GARISSA INTEGRATED SMART SURVEY_REPORT

JULY 2024

Author: County Department of Health
Garissa County

TABLE OF CONTENTS

Contents

LIST OF TABLES

LIST OF FIGURES

ACKNOWLEDGEMENT

The successful implementation of Garissa County SMART survey is attributable to the support and pivotal role of the various stakeholders: recognition of immense financial support provided by Terres des Hommes – Kenya, UNICEF, Kenya Red Cross Society and the Department of Health. Special appreciation to County Health Management Team for Garissa County for ensuring coordination of the survey with support from Terres des Hommes – Kenya, UNICEF and Kenya Red Cross Society. A sincere thank you to the Garissa County communities and their respective leadership for providing consent as respondents during the data collection as well as the Community Health Workers and village guides for mobilizing various respondents. Further recognition of the important role the village leaders played by guiding the data collection teams to villages, assisting in household listing and identification during household, anthropometry and mortality data collection. A special appreciation of the coordination team led by the CNC and County M&E Unit, for their zeal and sacrifices when implementing the survey including resilience while ensuring quality during the long working hours throughout the implementation period. Acknowledgement of the technical inputs by the NITWG that helped improve capacity of the health workers in Garissa to implement quality survey. Lastly, an exceptional acknowledgement of the enumerators, team leaders and supervisors for their zeal and sacrifices throughout the implementation duration, while ensuring collection of quality data.

ACRONYMS

ANC	Ante Natal Care
ARI	Acute Respiratory Infections
ASAL	Arid and Semi-Arid Lands
BFCI	Baby Friendly Community Initiative
BHA	Bureau of Humanitarian Assistance
CDH	County Director of Health
CECM	County Executive Committee Member
CHMT	County Health Management Team
CHS	Community Health Services
CHP	Community Health Promoter
CI	Confidence interval
CIDP	County Integrated Development Plan
CLTS	Community led Total Sanitation
cm	Centimeter
CNC	County Nutrition Coordinator
CO	Chief Officer
CSB	Corn Soy Blend
CSG	County Steering Group
CSI	Coping strategy index
DD	Dietary Diversity
DEFF	Design Effect
EWS	Early Warning System
FCS	Food Consumption Score
GAM	Global Acute Malnutrition
GoK	Government of Kenya
HAZ	Height for Age -Z score
HDD	Household Dietary Diversity
HH	Household
HHS	Household Hunger Scale
HSNP	Hunger Safety Net Program
IDP	Internally Displace Persons
IFAS	Iron and Folic Acid Supplements
IMAM	Integrated Management of Acute Malnutrition
IPC	Integrated Food Security Phase Classification
IYCF	Infant and Young Child Feeding
KEMSA	Kenya Medical Supplies Agency
KFSSG	Kenya Food Security Steering Group
KHIS	Kenya Health Information System
KNBS	Kenya National Bureau of statistics
KRCS	Kenya Red Cross Society
LMIS	Logistics Management Information System
LPPPD	Litres Per Person Per Day
LRA	Long Rains Assessment
MAM	Moderate Acute malnutrition
MCH	Mother Child Booklet
MDD	Minimum Dietary Diversity
MDD-W	Minimum Dietary Diversity for Women
MIYCN	Maternal and Infant Young Child Nutrition

MOH	Ministry of Health
MUAC	Mid Upper Arm Circumference
NDMA	National Drought Management Authority
NGO	Non-governmental Organization
NITWG	Nutrition Information Technical Working Group
ODK	Open Data Kit
ORS	Oral Rehydration Solution
OTP	Outpatient Therapeutic Programme
PLW	Pregnant and Lactating Women
PPS	Probability proportional to size
RC	Reserve cluster
rCSI	Reduced Coping Strategy Index
RUSF	Ready To use Supplementary food
RUTF	Ready to Use Therapeutic Food
SAM	Severe Acute Malnutrition
SCHMT	Sub-County Health Management Team
SCNO	Sub County Nutrition Officer
SD	Standard Deviation
SFP	Supplementary Feeding Programme
SMART	Standardized Monitoring and Assessment of Relief and Transitions
SPSS	Statistical package for Social Sciences
U5	Under Five Years Old
UN	United Nations
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WASH	Water Sanitation and Hygiene
WAZ	Weight for Age -Z score
WFP	World Food Programme
WHO	World Health Organization
WHO-GS	World Health Organisation Growth Standards
WHZ	Weight for Height -Z score
WRA	Women of Reproductive Age

1.0 INTRODUCTION

1.1 Background Information

Garissa County is an administrative County in the former North Eastern Region of Kenya. Its capital and largest town is Garissa an area of about 45,720.2 km². Garissa County is one of the three counties in the North Eastern Region of Kenya. It covers an area of 44,174.1Km2 and lies between latitude 10 58'N and 20 1' S and longitude 380 34'E and 410 32'E. The county borders the Republic of Somalia to the east, Lamu County to the south, Tana River County to the west, Isiolo County to the North West and Wajir County to the north. The County is low lying, with altitudes ranging between 70m and 400m above sea level. The area is hot and dry much of the year, receiving scarce rainfall in the range of 150mm-300mm annually. Frequent droughts and unreliable rains do not favour agriculture activities and the growth of pasture for livestock rearing. Tana River runs along the western boundary of the county and is the only permanent natural source of water for Garissa town and the surrounding areas. Seasonal Rivers (laggas) provide water during the wet season for both human and livestock, although they greatly interfere with road transportation. The county also hosts the Boni forest, a section of which is the Boni National Reserve, a protected wildlife conservation area. The County has four (4) main livelihood zones: pastoral, agro pastoral, casual/ waged labour and formal employment. Garissa has six constituencies namely: Garissa Township, Ijara, Dadaab, Lagdera, Fafi and Balambala. Garissa County is mostly inhabited by ethnic Somalis.

The County has a population of 850,077, A male population of 408,037 and a female population of 442,040 (census 2009). Garissa County has a child rich population, where 0-14 year olds constitute 48% of the total population. This is due to high fertility rates among women as shown by the percentage household size of 4-6 members at 35%. The lower proportion of 0-4 year olds is due to high infant and under five mortality rates.

Political and administrative set up

Garissa County has seven sub-counties, which include Fafi, Garissa, Ijara, Hulugho, Lagdera Balambala and Dadaab. However, this does not correspond to the six constituencies in the County; Hulugho is still under Ijara constituency.

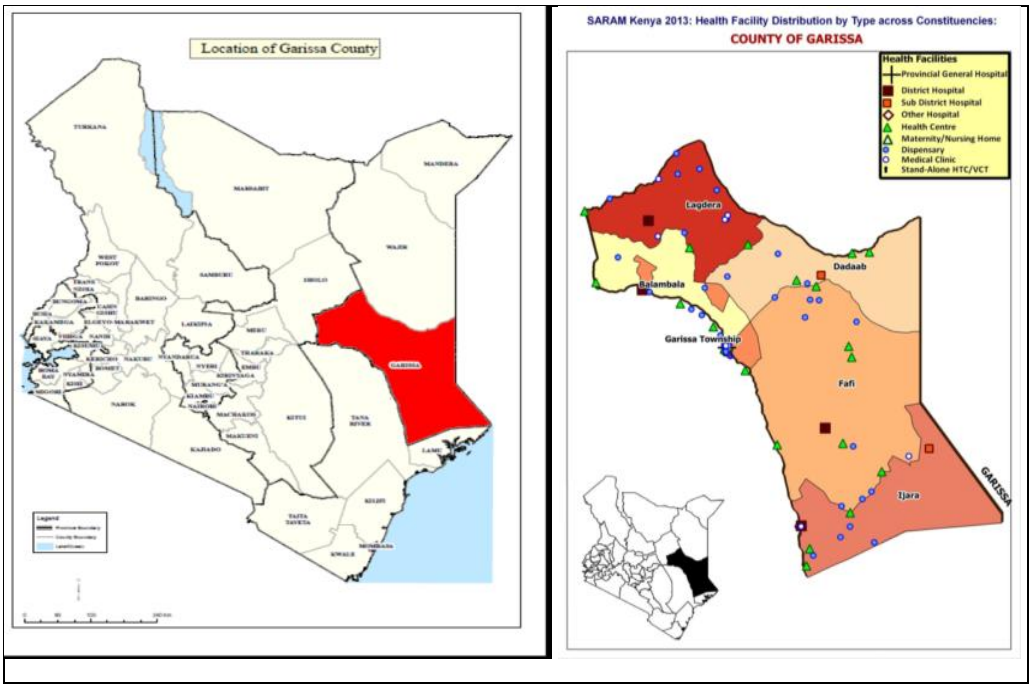


Figure 1: A map showing the location of Garissa in Kenya and the livelihoods

1.2 Status of the Previous SMART Survey (July 2023) Recommendations

Table 1: Status of the Previous SMART Survey (July 2023) Recommendations

Finding	Recommendation	Status
The nutrition situation for Garissa County is classified as Critical based on the IPC with a GAM of 16.4 % and a SAM of 2.8%.	Conduct countywide mass screening for malnutrition (using both MUAC and WHZ criteria) to reach all children 6-59 months in Garissa	Conducted 3 Mass screening exercise
	Sustain early detection and treatment of acute malnutrition through health facilities coupled with integrated outreaches in far to reach areas	Conducted 211 outreach services on biweekly for hard to read population
	Train 100 frontline health workers and managers on IMAM modular	Trained 75 HCWs
	Conduct Quarterly DQA to improve quality of IMAM data and reporting	Conducted 02 DQAs
	Conduct quarterly OJT and mentorship for health care workers	Conducted OJT on quarterly basis
	Increase BFCI Implementation in all health facilities and 50% of CUs	Implementing 36 CUs for BFCI
4.8% of pregnant and lactating women are malnourished compared to 12.7% in July 2022 which	Strengthen linkage of households with malnourished children to social protection programmes.	Advocated and included criteria for malnourished children as criteria
	Increase emergency response integrated health and nutrition outreach services in communities far (high priority) from functional health facilities and in malnutrition hotspot areas	Conducted outreaches for 211 sites on biweekly basis across the sub counties

was a significant improvement.	Preposition adequate therapeutic and supplementary nutrition (SAM and MAM) supplies to cater for potential increase of admissions due to mass screening for malnutrition.	Done on quarterly basis
39.7% (267) of the households practice Open Defecation (In the bush and fields)	Accelerate scale up Community Led Total Sanitation (CLTS) especially in Balambala, Lagdera, Dadaab, Fafi, Ijara and Hulugho sub counties.	Limited implementation on CTLS was done
Only 27.6% of the households treat their drinking water.	Sensitization of the community members on the importance of treating drinking water, safe sanitation practices, and practicing hand washing during critical times.	This was done through community units during dialogue days
14.1% of respondents practice hand washing during all the 4 critical times	Procure and distribute water treatment chemicals for distribution to households	Distribution done across the sub counties
	Enhance health promotion sessions on sensitization of communities on hand washing practices to improve on hygiene and sanitation	Done through CUs
59.3% percent of children 6-59 months received a dose of Vitamin A in the last 12 months.	Continue Vitamin A supplementation acceleration exercise during Malezi bora months in May/June and October/November every year	Conducted Malezi bora through integration of services

1.3 Health and Nutrition Situation

According to NDMA EWB, drought situation is classified as normal across the livelihood zones (NDMA, EWB, April 2024). Garissa County is classified under Crisis Insecurity (IPC phase 3)- IPC Acute Food Insecurity Phase Classification and Critical (Phase 3)- IPC Acute Malnutrition Phase Classification. According to SMART Survey conducted in July 2023, the County Nutrition situation was classified as critical (IPC-Phase 4). There has been increase in admission for MAM cases across the County in Q1 2024. The mean reduced coping strategy index (rCSI) for the month increased to 10.67. Predominantly, households resorted to stressed coping strategies, which mainly involved decreasing the frequency of meals and reducing dietary diversity, with a focus on prioritizing meal consumption for children and the elderly (NDMA Mar 2024). The proportion of children at risk of malnutrition based on MUAC was 18.3 percent as compared to the previous month the at risk levels increased by 8.2 percent (NDMA March 2024)

The average food consumption score for the month of March stood at 39.50, marking a 6.1 percent increase from the long-term average. However, this score still falls within the upper limit of the normal range for the month (NDMA Mar 2023). The proportion of the county population with poor, borderline and acceptable food consumption scores were 7.2 percent, 35.3percent and 57.5 percent respectively.

