SMART+ Survey *Preliminary* Report

REACH, July-2025, Ashenafi Kefyalew

Kapoeta East County, South Sudan

July 2025

Full SMART

Validated

Funded by: **Foreign, Commonwealth & Development Office (FCDO)**

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Acknowledgement

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Acronyms

ACF:	Action contre la Faim
AFSS:	Andrea Food South Sudan
AMN:	Acute Malnutrition
ARI:	Acute Respiratory Infection
BoF:	Bottle Feeding
CBF:	Continued Breastfeeding
CDR:	Crude Death Rate
CHD:	County Health Department
CM:	Centimeters
CI:	Confidence interval
CMR:	Crude Mortality Rate
DEFF:	Design Effect
DOT:	Diocese of Torit
EBF:	Exclusive Breastfeeding
EBF2D:	Exclusive Breastfeeding for the First Two Days After Birth
EEQ:	Eastern Equatoria
EFF:	Egg and/or Flesh Food Consumption
EIBF:	Early Initiation of Breastfeeding
EvBF:	Ever Breastfed
FAO:	Food and Agriculture Organization
FCDO:	Foreign, Commonwealth and Development Office
FCS:	Food Consumption Score
FSL:	Food Security and Livelihoods
FSNMS:	Food Security and Nutrition Monitoring System
GAM:	Global Acute Malnutrition
HFA:	Height for Age
HAZ:	Height for Age Z scores
HH:	Household
HHS:	Household Hunger Scale
HQ:	Head Quarters
IPC:	Integrated Phase Classification
IPC-AMN:	Integrated Phase Classification – Acute Malnutrition
ISSSF:	Introduction of Solid, Semi-Solid, or Soft Foods
IYCF:	Infant and Young Child Feeding
MAM:	Moderate Acute Malnutrition
MAD:	Minimum Acceptable Diet

MDD:	Minimum Dietary Diversity
MMFF:	Minimum Milk Feeding Frequency
MMF:	Minimum Meal Frequency
MixMF:	Mixed Milk Feeding
MM:	Millimeter
MOH:	Ministry of Health
MUAC:	Mid Upper Arm Circumference
NIWG:	Nutrition Information Working Group
PLW:	Pregnant and Lactating Women
PPS:	Probability Proportional to Size
RC:	Reserve Cluster
RRC:	Relief and Rehabilitation Commission
SAM:	Severe Acute Malnutrition
SD:	Standard Deviation (measure of spread around the mean)
SMART:	Standardized Monitoring and Assessment of Relief and Transitions
SMOH:	State Ministry of Health Easter Equatoria
SRS:	Simple Random Sampling
SwB:	Sweet Beverage Consumption
TEM:	Technical Error of Measurement
U5MR:	Under Five Mortality Rate
UFC:	Unhealth Food Consumption
UNHCR:	United Nations High Commissioner for Refugees
UNICEF:	United Nations International Children's Emergency Fund
WASH:	Water Sanitation and Hygiene
WFH:	Weight for Height
WFP:	World Food Program
WHO:	World Health Organization
WHZ:	Weight for Height Z Scores
ZVF:	Zero Vegetable or Fruit

Executive Summary

This survey was conducted by REACH Initiative South Sudan with technical support from Impact initiatives at HQ and Global SMART team at the SMART Initiative. This survey primarily conducted to update information on the nutrition situation of Kapoeta East County, Eastern Equatoria State of South Sudan covering all payams and piloting the newly developed SMART+ tool. The survey data was collected between July 28th and August 9th, 2025, across 42 clusters. Overall objective of the survey was to determine the nutrition and health status of children between 6 – 59 months of age in the county. The new SMART+ digital infrastructure was also pretested for the first time by REACH South Sudan mission during this survey.

The survey followed the Standardized Monitoring and Assessment of Relief and Transitions (SMART) methodology which featured a two-stage sampling approach. The first stage of sampling was the selection of clusters (equivalent to villages) following the probability proportional to population size (PPS) approach while the second stage of sampling was the selection of households in the selected clusters using simple random sampling. The sample size determination for both the anthropometry sample size and the households were determined using the SMART+ infrastructure, including the stage one selection of clusters. The core indicator for this survey was anthropometry with the inclusion of other indicators for Water, Sanitation and Hygiene (WASH), Food Security and Livelihoods (FSL). Infant and Young Child Feeding (IYCF) and Women's nutritional status and children's health were also included.

The survey targeted 490 children from 453 households and successfully covered 485 children across 462 households. The summary findings showed a Global Acute Malnutrition (GAM) prevalence in children 6-59 months of 8.9% (95% CI: 6.3 – 12.5) based on weight for height z score (WHZ) and/or Oedema. The prevalence of Severe Acute Malnutrition (SAM) weight for height z score (WHZ) and/or Oedema was 0.8% (95% CI: 0.2 – 2.8). This indicates that the prevalence of acute malnutrition in Kapoeta East County is alarming and action is needed to identify and treat malnourished children while also preventing further deterioration. The Crude Death Rate (CDR) was 0.19 per 10,000 persons per day (95% CI: 0.08 – 0.49), and the Under-5 Mortality Rate (U5MR) was 0.35 (95% CI: 0.09 – 1.29), both well below emergency thresholds, indicating relatively stable mortality situation during the recall period. A summary of nutritional status and other indicators in the survey is presented in table 1 below.

In addition to anthropometry and mortality, the survey highlighted several aggravating factors. Infant and Young Child Feeding (IYCF) practices remain poor, with only 61% of infants under six months exclusively breastfed and just 4.3% of children 6-23 months achieving Minimum Acceptable Diet (MAD). Child morbidity was high, with significant prevalence of diarrhoea, fever, and Acute Respiratory Infection (ARI) in the two weeks prior to the survey. Water sanitation and hygiene (WASH) are dire as only 40% of households rely on unsafe water sources, none treat their water, and open defecation is nearly universal. In terms of Food Security and Livelihoods (FSL), one in four households reported poor food consumption, 78% faced moderate hunger, and most relied on negative coping strategies such as reduced meals or borrowing food.

Table 1: Executive summary table

Category	Indicator	Numerator (n)	Denominator (N)	(%) (95% CI)
Nutrition and Mortality Indicators				
Wasting	Prevalence of global malnutrition by WHZ (<-2 z-score and/or oedema)	43	483	8.9 (6.3 – 12.5)
	Prevalence of severe malnutrition (<-3 z-score and/or oedema)	4	483	0.8 (0.2 – 2.8)
	Prevalence of global malnutrition by MUAC (< 125 mm and/or oedema)	14	485	2.9 (1.4 – 5.7)
	Prevalence of severe malnutrition (< 115 mm and/or oedema)	2	485	0.4 (0.1 – 1.6)
	Prevalence of combined GAM (WHZ <-2 and/or MUAC < 125 mm and/or oedema)	47	485	9.7 (6.9 – 13.5)
	Prevalence of combined SAM (WHZ < -3 and/or MUAC < 115 mm and/or oedema	6	485	1.2 (0.5 – 3.0)
Stunting	Prevalence of stunting (<-2 z-score)	NA	NA	15.2 calculated with SD of 1
Underweight	Prevalence of underweight (<-2 z-score)	88	483	18.2 (14.0 – 23.4)
	Prevalence of severe underweight (<-3 z-score)	25	483	5.2 (3.3 – 8.1)
Mortality	Crude Death Rate (Deaths/10,000 people/day)	4	1,949	0.19 (0.08 – 0.49)
	Under-5 Death Rate (Deaths/10,000 children U5/day)	2	544	0.35 (0.09 – 1.29)
Nutrition and Health Service Coverage	Measles card + mother confirmation (9-59 months)	393	466	84.3 (72.8 – 91.5)
	De-worming (children12-59 months)	237	438	54.1 (40.8 – 66.8)
	Vitamin A Supplementation (6-59 months)	411	485	84.7 (74.9 – 91.2)
Maternal Nutrition	Pregnant and Lactating Women (PLW) GAM	18	65	27.7 (16.2 – 43.2)
IYCF Indicators				
Breastfeeding indicators	Ever breastfed (0-23 months)	221	231	95.7 (90.4 – 98.1)
	Early initiation of breastfeeding (0-23 months)	206	231	89.2 (80.4 – 94.3)
	Exclusive breastfeeding under 6 months (0-5 months)	43	231	61.4 (45.0 – 75.6)
	Continued breastfeeding (12-23 months)	105	231	84.0 (71.3 – 91.7)
	Minimum dietary diversity 6–23 months	16	161	9.9 (4.7 – 19.6)

Complementary feeding practices	Minimum meal frequency 6–23 months	31	161	19.3 11.7 – 30.1)
	Minimum acceptable diet 6–23 months	7	161	4.3 (1.5 – 12.0)
	Egg and/or flesh food consumption 6–23 months	39	161	24.2 (14.6 – 37.4)
	Sweet beverage consumption 6–23 months	54	161	33.5 (20.3 – 50.0)
	Zero vegetable or fruit consumption 6–23 months	132	161	82.0 (71.8 – 89.0)
Food Security and Livelihoods	Food Consumption Score			
	Acceptable	209	459	45.5 (34.9 – 56.6)
	Borderline	139	459	30.3 (23.4 – 38.2)
	Poor	111	459	24.2 (15.5 – 35.7)
	Household Hunger Scale			
	Little to no Hunger	97	460	21.1 (11.1 – 36.3)
	Moderate Hunger	360	460	78.3 (63.3 – 88.3)
	Severe Hunger	3	460	0.7 (0.2 – 2.0)
	Reduced Coping Strategy Index (rCSI)			
	Yes	77	458	16.7 (15.1 – 18.3)
WASH	Water Sources (Improved and unimproved)			
	Improved	233	462	50.4 (36.1 – 64.7)
	Not Improved	229	462	49.6 (35.3 – 63.9)
	Treatment method			
	Yes, always treat it before drinking	0	462	0.0 (0.0 – 0.0)
	No, never treat it before drinking	462	462	100.0 (100.0 – 100.0)
	Access to improved sanitation facility			
	Improved sanitation facility	0	462	0.0 (0.0 – 0.0)
	Unimproved sanitation facility (open defecation)	462	462	100.0 (100.0 – 100.0)

Introduction

Organization

The survey was conducted by REACH Initiatives South Sudan mission in collaboration with other partners (State and County MoH, other partners) with technical support from SMART Initiative–Canada Team and IMPACT Initiatives HQ.

Background Information

South Sudan continues to face protracted conflict, insecurity, and deteriorating food and nutrition conditions. As of mid-2025, an estimated 7.7 million people (57% of the population) are experiencing high levels of acute food insecurity, including 2.4 million in Emergency (Integrated Phase Classification (IPC) Phase 4) and about 83,000 in Catastrophe (Phase 5). Acute malnutrition also remains widespread: by June 2025, 2.075 million children were projected to suffer from acute malnutrition, of whom 646,000 severely malnourished[1]. The main drivers include disease burden, poor sanitation, inadequate infant and young child feeding practices, and widespread food insecurity.

Kapoeta East County, in Eastern Equatoria State, shares borders with Kapoeta South, Kapoeta North, Budi and Pibor Counties, and also with Kenya to the south, and Ethiopia to the east, and is inhabited mainly by the Toposa, Buya, and Jie communities. The county is part of the semi-arid pastoral livelihood zone, where households depend heavily on livestock and sorghum production. According to the June 2025 IPC Acute Malnutrition (IPC-AMN) analysis, Kapoeta East was classified in Phase 4 (Critical), reflecting persistent nutrition challenges.[2] Seasonal migration, insecurity, and limited access to health and nutrition services exacerbate vulnerability. The last SMART survey (Action Against Hunger, December 2023) reported GAM prevalence of 10.6% (7.7 – 14.4, 95% CI) WHZ, below the 15% WHO emergency threshold but still concerning, particularly when combined with deteriorating food security conditions.

Since the last SMART in 2023 has been conducted, no updated SMART survey had been conducted in the County, despite significant contextual changes including the influx of returnees from Kenya, rising food insecurity, and worsening public health risks. To address this information gap, REACH, in collaboration with the Nutrition Information Working Group (NIWG) and local authorities, implemented a SMART+ survey from 28 July to 9 August 2025. The survey collected data on anthropometry and mortality, alongside multi-sectoral indicators including food security and livelihoods (FSL), water, sanitation, and hygiene (WASH), and health. This will provide robust, up-to-date evidence on the nutrition situation and its drivers, and to inform planning, targeting, and response by partners and stakeholders in the County.

[1] IPC-AMN South Sudan 2024
[2] Ibid

Survey Type

The survey type used was a full SMART survey using SMART+ platform.

Survey Timing

The survey was conducted between 28th July and 9th August 2025 and according to the Kapoeta East County seasonal Calendar, this was lean harvest.

Survey Setting

The survey took place in all payams of Kapoeta East County, Eastern Equatoria (EEQ) State, South Sudan.

Survey Location

The survey is taking place in Kapoeta East, South Sudan, South Sudan. No areas were excluded from the survey.

Survey Goal and Objectives

Overall Objective

The overall objective of this survey was to determine the prevalence of acute malnutrition among children 6-59 months of age and asses the mortality situation of the community in Kapoeta East County of EEQ state, South Sudan.

Specific Objectives

- To estimate the prevalence of acute malnutrition, stunting and underweight among children aged 6 to 59 months in Kapoeta East County.
- To estimate retrospective crude mortality rate (CMR) and under five mortality rates (U5MR) among the overall population and under five children, respectively, in Kapoeta East County.
- To assess two weeks retrospective Episode of diarrhoea, care-seeking for children with diarrhoea, and use of ORS and Zinc during an episode of diarrhoea among children 6-59 months in Kapoeta East County.
- To assess two weeks retrospective childhood Episode of fever and care-seeking for children with fever among children 6-59 months in Kapoeta East County.
- To assess two weeks retrospective childhood Episode of Acute Respiratory Infection (ARI), and care-seeking for children with ARI among children 6-59 months in Kapoeta East County.
- To assess the vaccination coverage of measles (9-59 months), deworming (12-59 months) and Vitamin A supplementation (6-59 months) of children in Kapoeta East County.
- To assess proxy IYCF practice (breast feeding and complementary feeding) among mothers who have children under the age of two years, based on the standard WHO recommendations (WHO/UNICEF, 2021) in Kapoeta East County.
- To assess the nutritional status of women in the reproductive age group (15-49 years) by Mid-Upper Arm Circumference (MUAC) measurement in Kapoeta East County and
- To assess contextual factors: food security (Food Consumption Score (FCS), Household Hunger Scale (HHS), reduced Coping Strategy Index (rCSI)) and WASH situation in Kapoeta East County.

