RAPID NUTRITION SURVEY

Gorom Refugee Camp

Juba

South Sudan

Surveys conducted: December 2016

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ACRONYMS AND ABBREVIATIONS

ACROSS	Association of Christian Resource Organisation Serving Sudan
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
HH	Household
HIS	Health Information System
IYCF	Infant and Young Child Feeding
KCAL	Kilocalorie
MAM	Moderate Acute Malnutrition
MOH	Ministry of Health
MUAC	Middle Upper Arm circumference
NCHS	National Centre for Health Statistics
OTP	Out-patient Therapeutic Programme
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
TFP	Therapeutic Feeding Programme
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Funds
WASH	Water Sanitation and Hygiene
WAZ	Weight-for-Age z-score
WFH	Weight-for-height
WHZ	Weight-for-Height z-score
WFP	World Food Programme
WHO	World Health Organization

ACKNOWLEDGMENTS

EXECUTIVE SUMMARY

The nutrition situation in the Gorom camp is poor according to WHO classification and as indicated by the prevalence of global acute malnutrition (GAM). The survey results showed a prevalence of global acute malnutrition of 6.2%. Establishing a comprehensive nutrition program, strengthening of preventative activities including the provision of adequate household food intake, appropriate caring practices with support and promotion of IYCF practices, health and sanitation at household level children is recommended in 2017 to facilitate the reduction and the recurrence of malnutrition. This to be accomplished through 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.

UNHCR and ACROSS carried out the nutrition survey in Gorom between 30 November to 2 December 2016. The overall aim of the survey was to assess the nutrition situation among refugee population and to monitor the current programme coverage.

The survey objectives were as follows:

Specific primary objectives of the survey:
- a. To determine the prevalence of acute malnutrition among children 6-59 months.
- b. To determine the prevalence of stunting among children 6-59 months.
- c. To assess the two-week period prevalence of sickness among children 6-59 months.
- d. To determine the coverage of measles vaccination among children 9-59 months.
- e. To determine the coverage of vitamin A supplementation in the last six months among children 6-59 months.
- f. To establish recommendations on actions to be taken to address the situation.

Secondary objectives:
- a. To determine the coverage of selective feeding programs for children 6-59 months.

The Standardized Monitoring and Assessment of Relief and Transitions (SMART) methodology (Version 1 April 2006) was used to collect and analyse data on child anthropometry in the whole population. UNHCR population figures from ProGres were used to determine the total population and that of children 6-59 months for survey planning purposes.

An exhaustive survey was conducted as the total population size of Gorom camp was below 2,500 people rendering sampling unnecessary. All children 6-59 months in the camp were surveyed.

A total of five survey teams composed of three members each were included in each survey. This included a team leader and two anthropometric measurers. A two day training was carried out. This included half a day of standardization/pre-test. The survey teams were supported by two supervisors and a coordinator throughout the duration of data collection. Data collection was carried out using paper questionnaires. The data was entered daily into ENA for SMART software (version July 9, 2015). Data analysis was undertaken using the ENA for SMART and Epi Info softwares.

The summary results are as below
Table 1: Summary of results

	%	Classification of public health significance / target (where applicable)
	Gorom	
Global Acute Malnutrition (GAM)	6.6	Critical if ≥ 15%
Moderate Acute Malnutrition (MAM)	6.2	
Severe Acute Malnutrition (SAM)	0.4	
Oedema	0	
Total Stunting	22.5	Critical if ≥ 40%
Severe Stunting	5.0	
MUAC 125-134 mm	9.8	
MUAC 115-124 mm	1.2	
MUAC <115 mm and/or oedema	0.0	
Therapeutic program (based on all admission criteria WHZ,Oedema and MUAC)	0	
Therapeutic program (based on MUAC/Oedema only)	N/A	
SFP (based on all admission criteria WHZ and MUAC)	5.9	
SFP(based on MUAC only)	100.0	
Measles vaccination with card (9-59 months)	37.7	
Measles vaccination with card or recall (9-59 months)	82.5	Target of ≥ 95%
Vitamin A supplementation coverage with card, within past 6 months (6-59 months)	11.4	
Vitamin A supplementation coverage with card or recall within the last 6 months (6-59 months)	56.1	Target of ≥ 90%
Any sickness in the past 2 weeks	38.0	
Proportion of children with a sickness who were taken to a health facility	85.9	

Interpretation

- The overall nutrition situation in Gorom is classified as poor as GAM prevalence falls between 5-9% [1]

- The prevalence of global stunting was above the acceptable standard of <20% but this should be interpreted with caution due to the age estimation limitation where only 43% of the children 6-59 months provided reliable age documentation.

- The coverage of TSFP using MUAC met the recommended standard of >90% however it was below the standard using the WHZ scores criteria. This indicates the need to find an innovative way of identifying cases that are acute malnourished based on WHZ scores.

- The coverage of measles vaccination and vitamin A supplementation was below the target coverage of ≥95% and ≥90% respectively indicating the need to strengthen both the routine and campaign strategies.

- Over a third of children 6-59 months reported to have been sick in the last two weeks prior to the survey indicating a high morbidity rate requiring continued health services provision

Recommendations and Priorities

Nutrition related

Establish a comprehensive 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, ACROSS).

Ensure all community screened and referred 6-59 months children identified with a MUAC less than 125mm get enrolled into the management of acute malnutrition programs through community outreach follow up at household level (ACROSS)

Introduce blanket supplementary feeding programme for children 6-23months, 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 have in light of a predominant grain based general food diet (UNHCR, WFP & ACROSS)

Conduct the two step MUAC and WHZ scores (for children with MUAC at risk) screening monthly once the BSFP site at the Gorom camp is established to ensure both high MUAC and WHZ score coverage (ACROSS)

Strengthen the capacity of established nutrition facility in terms of nutrition supplies and staff training to facilitate quality provision of both curative and preventative components of nutrition (UNHCR, WFP, UNICEF and ACROSS)

Expand and strengthen preventative nutrition components including Infant and Young Child Feeding (IYCF) and community outreach education aspects to stop malnutrition from occurring in the first place. (UNHCR, UNICEF and ACROSS)

Conduct follow up quarterly mass MUAC screening to monitor the evolution of the nutrition situation at the community level. (ACROSS)

Ensure regular monitoring, quarterly joint monitoring and yearly program perfomance evaluations in all camps to assess performance progress and formulate recommendations for any identified gaps. (UNHCR, WFP, UNICEF & ACROSS).

