63.0 95% CI)	(76) 47.9% (40.0-55.6 95% CI)
Mild Anaemia (Hb 10.0-10.9 g/dL)	(51) 18.4 (14.3-23.5 95% CI)	(26) 17.8% (11.4-26. 95% CI)	(33) 20.7% (15.1-27.8)
Moderate Anaemia (7.0-9.9 g/dL)	(76) 27.5 (22.5-33.1 95% CI)	(40) 33.6% (25.0-43.5 95% CI)	(42) 26.4% 20.1-33.8 95% CI)
Severe Anaemia (<7.0 g/dL)	(3) 1 (0.3-3.3 95% CI)	(2) 1.9% (0.4-7.6 95% CI)	(1) 0.6% (0.1-4.3 95% CI)
Mean Hb, g/dL (95% CI) [range]	10.6g/dL 4.6-14.0	10.3g/dL 4.6-13	10.6 g/dL 6.1-14

Table 31 : Prevalence of Moderate and Severe Anaemia in Children 6-59 Months of Age and By Age Group – Makpandu settlement, Yambio, South Sudan (November, 2021)

	6-59 months n = 276	**6-23 months** n=101	**24-59 months** n=159
Moderate and Severe Anaemia (Hb<10.0 g/dL)	(79) 34.1% (23.5-34.2 95% CI)	(42) 35.6% (26.8-45.5 95% CI)	(4) 27.0% (20.6-34.5 95% CI)

IYCF: Children 0-23 months

Table 32 : Prevalence of Infant and Young Child Feeding Practices Indicators – Makpandu settlement, Yambio, South Sudan (November 2021)

Indicator	**Age range**	**Number/ total**	**Prevalence (%)**	**95% CI**
Timely initiation of breastfeeding	**0-23 months**	95/96	98.9	(92.8-99.8)
Exclusive breastfeeding under 6 months	**0-5 months**	11/16	68.7	(41.0-87.4)
Continued breastfeeding at 1 year	**12-15 months**	15/21	71.4	(47.7-82.2)
Continued breastfeeding at 2 years	**20-23 months**	1/8	11.1	(1-59)
Introduction of solid, semi-solid or soft foods	**6-8 months**	4/9	42.1	(26.3-59.2)
Consumption of iron-rich or iron-fortified foods	**6-23 months**	4/9	44.4	(14.5-78.9)
Bottle feeding	**0-23 months**	1/117	0.9	(0.1-5.9)

Prevalence of Intake

Infant Formula

Table 33. Infant formula intake in children aged 0-23 months – Makpundu refugee settlement.

	Number/total	**% (95% CI)**
Proportion of children aged 0-23 months who receive infant formula (fortified or non-fortified)	1/101	1% (0.4-5.0)

Table 2. Fortified blended foods (CSB++) intake in children aged 6-23 months – Makpundu refugee settlement.

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive CSB++	13/101	12.8% (7.5-21)

Table 3. Lipid based Nutrient Supplements intake in children aged 6-23 months – Makpundu refugee settlement.

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive LNS	52/101	51.49% (41.6-61.1)

4.5. WOMEN 15-49 YEAR INDICATORS

4.5.1. Anaemia Women 15-49 years

Table 34 : Women Physiological Status and Age – Makpandu settlement, Yambio, South Sudan (October 2019)

Physiological status	Number/total	% of sample
Non-pregnant	150	86.2%
Pregnant	24	13.8%
Mean age (range)	26(15-47)	

Table 35 : Prevalence of Anaemia and Haemoglobin Concentration in Non-Pregnant Women of Reproductive Age (15-49 Years) – Makpandu settlement, Yambio, South Sudan (October 2019)

Anaemia - Women of reproductive age 15-49 years (non-pregnant)	All n = 150
Total Anaemia (<12.0 g/dL)	(41) 21.9% (16.5-28.4 95% CI)
Mild Anaemia (11.0-11.9 g/dL)	(35) 18.7% (13.7-24.9 95% CI)
Moderate Anaemia (8.0-10.9 g/dL)	(6) 3.2% (1.4-6.9 95% CI)
Severe Anaemia (<8.0 g/dL)	() 0.0 (0– 0% CI)
Mean Hb, g/dL **(SD)** **[range]**	12.7 g/dL 1.16 [8.8-15.9]

Table 36 : ANC Enrolment and Iron-Folic Acid Pills Coverage among Pregnant Women (15-49 Years) – Makpandu settlement, Yambio, South Sudan (November, 2021)

	Number /total	% (95% CI)
Currently enrolled in ANC programme	17/24	70.8 (48.9-86)
Currently receiving iron-folic acid pills	16/24	66.6 (44.9-83)

Table37. BSFP enrollment coverage among pregnant and lactating women (15-49 years) – Makpandu refugee settlement

	Number /total	% (95% CI)
Currently enrolled in BSFP programme	15/174	8.6% (5.2-13.8)

4.6.Food security

Access to food assistance

Table 38. cash coverage – Makpandu refugee settlement

	Number/total	% (95% CI)
Proportion of households with a ration card	126/127	99.2%% (94.5-99.8, 95% CI)
Proportion of households receiving cash grants	126/127	99.2%% (94.5-99.8, 95% CI)

99.2% of surveyed households in Makpandu refugee settlement had ration cards and have been receiving cash assistance and cash grants.

Table 39. Reported duration of General food distribution (CBT) – Makpandu refugee settlement

	Number/total	% (95% CI)
Average number of days general food ration (CBT) lasts out days (SD) [range]	126	6.5 (5.4) [1-21]

Most families reported that the spent money received from cash grants on supporting other family members and relations, followed by health costs (including medicines), hygiene items (e.g., cloths), fuel for cooking, rent or shelter repairing, and debts repayment.