Survey Justification

To gauge the prevalence of malnutrition and better understand the needs of affected populations, REACH South Sudan, in collaboration with the EEQ State Ministry of Health (SMoH), Kapoeta East Couty Health Department (CHD), Andrea Food South Sudan (AFSS), and other partners, conducted an integrated Nutrition and Mortality Survey using the SMART+ platform in July/August 2025, with financial support from FCDO.

The findings of this survey will provide updated evidence on the nutrition, food security, and health status of communities in Kapoeta East County, inform targeted actions to mitigate malnutrition, and support humanitarian planning and response by stakeholders. In addition, the results will serve as a key input for the upcoming September 2025 IPC analysis.

Methodology

Survey Design

Sampling Method

The cross-sectional study design used the Standardized Monitoring and Assessment of Relief and Transitions (SMART) methodology. The survey employed two-stage cluster sampling methodology based on the probability proportional to population size (PPS) for cluster selection. The first stage was the selection of clusters or villages (the smallest administrative unit), while the second stage involved the selection of households within the selected clusters/villages using simple random sampling.

Sample Size

The sample size for anthropometry and mortality was determined using the SMART+ infrastructure which involved the determination of the children and households to be included in the anthropometric survey and households for mortality survey, respectively. The following assumptions (based on the given context) were used to calculate the sample size in number of children and then converted into number of households to survey.

Table 2: Sample Size calculation of Anthropometry

Parameters for Anthropometry	Value	Assumption and Source
Estimated prevalence of GAM (%)	19.7%	The Food Security and Nutrition Monitoring System (FSNMS) conducted in July 2024 reported a GAM rate of 19.7% (11.8-31.0, 95% CI). The Point Prevalence of FSNMS is used to calculate the sample size.
Desired precision	± 4.50	Reasonable precision for expected prevalence as recommended by SMART survey guidelines.
Design effect (DEFF)	1.50	As per SMART survey guideline
Children to be included	**490**	
Average household (HH) size	5.90	FSNMS July 2024 survey finding average household size.
% Children 6-59 months	21.0%	Used national average as the findings from ACF SMART are very high (24.8%) as per NIWG recommendation.
% Non-response rate	3.0%	Expected non-response based on experience
Households to be included	**453**	**Minimum sample size-Households to be surveyed.**

Table 3: Sample size calculation of Mortality

Parameters for Mortality	Value	Assumption and Source
Estimated mortality rate/10,000/day	0.24	The December 2023 SMART survey reported the CMR of 0.24 (0.09 – 0.66, 95% C.I). As the security situation in the County is calm and no major disruption affecting Kapoeta East County communities since the 2023 survey, and assuming the situation remains the same, the December CMR point prevalence (0.24) is used for planning.
Desired precision/10,000/day	± 0.30	Applicable precision for CDR <1 as per the SMART guidelines.
Design effect	1.50	As per SMART guideline
Recall period in days	106	The recall period was anchored on Easter Sunday (April 20, 2025) and counted through to the midpoint of data collection (August 3, 2025), giving a total of 106 days
Population to be included	**1,578**	**Population**
Average household (HH) size	5.90	FSNMS July 2024 survey finding average household size.
% Non-response rate	3.0%	Expected non-response based on experience
Households to be included	**276**	**Households to be included**

Since the two different household sample sizes (anthropometric versus mortality) produced different numbers, the anthropometry sample size with the higher number of households was used for both anthropometry and retrospective mortality survey, with 453 households in Kapoeta East County were included in the survey.

Table 4: Calculation of household average per day

Activity	Estimated Time
Departure from Office	**7:00 AM**
a. Daily morning Briefings	*15 min*
b. Travel to villages	*50 min*
c. Introduction and HH list development	*30 min*
d. Lunch break	*30 min*
e. Total Time from one HH to another	*5 min*
f. Travel back to base	*50 min*
Total time for HH listing, travelling and breaks (a + b + c + d + f)	175 min
Arrival back to Base	**5:30 PM**
Total Available time in a day	10:30 hrs (630 minutes)
Total time per day for field work (7:30am –5:30 pm) available time for work	600 - 175 minutes = 455 minutes
Time taken to complete one questionnaire	*35 minutes*
Total time per household + e	*40 minutes*

Given the above, the number of households that a team can comfortably visit in a day is calculated as follows:

455 (min) / 40 (min) =**11.38 HHs/per day ~ 11 HHs**

The total number of households in the sample was then divided by the number of households to be completed in one day to determine the number of clusters to be included in the survey. The total number of clusters was obtained after dividing the total number of households.

(453/11) = 41.18 clusters ~ 42 clusters.

Survey	Sample Size	Target HHs per Cluster	No. of Clusters	Total final Target
Nutrition/Mortality	453 HHs	11	42	462

Description of sampling method

First stage sampling (selection of clusters): The first stage involved selection of clusters based on probability proportional to population size (PPS). Each village was considered as the smallest geographical unit. In order to obtain sampling frame of primary sampling units (villages); the list of villages and their population size compiled and updated, on the ground by AFSS and CHD staff together and other local authorities, before the actual cluster selection.[3] The list of all villages as per the sampling frame and their total population entered in the SMARTPlus platform "clusters & sampling" section. The platform randomly assigns clusters to the villages based on their respective populations and 42 clusters selected from the sampling frame based on the list of all villages found in Kapoeta East County.

Second stage sampling (selection of households): This stage of sampling involved selection of households within the selected clusters using simple random sampling. The survey team introduced themselves and the objectives of the survey to the village chief (sultan). In collaboration with village chief, they prepared a list of all households in the village. Simple Random Sampling (SRS) using the Random Number Generator (RNG), which is embedded in the SMART+ mobile application (SMARTcollect), was used in each cluster to select the required number of 11 households to visit. In each of the selected households, all the eligible children were included in the survey (6-59 months for anthropometry and 0-23 months for the IYCF survey). In households without eligible children, the teams proceeded with the collection of household-related data.

The team started the survey from any convenient household of the randomly selected households (11 households) to carry out anthropometric and mortality questionnaires. Revisits were done at least once before the team left the sampled village/cluster to all absent households, or in which eligible children (under five) were absent at first attempt. Survey teams were told not substitute households and adhered to that. The outcome for every selected household was indicated in the cluster control form which ensured easy follow-up of the survey by the supervision team.

Survey teams, training, data collection and data management

Survey teams: Six teams consisting of four members (1 Team Leader, 1 measurer, 1 assistant, 1 enumerator) were involved in the collection of data. In each cluster, a local guide was employed on site to facilitate data collection at the household level. The survey teams were recruited by REACH with the involvement of partners such as AFSS and the local officials at both State and County level. To the extent possible, the team members were a mix of both men and women and were recruited from the local communities. Supervisors consisted of a mix of Relief and Rehabilitation Commission (RRC), State Ministry of Health (SMOH), County Health Department (CHD) and REACH staff.

Training: The survey teams were trained for five days between July 23rd and 27th, 2025. The training covered various components including basic concepts of malnutrition, taking

[3] A list of selected clusters attached as Annex 1 in the report

anthropometric measurements, sampling of households, data collection tools, SmartCollect, standardization exercise, pilot test, among other themes. The training of the enumerators was facilitated by SMART+ certified staff and staff with experience conducting SMART surveys.

Supervision: The overall management of the survey was done by REACH Initiative. Maximum supervision of the survey teams was ensured to facilitate quality data.

Data entry and quality control: Data collection was conducted using the SMARTCollect mobile application, which is publicly available on the Google Play Store. Once team composition was finalized by the survey manager, each team leader (designated tablet holder) was provided with a QR/barcode. This enabled them to download the survey questionnaire specific to their team and ensure proper synchronization with the central server. The application allowed real-time data entry, monitoring, and quality control during the fieldwork.

Questionnaire

The survey employed structed data collection tools developed by the global SMART Initiative, written in English but administered in the local language. The tools covered anthropometric and mortality modules, as well as additional indicators. Using the SMARTCollect application, questionnaires were automatically generated once the relevant indicators were selected from the SMART+ platform indicator bank, ensuring standardized content and comparability with other SMART surveys.

To facilitate accurate administration, team composition was arranged so that each team included at least one member fluent in local language. During the enumerator training, adequate time was dedicated to reviewing the questionnaire and practicing its administration. A pre-test was conducted in one non-sampled village near the training venue, after which feedback was discussed and incorporated to strengthen data collection procedures.

Indicators: Definition, Calculation, and Interpretation

Overview of Indicators

Household, child, and women related level indicators were collected for this survey. A full description of these indicators can be found in the table below.

Table 5: Standardized Integrated SMART Indicators

Indicator	Target Population
Household Indicators	
Mortality	
Mortality	Total population
Food Security	
Food Consumption Score (FCS)	Total population
Reduced Coping Strategy Index (rCSI)	Total population
Household Hunger Scale (HHS)	Total population
Food Insecure Experience Scale	Total population
WASH	
Access to safe/improved water for drinking and cooking	Total population
Household water treatment	Total population
Access to improved sanitation facilities	Total population
Child Indicators	
Anthropometry	6-59 months
Vitamin A supplementation coverage	6-59 months
Deworming coverage	12-59 months
Measles vaccination coverage	9-59 months
Episode of ARI, and care-seeking for children with ARI	6-59 months
Episode of diarrhoea, care-seeking for children with diarrhoea, and use of ORS and Zinc during an episode of diarrhoea	6-59 months
Episode of fever and care-seeking for children with fever	6-59 months
IYCF [Ever Breastfed (EvBF), Early Initiation of Breastfeeding (EIBF), Exclusive Breastfeeding for the First Two Days After Birth (EBF2D), Exclusive Breastfeeding (EBF), Mixed Milk Feeding (MixMF), Continued Breastfeeding (CBF), Introduction of Solid, Semi-Solid, or Soft foods (ISSSF), Minimum Dietary Diversity (MDD), Minimum Meal Frequency (MMF), Minimum Milk Feeding	0-24 months

Indicator	Target Population
Frequency (MMFF), Minimum Acceptable Diet (MAD), Egg and/or Flesh Food Consumption (EFF), Sweet Beverage Consumption (SwB), Unhealthy Food Consumption (UFC), Zero Vegetable or Fruit (ZVF), Bottle Feeding (BoF)]	
Women Indicators	
Anthropometry (MUAC)	15-49 years

Anthropometric Indicators

a) ***Age***: The age of a child recorded as date of birth (day/month/year) if the information is available on official written documents such as vaccination or birth registration cards. If documentation is unavailable, age recorded in months. A local calendar of events also used to estimate the age

b) ***Weight*** (in kg): Children weighed removing of all clothes to the nearest 100g (0.1 kg) by using a SECA electronic scale. The children who can easily stand asked to stand on the weighing scale and their weight recorded. In a situation when the children cannot stand, the double weighing method applied.

c) ***Height/Length*** (in cm): A measuring board used to measure bare headed and barefoot children. The precision of the measurement was 0.1 cm. All children under 2 years measured lying down (length) and all children over 2 years measured standing up (height). Two measurers undertake measurements of each child, with the participation of the caregivers.

d) ***Mid-Upper Arm Circumference*** (MUAC): measured using a flexible non-elastic tape, midway between the tip of the acromion process and the tip of the olecranon process of the left arm with the arm hanging freely by the child's side. MUAC measurements recorded in millimeters (precision to the nearest millimeter).

e) ***Bilateral Pitting Oedema***: assessed by applying a moderate thumb pressure on BOTH feet for three seconds. If oedema is present, a shallow pit will remain after releasing pressure from the feet. Only children with bilateral oedema (oedema on both feet) diagnosed positive for nutritional Oedema. Supervisors confirm all cases of oedema (if any).

f) ***Cut-offs for malnutrition status***: The following Tables show anthropometric indicators [Weight for Height (WFH), WFA and HFA index expressed in Z score) and MUAC cut-off points that will be used in this survey.

Table 6: MUAC cut off points for children 6-59 months

Nutritional Status	Definition
No malnutrition	125 mm > MUAC
Global Acute Malnutrition (GAM)	125 mm ≤ MUAC
Moderate Acute Malnutrition (MAM)	115 mm ≤ MUAC < 125 mm
Severe Acute Malnutrition (SAM)	MUAC < 115 mm

Table 7: Cut off points for the WHZ index expressed in Z-score, WHO Standards

Nutritional Status	Definition
No undernutrition	WHZ ≥ -2 and no oedema
Global Acute Malnutrition (GAM)	WHZ < -2 or bilateral oedema (or both)
Moderate Acute Malnutrition (MAM)	(-3 ≤ WHZ < -2) and absence of bilateral oedema
Severe Acute Malnutrition (SAM)	WHZ < -3 or bilateral oedema (or both)
Overweight	WHZ > 2 and no oedema
Moderate overweight	(2 < WHZ ≤ 3) and no oedema
Severe overweight	WHZ ≥ 3 and no oedema

Table 8: Cut off points for the HAZ index expressed in Z-score, WHO Standards

Nutritional Status	Definition
Not stunted	HAZ ≥ -2
Stunted	HAZ < -2
Moderate stunting	-3 ≤ HAZ < -2
Severe stunting	HAZ < -3

Table 9: Cut off points for WAZ Index expressed in Z-scores, WHO Standards

Nutritional Status	Definition
Not underweight	WHZ ≥ -2
Global underweight	WAZ < -2
Moderate underweight	-3 ≤ WAZ < -2
Severe underweight	WAZ < -3

Table 10: WHO/UNICEF Classification for severity of malnutrition by prevalence

Indicators	Prevalence Thresholds Level (%)				
	Very High	High	Medium	Low	Very Low
Wasting (WHZ)	≥ 15	10 - 15	5 - < 10	2.5 - < 5	< 2.5
Overweight (WHZ)	≥ 15	10 - 15	5 - < 10	2.5 - < 5	< 2.5
Stunting (HAZ)	≥ 30	20 - > 30	10 - < 20	2.5 - < 10	< 2.5
	Critical		Serious	Poor	Acceptable
Underweight (WAZ)	≥ 30		20 - > 30	10 - < 20	< 10

Mortality

The mortality indices included in this survey were Crude Mortality Rate (CMR) and Under Five Mortality Rate (U5MR).

i. Crude Mortality Rate (CMR): Number of deaths from all causes per 10,000 people per day
ii. Under five mortality rate (U5MR): Number of deaths among children under five from all causes per 10,000 people per day.