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[1] WHO 2000 categorisation

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

Food security related

General food ration providing the minimum dietary requirements (2100kcal/person/day) is critical to ensure basic nutrition provision. Currently the ration Gorom ration only provides 72% of the recommended calories which is insufficient in a population that predominantly relies on the general food ration.This is in addition to the promotion of food security and livelihood options that provide diet diversity and complimentary feeding (UNHCR, ACROSS & WFP).
Continue the routine joint monthly food basket monitoring on site and beneficiary contact monitoring at the household level in Gorom to ensure that refugees receive their entitlement (UNHCR, ACROSS and WFP).

Expand the coverage of sustainable food security and livelihood solutions in the refugee context in Goromo complement the general food distribution (UNHCR, WFP & ACROSS).

Health related

Maintain and strengthen the provision of comprehensive primary health programme for refugee and host populations in Central Equitoria. (UNHCR & ACROSS)

UNICEF, ACROSS and UNHCR to ensure the EPI program and Vitamin A supplementation campaigns and routine program is maintained and strengthened to increase coverage to acceptable standards.

INTRODUCTION

This report presents the results of nutrition survey conducted in Gorom camp. The survey was carried out from 28 November to 2 December 2016.
This report is divided into the following sections:

- The *background*: This section sets out background information related to the health, nutrition and food security situation for Gorom camp.
- The *methodology*
- The *results:* presents the findings.
- The *discussion*
- The *recommendations*

BACKGROUND

Gorom Refugee camp is located 24 km from Juba city. It has an estimated refugee population of 2168[2] who are mainly of Ethiopian nationality. The Anyuak refugees from Ethiopia have been in Gorom settlement since 2011

A number of humanitarian organisations work in Gorom refugee camps to ensure delivery of essential services and supplies to the refugees. Key partners in terms of the provision of the health, nutrition and food security services include UNHCR, WFP, UNICEF and ACROSS. 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 ration (GFR) once per month. UNICEF in collaboration with UNHCR provides support to the nutrition programme. ACROSS implements the health, nutrition and food security programme.

Food Security

Refugees in the Gorom camp are mainly dependant on the WFP provided (GFR) and have limited access to additional sources of food/income. The 28% reduced General Food Distribution (GFD) provided to all registered refugees remained the same from January to December 2016. It consisted of 333g sorghum, 33g of yellow split peas, 20ml of vegetable oil oil and 3.3g salt. This cumulates to approximately 370 grams/person/day providing 1511 kilocalories/person/day. This provided 72% of the recommended food ration of2100 kcal/person/day). There was no ration provided in May and November 2016 due to lack of food supplies in Gorom. WFP was unable to ensure timely deliveries within the month and could not provide the food retroactively. See breakdown below showing the monthly ration provision

Table 2 General food ration provision by month – Gorom refugee camp, Central Equitoria, 2016

Ration provided at the distribution in g/p/d	Standard	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
Cereal	500g	333	333	333	333	0	333	333	333	333	333	0	333	278
Pulses	50g	33.3	33.3	33.3	33.3	0	33.3	33.3	33.3	33.3	33.3	0	33.3	27.8
Vegetable oil	30g	20	20	20	20	0	20	20	20	20	20	0	20	16.7
Salt	5g	3.3	3.3	3.3	3.3	0	3.3	3.3	3.3	3.3	3.3	0	3.3	2.8
CSB+	50g	0		0	0	0	0	0	0	0	0	0	0	0.0
Kcal	2100	1511	1511	1511	1511	0	1511	1511	1511	1511	1511	0	1511	1259.2
	% of standard met	72	72	72	72	0	72	72	72	72	72	0	72	60.0

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[2] UNHCR ProGres December 2016 population

Health situation

Gorom refugee camp has one Primary Health Care Centre.

The overall crude mortality rate for Gorom camp from the UNHCR health information system (January to December 2016) was 0.17/10000/day while under-five mortality rate was 0.41/10000/day which was below the emergency threshold of <1 and <2 respectively. This indicates a stable population.

The main causes of illness in 2016 were malaria, respiratory tract infections, skin and eye disease, intestinal worms and watery diarrhoea.

Figure 1: Under-five proportional morbidity from January-December 2016; Gorom, Central Equitoria camps (UNHCR HIS**)**
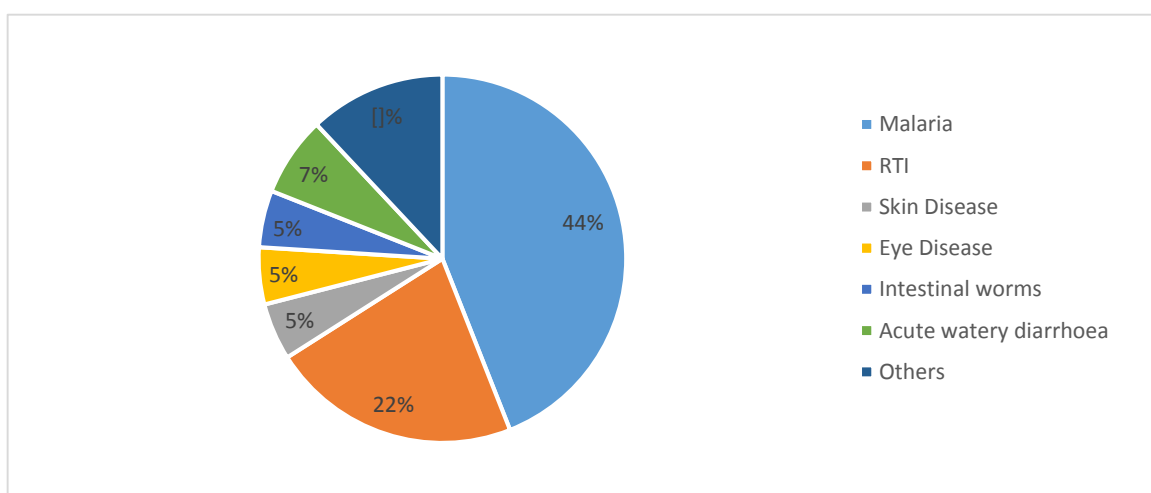
Nutrition Situation

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

- Targeted Supplementary Feeding Programmes (TSFP) for moderately acute malnourished 6-59 months using locally sourced food sources.
- Outpatient and inpatient therapeutic feeding programmes for severely acute malnourished children.
- Basic Infant and young child feeding support and promotion programme.
- MUAC screening of children 6-59 months at the triage area of the PHCC.
- Community Outreach MUAC screening.