4.7. Coverage of basic needs

Table 40. Description of basic needs not met by the households – Makpandu refugee settlement

Basic needs not met by the households:	Number/total	% (95% CI)
Food	35/127	27.5% (20.4-36)
Water	5/127	3.9% (1.6-9.1)
Hygiene items, clothes, shoes	41/127	32.8% (24.6-40.9)
Health costs (including medicines)	48/127	37.7% (29.7-46.6)
Rent, shelter repair, household items (e.g. mattress, blankets, jerrycan), utilities and bills (e.g. electricity, water bills, phone calling credit)	43/127	33.8% (26.1-42.5)
Firewood / fuel for cooking or heating	2/127	1.5% (0.3-6.1)
Assets for a livelihood activity (e.g. seeds, tools, farming, fishing, petty trade, etc.)	16/127	12.6% (7.8-19.6)
Debts repayment	40/127	31.5% (23.9-40.1)
Saved some money, support other family members, relatives, friends	75/127	59.0% (50.2-67.3)
Education (e.g. school fees, uniform, books)	13/127	10.2% (6-16.9)
Other	48/127	37.8% (29.7-46.6)

Table 41. Households by categories of coverage of basic needs – Makpandu refugee settlement

Proportion of households in each category of coverage of basic needs	Number/total	% (95% CI)
All basic needs are met (100%)	0/127	0.0% (0.0-0.0)
More half basic needs are met (>50%)	5/127	4.0% (1.6-9.4)
Few basic needs are met (<50%)	118/127	94.5% (90.5-98.3)
Basic needs are not met (0%)	0/240	0.0% (0.0-0)

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

4.8. Negative household coping strategies

From April 2021, GFD ration was reduced to only 50% in all refugees' settlements including Makpandu. Food basket consists of cereals, lentils, and cooking oil all provided at 100% in cash grant. 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 settlement had to use the below coping strategies.

Table 42. Coping strategies used by the surveyed population over the past month – Makpandu refugee settlement

	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	121/127	95.2% (89.8-97.8)
Borrow food, or rely on help from a friend or relative	34/127	26.7% (19.7-35.2)
Reduce the number of meals eaten in a day	105/127	82.6% (75.0-88.3)
Limit portion sizes at mealtime	109/127	85.8% (78.5-90.9)
Reduce consumption by adults so children could eat	90/127	70.8% (62.3-78.1)
Average rCSI (mean, SD / range)	127	9.2 (4.5) [0-26]
Proportion of households reporting using none of the negative coping strategies over the past month	2/127	1.57% (0.3-6.1)

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

Only 1.6% 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.

4.9. 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 43 : Food consumption score by category **and average FCS – Makpandu refugee settlement**

FCS profiles	Number/total	% (95% CI)
Acceptable (FCS > 35)	7/127	5.5% (2.6-11.1)
Borderline (21.5≤FCS≤35)	38/127	29.9% (22.5-38.5)
Poor (FCS≤21)	82/127	64.5% (55.7-72.4)
Average FCS (SD) [range]	127	19.8 (8.7) [6.5-48]

*Maximum FCS is 112.

The average FCS among refugees in Makpandu settlement was 19.8 out of total score of 112, which falls under the poor category. This is echoed by the majority of households had an FCS score classified as poor.

Table 44. Consumption frequency categories of each nutrient rich food groups (FCS-N) – Makpandu refugee settlement

Nutrient rich food groups	Consumption frequency categories	Number/total	% (95% CI)
Vitamin A rich foods	Never	47/127	58.0% (46.8-68.3)
	Sometimes	7/127	8.6% (4.1%-17.2)
	At least daily	27/127	33.3% (23.8-44.4)
Protein rich foods	Never	32/127	58% (44.5-70.6)
	Sometimes	21/127	38% (26.1-51.8)
	At least daily	2/127	3% (0.8-13.7)
Haem iron rich foods	Never	36/127	65.4% (76.9)
	Sometimes	17/127	30.9% (19.9-44.5)
	At least daily	2/127	3% (0.8-13.7

In terms of the nutrient rich food, 41% households reported consumed Vitamin A rich foods (sometimes or daily), 41% reported consumed protein rich foods, while only 34% reported consumed Haem iron rich foods.

Table 45. Food acquisition sources – Makpandu refugee settlement

Food acquisition sources	Number/total	% (95% CI)
Purchase (using cash grants and/or with their own cash)	104/127	81.9% (74.1-87.7)
Own production (crops, livestock, fishing/ hunting, gathering)	16/127	12.6% (7.8-19.6)
Borrowed (loan/credit from traders)	2/127	1.6% (0.3-6.1)
Received as gift (from family relatives or friends/neighbour)	3/127	2.36% (0.7-7.1)
Other	2/127	1.6% (0.3-6.1)

The main source for food reported was purchasing (81/9%), followed by own production and gift.

5.0. DISCUSSION

5.1. Nutritional status of young children and mortality

The GAM prevalence in Makpandu settlement was found to be [1.3 % (0.4 - 3.7 95% C.I.)] which falls under very low prevalence and within the acceptable standards.

The proportion of children that had MUAC (< 125 mm and/or oedema) was 0.8 % (0.2 - 3.0 95% C.I). In 2019 the GAM prevalence was 3.6%; MUAC < 125 mm and/or oedema was 5.2% (4.7 - 5.7 95% C.I.) Looking at the prevalence of 2019 which has reduced further in 2021, the nutrition wellbeing of the refugees if Makpandu settlement is relatively ok compared with other settlements in South Sudan. In 2021, regardless of COVID-19 pandemic, which brought about many changes with regards to nutrition programming including halting using weight for height criteria for screening and active case findings , the CMAM program continued. Therapeutic supplies were adequate throughout the year. Blanket supplementary feeding supplies were available throughout the year without pipeline shortage experienced. A key concern from the survey was that the results may not necessarily be a true reflection of reality since CMAM programme was largely affected by Corona Virus.

Stunting refers to a deficit in height relative to age due to a long-term process of linear growth retardation. The prevalence of global stunting was 30.9 % (25.3 - 37.1 95% C.I). This is categorized as very high according to WHO/UNICEF 2018 classification. This should however be interpreted with caution due to the age estimation limitation as some of the children 6-59 months did not have a reliable age documentation. Boys tend to be more stunted than girls. Reason for this to be investigated. It is pleasing to note that Global stunting has slight reduced in 2021 compared to 2019 with 1%; p<0.05. 'Stunting is a well-established risk marker of poor child development. Stunting before the age of 2 years predicts poorer cognitive and educational outcomes in later childhood and adolescence. Factors that contribute to stunted growth and development include poor maternal health and nutrition, inadequate infant and young child feeding practices, and infection.'[5] Action across multiple areas is necessary to reduce the stunting levels. This to include promotion of infant and young child feeding practices, ensuring adequate water and sanitation, infection control and maternal health and nutrition support.