Other Indicators

Food Security and Livelihoods (FSL)

Additional indicators relating to food security and livelihoods included in this survey are described below.

a) **Reduced Coping Strategy Index (rCSI)** measures how households manage or cope with reduced access to food. It is a proxy indicator for household food access and helps to identify those who are most vulnerable in a community. The index is based on a list of five coping strategies applied seven days before the survey and combines the frequency of each and their severity. Each coping strategy has a universal severity weight applied to the final score. Though there is no universal threshold for the rCSI, the higher the rCSI, the more severe the coping is in a household. A score of 0-15 indicates low coping, 16-40 indicates medium coping, and 41 or higher indicates high coping.[4]

b) **Household Hunger Scale (HHS)** is a food deprivation scale. It is built around three questions about the perceptions of a household on varying degrees of hunger by the number of times a household has experienced hunger within the 30 days prior to the survey. A score of 0-1 is categorized as "little or no hunger", a score of 2-3 as "moderate hunger", and a score of 4-6 as "severe hunger".[5]

[4] The Coping Strategies Index: Field Methods Manual 2nd Edition, January 2008.

[5] Ballard, Terri; Coates, Jennifer; Swindale, Anne; and Deitchler, Megan. Household Hunger Scale: Indicator Definition and Measurement Guide. Washington, DC: Food and Nutrition Technical Assistance II Project, FHI 360, August 2011.

c) **Food Consumption Score (FCS)** is a composite score of dietary diversity, food frequency, and relative nutritional importance of different food groups. It represents households' dietary diversity and nutrient intake. The FCS was calculated from households' consumption of different food groups in the seven days before the survey. A score of 0-21 was considered poor, 21.5-35 is borderline and above 35 is an acceptable consumption score.[6]

Water, Sanitation and Hygiene (WASH)

Additional indicators relating to WASH included in this survey are described below.

a) **Access to safe/improved water for drinking and cooking:** Percentage of households with access to safe/improved water for drinking and cooking.
b) **Household water treatment**: Percentage of households practicing household water treatment.
c) **Access to improved sanitation facilities**: Percentage of households with access to improved sanitation facilities.

Child health and nutrition

Additional indicators relating to infant and young child feeding (IYCF) practices[7] are outlined below.

a) **Complementary feeding indicators**
   i. **Introduction of solid, semi-solid or soft foods:** Percentage of infants 6–8 months of age who consumed solid, semisolid, or soft foods during the previous day.
   ii. **Minimum dietary diversity:** Percentage of children 6–23 months of age who consumed foods and beverages from at least five out of eight defined food groups during the previous day.
   iii. **Minimum meal frequency:** Percentage of children 6–23 months of age who consumed solid, semi-solid or soft foods (but also including milk feeds for non-breastfed children) at least the minimum number of times during the previous day.
   iv. **Minimum milk feeding frequency for non-breastfed children:** Percentage of non-breastfed children 6–23 months of age who consumed at least two milk feeds during the previous day.
   v. **Minimum acceptable diet:** Percentage of children 6–23 months of age who consumed a minimum acceptable diet during the previous day.
   vi. **Egg and/or flesh food consumption:** Percentage of children 6–23 months of age who consumed egg and/or flesh food during the previous day.
   vii. **Sweet beverage consumption:** Percentage of children 6–23 months of age who consumed a sweet beverage during the previous day.
   viii. **Unhealthy food consumption:** Percentage of children 6–23 months of age who consumed selected sentinel unhealthy foods during the previous day.

[6] Calculation and use of the food consumption score in food security analysis, UNWFP, 2008.
[7] World Health Organization & United Nations Children's Fund (UNICEF). (2021). Indicators for assessing infant and young child feeding practices: definitions and measurement methods. World Health Organization.

ix. **Zero vegetable or fruit consumption:** Percentage of children 6–23 months of age who did not consume any vegetables or fruits during the previous day.

b) **Other IYCF indicators**

Bottle feeding: percentage of children 0–23 months of age who were fed from a bottle with a nipple during the previous day.

Additional indicators relating to child health are outlined below:

a) **Vitamin A supplementation coverage:** Percentage of children aged 6-59 months who received a vitamin A capsule in the six months preceding the survey.
b) **Deworming coverage:** Percentage of children aged 12-59 months who were given deworming medication in the six months preceding the survey.
c) **Measles vaccination coverage:** Percentage of children aged 9-59 months who received measles vaccination.
d) **Episode of diarrhoea, care-seeking for children with diarrhoea, and use of ORS and Zinc during an episode of diarrhoea:** Percentage of children aged 6-59 months who had a diarrhoea episode in the two weeks preceding the survey. Additional measures include the percentage of caregivers who sought treatment for the child and the percentage of children who received ORS, zinc, or both during the episode.
e) **Episode of fever and care-seeking for children with fever:** Percentage of children aged 6-59 months who had a fever episode in the two weeks preceding the survey and the percentage of caregivers who sought treatment for the child.
f) **Episode of acute respiratory infection (ARI), and care-seeking for children with ARI:** Percentage of children aged 6-59 months who had an ARI episode in the two weeks preceding the survey and the percentage of caregivers who sought treatment for the child.

Limitations

The survey was conducted in July/August 2025, during the rainy season, whereas the previous SMART survey (December 2023) took place in the dry season. This difference in seasonality requires caution when interpreting and comparing results, as seasonal variations strongly affect food security, disease prevalence, and nutrition outcomes. Furthermore, the December 2023 data were outdated, making direct comparisons to assess changes in nutrition status less reliable.

In addition, the absence of birth documentation for the majority of children (94%) required the use of local events calendars for age estimation. This challenge may have contributed to the higher standard deviation observed in stunting (HAZ), which exceeded the recommended range. In line with SMART guideline, the adjusted prevalence based on SD=1 was reported to ensure comparability and reliability of results.

Results

Survey Sample

The survey targeted 490 children for the anthropometric survey from 453 households distributed across 42 clusters. The survey reached 485 (98.97%) children from 453 (100%) households in 42 clusters (100%). The survey, therefore, met and exceeded the minimum thresholds of 80% of sampled children and 90% of sampled clusters.

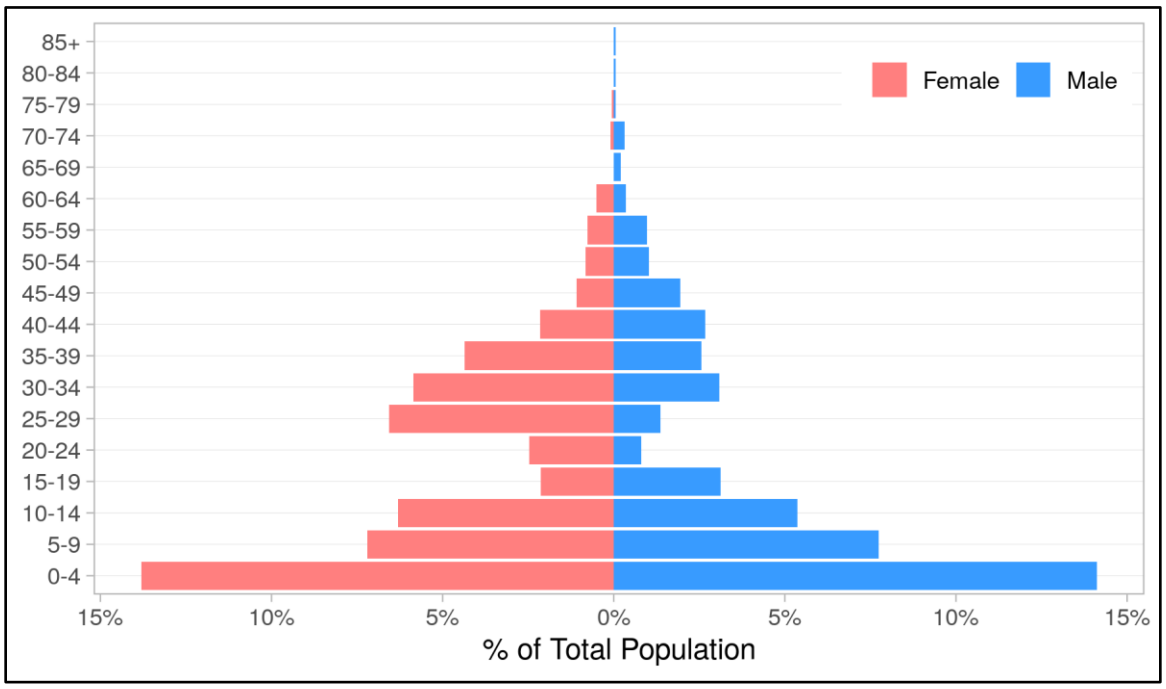
The total number of households with children under five years of age was 358, indicating that approximately 77.5% of households had children under five years. The average household size in Kapoeta East County was 4.2 persons and the percentage of children under five was 28.6%. Other demographic aspects of the survey are shown in Table 11 below.

Table 11: Demographic Summary

Indicator	Values	95% CI
Sampled number of HHs	462	
Sampled number of clusters	42	
Sampled number of HHs with children under five	358	
% of sampled HHs with children under five	77.5%	
Average household size	4.22	(3.98, 4.46)
Mid Interval Population Size	1,949.0	(1,837.5, 2,060.5)
Percentage of children under five	28.6%	(26.0%, 31.3%)
Female % of the population	54.0%	(52.3%, 55.7%)
Male % of the population	46.0%	(44.3%, 47.7%)

The population age and sex pyramid for Kapoeta East County can be found in figure 1 below. The sex ratio appears to be equal for ages 0-19 years in the county. There are, however, more females than males in ages 20-39 years. This could be due to men in that age group being more exposed to mortality than their female counterparts. This figure exemplifies a population likely to be exposed to violent contexts, more so in the north-eastern and north-western parts of the county which occasionally experience violence linked to cattle raiding and deadly tribal clashes.

Figure 1: Population Age and Sex Pyramid



Out of the 485 children included in the anthropometric survey, 238 were boys while 247 were girls. The ratio of boys to girls was 0.96, which shows that the boys and girls were equally represented in the survey with a p-value of 0.683. The age ratio of 6-29 months to 30-59 months was 0.92. This value is close to the expected value of 0.85 and therefore younger and older children were equally represented in the survey.

Table 12: Distribution of Age and Sex among children 6-59 months (SMART exclusions)

Age (Months)	Boys		Girls		Total		Ratio
	n	%	n	%	n	%	Boy: Girl
6 to 17	47.0	19.7%	39.0	15.8%	86.0	17.7%	1.21
18 to 29	63.0	26.5%	83.0	33.6%	146.0	30.1%	0.76
30 to 41	60.0	25.2%	47.0	19.0%	107.0	22.1%	1.28
42 to 53	41.0	17.2%	52.0	21.1%	93.0	19.2%	0.79
54 to 59	27.0	11.3%	26.0	10.5%	53.0	10.9%	1.04
Total	238.0	100.0%	247.0	100.0%	485.0	100.0%	0.96

Data Quality

All exclusions for z-scores were determined by applying SMART flags (WHZ -3 to 3; HAZ -3 to 3; WAZ -3 to 3) to the survey data, which are based on the observed survey mean rather than a reference population. The table below summarizes the three anthropometric indices. The mean z-scores for the three indices are negative, which indicates the population is affected by both acute and chronic malnutrition. The standard deviation or all the indices except stunting is within the acceptable range, an indication the data is of good quality hence conclusions regarding the prevalence can be confidently made.

Table 13: Mean Z-scores, Design Effects, Missing and Out-of-Range Data of Anthropometric Indicators among Children 6-59 months (SMART exclusions)

Indicator	N	Mean z-scores ± SD	Design effect (z-score < -2)	Z-scores not available*	Z-scores out of range
Weight-for-Height	483	-0.79 ±0.92	1.36	0	2
Weight-for-Age	483	-1.06 ±1.10	1.75	0	2
Height-for-Age	458	-0.97 ±1.33	1.83	0	27

Prevalence of Acute Malnutrition

Global acute malnutrition (GAM) was defined as <-2 z scores weight-for-height and/or oedema and severe acute malnutrition (SAM) was defined as <-3 z scores weight-for-height and/or oedema. With SMART flags used for exclusion, 2 children were excluded with z-scores out of range and total of 483 children were included in the final analysis for acute malnutrition.

The prevalence of Global Acute Malnutrition (GAM) among children 6-59 months old was estimated at 8.9% (6.3 - 12.5, 95% CI) (see table 14 below), which is categorized as "Alert" per IPC AMN classification[8]. In addition, the prevalence of Severe Acute Malnutrition (SAM) per WHZ among children 6-59 months old was 0.8% (0.2 - 2.8, 95% CI). There was no nutritional bilateral oedema found during the assessment. Boys had a higher prevalence of GAM (11.4%) compared to girls (6.5%), though this was not statistically significant due to overlapping confidence intervals.[9] A similar pattern was seen for MAM (10.5% vs 5.7%), which was also not statistically significant. SAM prevalence was identical in both groups (0.8%).

[8] Integrated Phase Classification (IPC) Technical Manual Version 3.1

[9] Boys are more likely to be undernourished than girls: a systematic review and meta-analysis of sex differences in undernutrition, PubMed Central, Dec 2020

Table 14: Prevalence of Acute Malnutrition by WHZ (and/or oedema) by Severity and Sex among Children 6-59 months (SMART exclusions), WHO 2006 Reference

Indicator	All (N=483)	Boys (N=237)	Girls (N=246)
No undernutrition	(440) 91.1% (87.5%, 93.7 %)	(210) 88.6% (84.0%, 92.0 %)	(230) 93.5% (88.8%, 96.3 %)
Prevalence of global acute malnutrition (<-2 z-score and/or oedema)	(43) 8.9% (6.3%, 12.5%)	(27) 11.4% (8.0%, 16.0%)	(16) 6.5% (3.7%, 11.2%)
Prevalence of moderate acute malnutrition (<-2 to ≥-3 z-score)	(39) 8.1% (5.5%, 11.7%)	(25) 10.5% (7.2%, 15.2%)	(14) 5.7% (3.1%, 10.3%)
Prevalence of severe acute malnutrition (<-3 z-score and/or oedema)	(4) 0.8% (0.2%, 2.8%)	(2) 0.8% (0.2%, 3.5%)	(2) 0.8% (0.2%, 3.2%)

Further analysis by the age cohorts is shown in the table below. Children 18-29 months were the most affected by moderate wasting while children 30-41 months were most affected by severe wasting. No age cohort stood out regarding moderate or severe wasting. Further breakdown is shown in table 15 below.