From January to December 2016 there were 142 children 6-59 admissions of which 28 were admitted to the Outpatient Therapeutic Program (OTP) and 124 in the Targeted Supplementary Feeding Program (SFP). At the end of December 2016 there were 13 children 6-59 months enrolled in both the OTP and SFP program. There was an additional 19% admissions from other age groups who were malnourished and the host community.

Figure 2: Admissions to the selective feeding program (OTP & TSFP) January- December 2016 (Health Information System)

Acute malnutrition admissions, Gorom refugee camp , 2016

	J	F	M	A	M	J	J	A	S	O	N	D
■ SFP New Admissions	1	11	13	17	24	4	0	2	25	6	14	7
■ OTP New Admissions	0	2	2	3	2	0	0	4	7	2	2	4
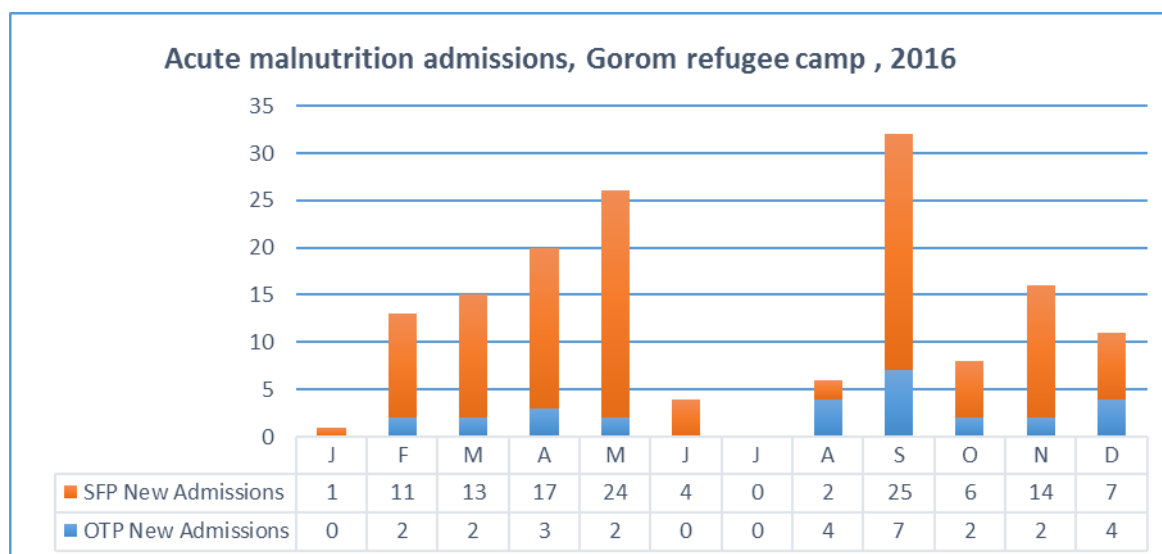
Provision of health and nutrition services was interrupted in July due to insecurity. ACROSS was thus unable to access the camp thus the no admissions in July. As there was no comprehensive nutrition services in 2015/6 admission trend patterns will be assessed in 2017.

SURVEY OBJECTIVES

Specific primary objectives of the survey:
   a. To determine the prevalence of acute malnutrition among children 6-59 months
   b. To determine the prevalence of stunting among children 6-59 months
   c. To assess the two-week period prevalence of sickness among children 6-59 months
   d. To determine the coverage of measles vaccination among children 9-59 months
   e. To determine the coverage of vitamin A supplementation in the last six months among children 6-59 months and postnatal women
   f. To establish recommendations on actions to be taken to address the situation

Secondary objectives:

a. To determine the coverage of selective feeding programs for children 6-59 months

METHODOLOGY

Survey population

An exhaustive survey was conducted as the total population size of Gorom camp was below 2,500 people rendering sampling unnecessary. All children 6-59 months in the camp were surveyed.

House hold questionnaire administration

All households with children 6-59 months were surveyed. Each team was allocated the villages to survey. Village locations and boundaries was discussed during the training to ensure all teams knew where to go.

If an individual or an entire household was absent the teams were instructed to return to the household or revisit the absent individual up to two times on the same survey day. If they were unsuccessful after this, the individual or the household was recorded as absent and they were not replaced with another individual.

If the individual or an entire household refused to participate then it was considered a refusal and the individual or the household were 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.

Questionnaires

The paper versions of questionnaires are attached in **Appendix 3**

The questionnaires were prepared in English language. Following the survey training/pilot, revisions were adapted. The questionnaires were administed in English or translated to the local ldiallectvia the enumerators where necessary.

The anthropometric module questionnaire (adapted from UNHCR SENS Guidelines version 2, 2013) was administered targeting c*hildren 6-59 months.* This included questions and measures for children aged 6-59 months. Information was collected on anthropometric status, oedema, enrolment in selective feeding programmes, immunisation (measles), vitamin A supplementation in the last six months, morbidity presence and health seeking behavior. Either an EPI card or child health card were used to determine the age in case there was no birth certificate. If no reliable proof of age was available, age was estimated in months using a local event calendar and was recorded in months on the questionnaire. If the child's age could absolutely not be determined by using a local events calendar or by probing, the child's length/height was used for inclusion; the child had to measure between 65 cm and 110 cm.

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.

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.

Sickness in last 2 weeks in children 6-59 months: Caregivers were asked if their child had suffered of any illness in the past two weeks.

Health seeking behavior: for children that were ill, whether the caretaker took the child to the health centre for treatment.

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

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. Results using the NCHS 1977 Growth Reference are reported in **Appendix 4**.

Table 3: Definitions of acute malnutrition using weight-for-height and/or oedema in children 6–59 months

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

Stunting, also known as chronic malnutrition was defined using height-for-age index values and was classified as severe or moderate based on the cut-offs shown below. Main results are reported according to the WHO Growth Standards 2006. Results using the NCHS Growth Reference 1977 are reported in **Appendix 4**.

Table 4: Definitions of stunting using height-for-age in children 6–59 months

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

Underweight was defined using the weight-for-age index values and was classified as severe or

moderate based on the following cut-offs. Main results are reported according to the WHO Growth Standards 2006. Results using the NCHS Growth Reference 1977 are reported in **Appendix 4**.

Table 5: Definitions of underweight using weight-for-age in children 6–59 months

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

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

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

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

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

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

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

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

Table 7: Classification of public health significance for children under 5 years of age

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

Selective feeding programmes:

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

Table 8: Performance indicators for selective feeding programmes (UNHCR Strategic Plan for Nutrition and Food Security 2008-2012)*

	Recovery	Case fatality	Defaulter rate	Coverage		
				Rural areas	Urban areas	Camps
SFP	>75%	<3%	<15%	>50%	>70%	>90%
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 camp, country and region should be >90%.