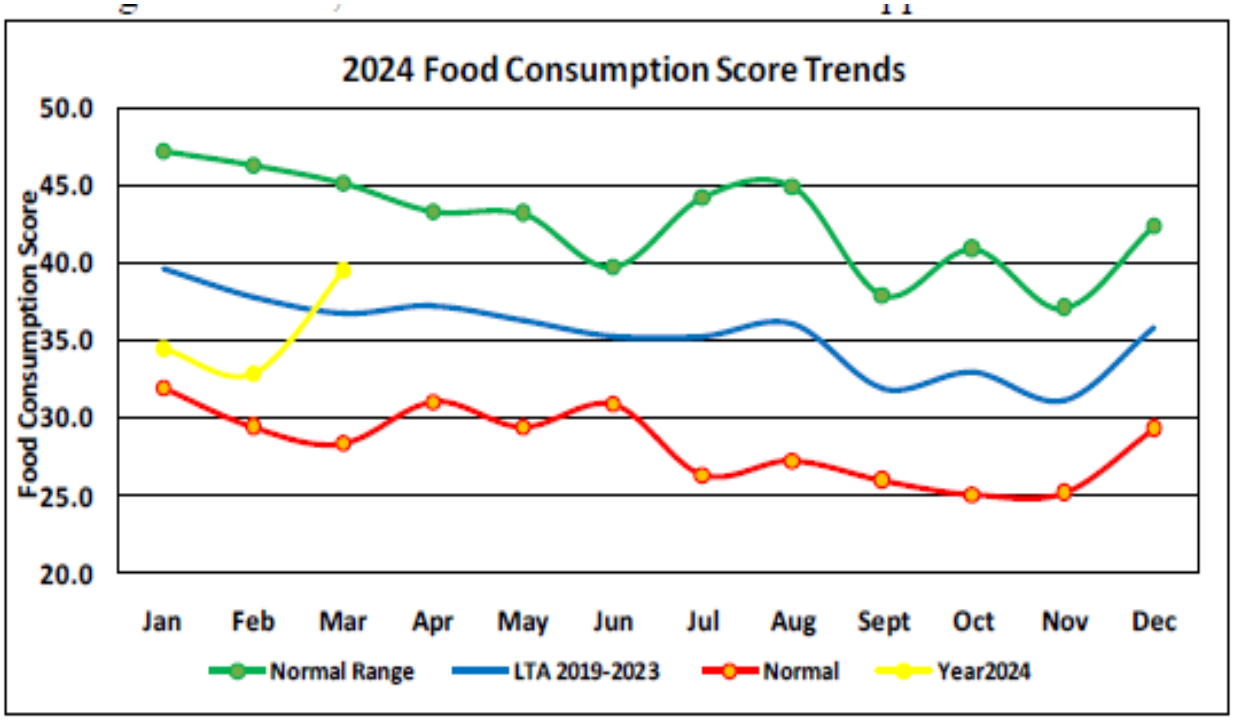
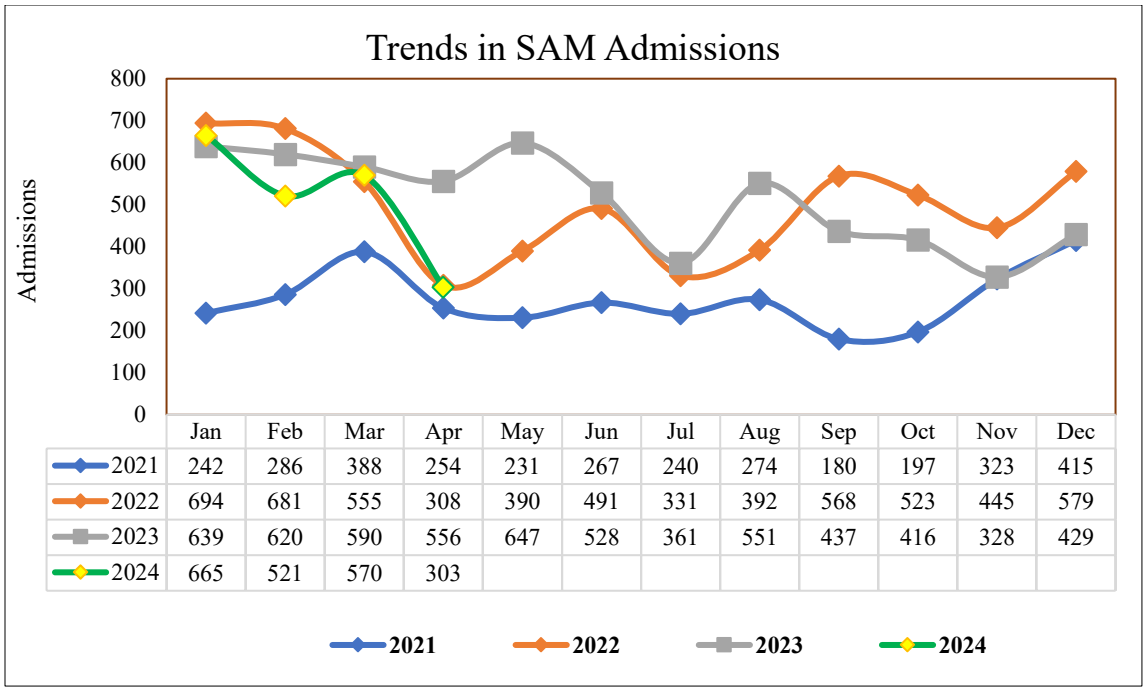


Figure 2: Trends in Food Consumption Score in Garissa

In March 2024 the trekking distance for households increased from 4.3 kilometers to 6.2 kilometres during the month of March. During the same month, there was a significant increase in the average return trekking distance from grazing areas to water sources, escalating from 9.2 kilometers to 13.6 kilometers (NDMA Mar 2024). Sub-optimal breastfeeding practices are a concern, with only 48.1% of mothers continuing breastfeeding at one year (SMART Survey 2023). Active measles outbreak reported with 533 line listed in Dadaab, Lagdera, Fafi and Garissa.

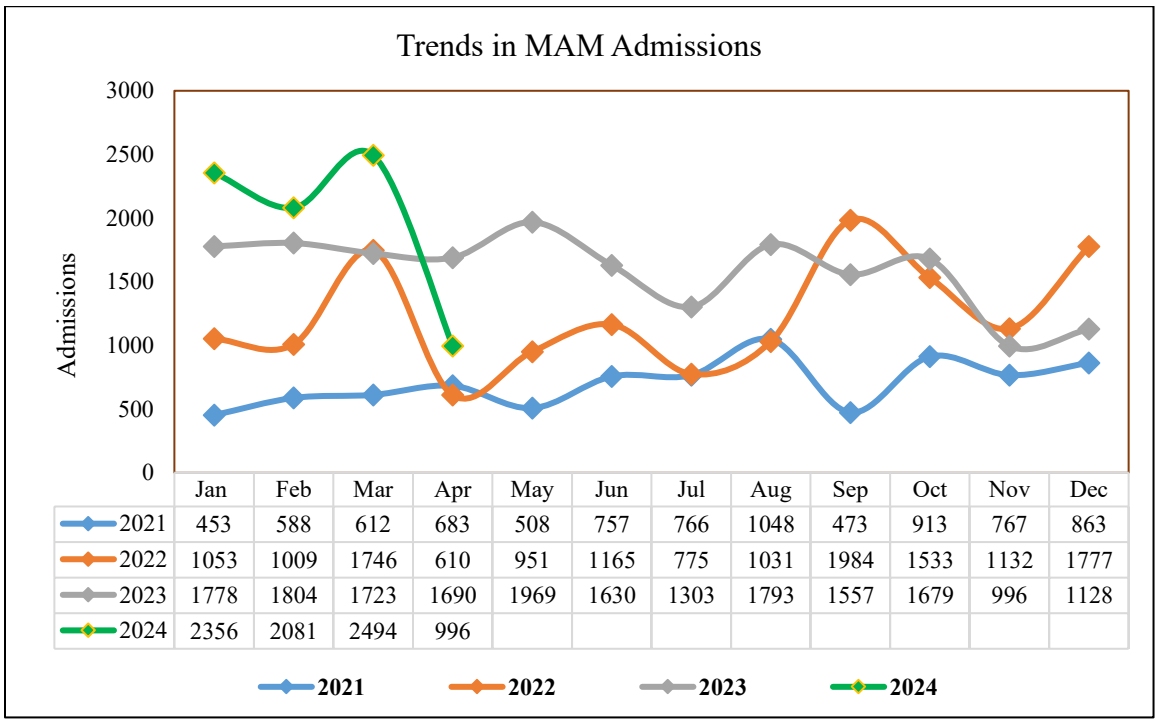
IMAM Program Admissions

SAM cases were observed on the increasing trends over a three-year period with 2021 reporting 3,297 cases while 2022 and 2023 reporting 5,957 cases and 6,102 cases respectively. The observed decline in admissions was to attributed to disruptions of service delivery by floods in the County. MAM cases on the other hand have been increasing over the three-year period with 2021 reporting 8,431 cases while 2022 and 2023 reporting 14,766 cases and 19,050 cases respectively. Higher admissions observed at the beginning of the year with a decline during the reporting period.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	242	286	388	254	231	267	240	274	180	197	323	415
2022	694	681	555	308	390	491	331	392	568	523	445	579
2023	639	620	590	556	647	528	361	551	437	416	328	429
2024	665	521	570	303								

Figure 3: Trends in SAM Admissions in Garissa County



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	453	588	612	683	508	757	766	1048	473	913	767	863
2022	1053	1009	1746	610	951	1165	775	1031	1984	1533	1132	1777
2023	1778	1804	1723	1690	1969	1630	1303	1793	1557	1679	996	1128
2024	2356	2081	2494	996								

Figure 4: Trends in MAM Admissions in Garissa County

1.4 Justification for Integrated SMART Survey

The county has experienced severe impacts from two episodes of enhanced "El Niño rains" within a span of seven months, resulting in widespread flooding. This has led to the displacement of residents, destruction of infrastructure and property, loss of lives and livelihoods, and disruption of health services, including the

IMAM program. Many integrated health and nutrition outreach activities were suspended due to inaccessible roads. Consequently, this situation is likely to significantly affect the nutritional status of both children and women. Hence the need to conduct a SMART Survey to assess the nutrition situation as well inform programming based on recommendations from the findings

Garissa County Department of Health (CDH) has been responding to the critical nutrition situation while sustaining the implementation of routine high-impact nutrition interventions. This is in line with the Garissa County Nutrition Action Plan (2019-2023). To understand the current nutrition situation, the county department of health is proposing to conduct a nutrition SMART survey in 3rd-30th June 2024. The findings of the survey would inform the nutrition response and provide up to date information on the nutrition situation for the 2024 Food security and nutrition situation Long Rains Assessment as well as Integrated Phase Classification.