Table 15: Prevalence of Acute Malnutrition per WHZ and/or Oedema by Severity and Age Group (SMART exclusions)

Age (Months)	N	No wasting (WHZ ≥ -2)		Wasting (WHZ < -2)		Moderate wasting (-3 ≤ WHZ < -2)		Severe wasting (WHZ < -3)		Oedema	
		n	%	n	%	n	%	n	%	n	%
6 to 17	85	77	90.6%	8	9.4%	8	9.4%	0	0.0%	0	0.0%
18 to 29	145	132	91.0%	13	9.0%	12	8.3%	1	0.7%	0	0.0%
30 to 41	107	98	91.6%	9	8.4%	6	5.6%	3	2.8%	0	0.0%
42 to 53	93	84	90.3%	9	9.7%	9	9.7%	0	0.0%	0	0.0%
54 to 59	53	49	92.5%	4	7.5%	4	7.5%	0	0.0%	0	0.0%
All	483	440	91.1%	43	8.9%	39	8.1%	4	0.8%	0	0.0%

The surveyed population in Kapoeta East County had a WHZ mean of -0.79, which indicates that the surveyed population is more likely to be wasted when compared to the reference (WHO) population. The county's Gaussian curve of wasting (red) is shifted to the left of the reference population (green) as shown in the graph below.

Figure 2: Distribution of WHZ Sample Compared to the WHO 2006 WHZ Reference Curve

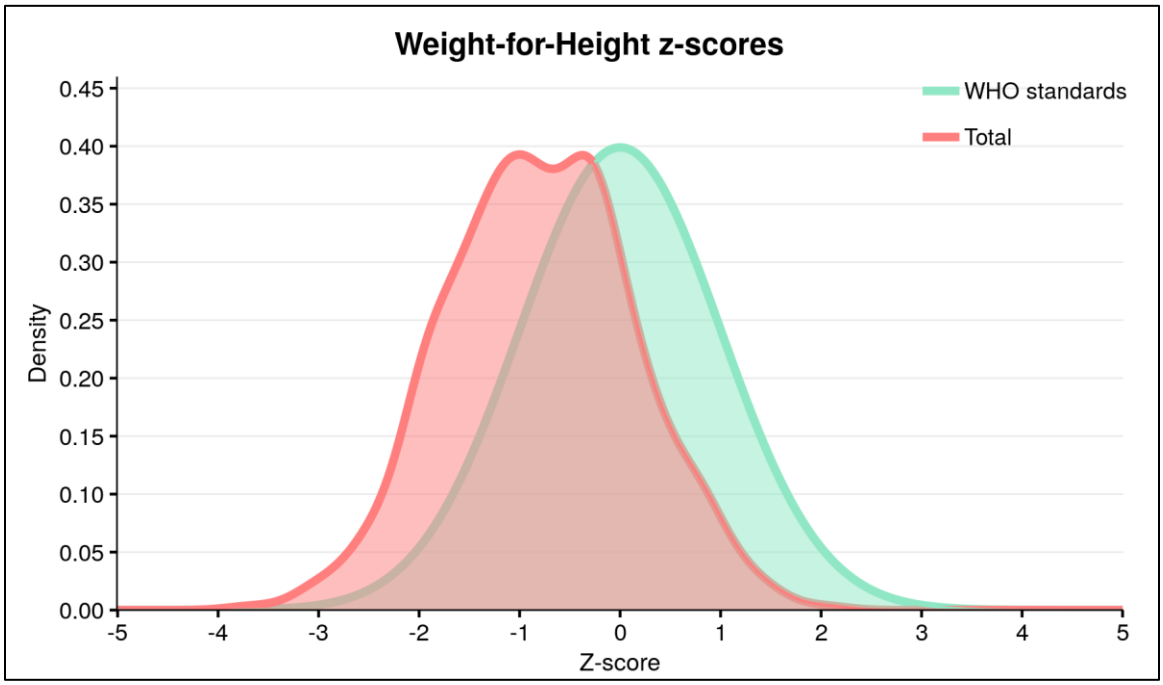


Figure 3 below depicts the mean z-scores for wasting in each age category. Among the age categories, the lowest mean z-score of wasting is observed in the 54 to 59 months group (-0.845395), indicating a relatively higher prevalence of wasting in this age category. On the other hand, the highest mean z-score for wasting is observed in the 6 to 17 months group (-0.736098), suggesting a comparatively lower prevalence of wasting in this age group.

The standard deviation (SD) represents the variability or spread of the data. A higher SD suggests more variability in the prevalence of wasting within that age group. The age category with the lowest SD is 54 to 59 months (±0.757715), indicating less variability in the prevalence of wasting compared to other age categories. The age category with the highest SD is 6 to 17 months (±1.039538), suggesting more variability in the prevalence of wasting among children in this age group. These findings can help guide targeted interventions and strategies to address and reduce wasting in specific age groups with higher prevalence of malnutrition.

Figure 3: Mean WHZ by Age Group

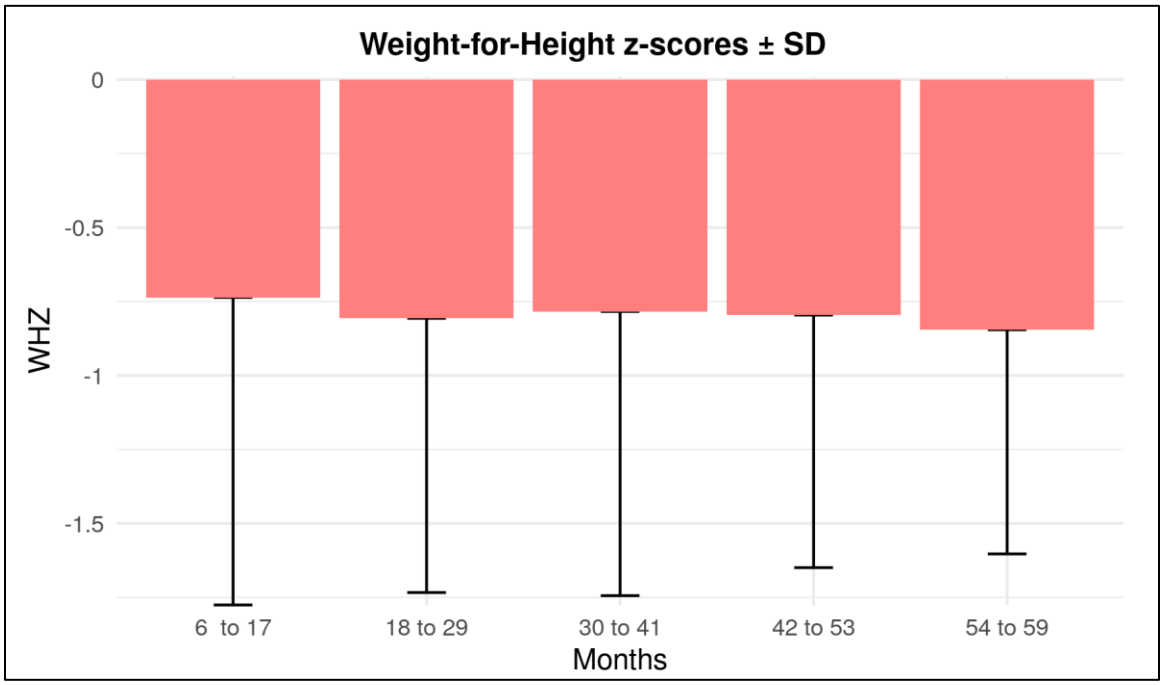


Table 16 below provides the distribution of severe acute malnutrition based on the presence or absence of Oedema among children 6 to 59 months. It indicates that there were no cases of Oedema in this assessment whereas there were 4 cases (0.8%) of marasmus.

Table 16: Distribution of Severe Acute Malnutrition per Oedema among Children 6-59 months (SMART exclusions)

	WHZ < -3	WHZ ≥ -3
Presence of Oedema*	Marasmic kwashiorkor 0 (0.0%)	Kwashiorkor 0 (0.0%)
Absence of Oedema	Marasmic 4 (0.8%)	Not severely malnourished 479 (99.2%)

Mid-upper arm circumference (MUAC) is an anthropometric measurement used to assess wasting in children 6-59 months.[10] It is widely used in nutrition programmes for the determination of admission of children into the nutrition programme and is predominantly used in community screening and referral in Kapoeta East County and South Sudan in general. Additionally, it is a good predicator of mortality among children under five years of age. The analysis was done based on MUAC cut-offs used in the country (SAM <115mm and MAM ≥ 115mm and <125mm). No exclusion were applied; hence analysis was done for 485 children.

[10] WHO growth standards - Arm Circumference for Age

The prevalence of GAM based on MUAC was 2.9% (1.4 – 2.7, 95% CI) and the prevalence of SAM was 0.4% (0.1 – 1.6, 95% CI). Girls appear more affected by GAM and MAM than boys in the survey as shown in the table 17 below.

Table 17: Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex

Indicator	All (N=485)	Boys (N=238)	Girls (N=247)
No malnutrition	(471) 97.1% (94.3%, 98.6 %)	(233) 97.9% (95.1%, 99.1 %)	(238) 96.4% (91.6%, 98.5 %)
Prevalence of global acute malnutrition (< 125 mm and/or oedema)	(14) 2.9% (1.4%, 5.7%)	(5) 2.1% (0.9%, 4.9%)	(9) 3.6% (1.5%, 8.4%)
Prevalence of moderate acute malnutrition (< 125 and ≥ 115 mm, no oedema)	(12) 2.5% (1.1%, 5.4%)	(3) 1.3% (0.4%, 4.0%)	(9) 3.6% (1.5%, 8.4%)
Prevalence of severe acute malnutrition (< 115 mm and/or oedema)	(2) 0.4% (0.1%, 1.6%)	(2) 0.8% (0.2%, 3.2%)	(0) 0.0% (0%, 0%)

The prevalence of wasting based on MUAC cut-offs was notably higher among younger children aged 6-29 months compared to older children (30-59 months). Specifically, GAM was 9.3% in the 6–17-month age group and 3.4% among 18-29 months, while prevalence was minimal among older age groups (≤0.9%) and absent in children above 42 months. SAM cases were also only reported in the younger groups, with 1.2% in 6-17 months and 0.7% in 18-29 months, further underscoring their vulnerability.

This pattern reflects the critical nutritional risks faced during the transition from exclusive breastfeeding (at 6 months) to reliance on complementary feeding, which is often inadequate in quality and diversity. The concentration of acute malnutrition in the youngest age groups may indicate sub-optimal complementary feeding practices and challenges in providing an adequate, balanced diet. These findings highlight the importance of Infant and Young Child Feeding (IYCF) interventions, particularly targeting under two years of age, who are most vulnerable to shocks affecting nutrition and health.

Table 18: Prevalence of Acute Malnutrition per MUAC and/or Oedema by Severity and Age Group

Age (Months)	N	No malnutrition		GAM		MAM		SAM		Oedema	
		n	%	n	%	n	%	n	%	n	%
6 to 17	86	78	90.7%	8	9.3%	7	8.1%	1	1.2%	0	0.0%
18 to 29	146	141	96.6%	5	3.4%	4	2.7%	1	0.7%	0	0.0%
30 to 41	107	106	99.1%	1	0.9%	1	0.9%	0	0.0%	0	0.0%

Age (Months)	N	No malnutrition		GAM		MAM		SAM		Oedema	
		n	%	n	%	n	%	n	%	n	%
42 to 53	93	93	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
54 to 59	53	53	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
All	485	471	97.1%	14	2.9%	12	2.5%	2	0.4%	0	0.0%

The combined GAM estimate considered all children identified as malnourished by any of the criteria used in the survey (WHZ, MUAC, and/or oedema). The prevalence of GAM and SAM was 9.7% (6.9 – 13.5, 95% CI) and 1.2% (0.5 – 1.2, 95% CI), respectively. While no internationally agreed cut-offs exist for classifying severity based on combined indicators, these estimates are valuable for caseload determination and program monitoring, particularly in contexts such as Kapoeta East County where multiple admission criteria are applied in nutrition programming.

Table 19: Prevalence of combined GAM and SAM based on WHZ and MUAC cut off's (and/or oedema) and by sex

Indicator	All (N=485)	Boys (N=238)	Girls (N=247)
Prevalence of combined GAM (WHZ <-2 and/or MUAC < 125 mm and/or oedema)	(47) 9.7% (6.9%, 13.5%)	(27) 11.3% (7.9%, 16.0%)	(20) 8.1% (4.7%, 13.5%)
Prevalence of combined SAM (WHZ <-2 and/or MUAC < 125 mm and/or oedema)	(6) 1.2% (0.5%, 3.0%)	(4) 1.7% (0.6%, 4.3%)	(2) 0.8% (0.2%, 3.1%)

**With SMART or WHO flags a missing MUAC/WHZ or not plausible WHZ value is considered as normal when the other value is available*

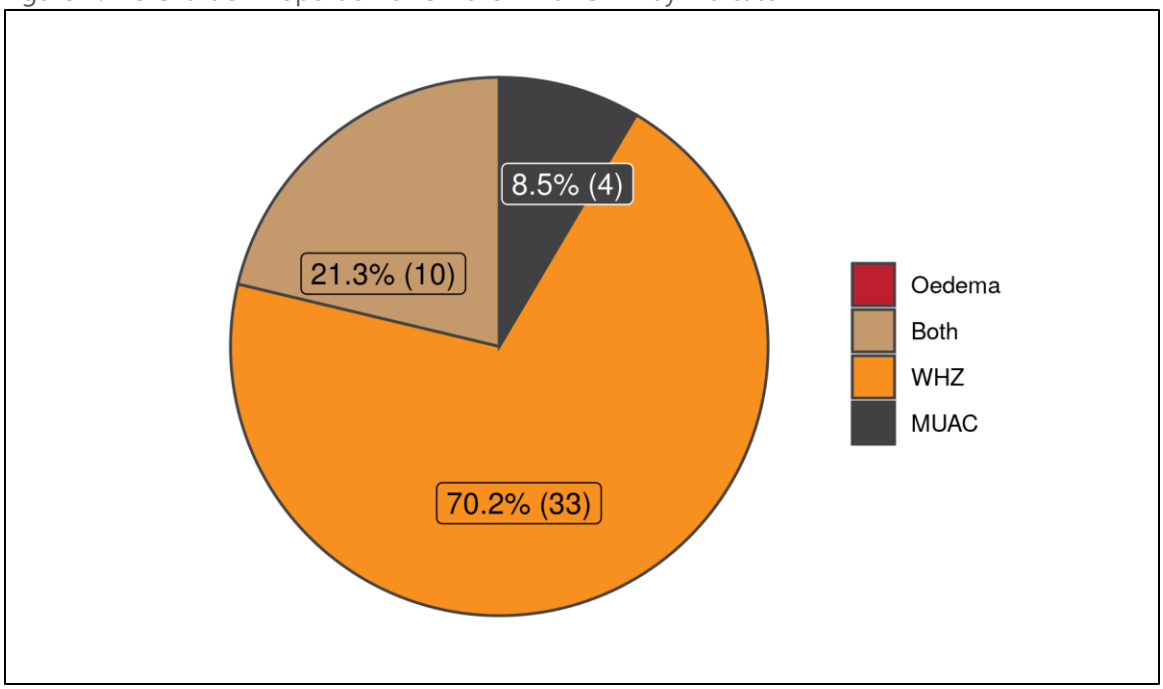
To further interpret the combined prevalence, the disaggregated number of GAM and SAM cases by diagnostic indicator is presented in Table 20. Overall, among combined GAM cases, the majority were identified through WHZ (70%), while 21% were captured by both WHZ and MUAC, and 9% were identified by MUAC-only (Figure 4). This demonstrates that no single criterion in Kapoeta East is sufficient to capture all malnourished children. Consequently, case finding and community-based screening should apply all three admission criteria—WHZ, MUAC, and oedema—to maximize the identification and referral of children in need of treatment.