Training, coordination and supervision

The surveys were coordinated by Terry Theuri (UNHCR) in collaboration with the ACROSS team including Dr Emmanuel Soma, Diana Wesly Anyango and Tommy Otto.

The surveys were undertaken by five teams for all camps with each team composed of three members: one team leader/questionnaire enumerator and two anthropometric measurers. The team leaders/enumerators were qualified staff, while the anthropometric measurers were home health promoters. The teams were supervised on a daily basis.

A two day training was carried out from 28-29 November 2016. 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 practical session on anthropometric measurements was also carried out for practice as well as a standardisation test. Post the training the data collection tools were then reviewed based on the feedback from the team.

Data collection, entry and analysis

Data collection lasted for 3 days days from 30 November to 2 December 2016. 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 3**.

Data entry was entered on a daily basis. A plausibility check was generated thereafter for the provision of daily feedback to the supervisors. Records with queries were marked to be returned to the team for correction and/or confirmation the following day. Practical feedback to ensure accuracy and thoroughness in recording the measurements and responses was provided each morning.

At the end of the data collection, a complete set of data was ready. All data files were cleaned before analysis. Entries were double checked, one by one, with the original questionnaire to ensure there were no data entry errors.Analysis was performed using ENA for SMART and Epi Info software. The SMART Plausibility Report was generated in order to check the quality of the anthropometric data and a summary of the key quality criteria is shown in **Appendix 2**.

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.

RESULTS FROM GOROM

CHILDREN 6-59 MONTHS INDICATORS, GOROM CAMP, CENTRAL EQUITORIA (DEC 2016)

Table 9 shows the different population groups and the total number of individuals who were sampled within each group.

Table 9: Actual number of children captured during the survey Gorom camp versus the UNHCR Progress population target, (December 2016)

Target group	Target population	Subjects measured/interviewed during the survey	% of the target
Children 6-59 months	335	246	73.4%

The target of the children was lower than expected as some families were no longer living in the camp or had travelled to other locations

Anthropometric results (based on WHO Growth Standards 2006)
The coverage of age documentation was 43.1% (children having an exact birth date). As this was low the stunting and the underweight data should be interpreted with caution owing to the age unreliability.

Table 10: Distribution of age and sex of sample-Gorom camp, Central Equitoria (December 2016)

	Boys		Girls		Total		Ratio
AGE (mo)	no.	%	no.	%	no.	%	Boy:girl
6-17	31	45.6	37	54.4	68	27.6	0.8
18-29	20	37.0	34	63.0	54	22.0	0.6
30-41	32	59.3	22	40.7	54	22.0	1.5
42-53	35	63.6	20	36.4	55	22.4	1.8
54-59	8	53.3	7	46.7	15	6.1	1.1
Total	126	51.2	120	48.8	246	100.0	1.0

The overall sex ratio was 1.0 (sex ratio should be between 0.8-1.2), which confirms that both sexes were equally distributed.

Table 11: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex- Gorom camp, Central Equitoria (December 2016)

	All n = 244	Boys n = 125	Girls n = 119
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(16) 6.6 %	(8) 6.4 %	(8) 6.7 %
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(15) 6.2 %	(8) 6.4 %	(7) 5.9 %
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(1) 0.4 %	(0) 0.0 %	(1) 0.8 %

The prevalence of oedema is 0.0%
There was no difference between boys and girls in the prevalence of acute malnutrition (p>0.05)

Table 12: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema- Gorom camp, Central Equitoria (December 2016)

Age (mo)	Total no.	Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-17	68	0	0.0	1	1.5	67	98.5	0	0.0
18-29	54	1	1.9	5	9.3	48	88.9	0	0.0
30-41	53	0	0.0	3	5.7	50	94.3	0	0.0
42-53	54	0	0.0	5	9.3	49	90.7	0	0.0
54-59	15	0	0.0	1	6.7	14	93.3	0	0.0
Total	244	1	0.4	15	6.1	228	93.4	0	0.0

Figure 3: Prevalence of wasting by age in children 6-59 months- Gorom camp, Central Equitoria (December 2016)
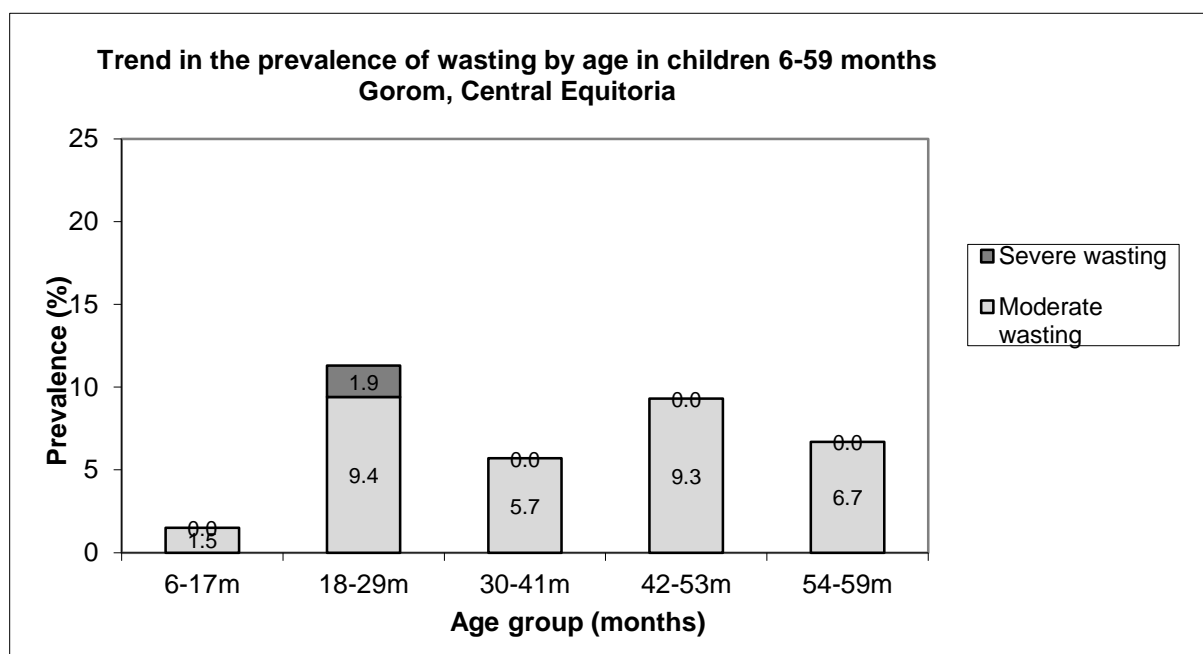
Children in the older age group 18-29 and 42-53 months tend to be most affected by wasting in Gorom.