1.5 Survey Objectives

The Main Objective was to determine the prevalence of malnutrition among the children aged 6- 59 months old and women of reproductive age in Garissa county.

Specific Objectives were;

1. To determine the prevalence of acute malnutrition among children 6-59 months, pregnant and lactating women.
2. To determine the nutrition status of women of reproductive age of 15-49 years based on maternal mid-upper circumference.
3. To determine the immunization coverage for BCG, measles at 9 and 18 Months, Oral Polio Vaccines (OPV 1 and 3),
4. To determine micronutrient supplementation coverage: vitamin A supplementation among children aged 6-59 months and Iron folic supplementation coverage during pregnancy.
5. To determine de-worming coverage among children aged 12 to 59 months
6. To determine morbidity rates among children aged 6-59 months two weeks prior to the survey
7. To collect information on possible underlying causes of malnutrition such as household food security, Water, Sanitation, and hygiene practices.

1.6 Survey Timing

The survey, led by the county Department of Health in collaboration with other stakeholders, was conducted after the end of the long rains, 21st to 28th June 2024. The results of the survey would feed into the Long Rains Assessment to inform the food security and nutrition situation.

Table 2: Garissa County Seasonal Calendar

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Dry Season			**Long Rain**			**Dry Cool Season**			**Short Rains**		

2.0 SURVEY METHODOLOGY

2.1 Survey Design

The survey used cross sectional and descriptive survey design. Standardized Monitoring and Assessment on Relief and Transition (SMART) methodology was adopted in planning and analysis of anthropometric and mortality data. Data on socio demographic information, immunization, Vitamin A, morbidity, food security, water, sanitation and hygiene practices were collected concurrently with the anthropometric, making it an integrated survey.

2.2 Survey Area

One survey was conducted covering all the livelihood zones in the county (pastoral, agro-pastoral and formal employment/business/petty trade).

2.3 Target groups, inclusion and exclusion criteria

The target population for the anthropometric survey was children aged 6-59 months. Mothers or caregivers were interviewed to obtain information on childhood morbidity and health seeking behaviours, vitamin A supplementation, BCG, Polio and measles vaccination, deworming, women health and nutrition, food security, and water, sanitation and hygiene practices.

Table 3: Survey indicators and target groups

	Key indicators	Survey target
	Demographic Information	
1.	Residency, marital status, Education level, Mosquito net ownership, income source	
2.	**Nutrition status**	
3.	Prevalence of wasting, stunting, and underweight	Children 6-59 months
4.	Prevalence of wasting among women of reproductive age	Women 15-49 years
	Health services coverage	
5.	Child morbidity (e.g. Fever, ARI, Diarrhoea)	Children 6-59 months
6.	ORS and Zinc Supplementation diarrhea	
7.	Health seeking behaviour	
8.	Enrolment in IMAM program	
9.	BCG Vaccination	
10.	Oral Polio Vaccination	
11.	Measles vaccination	
12.	Vitamin A supplementation coverage	

13.	Deworming coverage	Children 12-59 months
14.	Community Health Strategy Coverage	All surveyed households
15.	Household visitation by CHVs	All surveyed households
	Maternal Health and Nutrition	
16.	Physiological status	Women 15-49 years
17.	Ante-natal care attendance	
18.	Iron-folic acid supplementation	
19.	Minimum Dietary Diversity – Women	
	Water, Sanitation and Hygiene	
20.	Main source of water for drinking and cooking	All surveyed households
21.	Distance to and from main water source	
22.	Households Queuing for water	
23.	Water storage system	
24.	Water payment	
25.	Per capita water consumption	
26.	Water treatment	
27.	Type of latrine/toilet used	
28.	Hand washing awareness and practice	
29.	Water and soap availability for handwashing	
	Household Food Security and Livelihood	
30.	Household dietary diversity score	All surveyed households
31.	Minimum Dietary Diversity – Women	
32.	Food consumption score	
33.	Reduced Coping Strategy Index	
34.	Household Hunger Scale	

35.	Food fortification among households	

Cut offs for nutrition indices and malnutrition classification

Table 4: Cut-offs for the indices of WHZ, HAZ, WAZ, and MUAC

Malnutrition Status	Malnutrition Status Classification			
	Acute Malnutrition (WHZ)		Chronic malnutrition (HAZ)	Underweight (WAZ)
	Weight/ Height [WHZ]	MUAC	Height/Age [HAZ]	Weight/Age [WAZ]
Global	WHZ< -2 SD and/or Oedema	MUAC< 125 mm and /or Oedema	HAZ< -2 SD	WAZ< -2 SD
Moderate	WHZ <- 2SD to ≥ -3 SD	115 mm≤ MUAC< 125 mm	HAZ <- 2SD to ≥ -3 SD	WAZ <- 2SD to ≥ -3 SD
Severe	WHZ < -3 SD and/or Oedema	MUAC< 115 mm and /or Oedema	HAZ < -3 SD	WAZ < -3 SD

Table 5: WHO/UNICEF Classification for the severity of malnutrition by prevalence

	Prevalence Thresholds Level [%][1]				
	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

2.4 Indicator measurements

Nutrition data

- ***Age:*** Children 0-59 months from the selected households were considered eligible for the survey. Age was obtained from official written documents such as vaccination or birth registration cards. If documentation was unavailable, a local calendar of events was used to estimate age.
- ***Sex:*** This will be recorded as either 'f' for female or 'm' for male.
- ***Weight:*** Standardized SECA scales were used for weight measurement of children between 0 to 59 months. The weight was recorded to the nearest 100g (0.1 kg). Direct weighing option was used for

1WHO/UNICEF latest public health emergency thresholds for the prevalence of wasting, overweight and stunting in children under 5 years, August 2018

older children who could easily stand while the double weighing option was applied for younger children or children who could not stand.

- ***Height:*** Standard, height boards were used for taking length and height of children. Children less than 24 months were measured lying down, and children greater than or equal to 24 months were measured standing. The precision of the measurement is 0.1 cm
- ***Mid Upper Arm Circumference (MUAC):*** Was 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/PLW side. MUAC measurements was recorded to the nearest 0.1 cm or 1.0 mm.
- ***Bilateral Oedema:*** Was assessed by applying a moderate thumb pressure on both feet for three seconds. If oedema was present, a shallow pit remained after releasing pressure from the feet. Only children with bilateral oedema (oedema on both feet) were diagnosed positive for nutritional oedema. The team leader confirmed all cases of oedema and referred the cases for immediate inpatient care.
- ***Maternal Nutrition****:* The nutritional status of women of reproductive age was assessed using MUAC measurements. The MUAC measurements were recorded to the nearest 0.1 cm or 1.0 mm.

Water, Sanitation and hygiene

- ***Main source of water for drinking and cooking:*** This was assessed by asking respondents to identify their main water sources
- ***Distance to main water source:*** This was assessed by asking respondents about the return distance to their main water sources
- ***Queuing for water:*** This was assessed by asking respondents how long they queued for water at their main water sources
- ***Water storage:*** This was assessed by asking respondents to mention their main water storage containers
- ***Water consumption:*** This was assessed by asking respondents to quantify the amount of water used for domestic purpose
- ***Cost of water:*** This was assessed by asking respondents whether they purchased water and how much it cost per 20 litre Jerrican or monthly bill.
- ***Type of toilet/latrine used:*** This was assessed in all the selected households by asking the respondents about the kind of latrine/toilet used
- ***Sharing of toilet/latrine with other households:*** This was assessed in all the selected households by asking the respondents whether they shared their sanitary facility with other households.
- ***Hand washing awareness and practice:*** This was assessed by asking the respondents on the critical incidents of washing hands and confirming practice

Morbidity

- ***Retrospective morbidity:*** Mothers or caregivers were asked about illnesses that affected their children (6-59 months) in the past two weeks prior to the survey date.
- ***Diarrhea:*** This was assessed among children 6-59 months by a two-week recall. Diarrhea is defined as the passage of three or more loose or liquid stools in a day.
- ***Cough (with fast, short, rapid or difficulty breathing):*** This was assessed among children 6-59 months by a two-week recall. This indicator was used as a proxy for suspected ARI or pneumonia.
- ***Fever*** (without cough and rash): This was assessed among children 6-59 months by a two-week recall, defined as fever in the absence of respiratory symptoms (cough).
- ***Health seeking:*** This was done by asking caregivers whether they sought for any assistance when the child was sick.
- ***ORS and Zinc supplementation during diarrhea:*** This was assessed by asking caregivers of children who had diarrhea what they were given to manage it.

Vitamin A supplementation, deworming, and measles vaccination

- ***Measles vaccination:*** This was assessed among children 9-59 months by checking for the measles vaccine on the EPI card if available or by asking the caregiver to recall if no EPI card was available.
- ***Vitamin A supplementation:*** This was assessed among children 6-59 months by checking the EPI card or health card if available or by asking the caregiver to recall if no card is available. A vitamin A capsule image will be shown to the caregiver when asked to recall.
- ***Deworming:*** This was assessed among children 12-59 months by asking the caregiver to recall. A deworming tablet was shown to the caregiver when asked to recall.

2.5 Sample Size Calculation: Household and Anthropometry

The following assumptions (based on context) were used to calculate the sample size in number of children, which were then converted into number of households to be surveyed. All calculations were made using ENA Software for SMART ENA for SMART software (version January 11, 2020).