Table 20: Detailed number for combined GAM and SAM

	Global Acute Malnutrition (GAM)		Severe Acute Malnutrition (SAM)	
	n	%	n	%
Oedema	0	0.0% (0%, 0%)	0	0.0% (0%, 0%)

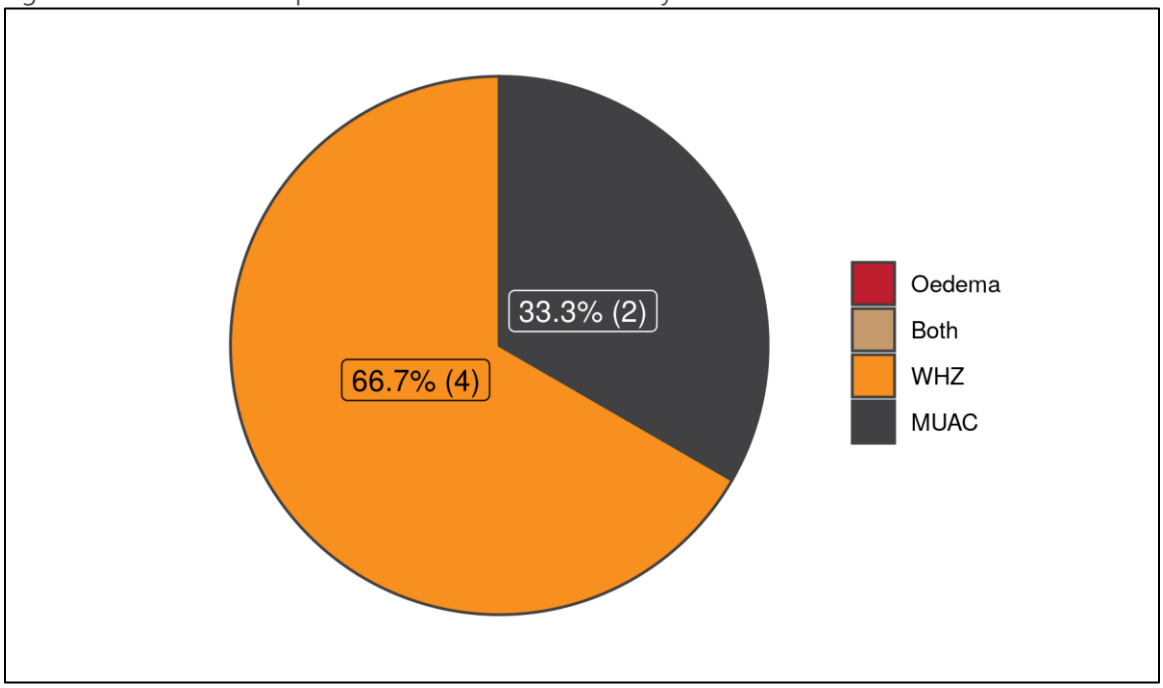
	Global Acute Malnutrition (GAM)		Severe Acute Malnutrition (SAM)	
	n	%	n	%
Both	10	2.1% (1.1%, 3.8%)	0	0.0% (0%, 0%)
WHZ	33	6.8% (4.5%, 10.1%)	4	0.8% (0.2%, 2.7%)
MUAC	4	0.8% (0.2%, 3.3%)	2	0.4% (0.1%, 1.6%)
Total	47	9.7% (6.9%, 13.5%)	6	1.2% (0.5%, 3.0%)

Figure 4: Pie Chart of Proportion of Children with GAM by Indicator



The proportions of children identified as severely wasted by different criteria mirrored the pattern observed for combined GAM. The majority of SAM cases were identified through WHZ (66.7%), while the remaining 33.3% were captured by MUAC (Figure 5). This highlights the importance of using both WHZ and MUAC in surveillance and programming, since reliance on a single indicator would risk missing a significant proportion of severely malnourished children—particularly those captured through MUAC, which is the primary tool used in community-level screening.

Figure 5: Pie Chart of Proportion of Children with SAM by Indicator



Prevalence of Chronic Malnutrition

The survey revealed a stunting rate of 15.2% calculated with a SD of 1, which is classified as medium according to the UNICEF/WHO 2021 classification of stunting. The analysis of stunting based on height for age z-scores was based on a total of 458 children after the exclusion of 27 children, whose z-scores were out of range.

Prevalence of Underweight

Underweight is defined as inadequate low weight relative to age (weight-for-age z-scores -WHO 2006). Underweight depicts both acute and chronic forms of malnutrition, hence referred to as a compound index for both WHZ (wasting) and HAZ (stunting). Underweight prevalence analysis included 483 children 6-59 months excluding 2 whose z-scores were out of range.

The prevalence of underweight in this assessment was 18.2% (14.0-23.9, 95% CI) which was considered high according to the WHO/UNICEF classification of underweight. Boys and girls in the sample were equally underweight as shown in Table 21 below.

Table 21: Prevalence of Underweight by WAZ by Severity and Sex among Children 6-59 months (SMART exclusions), WHO 2006 Reference

Indicator	All (N=483)	Boys (N=236)	Girls (N=247)
Not underweight	(395) 81.8% (76.6%, 86.0 %)	(181) 76.7% (69.6%, 82.6 %)	(214) 86.6% (79.9%, 91.4 %)
Prevalence of underweight (WAZ < -2 SD)	(88) 18.2% (14.0%, 23.4 %)	(55) 23.3% (17.4%, 30.4 %)	(33) 13.4% (8.6%, 20.1%)
Prevalence of moderate underweight (WAZ ≥ -3 to -2 SD)	(63) 13.0% (9.7%, 17.4%)	(40) 16.9% (12.3%, 23.0 %)	(23) 9.3% (5.9%, 14.5%)
Prevalence of severe underweight (WAZ < -3 SD)	(25) 5.2% (3.3%, 8.1%)	(15) 6.4% (3.6%, 11.0%)	(10) 4.0% (2.2%, 7.4%)

Table 22 presents the prevalence of underweight (WAZ) across different age groups. The prevalence was highest among younger children, particularly 18–29 months (24.3%) and 6–17 months (20.9%) and declined progressively among older age groups: 30–41 months (15.0%), 42–53 months (14.0%), and 54–59 months (11.3%). Severe underweight was most common in the 18–29 months group (9.0%), followed by 6–17 months (5.8%).

These findings suggest that the risk of underweight disproportionately affects children below two years of age, a period of rapid growth and high nutritional demand. The results may reflect the vulnerability of this age group to inadequate complementary feeding practices, recurrent illness, and limited dietary diversity, underscoring the need to strengthen Infant and Young Child Feeding (IYCF) and preventive health interventions targeting the first two years of life.

Table 22: Prevalence of Underweight per WAZ by Severity and Age Group (SMART exclusions)

Age (Months)	N	Not underweight		Underweight (WAZ < -2)		Moderate Underweight (-3 ≤ WAZ < -2)		Severe Underweight (WAZ < -3)	
		n	%	n	%	n	%	n	%
6 to 17	86	68	79.1%	18	20.9%	13	15.1%	5	5.8%
18 to 29	144	109	75.7%	35	24.3%	22	15.3%	13	9.0%
30 to 41	107	91	85.0%	16	15.0%	13	12.1%	3	2.8%
42 to 53	93	80	86.0%	13	14.0%	10	10.8%	3	3.2%
54 to 59	53	47	88.7%	6	11.3%	5	9.4%	1	1.9%
All	483	395	81.8%	88	18.2%	63	13.0%	25	5.2%

Figure 6 illustrates the distribution of weight-for-age Z-scores (WAZ) among surveyed children. The curve shows a leftward deviation with a mean of −1.06 and a standard deviation of 1.10, indicating that the surveyed population has a poorer nutritional status compared to the WHO reference population. The standard deviation falls within the acceptable range of 0.8–1.2, suggesting overall data quality is reliable.

Figure 6: Distribution of WAZ Sample Compared to the WHO 2006 WHZ Reference Curve

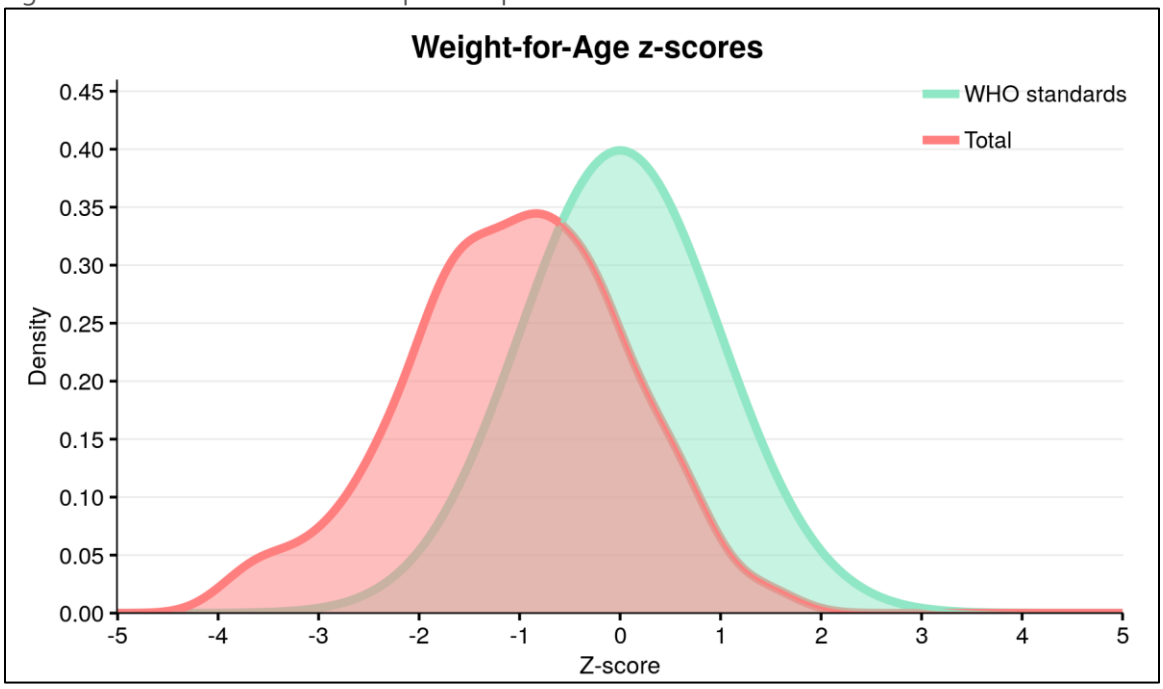
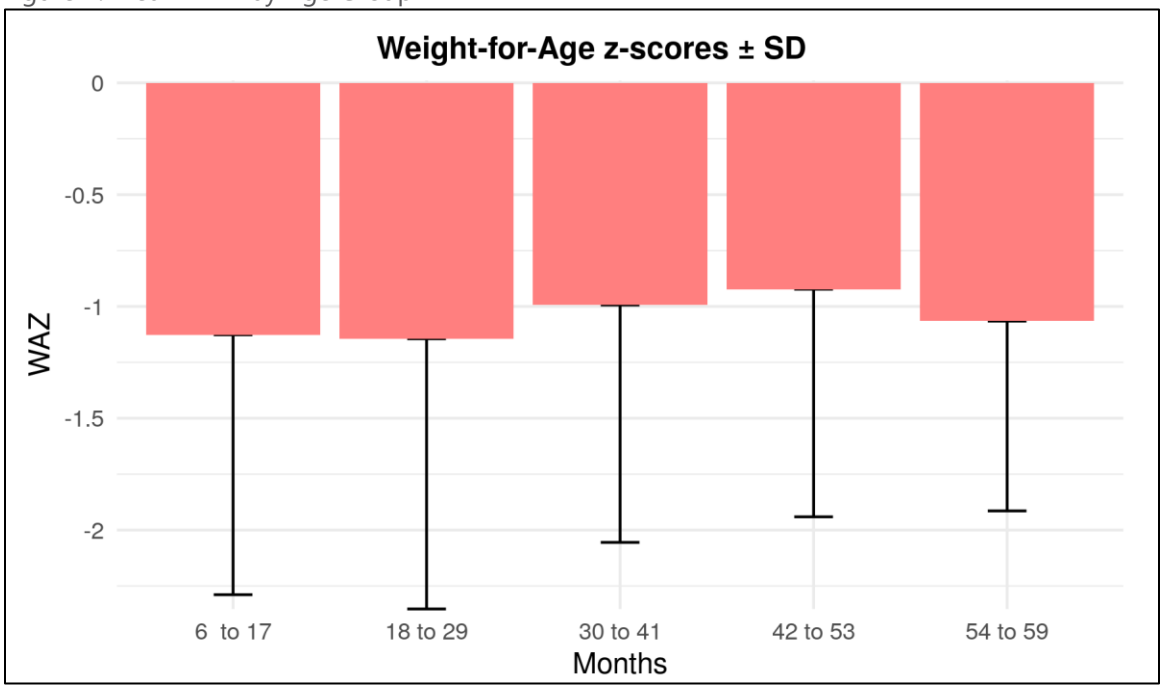


Figure 7 presents the mean weight-for-age Z-scores across age categories. The highest mean score was observed among children 42–53 months (−0.92), reflecting relatively lower prevalence of underweight in this group. Older children generally had higher mean z-scores (−0.99 for 30–41 months and −1.07 for 54–59 months) compared to younger children. In contrast, the lowest mean scores were recorded among those 6–17 months (−1.13) and 18–29 months (−1.14), indicating a higher burden of underweight among younger children. This pattern highlights the greater nutritional vulnerability of children under two years of age.

Figure 7: Mean WAZ by Age Group



Mortality Results

Crude and under-five mortality rates are critical indicators for assessing the severity of a humanitarian crisis and the need for strengthened public health surveillance. In this survey, mortality data was collected from 1,949 individuals across all sampled households over a 106-day recall period (April 20, 2025 – August 3, 2025, anchored on Easter Sunday and the midpoint of data collection). Respondents were asked to retrospectively report household deaths during this timeframe.