Table 13: Distribution of severe acute malnutrition and oedema based on weight-for-height z-scores- Gorom camp, Central Equitoria (December 2013)

	<-3 z-score*	>=-3 z-score
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 1 (0.4%)	Not severely malnourished No. 244 (99.6 %)

Includes Flags

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

Figure 4: 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- Gorom camp, Central Equitoria (December 2016)
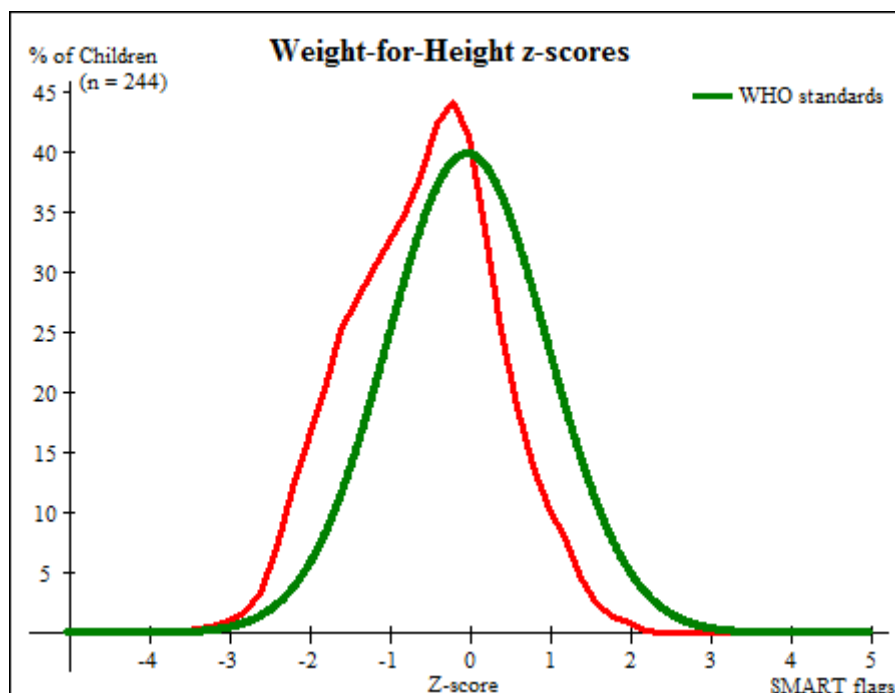
Table 14: Prevalence of stunting based on height-for-age z-scores and by sex- Gorom camp, Central Equitoria (December 2016)

	All n = 240	Boys n = 120	Girls n = 120
Prevalence of stunting **(<-2 z-score)**	(54) 22.5 %	(23) 19.2 %	(31) 25.8 %
Prevalence of moderate stunting **(<-2 z-score and >=-3 z-score)**	(42) 17.5 %	(21) 17.5 %	(21) 17.5 %
Prevalence of severe stunting **(<-3 z-score)**	(12) 5.0 %	(2) 1.7 %	(10) 8.3 %

Table 15: Prevalence of stunting by age based on height-for-age z-scores- Gorom camp, Central Equitoria (December 2016)

Age (mo)	Total no.	Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
		No.	%	No.	%	No.	%
6-17	68	2	2.9	11	16.2	55	80.9
18-29	53	5	9.4	11	20.8	37	69.8
30-41	50	4	8.0	10	20.0	36	72.0
42-53	54	1	1.9	7	13.0	46	85.2
54-59	15	0	0.0	3	20.0	12	80.0
Total	240	12	5.0	42	17.5	186	77.5

Children in the age groups 18-29 and 30-41 months tend to be the most affected by stunting as compared to the other age groups.

Figure 5: Prevalence of stunting by age in children 6-59 months- Gorom camp, Central Equitoria (December 2016)

Table 16: Prevalence of underweight based on weight-for-age z-scores by sex- Gorom camp, Central Equitoria (December 2016)
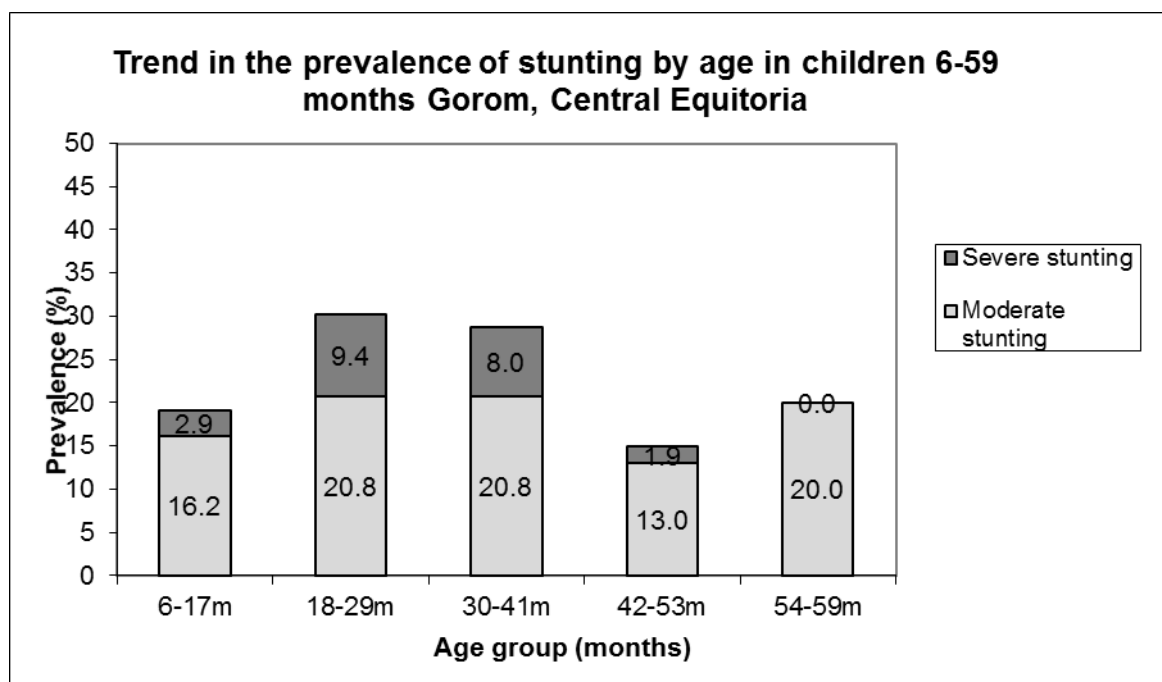
	All n = 244	**Boys** n = 125	**Girls** n = 119
Prevalence of underweight (<-2 z-score)	(43) 17.6 %	(20) 16.0 %	(23) 19.3 % (
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(37) 15.2 %	(16) 12.8 %	(21) 17.6 %
Prevalence of severe underweight (<-3 z-score)	(6) 2.5 %	(4) 3.2 %	(2) 1.7 %