5.2. Morbidity and Health seeking behaviour

The interactions of nutrition and infection are cyclic with each exacerbating the other. About 18.2% of children 6-59 months reported to have had diarrhoea in the last two weeks prior to the survey. This figure has reduced drastically compared to results of SENS 2019, which had up to 34% children reporting diarrhoea two weeks prior to the survey. Interventions to prevent diarrhoea, including safe drinking-water, use of improved sanitation and hand washing with soap need to be strengthened and maintained. To reduce the morbidity caseload further there is need to strengthen the current health service provision. Top causes of morbidities (malaria, respiratory tract infections, skin infections and intestinal worms) should also be given special attention.

5.3. Programme coverage and enrolment children 6 – 59 months

5.3.1. Selective feeding programme

The enrolment coverage of targeted supplementary feeding program and therapeutic feeding program was low and did not meet the recommended standard of ≥90%. Largely this was contributed by COVID-19 pandemic which affected CMAM programming and stopped active case finding through mass MUAC screening and admission criteria using weight for height Z-Score. Strengthening of active case screening at the community highly recommended. It is always recommended to use a mixed criterion for admission using MUAC or WHZ scores to capture the children missed by either MUAC or the WHZ scores admission criteria. In addition to this to improve coverage a two-stage monthly screening to be carried out during BSFP for children 6-23 months at risk (12.5 -13.5cm) and for all children 24-59 months at risk (12.5 -16.0cm) presenting at the health facility. Any child found to meet the admission criteria using the WHZ scores to be enrolled into the appropriate program.

[5] WHA Global Nutrition Targets 2025: Stunting policy brief

5.3.2. *Measles vaccination and vitamin A supplementation*

The coverage of measles vaccination and vitamin A supplementation was 85.8% and 98% respectively. Although the coverage for measles vaccination has slightly reduced from 89.9% in 2019, the Vitamin A supplementation on the other hand improved from 73% in 2019 and hit beyond the target coverage of ≥95% while measles vaccination still below ≥90% target indicating the need to continue strengthening both the routine and settlementaign vaccination/supplementation interventions. As these results were based on both card and recall there is also need to improve the coverage of cards for reliability and monitoring.

5.3.3. *Anaemia in Young Children and Women*

Total anaemia prevalence in children 6 to 59 months was 47% (with only 1% being severe anaemia). The prevalence of anaemia among children is very high as it is above the 40% level of public health significance (WHO classification). There is reducing trends from the result of 2019 SENS which was at 60.3%. Analysis by age categories indicated that the prevalence of anaemia was higher among children aged 6-23 months with 53.4%. Although anaemia prevalence was high, 18% of the children were mildly anaemic. The prevalence of moderate and severe anaemia among children 6 to 59 was 30%. If only moderate and severe anaemia is considered, the anaemia prevalence is of medium public health concern. Total anaemia prevalence among non-pregnant women 15-49 years (non-pregnant) was 21.9% (with 0% being severe anaemia). The results show improvement from 2019 results of which anaemia was found to be 27.85 According to the WHO classification the women anaemia prevalence is of medium public health significance. Anaemia impairs the development and learning of children and impairs the health and quality of life in adults, especially women in the reproductive age group. It also increases the risk of adverse maternal and neonatal outcomes[6] and worsens clinical outcomes especially when it occurs as a comorbidity[7]

The anaemia prevalence is likely to be attributed to several factors. This include i) inadequate macro and micronutrients; ii) inappropriate feeding practices; iii) disease burden requiring continuous attention; iv) maternal health and nutrition. A 50% ration in form of cash was provided monthly in Makpandu. This does not meet the 100% (2100 kilocalories) recommended standard as household can also decide to use the cash for other things other than buying food. The HDDS indicated that only 65% of the households never consumed food sources rich in iron. 4 out of 9 children (44.4%) of 6-23 months reported to have not consumed iron rich foods the day before the survey. A multisectoral approach to anaemia prevention and control will be required in 2022 and beyond. There is need to strengthen the health and nutrition facility-based capacity for anaemia prevention and treatment, community screening and referral, scaling up of livelihood options that complement the existing food assistance options and information, education and communication on diet diversity and appropriate utilisation to be prioritised in 2022 and beyond.

5.4. IYCF Indicators

From the survey results the proportion of children aged 0-23 months that had timely initiation of breast milk within the first hour of delivery was 98.9%, this a great improvement as compared to 2019 results which was 77.8%. Early initiation (within one hour of birth) of exclusive breastfeeding significantly reduces the risk of neonatal mortality. Infants for whom initiation of breastfeeding is delayed to more than 24 hours after birth are 2.4 times more likely to die during their first month of life. The rate of exclusive breast feeding for the first six months of life has unfortunately reduced from 74.1% in 2019 t0 68.7% in 2021 SENS. Breastmilk alone (exclusive) satisfies the nutritional and fluid requirements of an infant for the first complete six months of life in all settings and climates.[8]

[6] WHO anaemia global targets brief
[7] Iron deficiency revisted, M.D Capellini, K.M.Musallam and A.T.Taher 2019; https://doi.org/10.1111/joim.13004
[8] UNHCR SENS guidelines for refugee populations, Version 2 (2013)

Continued breastfeeding at 1 year was reduced to 71.4% from 83.3% in 2019 SENS while up to two years was improved from 3.7% SENS 2019 to 11% in 2021 results. Efforts to improve continuation of breastfeeding into the second year should be put in place in 2022 and beyond.

The proportion of children aged 6 to 8 months that were introduced to solid and semi-solid foods in a timely fashion has greatly improved from 20%. SENS 2019 results to 42% in 2021 This is very commendable. After six months, adequate and appropriate infant complementary foods become necessary to complement breastmilk to meet the energy and other nutrient requirements of the infant (timely complementary feeding). There is need to continue strengthening IYCF messaging and counselling that addresses this important component of complementary feeding coupled with viable settlement level solutions in conjunction with other sectors.