Table 23: Mortality Rate by Age and Sex with Reported Design Effect

Population	Mortality Rate (/10,000/Day)	Design Effect
Overall	0.19 (0.08, 0.49)	1.00
By Sex		
Male	0.32 (0.11, 0.92)	1.00
Female	0.09 (0.01, 0.53)	1.00
By Age Group		

Population	Mortality Rate (/10,000/Day)	Design Effect
0 to 4	0.35 (0.09, 1.29)	1.00
5 to 11	0.00 (0.00, 8.96)	1.00
12 to 17	0.00 (0.00, 10.22)	1.00
18 to 49	0.27 (0.07, 1.00)	1.00
50 to 64	0.00 (0.00, 11.89)	1.00
65 to 120	0.00 (0.00, 31.30)	1.00

As presented in Table 24, the crude mortality rate (CMR) was 0.19 deaths per 10,000 persons per day, and the under-five mortality rate (U5MR) was 0.35 deaths per 10,000 children per day. Mortality was higher among males (0.32) compared to females (0.09). All rates remain well below the emergency thresholds (CMR ≥1 and U5MR ≥2 deaths per 10,000 per day), indicating no acute public health crisis during the recall period. Population movement was notable, with an in-migration rate of 0.77 (0.4 – 1.49, 95% CI) compared to an out-migration rate of 1.55 (0.87 – 2.74, 95% CI), suggesting a net departure of individuals from surveyed households during this period.

Among the four reported deaths, two were associated with trauma while the remaining two were of unknown cause. Seventy-five percent of deaths occurred within the current location, whereas 25% took place during migration, reflecting both local and mobility-related vulnerabilities. The design effect (DEFF) for mortality was 1, indicating no clustering of deaths and homogenous distribution of mortality across the surveyed population.

Table 24: CMR and U5MR

Population	Unit	Rate (95% CI)
Crude Mortality Rate	deaths per 10,000 people per day	0.19 (0.08, 0.49)
U5 Mortality Rate	deaths per 10,000 children under five per day	0.35 (1)

Food Security Results

The food security and livelihoods (FSL) survey was conducted on all the sampled households (462). The assessment centered on the key FSL indicators as suggested by both United Nations food and agriculture organization (FAO) and world food program (WFP) and approved by the Nutrition Information Working Group (NIWG). The indicators assessed include food consumption score (FCS), Household Hunger Scale (HHS), and reduced coping strategy index (rCSI).

Food consumption Score (FCS)

Food consumption score (FCS) is the widely used food security indicator. It reflects the dietary diversity and nutrient intake of the households. The score is determined by determining how much the households eat food from the various food groups over a reference span of 7 days. Higher FCS, therefore, implies greater dietary diversity and duration, and the probability that a household will achieve adequacy of nutrients.[11]

In Kapoeta East, the mean FCS was 32.0% (28.9 – 25.2, 95% CI) (table 25). Overall, 45.5% of households reported an acceptable FCS, while 30.3% fell into the borderline category and 24.2% were classified as poor (Table 26). These results indicate that more than half of households are experiencing insufficient dietary diversity and frequency, highlighting significant food security challenges in the county.

Table 25: Average FCS*

Variable	Mean	95% CI	Obs.	SD	Min	Max
FCS	32.03	(28.9, 35.2)	459	12.74	1	63.5

** Maximum FCS is 112 (129.5 if specialized nutritious foods are included).*

Table 26: Food Consumption Score by Category

Level	Freq.	Proportion	95% CI
Acceptable (FCS > 35)	209	45.5%	(34.9%, 56.6%)
Borderline (21.5 ≤ FCS ≤ 35)	139	30.3%	(23.4%, 38.2%)
Poor (FCS ≤ 21)	111	24.2%	(15.5%, 35.7%)
Total	**459**	**100.0%**	-

** In countries where households have a high sugar and oil consumption (oil and sugar eaten on a daily basis - ~7 days per week), cut-off points of 28 (poor/borderline) and 42 (borderline/acceptable) are usually recommended.*

[11] INDDEX Project (2018), Data4Diets: Building Blocks for Diet-related Food Security Analysis. Tufts University, Boston, MA. https://inddex.nutrition.tufts.edu/data4diets. Accessed on 2nd April 2020.

Household Hunger Scale (HHS)

The hunger scale of households is a proxy measure of access to food and is based on 3 questions about different degrees of hunger and the number of times hunger was felt in the past 30 days.

In Kapoeta East County, the median HHS was 3 [IQR: 3-3][12] (Table 27). A vast majority of the households (78.3%) experienced moderate hunger, while a small proportion (0.7%) reported severe hunger during the recall period (Table 28). These findings highlight widespread food access constraints, though most households did not report conditions indicative of severe hunger.

Table 27: Median Household Hunger Score

Variable	Median	IQR	Min	Max
Household Hunger Scale	3	[3 - 3]	0	4

** Maximum HHS is 6*

Table 28: Household Hunger Score by Category

	Freq.	Proportion	95% CI
Little to no hunger in the household	97	21.1%	(11.1%, 36.3%)
0 HHS = 0	86	18.7%	(9.8%, 32.7%)
1 HHS = 1	11	2.4%	(0.9%, 6.5%)
Moderate hunger in the household	360	78.3%	(63.3%, 88.3%)
2 HHS = 2	2	0.4%	(0.1%, 1.8%)
3 HHS = 3	358	77.8%	(62.6%, 88.0%)
Severe hunger in the household	3	0.7%	(0.2%, 2.0%)
4 HHS = 4	3	0.7%	(0.2%, 2.0%)
5 HHS = 5	0	0.0%	(0%, 0%)
6 HHS = 6	0	0.0%	(0%, 0%)
Total	**460**	**100.0%**	**(100.0% - 100.0%)**

[12] HHS = 3 [IQR: 3–3] indicates that both the 25th and 75th percentiles are 3, meaning nearly all households scored 3 on the hunger scale. This shows that moderate hunger was both common and consistent across households.

Reduced Coping Strategy Index (rCSI)

Coping strategy index (CSI) is a proxy indicator of household food security, reflecting the frequency and severity of strategies used to manage food shortages during crises.[13] A higher CSI score indicates greater food insecurity. This survey applied the reduced CSI (rCSI), which is based on five standard food-related coping strategies reported over a seven-day recall period.

In Kapoeta East, the mean rCSI was 16.7 (15.1 – 18.3, 95% CI) among households in the surveyed population (Table 29). Households reported widespread reliance on negative coping mechanisms (Table 30). Nearly all households (97%) relied on less preferred or less expensive foods, while 95% limited portion size. In addition, 93% reduced the number of meals eaten per day, 80% reduced adult consumption so that children could eat, and 78% borrowed food or relied on support from friends or relatives. These findings reflect significant stress on household food security in the county.

Table 29: Average rCSI

Variable	Mean	95% CI	Obs.	SD	Min	Max
Reduced Coping Strategy Index (rCSI)	16.70	(15.1, 18.3)	458	6.33	0	34

** Maximum rCSI is 56*

Table 30: Negative coping strategies used by the surveyed population over the past 7 days

Level	Freq.	Proportion	95% CI
Rely on less preferred and/or less expensive foods	446	96.5%	(92.5%, 98.4%)
Borrow food, or rely on help from a friend or relative	359	77.9%	(64.3%, 87.3%)
Limit portion sizes at mealtime	439	95.0%	(88.1%, 98.0%)
Reduce the number of meals eaten in a day	428	92.6%	(85.9%, 96.3%)
Reduce consumption by adults so children could eat	365	79.5%	(65.0%, 89.0%)

** The total will be over 100% as households may use several negative coping strategies.*

[13] The coping strategies index field methods manual 2nd edition, January 2008, Daniel Maxwell et al.

WASH Results

Improved Water, Sanitation, and Hygiene (WASH) practices are crucial for both nutrition and overall health, as they prevent diseases like diarrhea and parasitic infections, which can lead to malnutrition and stunted growth, while also reducing the spread of infectious diseases.[14]

Access to safe/improved water for drinking and cooking

Overall, 50% of households reported access to protected water sources for drinking and cooking, all of which were from protected handpumps and boreholes (Table 31).

The remaining 50% of households used untreated/unprotected water sources for drinking and cooking. This water came from mainly sources namely surface water and unprotected spring (45%) and (4.3%) while very few (0.2%) collect water from rain.

Table 31: Water Quality

		Freq.	Proportion	95% CI
Protected/treated		233	50.4%	(36.1%, 64.7%)
1	Public tap/standpipe	0	0.0%	(0%, 0%)
2	Handpumps/boreholes	233	50.4%	(36.1%, 64.7%)
3	Protected well	0	0.0%	(0%, 0%)
4	Water seller/kiosks	0	0.0%	(0%, 0%)
5	Piped connection to house (or neighbour's house)	0	0.0%	(0%, 0%)
6	Protected spring	0	0.0%	(0%, 0%)
7	Bottled water, water sachets	0	0.0%	(0%, 0%)
8	Tanker trucks	0	0.0%	(0%, 0%)
Un-protected/un-treated		229	49.6%	(35.3%, 63.9%)
9	Unprotected hand-dug well	0	0.0%	(0%, 0%)
10	Surface water (lake, pond, dam, river)	208	45.0%	(31.2%, 59.7%)
11	Unprotected spring	20	4.3%	(1.0%, 16.6%)
12	Rainwater collection	1	0.2%	(0.0%, 1.6%)
96	Other unprotected	0	0.0%	(0%, 0%)
Unknown		0	0.0%	(0%, 0%)
98	Don't know	0	0.0%	(0%, 0%)

[14] Water Sanitation and Hygiene, WHO 2025

		Freq.	Proportion	95% CI
Total		**462**	**100.0%**	**(100.0% - 100.0%)**

All the surveyed households never treated their water before drinking (Table32).

Table 32: Proportion of households practicing household water treatment

		Freq.	Proportion	95% CI
Yes		0	0.0%	(0%, 0%)
1	Yes, always treat it before drinking	0	0.0%	(0%, 0%)
2	Yes, sometimes treat it before drinking	0	0.0%	(0%, 0%)
No		462	100.0%	(100%, 100%)
3	No, never treat it before drinking	462	100.0%	(100%, 100%)
Other		0	0.0%	(0%, 0%)
8	Don't know	0	0.0%	(0%, 0%)
Total		**462**	**100.0%**	**(100.0% - 100.0%)**

Poor sanitation and hygiene significantly contribute to malnutrition, particularly in children, by increasing the risk of diarrheal diseases, intestinal worms, and environmental enteric dysfunction, which hinder nutrient absorption and overall development.[15]

When households were asked about their latrine access, all (100%) reported not having access to a safe latrine facility and thus practiced mainly open defecation.

Table 33: Safe Excreta Disposal

		Freq.	Proportion	95% CI
Improved		0	0.0%	(0%, 0%)
1	An improved excreta disposal facility	0	0.0%	(0%, 0%)
2	A shared family toilet	0	0.0%	(0%, 0%)
3	A communal toilet	0	0.0%	(0%, 0%)
Unimproved		462	100.0%	(100%, 100%)
4	An unimproved toilet	462	100.0%	(100%, 100%)
Other		0	0.0%	(0%, 0%)
98	Don't know	0	0.0%	(0%, 0%)

[15] Undernutrition and Intestinal Infections in Children: A Narrative Review, MDPI, 2025

		Freq.	Proportion	95% CI
Total		**462**	**100.0%**	**(100.0% - 100.0%)**

Indicators at individual level – Children 6-59 months

Health and Nutrition

According to national library of medicine study on determinants of wasting published in June 2022, Children of 6-59 months old who had been sick in the two weeks prior to data collection were more likely to be malnourished than their counterparts who had not been ill. Generally, ill children are more at risk of malnutrition than healthy children due to reasons such as reduced food intake, nutrient losses, diseases like measles and malaria, diarrheal diseases and health care access and care practices, etc.

Measles vaccination, deworming, and vitamin A supplementation are critical public health interventions, particularly for children, as they play a vital role in preventing illness and promoting overall health.[16] In Kapoeta East, coverage level of these interventions are summarized below.

Vitamin A Supplementation

About 85% children aged 6-59 months were reported to have received vitamin A supplementation within the past 6 months prior to the survey. This shows a good coverage as per the SPHERE recommendation for Vitamin A supplementation and is above the WHO threshold.

Table 34: Vitamin A supplementation coverage for children aged 6-59 months within the past 6 months

		Freq.	Proportion	95% CI
Supplementation		411	84.7%	(74.9%, 91.2%)
1	Yes, card	24	4.9%	(1.7%, 13.3%)
2	Yes, recall	387	79.8%	(69.6%, 87.2%)
No supplementation		74	15.3%	(8.8%, 25.1%)
3	No or don't know	74	15.3%	(8.8%, 25.1%)
Total		**485**	**100.0%**	**(100.0% - 100.0%)**

Deworming coverage

The deworming coverage for children 12-59 months is 54% during the recall period for Kapoeta East County. This coverage is below WHO recommendation of regular treatment for at least 75% of high-prevalence children[17] as seen in table 35 below.

[16] Vitamin A supplementation in infants and children 6–59 months of age, WHO August 2023
[17] Recommendations for large-scale deworming to improve children's health and nutrition, WHO 2017

Table 35: Deworming coverage for children aged 12-59 months within the past 6 months*

Level	Freq.	Proportion	95% CI
No	201	45.9%	(33.2%, 59.2%)
Yes	237	54.1%	(40.8%, 66.8%)
Total	**438**	**100.0%**	**(100.0% - 100.0%)**

* Note that this refers to large-scale campaigns done with mebendazole and/or albendazole.

Measles vaccination coverage

Among children aged 9-59 months, measles vaccination coverage was 84.3%, while 15.7% of children were either not vaccinated or their caregiver was unsure of their vaccination status.

Table 36: Measles vaccination coverage for children aged 9-59 months

		Freq.	Proportion	95% CI
Yes		393	84.3%	(72.8%, 91.5%)
1	Yes, card	29	6.2%	(2.6%, 14.1%)
2	Yes, recall	364	78.1%	(66.4%, 86.6%)
No		73	15.7%	(8.5%, 27.2%)
3	No or don't know	73	15.7%	(8.5%, 27.2%)
Total		**466**	**100.0%**	**(100.0% - 100.0%)**

For children aged 9-23 months, measles vaccination coverage was approximately 87% (Table 37). About 13% of children were either not vaccinated or their caregiver was unsure of their vaccination status.