Table 17: Mean z-scores and excluded subjects - Gorom camp, Central Equitoria (December 2016)

Indicator	n	Mean z-scores ± SD	z-scores not available*	z-scores out of range
Weight-for-Height	244	-0.57±0.90	1	1
Weight-for-Age	244	-1.00±1.00	0	2
Height-for-Age	240	-1.08±1.16	1	5

MUAC was used in the community for screening and admission to therapeutic and supplementary feeding programmes.

Table 18: Prevalence of MUAC malnutrition- Gorom camp, Central Equitoria (December 2016)

	All n = 246	Boys n = 126	Girls n = 120
Prevalence of MUAC (< 125 mm and/or oedema)	(3) 1.2 %	(1) 0.8 %	(2) 1.7 %
Prevalence of MUAC (< 125 mm and >= 115 mm, no oedema)	(3) 1.2 %	(1) 0.8 %	(2) 1.7 %
Prevalence of MUAC (< 115 mm and/or oedema)	(0) 0.0 %	(0) 0.0 %	(0) 0.0 %

The case load for the selective feeding programmes was estimated to aid in programme planning. The Gorom population used during the survey planning was 2122. 16.9% (359) of this was the under 5 population. 335 of this was the 6-59 months children target (assuming that 10% of under-5 are 0-5 months).

Table 19: Estimated number of malnourished children aged 6-59 months eligible to be enrolled in a selective feeding programme at the time of the survey (based on all admission criteria)- Gorom camp, Central Equitoria (December 2016)

	Total/number	%	Estimate based on 335 6-59 population
Eligible for therapeutic feeding programme	1/244	0.4	2
Eligible for supplementary feeding programme	17/244	7.0	24

**WHZ flags excluded from analysis

Using the HIS data for week 52 there were 4 children enrolled in the therapeutic feeding program which was 1.6% of children 6-59 months while 9 were enrolled in the supplementary feeding program which was 3.7% of children 6-59 months using the survey population.

Programme coverage

Selective feeding programme**
Table 20: Nutrition treatment programme coverage based on all admission criteria (weight-for-height, MUAC, oedema) – Gorom camp, Central Equitoria (December 2016)

	Number/total	%
Proportion of children aged 6-59 months with severe acute malnutrition currently enrolled in therapeutic feeding programme*	0/1	0
Proportion of children aged 6-59 months with moderate acute malnutrition currently enrolled in supplementary feeding programme*	1/17	5.9%

*WHZ flags excluded from analysis

Table 21: Nutrition treatment programme coverage based on MUAC and oedema only- Gorom camp, Central Equitoria (December 2016)

	Number/total	% (95% CI)
Proportion of children aged 6-59 months with severe acute malnutrition currently enrolled in therapeutic feeding programme	0/0	-
Proportion of children aged 6-59 months with moderate acute malnutrition currently enrolled in supplementary feeding programme	3/3	100%

Vaccination and supplementation programmes

Measles vaccination coverage

Table 22: Measles vaccination coverage for children aged 9-59 months (n= 228) - Gorom camp, Central Equitoria (December 2016)

	Measles (with card) n=86	Measles (with card <u>or</u> confirmation from mother) n=188
YES	37.7 %	82.5 %

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

Vitamin A supplementation coverage

Table 23: Vitamin A supplementation for children aged 6-59 months within past 6 months (n=246) - Gorom camp, Central Equitoria (December 2016)

	Vitamin A capsule (with card) n=28	Vitamin A capsule (with card <u>or</u> confirmation from mother) n=110
YES	11.4 %	56.1 %

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

Morbidity

38% of the children 6-59 months reported to have been sick two weeks prior to the survey. 85.9% of these reported to have been taken to the health facility.

Table 24 : Prevalence of sickness in children 6-59 months

	Number/total	%
Children sick in the last two weeks (6-59 months)	93/245	38%

LIMITATIONS

- There was restricted/limited access to Gorom refugee camps for UN staff during the survey period. To ascertain the nutrition situation in Gorom thus required a rapid survey thus limiting the number of modules that could be carried out.

- The total number of children found during the survey was lower than the expected number from the UNHCR ProGres database. This could have been due to some families being away and others no longer living in the camp.

- The age documentation coverage was 43%. Although an event calendar was used by the surveyors to ascertain age, stunting results need to be interpreted with caution because z-scores for height-for-age require accurate ages to within two weeks[3]

- Coverage was assessed based on the community screening process practice where children with a MUAC of <12.5cm are referred for nutrition rehabilitation. <-2 WHZ scores not captured by this MUAC range could thus have been missed in the program coverage calculation using both Z score and MUAC admission criteria.

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[3] (CDC/WFP: A manual: Measuring and Interpreting Mortality and Malnutrition, 2005).

DISCUSSION

Nutritional status of young children and mortality

The prevalence of global acute malnutrition (GAM) in Gorom camp (6.6%) **is poor based on the WHO classification (acute malnutrition between 5-9% is considered poor)**. The prevalence of severe acute malnutrition (SAM) was within the UNHCR acceptable level of <2%. This can be attributed to the presence of an OTP program which rehabilitates any identified cases. Targeted Supplementary Feeding in 2016 was carried out but using locally sourced food products. To allow for better outcomes in 2017, supply support to facilitate the use of recommended SFP products to be carried out in 2017.

Stunting refers to a deficit in height relative to age due to a long-term process of linear growth retardation. It has long been proposed as a measure of chronic under nutrition or ill health, but may also be attributed to certain micronutrient deficiencies such as Vitamin A, zinc, calcium or folate[4].The prevalence of global stunting among children 6-59 months was above the WHO acceptable range of <20% in Gorom. Of note though is that only 43% of the population had age documentation thus stunting results need to be interpreted with caution.

Morbidity and Health seeking behaviour

The interactions of nutrition and infection are cyclic with each exacerbating the other. Over a third of children 6-59 months were reported to have been sick in the last two weeks prior to the survey indicating a high morbidity burden. Majority of those (85.9%) reported to have been taken to the health facility indicating positive health facility utilization.To reduce the morbidity caseload further there is need to maintain the current health service provision.Top morbidities (malaria, respiratory tract infections, skin and eye disease, intestinal worms and watery diarrhea) should also be given special attention.