0.9% of the surveyed children aged 0-23 months were bottle fed. Efforts to discourage this should be continued. Bottle feeding is associated with increased diarrhoeal disease due to the contamination likelihood of the bottle and nipple. It is therefore necessary to support all women to achieve early initiation and exclusive breastfeeding for the first six completed months and the continuation of breastfeeding into the second year of life to provide the best chance of survival for infants and young children[9] . Only 1% of the surveyed children aged 0-23 months received infant formula. Infant formula is a nonhuman milk product formulated from animal milk or vegetable protein (soy) and adapted to the physiological characteristics of infants. Infant and young child feeding practices directly affect the nutritional status of children under two years of age and, ultimately, impact child survival. Protecting, and improving on, appropriate infant and young child feeding practices in children aged 0-23 months is therefore critical to improved nutrition, health, and development of children[10].

Some of the IYCF results should be interpreted with caution as the sample is small to draw meaningful conclusions. These findings, however, give an idea of the status of infant and young feeding practices among the surveyed population.

5.5. Food security related

Food insecurity is one of the causes of undernutrition as it directly affects the nutritional status of an individual. It is a direct cause of malnutrition in terms of dietary intake and an underlying cause in terms of access to and utilisation of food. Improving overall food security remains critical to improved nutrition, health and long-term development of children and other household members. Almost all refugees in Makpandu had access to food assistance as indicated by the coverage of ration cards (99.2%). Food assistance in form of cash grants continued to be provided at a 70% ration scale until April 2021 when the ration was cut to 50%. This change could be one of the causes why some results have deteriorated further from 2019 SENS. The general Cash assistance does not meet all the food need required. Complementary livelihood options remain limited. To fill the gap in food assistance most of the households reported using negative coping strategies such as relying on less preferred food (95%), reduced number of meals (82%), reduced portion sizes (85%) or adults eating less than normal to accommodate children at 70%. The results for food consumption score indicate that most household did not eat a well-diversified diet as up to 64% house were categorised as poor food consumption score (FCS). Advocacy to fill the food assistance gap to be continued.

[9] Operation Guidance on IFE, section 5.2.8, v2.1, Feb 2007
[10] WHO, Indicators for Assessing Infant and Young Child Feeding Practices, WHO 2010

6.0.RECOMMENDATIONS AND PRIORITIES

6.1.Nutrition related

- Maintain a comprehensive Community based Management of Acute Malnutrition (CMAM) program providing both therapeutic and supplementary feeding programs to facilitate the rehabilitation of identified acute malnourished children, pregnant and lactating women, people living with HIV/AIDS, and TB patients on treatment. This to include active case finding and community mobilization. (UNHCR, UNICEF, WFP and WVI)

- Active case finding and referral of all identified children aged 6-59 months children with a MUAC less than 125mm for management of acute malnutrition through community outreach follow up at household level (WVI).

- Conduct a two-step MUAC and WHZ scores (for children with MUAC at risk) screening monthly at all the health facility contact points including the EPI, triage and BSFP sites to ensure both high MUAC and WHZ score coverage (WVI).

- Maintain blanket supplementary feeding programme for children 6-23 months, pregnant and lactating women using a fortified blended food or lipid-based supplement to prevent malnutrition and to cover the nutrient gap these vulnerable groups face considering their predominant grain based general food diet (UNHCR, WFP and WVI).

- Continue strengthening the capacity of the nutrition program, in terms of provision of adequate staff and training to ensure quality provision of both curative and preventative components (UNHCR, WFP, UNICEF and WVI).

- Awareness creation, protection, and promotion of appropriate IYCF practices (using the multisectoral framework for action in refugee situations approach) to further improve breastfeeding practices and to strengthen complementary feeding practices (UNHCR, UNICEF and WVI)

- Expand and strengthen the prevention of malnutrition components including community outreach information, education and communication and diverse diet utilization aspects to stop malnutrition from occurring in the first place. (UNHCR, UNICEF, WFP and WVI).

- Conduct quarterly mass MUAC screening to monitor the evolution of the nutrition situation in Makpandu settlement. This to target children aged 6-59 months and PLWs (WVI)

- Prioritise implementation of the refugee micronutrient reduction strategy to curb the high anaemia prevalence (WVI)

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

- Undertake a follow up annual nutrition survey to analyse trends and facilitate program impact evaluation. (UNHCR, WVI, WFP and UNICEF)

6.2. Food security related

- Advocate for provision of food assistance providing the minimum dietary requirements (2100kcal/person/day). (UNHCR, WVI and WFP).

- Continue the routine joint monthly food basket monitoring on site and ensure Makpandu inclusion in the country post distribution monitoring at the household level (UNHCR, WVI and WFP).

- Expand the coverage of sustainable food security and livelihood solutions in Makpandu settlement to complement the provided food assistance (UNHCR, WFP and WVI).

6.3. Health related

- Maintain and strengthen the provision of comprehensive primary health care programme for refugees and host populations in Makpandu. (UNHCR and WVI)

- UNICEF, WVI and UNHCR to ensure that Expanded Programme on Immunization (EPI) and Vitamin A supplementation settlementaigns and routine programmes are strengthened to increase coverage to acceptable standards.

APPENDICES

Appendix 1 : Names of contributors

S/No	Name in full	Sex	Title	Organisation
1	Venessio Vitto	M	Team leader	WVI
2	Dikumbo Richard	M	Team leader	WVI
3	Nunu Angelina	F	Team leader	WVI
4	Foibe Ngbadurezere	F	Team leader	WVI
5	Benson Bakata Mamu	M	Team leader	WVI
6	AbuJohn James Busuera	M	Team leader	WVI
7	Deiudonne Daduwaba	M	Anthropometric measurer	WVI
8	Dominic Paite	M	Anthropometric measurer	WVI
9	Bogou Francoise	M	Anthropometric measurer	WVI
10	Elia Edward	M	Anthropometric measurer	WVI
11	Wilson Idie Samuel	M	Anthropometric measurer	WVI
12	Marie Lapatric	F	Anthropometric measurer	WVI
13	Justin Mbolani	M	Hemoglobin Measurer	WVI
14	Emmanuel Apollo	M	Hemoglobin Measurer	WVI
15	Emmanuel Atoroba	M	Hemoglobin Measurer	WVI
16	Bakoyogo Fidele	M	Hemoglobin Measurer	WVI
17	Simon Ngbazege	M	Hemoglobin Measurer	WVI
18	Isaac Elias	M	Haemoglobin Measurer	WVI
19	Berenice Zengba	F	Anthropometric/Hb Assistant	WVI
20	Alphonsine Nalayenga	F	Anthropometric/Hb Assistant	WVI
21	Moses Peter	M	Anthropometric/Hb Assistant	WVI
22	Joshua Joseph	M	Anthropometric/Hb Assistant	WVI
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27	Chan Gatluak Deng	M	Supervisor	
28	Justin Elia Kosa	M	Survey operation support	WVI
29	Samuel Paul	M	Survey operations	UNHCR