Table 37: Measles vaccination coverage for children aged 9-23 months

		Freq.	Proportion	95% CI
Yes		123	86.6%	(73.5%, 93.8%)
1	Yes, card	7	4.9%	(1.6%, 13.9%)
2	Yes, recall	116	81.7%	(68.9%, 90.0%)
No		19	13.4%	(6.2%, 26.5%)
3	No or don't know	19	13.4%	(6.2%, 26.5%)
Total		**142**	**100.0%**	**(100.0% - 100.0%)**

Morbidity results and health-seeking behaviour

In the two weeks preceding the survey, only 0.6% of children (6-59 months) had ARI symptoms, 24.1% had a fever, and 17.3% had diarrhea (Table 38). Of these children, 68% with ARI symptoms received treatment from a healthcare facility, while 69% with fever and 61% with diarrhea received treatment from a healthcare facility, respectively (Table 40). Among children with diarrhea, 54% received ORS, 60% received zinc tablets/syrups, and 52% received both zinc and ORS (Table 39).

Table 38: Prevalence of ARI symptoms, fever and diarrhoea in the two weeks preceding the survey for children aged 6-59 months**Level**	**Freq.**	**Proportion**	**95% CI**
ARI symptoms*	3	0.6%	(0.1%, 2.6%)
Fever	117	24.1%	(15.3%, 35.8%)
Diarrhoea	84	17.3%	(10.8%, 26.7%)

* Cough accompanied by short, rapid breathing which was chest related or with difficulty breathing which was chest related

Table 39: ORS and zinc use during diarrhoea episode for children aged 6-59 months

Level	**Freq.**	**Proportion**	**95% CI**
ORS use during diarrhoea episode	45	53.6%	(34.6%, 71.6%)
Zinc tablet or syrup use during diarrhoea episode	50	59.5%	(36.2%, 79.2%)
ORS and zinc tablet or syrup use during diarrhoea episode	44	52.4%	(33.5%, 70.6%)

Table 40 Treatment for ARI symptoms, fever and diarrhoea for children aged 6-59 months

Level		**Proportion**	**95% CI**
Children with symptoms of ARI	2	66.7%	-
Children with fever	81	69.2%	(47.0%, 85.1%)
Children with diarrhoea	51	60.7%	(38.2%, 79.5%)

* Prevalences relate to whether advice or treatment was sought from a health facility/provider (excludes pharmacy, shop and traditional practitioners)

Infant and Young Child Feeding (IYCF) Practices

World Health Organisation (WHO) and United Nations Children's Fund (UNICEF) recommends that infants be exclusively breastfed for the first six months of age and thereafter receive complementary foods in addition to continued breastfeeding until second birthday or beyond[18]. The IYCF survey was conducted among all the children aged 0-23 months in the sampled

[18] Infant and Young Child Feeding, WHO 2023

households. The core indicator in this survey was anthropometry and therefore the IYCF survey did not have a sample size determined for precise results. The results should therefore be interpreted with caution as the survey was limited in meeting the required sample size for credible IYCF results. The IYCF results are, therefore, proxy indicators to guide programming and could be also used to guide further IYCF assessments.

In Kapoeta East, breastfeeding practices are relatively strong: ever breastfed (95.7%) and continued breastfeeding at 12–23 months (84%) meet or exceed global targets (≥90% and ≥80% respectively). However, exclusive breastfeeding under 6 months (61.4%) falls short of the ≥80% global target. Complementary feeding indicators are far below thresholds: minimum dietary diversity (9.9%) and minimum acceptable diet (4.3%) are critically low compared to the global target of ≥50%. Minimum meal frequency (19.3%) also remains well below the ≥50% target[19]. These gaps point to urgent needs for improved complementary feeding and IYCF programming, despite generally positive breastfeeding practices.

Table 41: Prevalence of Infant and Young Child Feeding Practices Indicators

Indicator	Age range	Freq	Proportion	95% CI
Breastfeeding Indicators				
Ever breastfed	0-23 months	221	95.7%	(90.4%, 98.1%)
Early Initiation	0-23 months	206	89.2%	(80.4%, 94.3%)
Exclusively breastfed for the first 2 days after birth	0-23 months	176	76.2%	(62.8%, 85.9%)
Exclusive breastfeeding under 6 months	0-5 months	43	61.4%	(45.0%, 75.6%)
Mixed milk feeding under 6 months	0-5 months	4	5.7%	(2.2%, 14.3%)
Continued breastfeeding	12-23 months	105	84.0%	(71.3%, 91.7%)
Complementary Feeding Indicators				
Introduction of solid, semi-solid or soft foods	6-8 months	9	47.4%	(25.9%, 69.8%)
Minimum dietary diversity	6-23 months	16	9.9%	(4.7%, 19.6%)
Minimum meal frequency	6-23 months	31	19.3%	(11.7%, 30.1%)
Minimum milk feeding frequency for non-breastfed children	6-23 months	19	86.4%	(48.7%, 97.7%)
Minimum acceptable diet	6-23 months	7	4.3%	(1.5%, 12.0%)

[19] UNICEF / WHO 2021 Guidelines: Indicators for assessing infant and young child feeding practices: definitions and measurement methods

Indicator	Age range	Freq	Proportion	95% CI
Egg and/or flesh food consumption	6-23 months	39	24.2%	(14.6%, 37.4%)
Sweet beverage consumption	6-23 months	54	33.5%	(20.3%, 50.0%)
Unhealthy food consumption	6-23 months	0	0.0%	(0%, 0%)
Zero vegetable or fruit consumption	6-23 months	132	82.0%	(71.8%, 89.0%)
Other Indicators				
Bottle feeding	0-23 months	32	13.9%	(7.2%, 25.0%)

Indicators at individual level – Women 15-49 years

Women have specific and increased nutritional needs before, during, and after pregnancy to support their own health and the proper development of their child. Adequate nutrient intake, particularly folic acid, iron, calcium, and iodine, is crucial for establishing healthy pregnancy reserves and preventing complications like anaemia and low birth weight. Meeting these heightened energy and nutrient demands through a balanced, safe diet is critical for both the mother and child[20].

Physiological Status and Age

Among women of reproductive age surveyed, 23% were non-pregnant and non-lactating, while 23% were pregnant. Among lactating women, 27.5% had infants younger than 6 months and 72.5% had infants older than 6 months. The mean age of women in this group was 30.9 years.

Table 42: Physiological status for women aged 15-49

Level	Freq.	Proportion	95% CI
Non-pregnant, non-lactating	111	23.0%	(17.0%, 30.5%)
Pregnant	111	23.0%	(18.4%, 28.4%)
Lactating with an infant less than 6 months	73	27.5%	(20.2%, 36.3%)
Lactating with an infant greater than 6 months	192	72.5%	(63.7%, 79.8%)

Table 43: Women's Age (all women aged 15-49)

Variable	Mean	95% CI	Obs.	SD	Min	Max
Age	30.90	(30.2, 31.6)	482	7.60	15	49

[20] Maternal nutrition: Preventing malnutrition in pregnant and breastfeeding women, UNICEF 2010

MUAC in Women

Among non-pregnant, non-lactating women aged 15 – 49 years, 6.2% had MUAC <210mm, indicating severe malnutrition. When applying the broader threshold of MUAC <230mm, the prevalence rose sharply to 27.7%. A similar pattern was observed among pregnant and lactating women with infants under six months: only 1.1% had MUAC <210mm, but prevalence increased to 25.1% when using the <230mm threshold.

These findings highlight concerningly high levels of maternal malnutrition, particularly when assessed against the <230 mm cut-off, underscoring the vulnerability of women of reproductive age and the need for targeted maternal nutrition interventions.

Table 44: Prevalence of MUAC Malnutrition in Non-Pregnant, Non-Lactating Women (Aged 15-49)

Level	Freq.	Proportion	95% CI
Prevalence of MUAC < 210mm	4	6.2%	(1.7%, 20.1%)
No malnutrition (MUAC ≥ 210mm)	61	93.8%	(79.9%, 98.3%)
Prevalence of MUAC < 230mm	18	27.7%	(16.2%, 43.2%)
No malnutrition (MUAC ≥ 230mm)	47	72.3%	(56.8%, 83.8%)

Table 45: Prevalence of MUAC Malnutrition in Pregnant Women and Lactating Women with an Infant Less Than 6 Months

Level	Freq.	Proportion	95% CI
Prevalence of MUAC < 210mm	2	1.1%	(0.3%, 4.4%)
No malnutrition (MUAC ≥ 210mm)	181	98.9%	(95.6%, 99.7%)
Prevalence of MUAC < 230mm	46	25.1%	(17.9%, 34.0%)
No malnutrition (MUAC ≥ 230mm)	137	74.9%	(66.0%, 82.1%)

Discussion

Nutritional status

The SMART+ survey in Kapoeta East County indicates a concerning nutrition situation, though below emergency thresholds. The prevalence of GAM was 8.9% and SAM 0.8%, placing the county in the *Alert* category per IPC AMN thresholds. The combined GAM prevalence of 9.7%, which incorporates WHZ, MUAC, and oedema, highlights the need for program admissions using all diagnostic criteria.

Compared to the December 2023 ACF survey (GAM 10.6%), the observed difference is modest and not statistically significant ($p>0.05$), suggesting that acute malnutrition levels remain largely unchanged, with seasonal variation a likely factor. Stunting prevalence was 15.2%, slightly lower than the 2023 finding (16.7%), but again the difference is not significant, reflecting persistent chronic undernutrition linked to poor complementary feeding and food insecurity.

Underweight prevalence was 18.2%, nearly identical to the ACF 2023 estimate (17.9%), showing no meaningful change ($p>0.05$). These consistently high rates underscore long-term vulnerabilities driven by inadequate dietary diversity, maternal undernutrition, and recurrent shocks.

Overall, the findings confirm that while acute malnutrition has not reached emergency thresholds, it continues to affect nearly 1 in 10 children. Stunting and underweight remain entrenched, pointing to the need for sustained nutrition-specific and multi-sectoral interventions addressing both immediate and underlying causes.

Mortality

The survey recorded a Crude Mortality Rate (CMR) of 0.19 and an Under-five Mortality Rate (U5MR) of 0.35 deaths/10,000/day, both well below emergency thresholds (CMR ≥1, U5MR ≥2). These findings suggest no acute public health crisis during the recall period.

Compared with the December 2023 ACF survey (CMR 0.28, U5MR 0.41), the rates are slightly lower, though the differences are not statistically significant ($p>0.05$). The design effect (DEFF=1) further suggests mortality cases were randomly distributed without clustering.

Of the four reported deaths, 75% had unknown causes and 25% were attributed to non-traumatic illness-related causes. In terms of location, 75% occurred within the current settlement, while 25% took place during migration, highlighting vulnerabilities both locally and in mobile populations. While the absolute number of deaths is small, the high proportion of unknown causes underscores challenges in verbal reporting, suggesting the need for improved probing in future surveys.

Child Health and Program Coverage

Child health service coverage showed mixed results. Measles vaccination coverage was 86.6% among children 9–59 months below the ≥95% threshold required to achieve herd immunity. Vitamin A supplementation and deworming coverage were similarly sub-optimal, leaving gaps in preventive health interventions critical for reducing morbidity and malnutrition risk. The high proportion of unknown causes of death, alongside trauma-related deaths, also suggests weaknesses in health service utilization and reporting. These findings underscore the need to strengthen routine immunization, micronutrient supplementation, and child health outreach in Kapoeta East, especially in hard-to-reach pastoralist areas where service delivery is often constrained.

Infant and Young Child Feeding (IYCF) Practices

IYCF indicators in Kapoeta East County were critically poor compared to global targets. While exclusive breastfeeding under 6 months was 61.4%, it fell below the ≥80% WHO/UNICEF benchmark, suggesting gaps in early infant feeding practices. Continued breastfeeding at 12–23 months was high at 84%, meeting the ≥80% target, and ever breastfed (95.7%) exceeded the ≥90% global target, reflecting strong adherence to breastfeeding norms.

However, complementary feeding indicators were alarmingly low. Only 9.9% of children achieved minimum dietary diversity and 4.3% met minimum acceptable diet (MAD), both far below the ≥50% target, confirming poor quality and frequency of complementary foods. Meal frequency was also inadequate at 19.3%, again under the ≥50% benchmark, showing that most children were not fed with sufficient frequency to meet nutritional needs.

These findings underscore a stark divide: while breastfeeding practices are relatively strong, the transition to complementary feeding is highly inadequate, leaving children 6–23 months especially vulnerable to malnutrition and illness. The low dietary diversity reflects limited access to varied food groups, likely linked to broader food insecurity (as seen in poor FCS and high rCSI), while inadequate meal frequency points to both availability and knowledge constraints. Maternal nutrition status compounds the risk, with 27.7% of non-pregnant, non-lactating women having MUAC <230mm, signaling widespread undernutrition that can negatively affect caregiving and perpetuate intergenerational malnutrition.

Food Security and WASH

Food security analysis paints a fragile picture. Only 45.5% of households had an acceptable Food Consumption Score, while 30.3% were borderline and 24.2% were poor. The Household Hunger Scale indicated 78.3% of households experienced moderate hunger, and the mean rCSI was 16.7, reflecting widespread reliance on negative coping strategies such as reducing meals, portion sizes, and adult consumption in favor of children.

WASH conditions were severe, with 0% of households treating drinking water and 100% practicing open defecation. These findings point to heightened risks of diarrheal disease, which

compound poor nutrition outcomes.

Overall, the findings reflect a population under chronic stress, where poor IYCF practices, maternal undernutrition, food insecurity, and inadequate WASH are sustaining high levels of undernutrition, despite mortality rates being stable.

Conclusions

The nutrition situation in Kapoeta East County is classified as ***Alert*** but remains highly precarious. The GAM rate (8.9%) falls within the Alert phase, requiring strengthened response capacity, continuous monitoring, and preparedness to respond should conditions deteriorate. Acute malnutrition disproportionately affects younger children (6–29 months), pointing to weaknesses in complementary feeding and child care practices. Maternal undernutrition is widespread, with over one-quarter of women of reproductive age undernourished, compounding intergenerational risks.

Food insecurity is evident through low food consumption scores, widespread reliance on negative coping strategies (rCSI 16.7), and high hunger scores, reflecting households' inability to meet basic dietary needs. WASH conditions are dire, characterized by universal open defecation and reliance on unsafe water sources, which amplify risks of diarrheal disease and exacerbate malnutrition. Morbidity levels remain concerning, particularly with common childhood illnesses such as fever, ARI, and diarrhea reported in the recall period.

Although mortality rates (CMR 0.19; U5MR 0.35) remain below emergency thresholds, the high proportion of unknown causes of death and deaths during migration highlight gaps in health access and reporting. Coverage of essential child health interventions, such as measles vaccination, vitamin A supplementation, and deworming, was suboptimal and needs strengthening to prevent avoidable illness and mortality.