Table 6: Sample Size Calculation for Anthropometric Survey

Parameters	**Value**	**Rationale**
Estimated prevalence of GAM	16.4%	Base on GAM from SMART Survey - July 2023
±Desired precision	4.5%	SMART methodology guideline recommends, If expected prevalence of GAM is higher, for example 15-20%, the precision of +/- 4-5% would likely be sufficient.
Design effect	1.64	This is based on the design effect from the July 2023 SMART Survey data based on WHZ < -2
Children to be included	**464**	

Average household size	5.3	KDHS 2022
Percent of under five children	14.4%	KHIS - Garissa County health information System data - 2024
Percent of non-respondent	**1%**	This is the anticipated non-response rate based on the July 2021 SMART.
Household to be included	**683**	

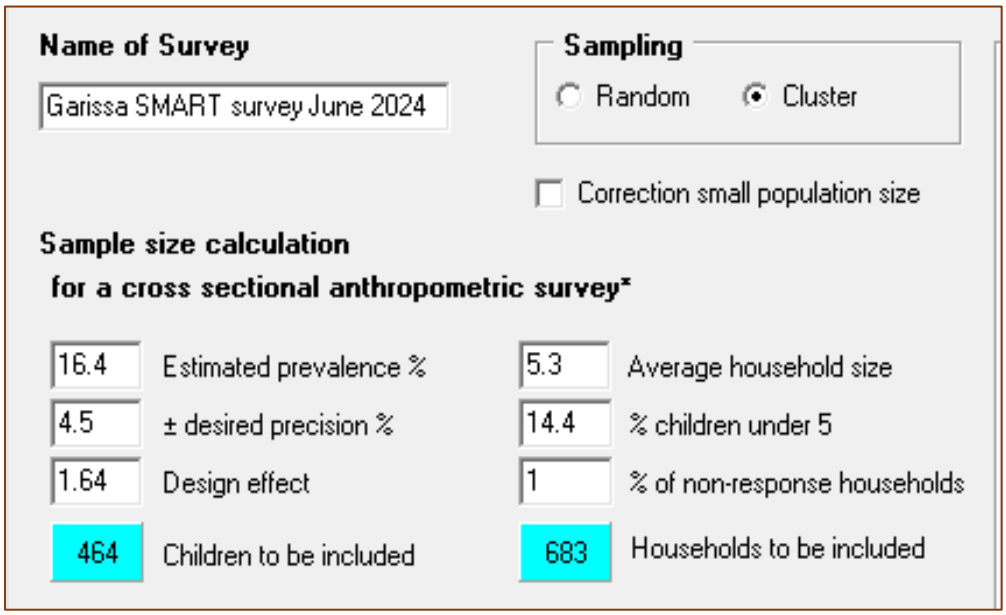


Figure 5: A snippet of the ENA planning page for Household sample size calculation

Number of households per cluster

The number of households to be completed in every cluster per day was determined according to the time the team could spend in the field excluding transportation, other procedures and break times. The details below are taken into consideration when performing this calculation based on the given context:

Table 7: Daily working timetable during data collection

Total working time	**7:00 AM to 6:00 PM** **11 hours = 660 minutes**	**Field Team Members**
Total time per day for field work	660	Team Leader, measurers
Travel time to cluster location	45	Team Leader, measurers
Duration for initial introduction and selection of household	30	Team Leader, measurers
Total duration of breaks	20	Team Leader, measurers
Travel time from one household to another	10	Team Leader, measurers

Average time in the household	30	Team Leader, measurers
Number of Households planned per day per Team	14 Households	

The number of households a team could visit **per day (14 HHs)** constituted a cluster. In view of this the total number of clusters for Garissa SMART survey was **49 Clusters (683/14=49 Clusters).**

Sample size for additional indicators

The above number of estimated households in Garissa was the final sample size. Sample size calculation for the additional survey indicators (Food Security and WASH) were based on the larger calculated sample size for anthropometry.

2.6 Sampling methodology

2.6.1 First stage sampling (selection of clusters)

Random selection of clusters (villages) was chosen using ENA for SMART based on probability proportion to size (PPS). An updated list of all accessible villages will be entered into the ENA for SMART for cluster assignment applying the PPS method. The list of villages were obtained from the most reliable sources in consultation with Community Health Strategy, local authorities and NGO partners. Insecure or inaccessible villages were excluded from the final sampling frame. Reserve Clusters (RCs) were also be selected by ENA for SMART. Reserve clusters were to be used only if 10% or more clusters or less than 80% of the children under five years are impossible to reach during the survey. In each selected village, a community leader (preferably village chief) would be approached and asked to help the survey teams to list down all the households and randomly select the required number of households. In cases where there are large villages containing more than 100 households, such villages would be divided into smaller segments and one or more segments will be randomly selected to represent the cluster. Cluster segmentation would then be done based on existing administrative boundaries, streets or natural landmarks such as a river, road, or public places like markets, schools, and mosques.

Segmentation into equal parts: If the village could be divided into 2 or more approximately equal parts, one segment would be selected randomly using the random method.

Segmentation into unequal parts: In most cases, it is impossible to divide the village into equal parts. Therefore, the survey teams would use natural landmarks that could help divide the village into separate clearly defined segments. Once those segments are defined with an approximate population size, one segment would then be selected based on probability proportional to size.

2.6.2 Second stage sampling (selection of households)

Simple random sampling was used to select 14 households per cluster. In each cluster, the survey team would compile a list of all households with the help of the village chief. The team leader working together with the village leader would then use the random number generator App to randomly select the required 14 households. The teams would start the survey from any convenient household among the randomly selected households by administering the survey questionnaires and taking anthropometric measurements. All the children aged 6 to 59 months living in the selected household were included in the anthropometric survey. If more than one eligible child was found in a household, both were included, even if they are twins. Eligible orphans living in the selected households were also be surveyed. All the selected HHs were asked

to respond to questions concerning the other indicators (i.e. Morbidity status, Food Security, WASH, and Maternal nutrition).

The household was the basic sampling unit. The term household was defined as all people eating from the same pot and living together. In some places, the term household was often defined as or synonymously used to mean a compound which potentially represents more than one household. In this case, the team worked with the village leader to identify compounds that would be listed as a single household if members live together and share their meals, and in compounds where members live together but do not share meals, households in the same compound were listed separately.

2.7 Referral

All children identified as meeting the case definition for severe acute malnutrition without complication were referred to the nearest outpatient therapeutic feeding program (OTP) or health center. Similarly, children meeting the case definition for moderate acute malnutrition were referred to the nearest facility with supplementary feeding program (SFP). Pregnant and lactating women with children <6 months that were assessed with MUAC <230 mm would also be referred to the nearest targeted supplementary feeding program (TSFP) or health center. A list of referred children was then submitted to treatment center supervisors for follow-up.

2.8 Special cases

a) **No children in the household:** Only the household questionnaire was administered. The survey teams were cautioned not to replace a household with no children.

b) **Abandoned household:** Generally, abandoned households have not been occupied for a long period of time. All abandoned households were removed before HH listing and selection.

c) **Absent household**: Household recently inhabited but is currently empty was considered as absent and was not be replaced. The teams would skip absent households and continue to the next household according to the sampling procedure. The absent household would then be revisited before leaving the field. A household was only marked absent after at least two re-visits to the household have been made.

d) **Absent children:** If a child was absent at the time of the survey it must be noted. The team would collect the other household related data and tell the mother that they will return later that day to look for the missing child before departure from the survey area.

e) **Children with disability/handicap:** All data that was not influenced by the disability was collected. The team would determine if it is possible to measure all anthropometric indicators. If it is not possible to measure height and weight, the team would give the child an ID number and record data as missing and report the reason.

A cluster control form was used to record the assessment outcome for every selected household.

2.9 Survey team composition, training and supervision

2.9.1 Survey team Selection and Composition

The Survey was managed by the County Department of Health, where the survey coordinators and team leaders were county health officials who have had previous experience in SMART surveys. The

enumerators with experience in conducting SMART surveys were recruited to reduce training time. Each survey team comprised of 2 enumerators and 1 team leader who formed 7 teams (7 team leaders and 14 enumerators) collecting data for 7 days to cover 49 clusters as required by the methodology. Each survey team managed by a team supervisor. Survey managers and coordinators managed the survey with technical lead from NITWG. Each team member had designated roles as explained below:

1. **Team Leader:** He/she led the field survey team. The team leader organized a meeting with the village chief and local authorities, conducted cluster mapping and segmentation (if required), ensured complete HHs listing, ensured random HH selection during the second stage of cluster sampling, monitored and supervised anthropometric measurement, and conducted household interview while maintaining the supervision checklist and filled the cluster control form.

2. **Lead measurer:** He/she measured weight, height, edema, and MUAC of children and pregnant and lactating women. The lead measurer also took proper care of measuring equipment and assisted the team leader with cluster mapping and other requested assistance.

3. **Assistant measurer:** assisted the lead measurer in taking anthropometric measurements, taking proper care of the measuring equipment and carrying the equipment while in the field.

4. **Field supervisor:** The field supervisors were technical staff drawn from CHMT, and the responsible staff of the supporting partners. These supervisors provided technical support including ensuring proper procedures are followed during household selection, ensuring interviews are done correctly and consistently in every household and ensuring data is captured accurately and providing feedback to the survey team while in the field.

To ensure successful data collection, survey teams enlisted the help of a local community member during a typical data collection day, with small incentives (lunch allowance) being paid to a community member on each survey day for supporting with identification of households, mapping cluster boundaries, and support in carrying of equipment.

2.9.2 Survey team training

A comprehensive training of the survey teams was carried out for 4 days. The training content involved; sampling methods; anthropometric measurements; interviewing techniques; identification and referral of malnourished children, how to use the ODK collect and understanding of the survey components. Since the survey was to use ODK Collect for the data collection, the teams were trained on ODK Collect. Standardization tests and pilot test were part of the training. The standardization involved the enumerators (working in pairs) taking the anthropometric measurements of 10 children twice. The pre-test entailed each team completing four questionnaires in purposively selected villages that are not part of the sampled clusters. Each team collected data from four Households applying all the sampling procedures. Data would afterwards be downloaded and results discussed with the team on areas of improvement.

2.9.3 Survey equipment

Weight was measured using SECA electronic scales that allow for double measurement. The Weighing scales were calibrated every morning before starting data collection. Standard UNICEF height boards were used for measuring height. The mid upper arm circumference of both the children and PLWs was measured using MUAC tapes.

2.9.4 Data collection

Data collection took place in the 49 sampled clusters in Garissa County from 16th to 24th June 2024. Data

collection took approximately 7 days, since there were no major challenges that could have delayed data collection.

- Anthropometric, morbidity and immunization data was collected for all eligible children (6-59m).
- Household related data including Food security and livelihoods, and WASH will be collected in all sampled households irrespective of the availability of children.
- Data collection from the selected households was conducted using ODK collect, where the survey teams collected data with Android mobile devices, with data being sent directly to the server (KOBO) at the end of each day's data collection.
- The collected data, especially the anthropometric data was downloaded into ENA to be checked for consistency and quality.
- Feedback was shared with teams every day.
- Anthropometry and Mortality Data was analyzed using ENA for SMART
- Analysis for additional indicators collected was done using Ms Excel, SPSS

2.9.5 Covid-19 control measures

- Training venue had adequate space to allow for social distancing shall be selected
- Previous survey database was used to select qualified and experienced survey team to lessen training and interview time
- All Covid-19 IPC protocols and guidelines was strictly be adhered to
- All survey team members provided with enough face masks and sanitizers during training and data collection
- All interviews and standardization conducted outdoor with only one caregiver and only children to be measured to minimize congestion
- Survey household members were requested to correctly wear mask during the interview
- Interviewers maintained a minimum of one-meter distance during the interview
- Interviewers disinfected anthropometric equipment after every child and sanitized hands

2.9.6 Data entry and management

Data was collected offline using mobile devices via the KoBoToolbox application. Every day when teams return to base, data was uploaded and sent to a configured server from where it would be downloaded and automatically analyzed. Automatically generated plausibility reports were reviewed so that feedback is given to the teams every morning before departing to the field.