			support	Yambio
30	Jackline Lollis	F	Survey operations support	UNHCR Yambio
31	Sebit Mustafa	M	Health data consolidation	UNHCR
32	Maria Chidumu	F	Lead Survey Coordinator	UNHCR

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Report Compilation
Maria Chidumu (Associate Nutrition and Food Security Officer, UNHCR Juba, South Sudan).

Report review
Gebrewold Petros Yohannes (Senior Public Health Officer, UNHCR Juba, South Sudan),
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Funding
UNHCR and WVI supported the survey. UNICEF and WFP provide the nutrition program supplies and support with capacity building.

Appendix 2: Summary of overall quality of anthropometric data (weight-for-height data)

Overall data quality

Overall data quality

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

Flagged data Incl % 0-2.5 >2.5-5.0 >5.0-7.5 >7.5
(% of out of range subjects) 0 5 10 20 **0** (2.2 %)

Overall Sex ratio Incl p >0.1 >0.05 >0.001 <=0.001
(Significant chi square) 0 2 4 10 **0** (p=0.565)

Age ratio(6-29 vs 30-59) Incl p >0.1 >0.05 >0.001 <=0.001
(Significant chi square) 0 2 4 10 **0** (p=0.227)

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

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

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

Standard Dev WHZ Excl SD <1.1 <1.15 <1.20 >=1.20
. and or
. Excl SD >0.9 >0.85 >0.80 <=0.80
0 5 10 20 **0** (0.96)

Skewness WHZ Excl # <±0.2 <±0.4 <±0.6 >=±0.6
0 1 3 5 **0** (0.10)

Kurtosis WHZ Excl # <±0.2 <±0.4 <±0.6 >=±0.6
0 1 3 5 **0** (-0.04)

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

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

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

Appendix 3 : Nutrition Survey Questionnaires November 2021

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.

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

UNHCR and WVI are working in the nutrition and health sectors are sponsoring this nutrition survey

Taking part in this survey is totally your choice. You can decide to not participate or stop taking part at any time and 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. We will then measure the arm circumference, weight and height of children who are older than 6 months up to 5 years.

Before we start to ask you, any questions or take any measurements, we will ask you to give your verbal consent. 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 decide whether to participate.

Thank you

Demography questionnaire		
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? ***Ngata ni wic paac dhaagø wala dïcwøø?*** 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)? ***Cwiiri mo ngata ni wÏc paac adïï?*** YOU DO NOT NEED TO SEE PROOF OF AGE.	|_____|_____| years
DM4	What is the total number of household members? ***Kwään jø paac bëët adïï?***	|_____|_____| people
SECTION DM2: Household Member Information ASK INTERVIEWEE IF THOSE ARE ALL THE MEMBERS IN THE HOUSEHOLD AND THAT NO ONE IS MISSING. Bäng dhaanhø mo tøør ki ri jø paac? 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 ***Nyeng nyilaal*** ONLY WRITE FIRST NAME.	
CH3	Sex of [NAME OF CHILD]? ***Dhaagø wala dïcwøø?***	Male Female
CH4	Do you have an official age documentation for [NAME OF CHILD]? ***GÏn mo nyootha cwiiri moi dagø teeng ID?***	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? ***Nyilaal o lwaarøgø I wänne?*** 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 MDC 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? Nyilaal nut paac ennØ?	Yes No
CH8	[NAME OF CHILD]'s weight in kilograms (±0.1kg)	|_____|_____| kg
CH9	[NAME OF CHILD]'s length/height in cm (±0.1cm)	|_____|_____| 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 (±1mm) or cm (±0.1cm)	
CH13	Is [NAME OF CHILD] currently being treated in SC/OTP/TSFP for malnutrition? ***Nyilaal mari ena tier kØny bang jØ nutrition ?*** 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? ***Nyilaal mari ena ro obwöre mo määØ ka a puuli ki I dwääy?*** SHOW COMMODITY/PACKAGING PROVIDED IN BSFP.	Yes No Don't know
CH15	Has [NAME OF CHILD] been vaccinated against measles? ***Nyilaal mari ocwøbø ki kïthi baath mar ajwääa?*** 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? ***Nyilaal da vitamin A mo cïbø jïre ki køør dwäde abÏciel?*** 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? ***Nyilaal da kÏÏna mar twöngi mo ec mo cÏbø jïre ki køør dwäde abÏciel ?*** 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. ***Nyilaal yie o timö leth køør juu ariew ?***	Yes No Don't know
CH19	Did you give ORS to [NAME OF CHILD] when s/he had diarrhoea? ***Nyilaal amooyi ki cørbamele kanya tÏm yie ni leth?*** 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? ***Nyilaal amooyi ki Zinc kanya tÏm yie ni leth?*** 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:** • Child needs to be referred for moderate acute malnutrition • Child needs to be referred for severe acute malnutrition ***Nyilaal manya jäängø Øt jaath kanyo poode ni dëëre poot theem/o ööl dØc.***	
CH22	[NAME OF CHILD]'s haemoglobin (Hb) in g/dL (±0.1 g/dL) or in g/L (±1g/L)	|___|___|.|___| g/dL or g/L
REFER	**Referral for child who has severe anaemia:** • Child needs to be referred for severe anaemia (if Hb<7 0g/dL) ***Nyilaal manya jäängø øt jaath kanyo näk mo remmø mare o døø piny.***	
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