Programme coverage children 6 – 59 months

Selective feeding programme

The TSFP coverage results based on all admission criteria was found to be low (5.9%). The TSFP coverage result based MUAC only criteria was within the acceptable standard of >90%. The latter indicates effective screening at the community level where MUAC is used. Of concern is the children that meet the WHZ score admission criteria but are not captured by the MUAC screening. Analysis of MUAC versus WHZ z-scores verified the above argument. In this light, a mixed criteria for admission using MUAC or WHZ scores to capture the children missed by either MUAC or the WHZ scores admission criteria is proposed.Once the BSFP is introduced the blanket supplementary feeding centre to carry out a 2 stage screening monthly measurements at the facility. All children found to be at risk (125 -135mm) for the 6-23months and (125-150mm) for the 24-59 months to go through a second stage weight for height z-score measurement and any child found to meet the admission criteria using the WHZ scores to be enrolled into the appropriate program.

Measles vaccination and vitamin A supplementation
The coverage for measles vaccination and vitamin A supplementation in the last 6 months was found to be below the target of ≥95% and ≥90% for measles vaccination and vitamin A supplementation respectively indicating the need to strengthen both the routine and campaign strategies. As these results were based on both card and recall there is also need to continue improving the coverage of cards for reliability and for monitoring.

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

CONCLUSION

There is a need to provide a comprehensive nutrition program that rehabilitates all the identified acute malnourished children. In addition to this strengthening of preventative activities targeting adequate household food intake, appropriate caring practices, promotion and protection of infant and young child feeding practices, improved health services, adequate water and sanitation and the expansion of livelihood activities need to be in place to address the underlying causes of malnutrition.

After birth, a child's ability to achieve the standards in growth is determined by the adequacy of dietary intake (which depends on appropriate infant and young child feeding and care practices and availability and access to nutritious food), as well as exposure to disease. Under-nutrition and infection are intertwined in a synergistic vicious cycle. Therefore, support to quality child feeding practices (breastfeeding and complementary feeding) and improvement of household food security, together with disease prevention and control programmes, are the most effective interventions that can significantly reduce stunting and acute malnutrition during the first two years of life and onwards into adult life.

Lastly considering the dependency of refugees on the general food ration, the 28% food ration cut in Gorom refugee camp is likely to continue to negatively impact on the nutrition situation. The resumption of the100% GFD provision is thus recomended.

Recommendations and Priorities

Nutrition related

Establish a comprehensive 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 ACROSS).

Ensure all community screened and referred 6-59 months children identified with a MUAC less than 125mm get enrolled into the management of acute malnutrition programs through community outreach follow up at household level (ACROSS)

Introduce blanket supplementary feeding programme for children 6-23months, 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 have in light of a predominant grain based general food diet (UNHCR, WFP and ACROSS)

Conduct the two step MUAC and WHZ scores (for children with MUAC at risk) screening monthly once the BSFP site at the Gorom camp is established to ensure both high MUAC and WHZ score coverage (ACROSS)

Strengthen the capacity of established nutrition facility in terms of nutrition supplies and staff training to facilitate quality provision of both curative and preventative components of nutrition (UNHCR, WFP, UNICEF and ACROSS)

Expand and strengthen preventative nutrition components including Infant and Young Child Feeding (IYCF) and community outreach education aspects to stop malnutrition from occurring in the first place. (UNHCR, UNICEF and ACROSS)

Conduct follow up quarterly mass MUAC screening to monitor the evolution of the nutrition situation at the community level. (ACROSS)

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

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

Food security related

General food ration providing the minimum dietary requirements (2100kcal/person/day) is critical to ensure basic nutrition provision. Currently the ration Gorom ration only provides 72% of the recommended calories which is insufficient in a population that predominantly relies on the general food ration.This is in addition to the promotion of food security and livelihood options that provide diet diversity and complimentary feeding (UNHCR, ACROSS and WFP).
Continue the routine joint monthly food basket monitoring on site and beneficiary contact monitoring at the household level in Gorom to ensure that refugees receive their entitlement (UNHCR, ACROSS and WFP).

Expand the coverage of sustainable food security and livelihood solutions in the refugee context in Goromo complement the general food distribution (UNHCR, WFP and ACROSS).

Health related

Maintain and strengthen the provision of comprehensive primary health programme for refugee and host populations in Central Equitoria. (UNHCR and ACROSS)

UNICEF, ACROSS and UNHCR to ensure the EPI program and Vitamin A supplementation campaigns and routine program is maintained and strengthened to increase coverage to acceptable standards.

APPENDICES
Appendix 1: Names of contributors

Data collection teams

	Name	Role	Organisation
1	Akune Odhieng Ochalla	Enumerator	ACROSS
2	Odolla Chum Abolla	Enumerator	ACROSS
3	Ariat Adiangura	Enumerator	ACROSS
4	Agee Abella	Enumerator	ACROSS
5	Mathaya Ochich	Enumerator	ACROSS
6	Ojullu Okwer	Enumerator	ACROSS
7	Omot Obang Wadi	Enumerator	ACROSS
8	Lingdit Mou Nguoth	Enumerator	ACROSS
9	Chiel Oman Ogut	Enumerator	ACROSS
10	Dor Camboni	Enumerator	ACROSS
16	Vincent Canagola	Team leader	ACROSS
17	Agele Confusas	Team leader	ACROSS
18	Akomi Vic Innocent	Team leader	ACROSS
19	Peter Ongwec	Team leader	ACROSS
20	Michael Olweny	Team leader	ACROSS
21	Tommy Otto	Supervisor/Coordinator	ACROSS
22	Diana Chicago Wesley	Supervisor/Coordinator	ACROSS
23	Dr. Emmanuel Soma	Coordinator	ACROSS
24	Terry Theuri	Supervisor/Coordinator	UNHCR
25	Sebit Mustafa	Supervisor	UNHCR

Data analysis and report compilation
Terry Theuri (Nutrition Officer, UNHCR Juba, South Sudan)

Report review
Gebrewold Petros Yohannes (Public Health Officer, UNHCR Juba, South Sudan),
Naser Mohmand (Senior Nutrition and Food security officer , Regional Service Unit, Nairobi) and
Melody Tondeur (UNHCR, Geneva HQ)

Funding
UNHCR and ACROSS supported the survey. UNICEF funds the nutrition program