2.9.7 Quality Assurance

Several measures were employed to ensure data quality including:

- Using the KoBo Toolbox application for digital data collection to minimize the possibility of errors when recording data.
- A five-day comprehensive training together with standardization test and field pretest for each state.
- Field supervision of the survey teams during data collection.
- Calibration and standardization of the survey equipment.

- Use of the cluster control forms to track the assessment outcome for every household.
- Daily plausibility checks and sharing of feedback with the teams for continuous improvement as data collection continued.

2.9.8 Data analysis, dissemination and report writing

All Anthropometric data was analyzed using ENA for SMART (January 11th, 2020 version). SMART flags were used to exclude values that are out of range. Preliminary findings were shared with stakeholders (Health Department, line ministries and other NGO partners) for validation. A Technical Working Group composed of experts from the participating agencies reviewed and validated the results before dissemination. A preliminary report and datasets were shared with stakeholders within one week of completing data collection. Feedback was incorporated, and the final report shared within a week after receiving feedback.

2.9.9 Ethical approval and considerations

The interviewers would formally introduce themselves, the organization they represent and state the purpose of their visit as well as ask for consent for participation. Informed consent was obtained from all participants before data collection. Participation in the survey was voluntary. The survey objectives were clearly explained to the respondents before gathering data. Collected data was treated with confidentiality. Interviewers ensured the participants information remained confidential and would be used for only purposes of the survey and nothing else. The respondents were assured that their names will not be included in reports. Survey approval was sought from relevant government ministries and institutions, the nutrition clusters technical working group, local authorities, and community leaders.

2.9.10 Organization of Garissa County Integrated SMART Survey

Table 8: Survey Activities and Timeline

Activity	**Timelines**
Training of survey team	10th -14th June 2024 (4 days)
Data collection and uploading	16th -24th June 2024 (8 days)
Validation & discussion of survey results at County level	25th June 2024
Report writing	26th -30th June 2024 (5 days)
Validation of Survey results by NITWG (During LRA report writing)	July 2024

3.0 SURVEY FINDINGS

3.1 Demographic Characteristics

3.1.1 General Characteristics of the Study Populations and Households

Survey coverage

The surveyed covered 49 cluster reaching 686 (100%) households and 972 (200%) children aged 6 to 59 months.

Table 9: Planned versus achieved sample

PLANNED			ACHIEVED		
No. of HHs	No. of Children (Sample Size)	No. of Clusters	No. of HHs	No. of Children (Sample Size)	No. of Clusters
683	464	49	686	972	49

The average household size as derived from 3,542 household members (only 2,732 were at home) from the 686 randomly selected households was approximately 6 (5.2) persons per household. The household size remained almost the same as the previous year (2022) at 5 members per household. In regards to the age cohort surveyed; 0-59 months were 1086 (540 Male, 546 Female) at home where children aged 6-59 months were 970 (476 Male, 494 Female), the population of 5 to 18 years were 740 (391 Male, 349 Female) at home, while those above 18 years of age at home were 932 (302 Male, 630 Female).

During the survey, interviewers Age verification was majorly done by health card/mother child booklet (55.9%). A calendar of event was used to estimate the age of children without age verification documents (11.8%).

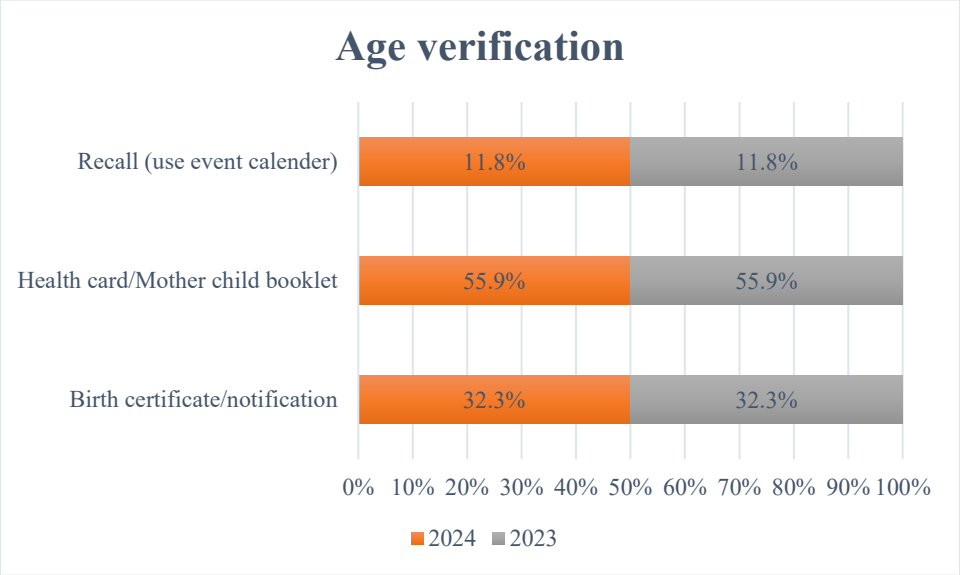


Figure 6: Age verification method

Table 10: A Summary of Household Demographics

AGE COHORT	Male AT HOME	Male ALL	Female AT HOME	Female ALL	Total AT HOME	Total ALL
less than 6month	49	49	41	41	90	90
6- 59 month	476	491	494	505	970	996
Less than 5 years	**525**	**540**	**535**	**546**	**1060**	**1086**
5 to less than 18 years	391	616	349	521	740	1137
18 years and above (Adult)	302	558	630	760	932	1318
Total	1218	1714	1514	1827	2732	3541
NUMBER OF HH INTERVIEWED				686		
AVERAGE HH SIZE (AT HOME)				4.0		
AVERAGE HH SIZE (ALL MEMBER)				5.2		

In Garissa County, a bigger proportion of the survey respondents are married at 93%, while 2% are widowed and divorced, and 1% are single and separated respectively. almost all the households (96.9%) were permanent residents and 2.9% were resident nomadic pastoralists, while IDPs and refugees formed a negligible proportion among the host community of Dadaab Sub County.

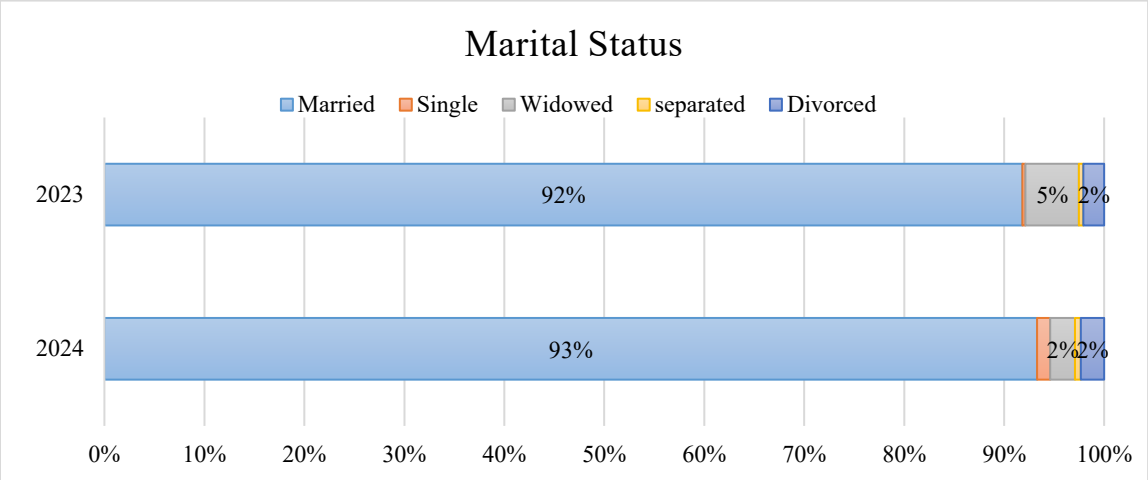


Figure 7: Marital Status of Households

3.1.2 Utilization of Mosquito Nets

Bed nets help to prevent disease spread by mosquitoes, such as malaria. The most effective nets are insecticide-treated nets (ITNs) which are treated with long-lasting insecticides that kills mosquitoes and other insects. When used by all or most members of the community have been observed to reduce malaria transmission. To be fully effective, nets must be installed and used properly. Studies recommend that the public health impact of LLIN use should be undertaken in all age groups. The assessment findings indicated that mosquito net ownership was at 94% an increase from 81% reported in July 2023. The proportion of the population sleeping under mosquito net the previous day was 81.2%, with 88.9% of this being children under five years.