	Nyilaal O dhwødhø?	Don't know
IF2	How long after birth did you first put [NAME OF CHILD] to the breast? ***Akany mo yie nyïëdi ni dwØth nyilaal kanya lwaarøgø?***	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? ***Amanynya gø nii pëënynya ki jammi ka teeng pïï wala nyilaal omäththø yawääre ki wang käng wala ki wäär bung pere këël dee nee jääbø ki caami møøk?*** ASK ABOUT EVERY LIQUID. EVERY QUESTION MUST HAVE AN ANSWER.	
	4A. Plain water ***Pïï mwøa tøng.***	Yes No Don't know
	4B. Infant formula, for example [INSERT LOCALLY AVAILABLE BRAND NAMES OF INFANT FORMULA, *ALL TYPES*] ***Caak (NAN 1, NAN2)***	
	4C. Milk such as tinned, powdered, or fresh animal milk, for example [INSERT LOCALLY AVAILABLE BRAND NAMES OF TINNED AND POWDERED MILK] ***Caak MwØa ajam, caa thunhnhØ***	
	4D. Juice or juice drinks, for example [INSERT LOCALLY AVAILABLE BRAND NAMES OF JUICE DRINKS] ***Cwaa, a pwØnnØ, Manga Avocado***	
	4E. Clear broth ***Amadida, cwige***	
	4F. Sour milk or yogurt, for example [INSERT LOCAL NAMES] ***Caak mwØa wac***	
	4G. Thin porridge, for example [INSERT LOCAL NAMES] ***Amadida***	

	4H. Tea or coffee with milk ***Caak Mo JääbØ ki buna***	
	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)* ***Mirinda Pepsi, Novida, fanta , Cay MwØa tØng, Buna,***	
IF5	Yesterday, during the day or at night, did [NAME] eat solid or semi-solid (soft, mushy) food? ***Yawääre ka a MØØlla wala a bØØya nyilaal acämö ki cam mo teek wala mo jööm***	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? ***Yawääre mana täge ka amöölla këël abØØya amäthØ ThoothØ***	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? ***Amanynya gØ ni pëënya ki cam mana cam nyilaal yawääre ki wang käng wala wäär këël dee ni cam mo ojääbØ ka teeng*** 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)* ***RÏng del, dhieng, rëëö, røge,cwÏny***	Yes
	7B. [INSERT CSB++ AVAILABLE IN THE LOCAL SETTING AND USE LOCAL NAMES] *(e.g. CSB++)* ***Angweth angweth***	No
	7C. [INSERT RUTF PRODUCTS AVAILABLE IN THE LOCAL SETTING AND USE LOCAL NAMES] (e.g. Plumpy'Nut®) SHOW SACHET. ***Apuuli (Mo obwöre mwØa näk dëëtge o ööl dØc***	Don't know

	7D. [INSERT RUSF PRODUCTS AVAILABLE IN THE LOCAL SETTING AND USE LOCAL NAMES] (e.g. Plumpy'Sup®) SHOW SACHET. ***Apuuli (Mo obwöre mwØa näk dëëtge theem)***	
	7E. [INSERT LNS PRODUCTS AVAILABLE IN THE LOCAL SETTING AND USE LOCAL NAMES] (e.g. Plumpy'Doz®) SHOW SACHET / POT. ***Apuuli (mo cÏp jÏ Mo obwöre mwØa näk dëëtge kär ööl cwiiri ariew KëëL dwäde abiciel)***	
	7F. [INSERT LOCALLY AVAILABLE BRAND NAMES OF IRON FORTIFIED INFANT FORMULA] (e.g. Nan, S26 infant formula) ***Caak (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) ***Apuuli, amadida Mar mØØ, Odëëna, OkØllØ***	

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? ***Ngëëti ena maal?***	Yes No Don't know
WM4	Are you currently enrolled in the ANC programme? ***Nyengi ogöörö kar jey mwøa ngëëti en maal?***	Yes No Don't know

WM5	Are you currently receiving iron-folate pills? ***Da kïïnne mo jook remmø mo cïbø jïri?*** SHOW PILL.	Yes No Don't know
WM6	Are you currently breastfeeding? ***I dhwödhø enø wala jïri da nyillal mo dhøøth?***	Yes No Don't know
WM7	Is the child you are breastfeeding younger than 6 months old? ***Nyilaal man dhwøthi döögö mare ena piny ki dwäde abïciel?***	Yes No Don't know
WM8	Are you currently enrolled in the BSFP? ***Nyengi o göörö bang jø nutrition?*** SHOW COMMODITY/PACKAGING GIVEN IN BSFP.	Yes No Don't know
WM9	[NAME OF WOMAN]'s MUAC in mm (±1mm) or cm (±0.1cm)	|_____|_____| cm
WM10	[NAME OF WOMAN]'s haemoglobin in g/dL (±0.1 g/dL) or in g/L (±1g/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) ***Dhaagø manya kïth øt-jaath kanyo näk mo remmø mare odøø piny.***	

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 a food voucher [INSERT LOCAL NAME OF FOOD VOUCHER] for general food needs? ***Jey mo en paac jïge da kaat mar cam?***	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 (food voucher/card)? ***Akiperngø nee tïme bäng jöö mii jïttø kaat mar cam?***	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? ***A nïnne adïï ni beet kaati mar cam mar dwää abïngween?***	
FS4	Did you sell any of the vouchers or products accessed with food vouchers received in September to access other goods and/or services? ***Kaat mar cam dagø ma gathi wala jammi mwøa mak dwää abïngween ni ngëëyi ki gïn mør?***	Yes No Don't know
FS5	Which of your household's basic needs can you not meet? ***Agïna ngø ki ri jammi mo many jø paaci ni løny jïri ki ngïëw?*** DO NOT READ THE ANSWERS. SELECT ALL THAT APPLY.	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 electricity, water bills, phone calling credit) Firewood/fuel for cooking or heating Assets for a livelihood activity (e.g seeds, tools, farming, fishing, petty trade, etc) Debt repayment Save some money or gave to other family members, relatives, friends Education (e.g school fees, uniform, books) Other Don't know
SECTION FS2: Negative coping strategy EXPLAIN TO THE RESPONDENT THAT THE QUESTIONS APPLY TO ALL HOUSEHOLD MEMBERS AND NOT ONLY TO HIM/HER.		
FS6	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? ***A nÏnne a dÏÏ ki I jwØk ni jØ paac ngweewa cam mo gätte jööt kiper mana näk mo bung gwel mo ngëëö***	RECORD DAYS 0-7.