Overall, the findings call for an urgent multi-sectoral response linking nutrition, health, food security, and WASH interventions. Priority should be placed on improving IYCF and maternal nutrition, enhancing access to safe water and sanitation, ensuring continuity of essential health services, and addressing food insecurity through both immediate and resilience-oriented programming. Without timely and coordinated action, the underlying drivers of malnutrition could rapidly push Kapoeta East into a more severe nutritional crisis.

Recommendations and priorities

Problems Identified	Key Recommendation	Priority Actions	Responsible Actors	Timeline
GAM: 8.9% (Alert); SAM: 0.8%	Strengthen community based detection and treatment of acute malnutrition	• Scale up CMAM coverage, ensuring admission by WHZ MUAC, and oedema. • Enhance active case finding and community referrals.	CHD, SMoH, UN agencies, Partners like AFSS	Short Term
Combined GAM: 9.7%	Use multiple criteria for program admissions	• Integrate WHZ, MUAC, and oedema screening in CMAM and community outreach.	CHD, SMoH, UN agencies, Partners like AFSS	Medium to Long term
Stunting: 15.2% (Medium)	Address chronic undernutrition	• Promote long-term nutrition-sensitive interventions (IYCF, health, WASH, FSL).	MOA, SMoH, Partners	Long term
Poor IYCF practices: MAD 4.3%, low complementary feeding	Improve complementary feeding and dietary diversity	• Scale up IYCF counseling, targeting 0–23 months. • Facilitate the linking of IYCF support to mother groups and health facilities.	CHD, SMoH, UN agencies, Partners like AFSS	Short to Medium term
Maternal undernutrition: 27.7% (MUAC <230mm)	Address maternal nutrition gaps	• Introduce/strengthen routine MUAC screening for women. • Provide supplementation for pregnant and lactating women.	CHD, SMoH, UN agencies, Partners like AFSS	Short to Medium term
Mortality: CMR 0.19; U5MR 0.35 (below threshold)	Maintain low mortality, strengthen surveillance	• Strengthening community immunization activities and health facility access	CHD, SMoH	Medium to Long term
Food insecurity: 45.5% acceptable FCS; 78.3% moderate hunger; mean rCSI 16.7	Strengthen food assistance and livelihoods	• Provide targeted food/cash assistance for vulnerable households. • Support crop and livestock interventions. • Promote dietary diversification beyond cereals.	MOA, UN agencies and FSL partners	Medium to Long term

Severe WASH conditions (water treatment, excreta disposal)	Urgently improve water and sanitation	• Promote household-level water treatment and hygiene education. • Expand safe water access (rehabilitate boreholes). • Promote sanitation campaigns and latrine construction.	SMOH, WASH partners at the county	Medium to long term

Annexes

Annex 1 – Cluster Selection

Geographical Unit	Population Size	Cluster
LONGAIMO	1,870	1
NAOYAGULE	2,170	RC
CHUMAMERI	770	2
NAWOYAPETA	203	3
LOCELER	137	4
NASODOKONYANG	151	5
NAPEIDAPAL	164	6
KADAPANGOLOL	84	7
NAPUSIRIET	63	8
NAWAMUS	954	9
NAITAMORU	140	10
LOTABO	200	11
LOPISA	75	12
ACHAMUNGOLE	240	13
TERAKILENG	65	14
LOKOLONG	105	15
LOPEYOK	155	16
NAKONGULEM	451	RC
ATAPANGIMOI	175	17
AKORUNI	145	18
LOKONGITOE	255	19
LOTIIRA	195	20
ITAO	375	21
KATANYA	340	RC
CHOKOIN	170	22

Geographical Unit	Population Size	Cluster
LONGOLETIANG	260	23
LOKAMOE	250	24
KOKURO	245	25
LOITA	90	26
NAPEIBEI	135	27
NANGOLET	1,305	28
NARIWORENG	190	29
NAMOJONGPETET	60	RC
LOTIRAH	170	30
LOTUKO	325	31
NAMOSURA	70	RC
NAKICHOIT	160	32
NAKUAMORU	140	33
LOPARINGA	150	34
LOKWARIO	90	35
MERI	180	36
NARUSTOWN	7,500	37
LOKIDOR	320	38
KAZILO	180	39
LODINGA	235	40
NEWSITE	761	41
NAGUM	592	42

Annex 2 – Standardization Test Results

Table 46: Bias and Technical Error of Measurement (TEM) Results for Weight

	No. of subjects	TEM	Bias	Bias relative to	Outcome (TEM)	Outcome (Bias)
Individual TEM (intra)						
Observer 1	10	0.16	0.05	Median	TEM poor	Bias acceptable
Observer 2	10	0.31	-0.07	Median	TEM reject	Bias acceptable
Observer 3	10	0.24	0.04	Median	TEM reject	Bias acceptable
Observer 4	10	0.11	0.01	Median	TEM poor	Bias good
Observer 5	10	0.33	-0.06	Median	TEM reject	Bias acceptable
Observer 6	10	0.30	-0.14	Median	TEM reject	Bias poor
Observer 7	10	0.33	-0.06	Median	TEM reject	Bias acceptable
Observer 8	10	0.50	-0.15	Median	TEM reject	Bias poor
Observer 9	10	0.20	0.00	Median	TEM poor	Bias good
Observer 10	10	0.23	0.06	Median	TEM reject	Bias acceptable
Supervisor 1	10	0.20	0.00	Median	TEM poor	Bias good
Observer 11	10	0.26	-0.01	Median	TEM reject	Bias good
Observer 12	10	0.76	-0.20	Median	TEM reject	Bias poor
Team TEM (inter)						
enum inter 1st	12x10	0.39			TEM reject	
enum inter 2nd	12x10	0.24			TEM reject	

Table 47: Bias and Technical Error of Measurement (TEM) Results for Height

	No. of subjects	TEM	Bias	Bias relative to	Outcome (TEM)	Outcome (Bias)
Individual TEM (intra)						
Observer 1	10	0.72	0.02	Median	TEM poor	Bias good
Observer 2	10	1.22	-0.17	Median	TEM reject	Bias good
Observer 3	10	0.73	0.13	Median	TEM poor	Bias good
Observer 4	10	0.67	0.04	Median	TEM poor	Bias good
Observer 5	10	0.70	0.56	Median	TEM poor	Bias acceptable
Observer 6	10	0.62	0.57	Median	TEM poor	Bias acceptable
Observer 7	10	1.05	-0.53	Median	TEM reject	Bias acceptable
Observer 8	10	0.37	-0.43	Median	TEM good	Bias acceptable
Observer 9	10	0.75	0.15	Median	TEM poor	Bias good
Observer 10	10	0.77	0.15	Median	TEM poor	Bias good
Supervisor 1	10	0.77	0.12	Median	TEM poor	Bias good
Observer 11	10	0.94	-0.31	Median	TEM poor	Bias good
Observer 12	10	1.64	0.21	Median	TEM reject	Bias good
Team TEM (inter)						
enum inter 1st	12x10	0.81			TEM acceptable	
enum inter 2nd	12x10	1.08			TEM poor	

Table 48: Bias and Technical Error of Measurement (TEM) Results for MUAC

	No. of subjects	TEM	Bias	Bias relative to	Outcome (TEM)	Outcome (Bias)
Observer 1	10	4.63	1.15	Median	TEM reject	Bias acceptable
Observer 2	10	3.60	-2.35	Median	TEM reject	Bias poor
Observer 3	10	3.11	0.05	Median	TEM poor	Bias good
Observer 4	10	1.50	0.25	Median	TEM good	Bias good
Observer 5	10	4.65	-0.30	Median	TEM reject	Bias good
Observer 6	10	2.06	-1.75	Median	TEM acceptable	Bias acceptable
Observer 7	10	2.88	-0.50	Median	TEM poor	Bias good
Observer 8	10	4.49	-2.35	Median	TEM reject	Bias poor
Observer 9	10	2.74	0.50	Median	TEM poor	Bias good
Observer 10	10	2.85	-0.35	Median	TEM poor	Bias good
Supervisor 1	10	2.91	0.25	Median	TEM poor	Bias good
Observer 11	10	1.50	-0.35	Median	TEM good	Bias good
Observer 12	10	8.90	3.10	Median	TEM reject	Bias reject
Team TEM (inter)						
enum inter 1st	12x10	4.76			TEM reject	
enum inter 2nd	12x10	3.39			TEM reject	

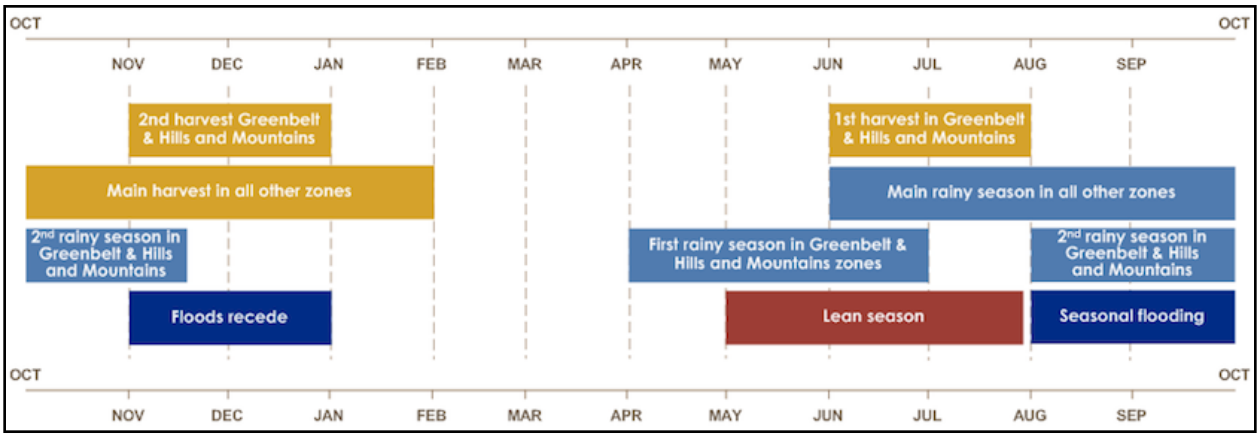
Annex 3 – Plausibility Check

Table 49: Anthropometry Data Quality Snapshot

Component	Value	Score	Outcome
Flagged data	0.4%	0	Excellent
Overall Sex ratio	p=0.683	0	Excellent
Age ratio (6-29 vs 30-59)	p=0.404	0	Excellent
Dig pref score - weight	4	0	Excellent
Dig pref score - height	4	0	Excellent
Dig pref score - MUAC	5	0	Excellent
Standard Dev WHZ	0.92	0	Excellent
Skewness WHZ	0.02	0	Excellent
Kurtosis WHZ	-0.15	0	Excellent
Poisson dist WHZ-2	p=0.063	0	Excellent
OVERALL SCORE WHZ =		0	Excellent

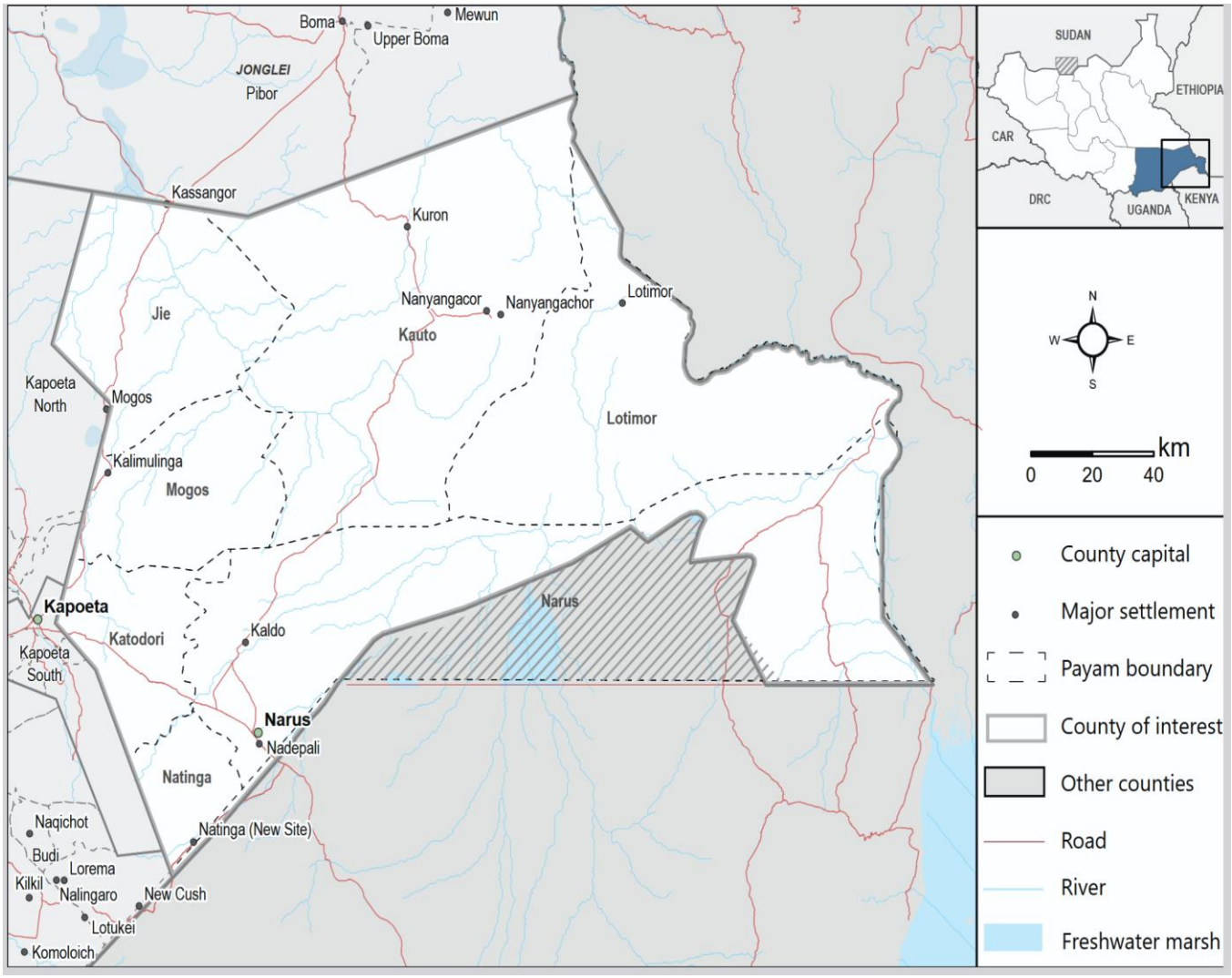
Annex 4 –Seasonal Calendar

Figure 8: South Sudan Seasonal Calendar



Annex 5 – Map of the area

Figure 9: Kapoeta East County Reference Map



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