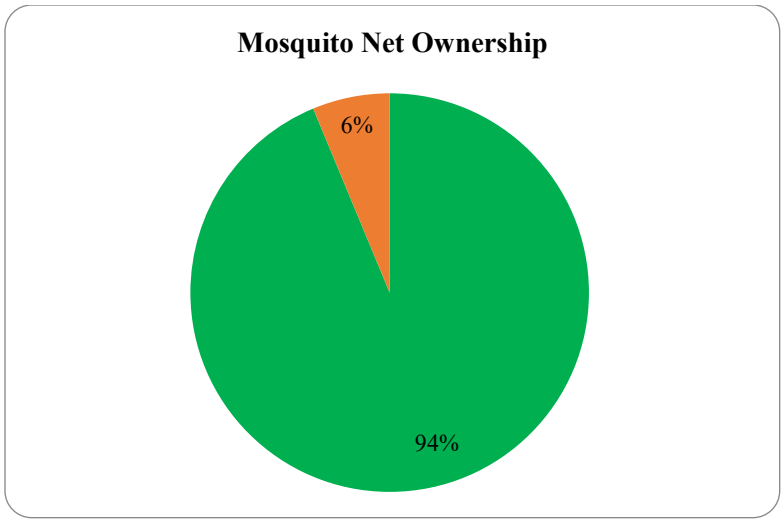


Figure 8: Mosquito Net Ownership

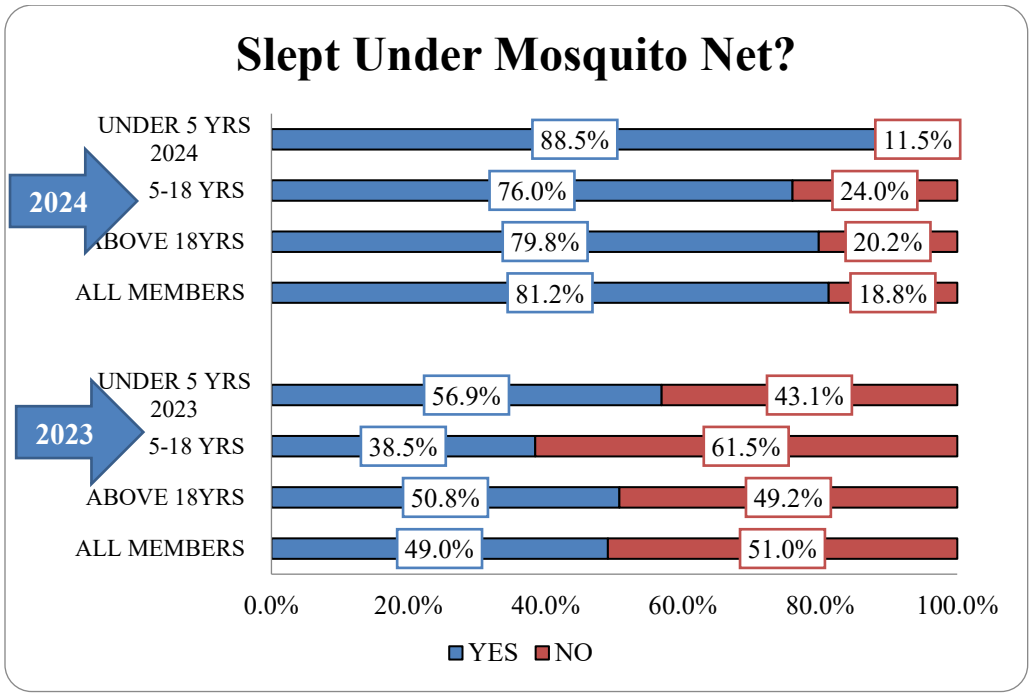


Figure 9: Household members who have slept under mosquito net

3.1.3 Income source

The main income (occupation) and current income source of the household heads in Garissa County is livestock herding (47.2%) and 41.3% respectively. Waged labour (casual) came in second as the main income and current income source at 25.4% and 30.0% respectively. There is observed reduction of the proportion who rely on livestock herding from 50.2% reported in July 2023 to 47.2%. On the other hand, an observed increase in the proportion of households on waged labour (casual) both as the main income and current income source from 21.5% and 22.4% to 25.4% and 30.0% respectively. reduced dependence on livestock can be attributed the previous prolonged drought period that resulted to spending more on

water and feed by households for their herds and received less income from animal sales, a burden which did not appear to be offset by increases in other sources of livelihoods. Many households are still recovering from the 2021 to 2023 drought when the El nino floods struck, leading to further loss of the already fewer livestock. This resulted to increase in casual (waged labor) as an alternative source of income.

Table 11: Main income source

Main income	n	2024	2023
Livestock herding	324	47.2%	50.2%
Waged labour (Casual)	174	25.4%	21.5%
Employed (salaried)	56	8.2%	10.8%
Petty trade	39	5.7%	7.4%
Others (Specify)	4	0.6%	5.1%
Firewood/charcoal	18	2.6%	2.1%
Merchant/trader	59	8.6%	1.6%
Crop farming/Own farm labour	12	1.7%	1.2%
Fishing	0	0.0%	0.0%

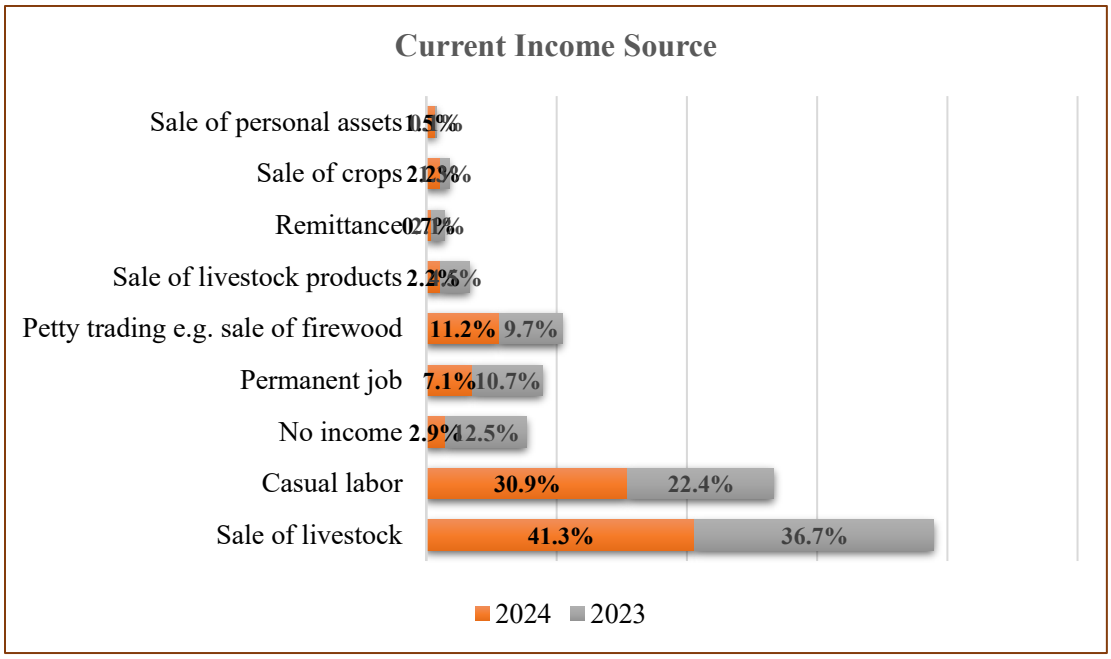


Figure 10: Current Income Source

3.1.4 Cash Transfer Program

Cash transfer programmes are aimed at reducing poverty as well as breaking the cycle of poverty for the next generation through the development of human capital. Whether in form of humanitarian or resilient cash transfers, they are a cost-effective way of quickly getting support to those who need it most. The overall cost of delivering cash assistance is often lower than in-kind assistance, meaning more people can be reached. Cash transfers also empower people to make decisions based on their individual situation, allowing recipients to meet their basic needs and restart their livelihoods in a dignified and respectful way. Plus, because the money households receive is spent in local markets, cash transfers support communities

and stimulate local economies. In the longer term, cash transfers can build households' resilience, strengthening their ability to better cope with shocks and reducing vulnerability to future crises. Strong public communication around targeting and enrolment are essential to ensure eligible households are reached.

From the assessment, only 9.6% are enrolled in Cash Transfer Program which include; Hunger Safety Net Program (HSNP), older persons' program, Orphaned and Vulnerable Children program, People With Severe Disabilities (PWSD), Linda Lishe Bora (LLB) by WFP among others (Kenya Red Cross Society and Flood Response). Majority of those enrolled in CTP were in Hunger Safety Net Program at 60.6%, a decrease in proportion compared to 35.2% reported in July 2023.

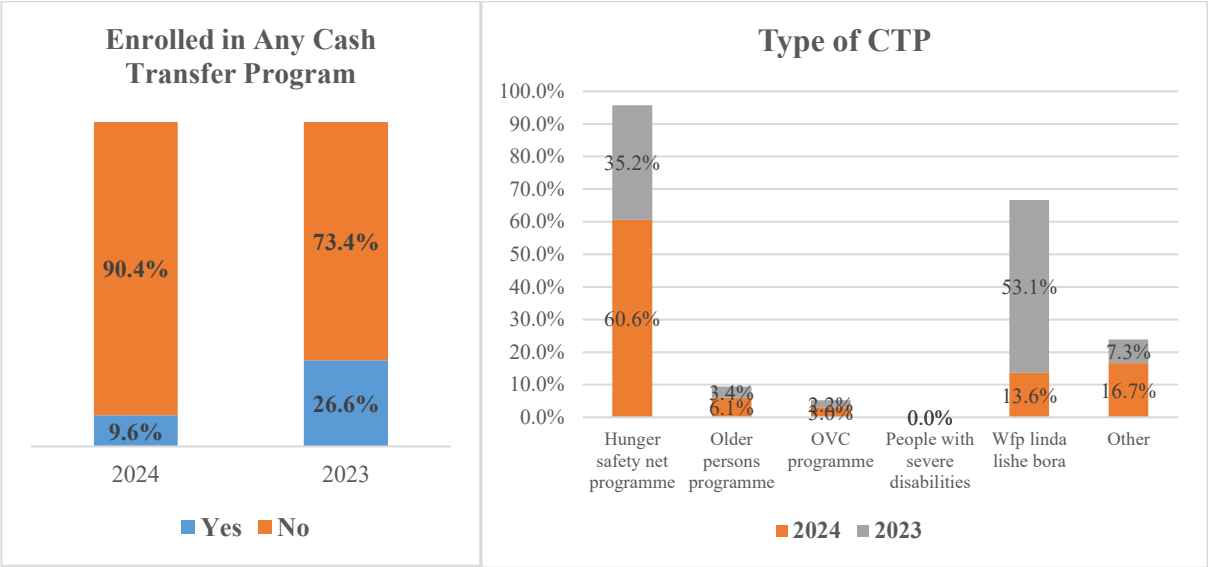


Figure 11: Proportion enrolled in any Cash Transfer Program

3.1.5 Education Level

The level of education of a child's caregiver can have an impact on the child's well-being. Caregivers with higher levels of education are more likely to accurately perceive aggression in preschool boys, which can affect how they interact with the child. Additionally, parental education has been found to have substantial effects on children's health, with increased education leading to positive health outcomes for children. Furthermore, adult children with higher levels of education are more likely to provide financial and caregiving support to their aging parents. In contrast, caregivers with limited education face challenges in providing a nurturing and stimulating environment for their children, which can hinder their educational advancement and future prospects. Therefore, the level of education of a child's caregiver can play a significant role in shaping the child's well-being and future outcomes2.

The proportion of adults in Garissa County who had no formal education was 31.5%, an improvement compared to the previous year's (42.9%), bringing to 68.5% of those with formal education with 8.5% of them reporting to have attained compulsory primary education, 9.1% secondary education and about 4.3% tertiary education.