	ki gØ	
FS7	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? ***A nÏnne a dÏÏ ki køør jwøk aciel ni jø paac mäya bang tungi wala nyÏÏawäädi ki cam kiper mana näk mo bung cam waala gwel mo ngëëö ki gØ***	RECORD DAYS 0-7.
FS8	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? ***A nÏnne a dÏÏ ki kØØr jwØk aciel ni ö jØ paac ni dwØkge kwään caanmi mo I käng piny kiper mana näk mo bung cam waala gwel mo ngëëö ki gØ***	RECORD DAYS 0-7.
FS9	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? ***A nÏnne a dÏÏ ki kØØr jwØk aciel ni ö jØ paac ni dwØkge cam mar I käng piny kiper mana näk mo bung cam waala gwel mo ngëëö ki gØ***	RECORD DAYS 0-7.
FS10	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? ***Aninne a dÏÏ ni ö jØ paaci mwØa dØØngØ ni dwØkge cam mar ge piny no obwöre cämge kiper mana näk mo bäng cam wala gwel***	RECORD DAYS 0-7.
SECTION FS3: FCS and FCS-N EXPLAIN TO THE RESPONDENT THAT THE QUESTIONS APPLY TO ALL HOUSEHOLD MEMBERS AND NOT ONLY TO HIM/HER.		
FS11	How many days over the last 7 days, did members of your household eat the following food items, prepared and/or consumed at home? ***Aninne a dÏÏ ki kØØr jwØk aciel ni cäm jØ paaci ki teeng wÏth caammi mo teengi paaci?*** 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.	
	1. In the past 7 days, how many days did your household eat any [INSERT CEREALS LOCALLY AVAILABLE] (*e.g. wheat*, *corn/maize*, *barley*, *buckwheat*, *millet*, *oats*, *rice*, *rye*, *sorghum*,	Number of days eaten in past 7 days

	teff) or any foods made from these such as [INSERT LOCAL FOODS] (*e.g. bread*, *porridge*, *noodles*, *ugali*, *nshima*, *pasta*). Or any [INSERT WHITE ROOTS AND TUBERS LOCALLY AVAILABLE] *(e.g. green bananas*, *lotus root*, *parsnip*, *taro*, *plantains*, *white potatoes*, *white yam*, *white cassava*, *white sweet potato)* or any foods made from roots such as [INSERT LOCAL FOODS]. Or any [INSERT OTHER STARCHY FOODS LOCALLY AVAILABLE] *(e.g. green bananas*, *plantains)* ***Cïnde, Abäy, ruuc, beel, dääbØ, Amadida, kwön Baala, ajwaala, opeela, babura,***	
	2. In the past 7 days, how many days did your household eat any [INSERT LEGUMES, NUTS AND SEEDS LOCALLY AVAILABLE] *(e.g. dried beans*, *chickpeas*, *lentils*, *nuts*, *seeds)* or any foods made from these such as [INSERT LOCAL FOODS] *(e.g. hummus*, *peanut butter)* ***Ongööri,Øgodi,kaali, köödhi***	Number of days eaten in past 7 days
	3. In the past 7 days, how many days did your household eat any [INSERT MILK AND MILK PRODUCTS LOCALLY AVAILABLE] *(e.g. fresh milk, sour milk, infant formula, cheese,* ***kefir, yogurt) Caa thunhnØ, caa mwØa wac caak mwØa ajäm***	Number of days eaten in past 7 days
	4. In the past 7 days, how many days did your household eat any meat, fish and eggs *(e.g. goat*, *beef*, *chicken*, *pork*, *blood*, *fish including canned tuna*, *snails*, *and/or other seafood*, *eggs)* ***Ringö, Rëëö, tØng gwienØ***	Number of days eaten in past 7 days
	4.1. In the past 7 days, how many days did your household eat any [INSERT FLESH MEAT LOCALLY AVAILABLE] *(e.g. beef*, *goat*, *lamb, mutton*, *pork*, *rabbit*, *chicken*, *duck*, *cane rat*, *guinea pig*, *rat*, *agouti frogs*, *snakes*, *insects)* ***Ring Diel, Dhiang, othur,gwienØ, badhØ, jÏëö, ngweenyi***	Number of days eaten in past 7 days
	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. liver*, *kidney*, *heart)*	Number of days eaten in past 7 days
	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. anchovies*, *tuna*, *sardines*, *shark*, *whale*, *roe/fish eggs*, *clam*, *crab*,	Number of days eaten in past 7 days

	lobster, crayfish, mussels, shrimp, octopus, squid, sea snails) **CwÏny, rØgi,** **Rec mwØa no otal**	
	4.4. In the past 7 days, how many days did your household eat any eggs from [INSERT EGGS LOCALLY AVAILABLE] (e.*g. eggs from chicken, duck, guinea fowl)* **TØng gwienØ, tØng badhØ**	Number of days eaten in past 7 days
	5. In the past 7 days, how many days did your household eat any [INSERT ANY VEGETABLES AND LEAVES LOCALLY AVAILABLE] *(e.g. spinach, cassava leaves, onion, carrot, lettuce, bamboo shoots, cabbage, pepper, tomato, eggplant, zucchini, etc.)* ***Bøøk babura, bacal, cabbages, a dimete,timatim***	Number of days eaten in past 7 days
	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. carrot, pumpkin, squash, or sweet potato that are orange inside, red sweet pepper)* ***økøllø, ajwaala,Orange carrots***	Number of days eaten in past 7 days
	5.2. In the past 7 days, how many days did your household eat any [INSERT DARK GREEN LEAFY VEGETABLES LOCALLY AVAILABLE INLCUDING WILD FORMS AND VITAMIN A RICH LEAVES] (*e.g. amaranth, arugula (rocket), cassava leaves, kale, broccoli, spinach*) ***BØØk babura gwedagwede***	Number of days eaten in past 7 days
	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 *(e.g. mango, apricot, peach, apple, avocados, banana, coconut flesh, lemon, orange, etc.)* ***Manga, apple, avucado, bääla, nyitwöö, lemun, orange***	Number of days eaten in past 7 days