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

Gorom

Overall data quality

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

Missing/Flagged data   Incl   %    0-2.5 >2.5-5.0 >5.0-7.5 >7.5
(% of in-range subjects)             0     5        10      20         0 (0.5 %)

Overall Sex ratio      Incl   p    >0.1  >0.05    >0.001  <=0.001
(Significant chi square)             0     2        4       10         0 (p=0.279)

Overall Age distrib    Incl   p    >0.1  >0.05    >0.001  <=0.001
(Significant chi square)             0     2        4       10         4 (p=0.023)

Dig pref score - weight Incl  #    0-7   8-12     13-20   > 20
                                     0     2        4       10         0 (5)

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

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

Standard Dev WHZ       Excl   SD   <1.1  <1.15    <1.20   >=1.20
.                                   and   and      and     or
.                      Excl   SD   >0.9  >0.85    >0.80   <=0.80
                                     0     2        6       20         0 (0.99)

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

Kurtosis   WHZ         Excl   #    <±0.2 <±0.4    <±0.6   >=±0.6
                                     0     1        3       5          1 (-0.27)

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

Timing                 Excl   Not determined yet
                                     0     1        3       5

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

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

Appendix 3:Nutrition Surveys Questionnaires December 2016

Standardised Nutrition Survey Questionnaire- Gorom Camp

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 household before the interview. Define a household as a group of people who live together and routinely eat out of the same pot. Define head of the household as a member of the family who manages the family resources and is the final decision maker in the house

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

- UNHCR/ACCROSS is supporting this nutrition survey.

- Taking part in this survey is totally your choice. You can decide to not participate, or if you do participate you can stop taking part in this survey at any time for any reason. If you stop being in this survey, it will not have any negative effects on how you or your household is treated or what aid you receive.

- If you agree to participate, I will ask you some questions about your family and I will also measure the MUAC, weight and height of all the children in the household who are older than 6 months and younger than 5 years

- Before we start to ask you any questions or take any measurements, we will ask you to state your consent on this form. Be assured that any information that you will provide will be kept strictly confidential.

- You can ask me any questions that you have about this survey before you decide to participate or not.

- If you do not understand the information or if your questions were not answered to your satisfaction, do not declare your consent on this form.

Thank you.

CHILDREN 6-59 QUESTIONNAIRE

Date (dd/mm/yyyy)	Team Number	Village	Block
|___|___|/|___|___|/|___|___||___|___|	|___|	|___|___|	|___|___|

CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8	CH9	CH10	CH11	CH12	CH13	CH14	CH15
ID	HH	Consent given 1=Yes 2=No 3=Absent	Sex (M/F)	Birthdate* dd/mm/yyyy	Age in months	Weight (KG) ±100g	Height (CM) ±0.1cm	Oedema (Y/N)	MUAC (CM)	If MUAC is <12.5cm, Is child enrolled in nutrition program? 1=SFP 2=TFP 3=None	Has the child been vaccinated against Measles 1=Yes card 2=Yes recall 3=No or don't know	Has the child received Vitamin A in past 6 months (show capsule) 1=Yes card 2=Yes recall 3=No or don't know	Has the child been sick in past 2 weeks including today? 1=Yes 2=No 8=DK *If answer is no, stop here, if Yes ask CH15*	If yes, was the child taken to the health facility? 1=Yes 2=No 8=DK
01				/ /										
02				/ /										
03				/ /										
04				/ /										
05				/ /										
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09				/ /										
10				/ /										
11				/ /										
12				/ /										

Appendix 4: Result Tables for NCHS growth reference 1977

Table 25: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex – NCHS growth reference 1977

	All n = 244	Boys n = 125	Girls n = 119
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(14) 5.7 %	(6) 4.8 %	(8) 6.7 %
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(14) 5.7 %	(6) 4.8 %	(8) 6.7 %
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(0) 0.0 %	(0) 0.0 %	(0) 0.0 %

The prevalence of oedema is 0.0 %

Table 26: Prevalence of underweight based on weight-for-age z-scores by sex

	All n = 246	Boys n = 126	Girls n = 120
Prevalence of underweight (<-2 z-score)	(53) 21.5 %	(25) 19.8 %	(28) 23.3 %
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(45) 18.3 %	(20) 15.9 %	(25) 20.8 %
Prevalence of severe underweight (<-3 z-score)	(8) 3.3 %	(5) 4.0 %	(3) 2.5 %

Table 27: Prevalence of stunting based on height-for-age z-scores and by sex

	All n = 240	Boys n = 121	Girls n = 119
Prevalence of stunting (<-2 z-score)	(46) 19.2 %	(18) 14.9 %	(28) 23.5 %
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(34) 14.2 %	(15) 12.4 %	(19) 16.0 %
Prevalence of severe stunting (<-3 z-score)	(12) 5.0 %	(3) 2.5 %	(9) 7.6 %

Table 28: Mean z-score values (NCHS Reference 1977) in children aged 6-59 months, and included and excluded subjects

Indicator	n	Mean z-scores ± SD	z-scores not available*	z-scores out of range
Weight-for-Height	244	-0.78±0.81	1	1
Weight-for-Age	246	-1.25±1.00	0	0
Height-for-Age	240	-0.94±1.13	1	5

* contains for WHZ and WAZ the children with edema.

Appendix 5: Event calendar for Gorom refigee camp, December 2016

Local Events calendar- GOROM Camp

MONTH	SEASON	YEAR					
		2011	2012	2013	2014	2015	2016
JANUARY	CPA celebration New year celebration	Referendum day 9th January	CPA celebrations New Year celebration 58	CPA celebrations New Year celebration 46	CPA celebrations New Year celebration 34	CPA celebrations New Year celebration 22	CPA celebrations New Year celebration 10
FEBRUARY			57	45	33	21	9
MARCH	Land preparation		56	44	32	20	8
APRIL	Planting season		55	43	31	19	7
MAY			54	42	30	18	6
JUNE	Weeding of crops World refugee day (20 June)		53	41	29	17	5
JULY	Crop weeding continues		52	40	28	16	4
AUGUST			51	39	27	15	3
SEPTEMBER	Harvest Ethiopian new year (11/09)		50	38	26	14	2
OCTOBER			49	37	25	13	1
NOVEMBER			48	36	24	12	0
DECEMBER	Gambella genocide commemoration Christmas (25/12) World AIDS day (01/12)	59	47	Juba fighting starts 15th December 35	23	11	

Appendix 6 – Map of Gorom refugee camp

SOUTH SUDAN: Central Equatoria-Gorom Refugee Settlement I 05/05/2016