2 Parental Education and children's health throughout life, Mathias Huebener 1st January 2020

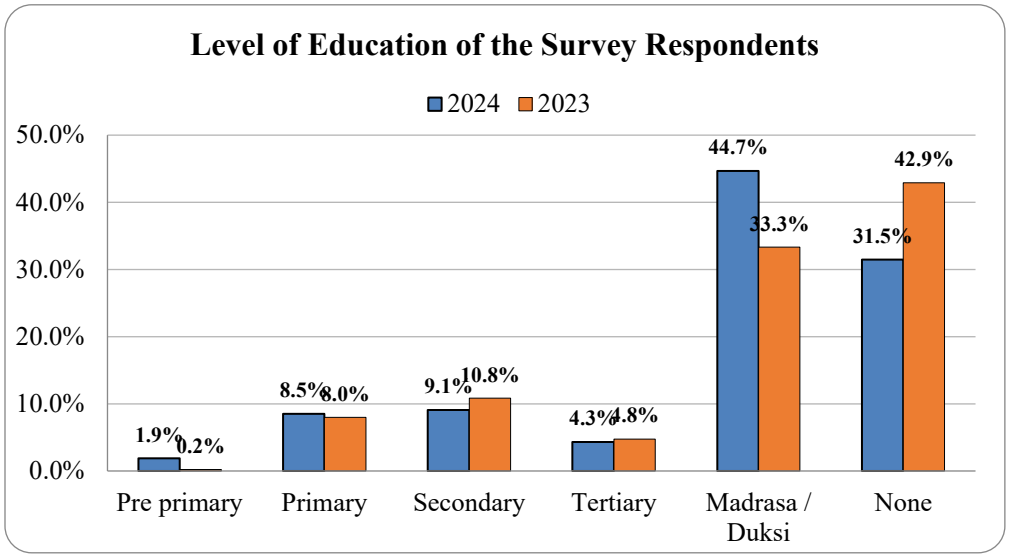


Figure 12: Adult Level of Education

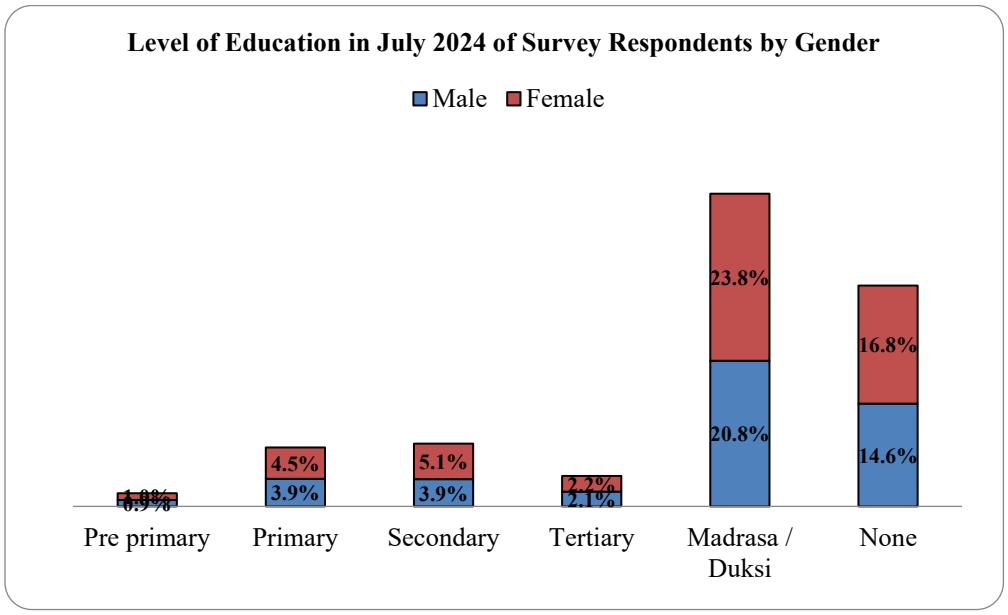


Figure 13: Adult Level of Education by Gender

School Enrollment

In Kenya, parents and guardians are expected to enroll their children in school as soon as they reach the age of four into the first level of education which is the pre-primary education level, where learners are engaged in their early years of education. The SMART survey sought to assess school enrolment for children aged 4 to 17 years in Garissa County, on whether they are enrolled or not, and the possible reason for lack of enrollment with further enquiry on the activities they engage in if not enrolled in formal education. From the survey findings, school enrollment in the county is at 61.0% an insignificant drop from the previous enrolment reported at 62.6% in July 2023. Majority of the respondents cited not seeing the value for

schooling, attending religious classes (Duksi or Madrasa), lack of school fees to join available private schools, and too young to attend school as the major reasons for lack of enrolment in school at 24.1%, 14.8%, 10.4% and 10.7% respectively. The biggest proportion (83.1%) of the children aged 4 to 17 years not enrolled in any form of learning were engaged in herding.

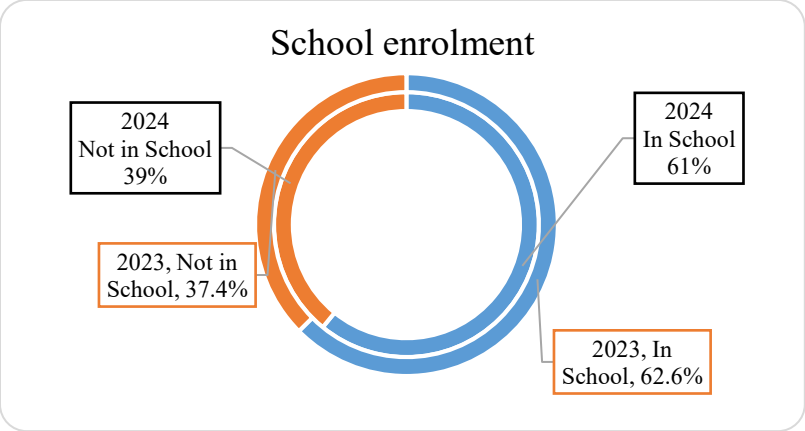


Figure 14: Proportion of School Enrolment

Table 12: A summary of Reasons why children 4 to 17 years are Not Enrolled in School

Reason out of school	**2023**	**n**	**2024**
Chronic Sickness	1%	3	0%
Family labour responsibilities	1%	52	8.4%
Working outside home	0%	5	0.8%
Teacher absenteeism	0%	10	1.6%
Lack of fees or money to meet other costs	1%	64	10.4%
Household doesn't see value of schooling	0%	149	24.1%
No food in the schools	0%	1	0.2%
Migrated / moved from school area	1%	10	1.6%
Insecurity / violence	0%	1	0.2%
No school Near by	19%	58	9.4%
Others (specify)	***75%***	***265***	***42.9%***
• Duksi/Madrasa	14.8%	5	14.8%
• Child just at home	0.0%	0	0.0%
• Too young for school	10.7%	0	10.7%
Activity they do off the school	***2023***	***n***	***2024***
Herding livestock	93.3%	49	83.1%
Working for payment away from home	4.4%	7	11.9%
Left home for else where	2.2%	3	5.1%

3.2 Anthropometric Results for Children Aged 6 to 59 months (Based on WHO Standards 2006)

3.2.1 Anthropometric Data Quality

The overall data quality for anthropometric measurements for Garissa County Integrated SMART Survey was 8%.

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	Score
Flagged data (% of out of range subjects)	Incl	%	0-2.5 0	>2.5-5.0 5	>5.0-7.5 10	>7.5 20	**0** (0.2 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	**0** (p=0.541)
Age ratio(6-29 vs 30-59) (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	**0** (p=0.933)
Dig pref score - weight	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**0** (1)
Dig pref score - height	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**0** (2)
Dig pref score - MUAC	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**0** (2)
Standard Dev WHZ .	Excl	SD	<1.1 and	<1.15 and	<1.20 and	>=1.20 or	
.	Excl	SD	>0.9 0	>0.85 5	>0.80 10	<=0.80 20	**5** (1.10)
Skewness WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	**0** (0.11)
Kurtosis WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	**0** (-0.09)
Poisson dist WHZ-2	Excl	p	>0.05 0	>0.01 1	>0.001 3	<=0.001 5	**3** (p=0.006)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	**8** %

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

There were no duplicate entries detected.

Figure 15: A snippet of the Overall Plausibility

Mean z-scores for Anthropometric Indices

The mean z-scores for the three anthropometric indices - Weight-for-Height, Weight-for-Age, and Height-for-Age - were negative, indicating a prevalence of both acute and chronic malnutrition within the population. The standard deviation for all indices fell within acceptable ranges, suggesting that the data is reliable and of good quality. Overall, the data provides valuable insights into the nutritional status of the surveyed population, enabling informed decision-making for intervention strategies.

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

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	967	-0.83±1.10	1.67	0	3

Weight-for-Age	961	-0.78±0.98	1.55	0	9
Height-for-Age	927	-0.47±1.14	1.00	0	43

3.2.2 Distribution of Age and Sex of Sample

The anthropometric measurements covered 967 children aged between 6 to 59 months indicating a 35.4% of total population. Both boys and girls were equally represented with p-value of (0.541). The Age ratio among children aged 6-29 months and 30-59 months was 0.85 with overall p-value of (p=0.933) indicating equal representation of both age cohorts. Statistical evaluation of sex and age ration using chi-squared statistics had a p-value of (0.001) indicating significant difference. Table 13 shows distribution by age and sex of the sampled children. The overall data quality score of the anthropometric survey results was 8% (interpreted as excellent score). From the integrated SMART survey, 34 out of the 49 assessed clusters in Garissa County had at least two (2) malnourished cases (WHZ <-2SD) (Table 14).

Table 14: Distribution of age and sex of sample

	Boys		**Girls**		**Total**		**Ratio**
AGE (mo)	**no.**	**%**	**no.**	**%**	**no.**	**%**	**Boy:girl**
6-17	102	45.9	120	54.1	222	23.0	0.9
18-29	112	50.9	108	49.1	220	22.8	1.0
30-41	117	45.9	138	54.1	255	26.4	0.8
42-53	100	51.3	95	48.7	195	20.2	1.1
54-59	42	57.5	31	42.5	73	7.6	1.4
Total	473	49.0	492	51.0	965	100.0	1.0

Malnutrition Hotspots

Since the Weight-for-Height Standard deviation is -0.83±1.10, from the integrated SMART survey, 25 clusters were found to be malnutrition hotspots (WHZ SD below -0.8). In total, 34 out of the 49 assessed clusters in Garissa County had at least two (2) acute malnourished cases (WHZ <-2SD).