	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 *(e.g. mango (ripe, fresh and dried), cantaloupe melon (ripe), apricot (fresh or dried), ripe papaya, passion fruit (ripe), dried peach)* ***Juice mar mangga, olillø, batunda***	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 *(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)* ***Maaw mar nyimi, apuuli,wädø***	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] *(e.g. sugar, honey, syrup, soda drinks, chocolates, candies, cookies, sweet biscuits and cakes)* ***Cukar, Maar kÏc, mirinda, pepsi, novida, bsicuits, cakes***	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] *(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)* ***AcäbØ, adimetti, buna, cay/caak***	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] *(e.g. CSB, Super Cereals)* ***Angweeth angweeth,***	Number of days eaten in past 7 days
FS12	How was this food acquired?	Purchase (using cash grants and/or with their

	Cammi moi o joodi ni dïï?	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: Event calendar for Makpandu refugee settlement, 2021

Seasons	**Religious Holidays**	**Other Events**	**Months / Years**	**Age (M)**	**Height Range**
Post harvest			novemebr 2021	**0**	
Harvest of sorghum			october 2021	1	
Groundnuts, simsim & bean harvest		Ethiopia new year (sep)	September 2021	2	
		World breastfeeding week	August 2021	3	
Crop weeding continues			July 2021	4	
Weeding of crops		World refugee day (June 2018)	June 2021	5	
			may 2021	6	
Planting season			April 2021	7	
Land preparation start			March 2021	8	65-70 cm
Land preparation start			Febrary 2021	9	
Renovation/Building of houses		CPA /new year celebrations	January 2021	10	
	Christmas (25 Dec)	World aids day & Gambela genocide remembrance	December 2020	11	71-76 cm
Post harvest			novemebr 2020	12	
Harvest of sorghum			october 2020	13	

Groundnuts, beans harvest		Ethiopia new year	September 2020	14	
		World breastfeeding week	August 2020	15	77-80 cm
Crop weeding continues			July 2020	16	
Weeding of crops		World refugee day (June 2018)	June 2020	17	
			may 2020	18	
Planting season			April 2020	19	
Land preparation			March 2020	20	
			Febrary 2020	21	
Renovation /building of houses		CPA /new year celebrations	January 2020	22	81-86 cm
	Christmas (25 Dec)	World aids day & Gambela genocide remembrance	December 2019	23	
Post harvest			novemebr 2018	24	
Harvest of sorghum			october 2018	25	
Ground nuts beans havest		Ethiopia new year	September 2019	26	
		World breastfeeding week	August 2019	27	87-90 cm
Crop weeding continues			July 2019	28	
Weeding of crops		World refugee day (June 2018)	June 2019	29	
			may 2019	30	
Planting season			April 2019	31	
Land preparation			March 2019	32	
			Febrary 2019	33	
Renovation/building of the houses		CPA /new year celebrations	January 2019	34	
	Christmas (25 Dec)	World aids day & Gambela genocide remembrance	December 2018	35	
Post harvest			novemebr 2018	36	
Harvest of sorghum			october 2018	37	
Ground nuts beans havest		Ethiopia new year	September 2018	38	
		World breastfeeding week	August 2018	39	91-99 cm
Crop weeding continues			July 2018	40	
Weeding of crops		World refugee day (June 2018)	June 2018	41	
			may 2018	42	
Planting season			April 2018	43	
Land preparation			March 2018	44	
			Febrary 2018	45	

Renovation/building of the houses		CPA /new year celebrations	January 2018	46	
	Christmas (25 Dec)	World aids day & Gambela genocide remembrance	December 2017	47	
Post harvest			novemebr 2016	48	
Harvest of sorghum			october 2016	49	
Ground nuts beans havest		Ethiopia new year	September 2017	50	
		World breastfeeding week	August 2017	51	100-110 cm
Crop weeding continues			July 2017	52	
Weeding of crops		World refugee day (June 2017)	June 2017	53	
			may 2017	54	
Planting season			April 2017	55	
Land preparation			March 2017	56	
			Febrary 2017	57	
Renovation/building of the houses		CPA /new year celebrations	January 2017	58	
	Christmas (25 Dec)	World aids day & Gambela genocide remembrance	December 2016	59	
Post harvest			novemebr 2016	60	

Survey inclusion and exclusion criteria

Survey inclusion criteria: these are the cut-off birth dates for children to be eligible to participate in the 6-59 months sample.

- Included in the survey are all children born between November 2014 and April 2019.

Survey exclusion criteria: all children born as of these dates are excluded from the sample (i.e., they are over 59 months or under 6):

- Excluded from the survey are all children born before November 2014 and April 2019.

When to use the events calendar?

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

How to use the events calendar

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

1. When the mother knows the age in years, convert the age in months using the calendar and ask her questions relating to the events that occurred around the child's birth. Specify with the mother:

- On the calendar, whether a particular even occurred about the time the child was born (e.g., end of Ramadan); ask the mother whether the birth occurred before or after this event;
- Ask her the season in which the child was born: rain, warm or cold season, etc.;
- This information will allow you to estimate the child's age in a more reliable and accurate way.

2. When the mother knows the child's birth date, but has no official document to prove it:

- Locate the birth date on the calendar;
- Ask the mother questions on events that occurred around the child's birth (religious holiday, celebration, season, etc.) in order to estimate the age in actual months.

3. When the mother knows neither the age nor the birth date, the events listed in the calendar will help her remember the circumstances of her child's birth and to estimate the age in months:

- Ask the mother, or the person who cares for the child, if she remembers the period or an event that surrounded the birth of the child;
- According to her answer, ask further questions to locate the month and year of the birth.

4. When it is absolutely impossible to get any reliable indication from the mother, look for a child of similar stature in the neighbourhood:

- Determine the age of the other child;
- Estimate the age difference between both children using the calendar;
- Deduce the age of the surveyed child.

To determine the age of a child, the surveyor must enter on the questionnaire either the date of birth or the

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

Appendix 5: Makpandu refugee settlement location in South Sudan