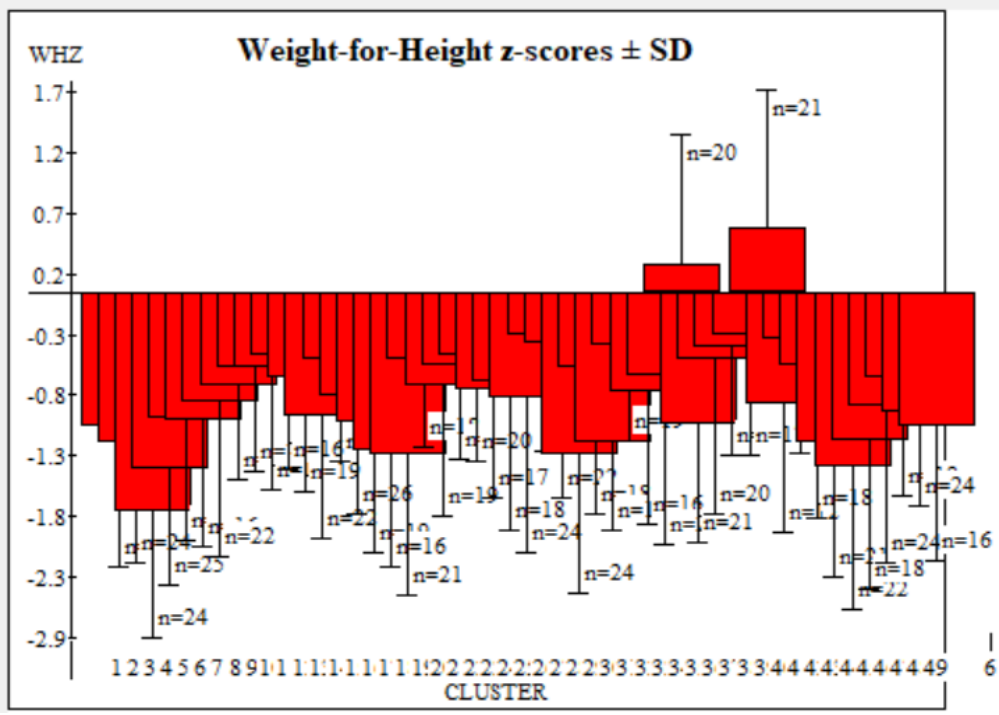


Figure 16: Distribution of malnutrition hotspots

Table 15: Distribution of wasting (based on WHZ Score) per Clusters

Cluster 1 :	-1.11 ± 1.14 (n=20)
Cluster 2 :	-1.24 ± 0.99 (n=24)
Cluster 3 :	-1.82 ± 1.03 (n=24)
Cluster 4 :	-1.46 ± 0.94 (n=25)
Cluster 5 :	-1.04 ± 1.00 (n=17)
Cluster 6 :	-1.06 ± 1.04 (n=16)
Cluster 7 :	-0.91 ± 1.27 (n=22)
Cluster 13 :	-1.03 ± 1.00 (n=22)
Cluster 15 :	-0.86 ± 0.97 (n=26)
Cluster 16 :	-1.08 ± 1.06 (n=19)
Cluster 17 :	-1.31 ± 0.94 (n=16)
Cluster 18 :	-1.35 ± 1.15 (n=21)
Cluster 23 :	-0.81 ± 0.88 (n=17)
Cluster 25 :	-0.87 ± 1.28 (n=24)
Cluster 28 :	-1.35 ± 1.13 (n=24)
Cluster 30 :	-1.25 ± 0.71 (n=19)
Cluster 32 :	-0.83 ± 1.08 (n=16)
Cluster 35 :	-1.09 ± 0.97 (n=21)
Cluster 40 :	-0.92 ± 1.05 (n=12)
Cluster 43 :	-1.25 ± 1.10 (n=21)
Cluster 44 :	-1.44 ± 1.18 (n=22)
Cluster 45 :	-1.22 ± 1.22 (n=18)
Cluster 46 :	-0.94 ± 1.29 (n=24)
Cluster 48 :	-1.00 ± 0.75 (n=24)

Cluster 49 :	-1.11 ± 1.11 (n=16)

3.2.3 Nutrition Status for children 6 to 59 months

3.2.3.1 Prevalence of Acute Malnutrition Based on Weight-for-Height Z-scores

The World Health Organization (WHO) sets out child growth standards – these show the expected trajectory of a child's growth from birth through to adulthood.3 These include measurements of a child's expected height and weight. One of the key measures of health is a child's weight *relative to their height*. If their weight is too low for their height, it is a sign that they have an insufficient energy intake. Of course, this weight-to-height ratio is not exactly the same for every child. The WHO therefore sets out a range of values around this median expectation. This 'acceptable range' spans two standard deviations. **A child whose weight falls two standard deviations below their expected weight for their height is defined as 'wasted'.**

Garissa Integrated SMART survey unveiled a Global and severe acute malnutrition prevalence based on weight for height z-scores of 14.7 % (12.0 – 17.9 95% C.I.) and 2.4 % (1.5 - 3.7 95% C.I.), with 0% prevalence of oedema, a slight though insignificant improvement compared to 16.4% (13.4 – 20.0 95% C.I) and 2.7% (1.7 – 4.3 95% C.I.) respectively unveiled in July 2023, with a p-value of 0.4404. The current GAM is classified as *high* based on the revised WHO classification of acute malnutrition (10.0 - <15.0%) and *serious* based on IPC classification for acute malnutrition (10.0 - <15.0%). Both boys and girls were equally malnourished with GAM and SAM prevalence at 15.8 % (11.9 - 20.5 95% C.I.) and 2.1 % (1.1 - 3.9 95% C.I.) for boys, and 15.6 % (12.5 - 19.3 95% C.I.) and 2.6 % (1.5 - 4.6 95% C.I.) for girls respectively.

Table 16: Prevalence of Acute Malnutrition Based on Weight-for-Height Z-scores, and by Sex

	All **n = 967**	**Boys** **n = 473**	**Girls** **n = 494**
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(142) **14.7 %** (12.0 - 17.9 95% C.I.)	(69) 14.6 % (10.9 - 19.3 95% C.I.)	(73) 14.8 % (11.6 - 18.6 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(119) 12.3 % (10.1 - 14.9 95% C.I.)	(59) 12.5 % (9.3 - 16.5 95% C.I.)	(60) 12.1 % (9.2 - 15.8 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(23) **2.4 %** (1.5 - 3.7 95% C.I.)	(10) 2.1 % (1.1 - 3.9 95% C.I.)	(13) 2.6 % (1.5 - 4.6 95% C.I.)

The Gaussian curve shows the survey curve (survey data colored in red) deviating to the left of the WHO reference curve (green color) meaning that **more children aged 6 to 59 months** assessed were categorized **within poor nutritional status**.

3 World Health Organization, and World Health Organization. Nutrition for Health. WHO child growth standards: growth velocity based on weight, length and head circumference: methods and development. World Health Organization, 2009.

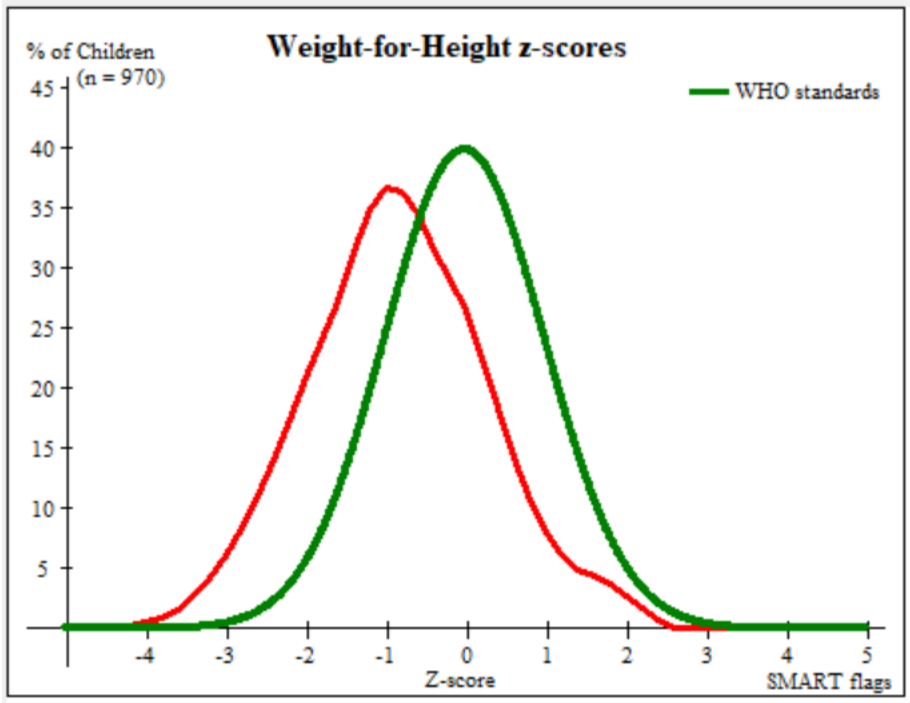


Figure 17: Gaussian Curve

The analysis across age categories reveals varying degrees of malnutrition prevalence. Wasting was consistently observed across all age groups, with the cohort of 54 to 59 months having the highest prevalence of Moderate and severe wasting at 4.1% and 23.3% respectively. No oedema observed across all the age cohorts, indicating a consistent lack of severe acute malnutrition with nutritional oedema.

Table 17: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema

		Severe wasting (<-3 z-score)		**Moderate wasting (>= -3 and <-2 z-score)**		**Normal (> = -2 z score)**		**Oedema**	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	220	8	3.6	15	6.8	197	89.5	0	0.0
18-29	220	1	0.5	29	13.2	190	86.4	0	0.0
30-41	255	6	2.4	30	11.8	219	85.9	0	0.0
42-53	195	5	2.6	28	14.4	162	83.1	0	0.0
54-59	73	3	4.1	17	23.3	53	72.6	0	0.0
Total	**963**	**23**	**2.4**	**119**	**12.4**	**821**	**85.3**	**0**	**0.0**

Table 18: Distribution of acute malnutrition and oedema based on weight-for-height z-scores

	<-3 z-score	**>=-3 z-score**
Oedema present	Marasmic kwashiorkor. 0 (0.0 %)	Kwashiorkor. 0 (0.0 %)

Oedema absent	Marasmic No. 23 (2.4 %)	Not severely malnourished. 947 (97.6 %)

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

Although the sensitivity of MUAC at the WHO-recommended cutoff is low for identifying acute malnutrition in children and MUAC admission criteria to community-based therapeutic programmes and may result in missed opportunities to treat severe condition4, it still remains the leading simple and low-cost method that can easily be applied with minimum training at the community level. It is less susceptible to measurement error than WHZ. The GAM (characterized by MUAC < 125 mm and/or presence of oedema among children 6 to 59 months) and SAM (characterized by MUAC < 115 mm and/or presence of oedema among children 6 to 59 months) prevalence by MUAC in Garissa County were 3.4 % (2.3 - 4.9 95% C.I.) and 0.8 % (0.4 - 1.6 95% C.I.) respectively, a slight deterioration with no significant difference (p=0.3130), compared to GAM and SAM prevalence by MUAC of 2.4 % (1.6 - 3.6 95% C.I.) and 0.4 % (0.1 - 1.1 95% C.I.) respectively reported in July 2023. There was no statistically significant difference between boys and girls who were malnourished by MUAC as shown in table 17.

Table 19: Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex

	All **n = 972**	**Boys** **n = 477**	**Girls** **n = 495**
Prevalence of global malnutrition (< 125 mm and/or oedema)	(33) **3.4 %** (2.3 - 4.9 95% C.I.)	(15) **3.2 %** (1.7 - 5.7 95% C.I.)	(18) **3.6 %** (2.2 - 6.0 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(25) 2.6 % (1.7 - 4.0 95% C.I.)	(10) **2.1 %** (1.0 - 4.5 95% C.I.)	(15) 3.0 % (1.7 - 5.3 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(8) **0.8 %** (0.4 - 1.7 95% C.I.)	(5) **1.1 %** (0.4 - 2.9 95% C.I.)	(3) **0.6 %** (0.2 - 1.9 95% C.I.)

3.2.3.3 Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema

The younger the age category, the bigger the proportion affected by acute malnutrition by MUAC, hence the proportion of those with moderate and severe acute malnutrition by MUAC was high in the age of 6 to 17 months.

Table 20: : Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema

		Severe wasting (< 115 mm)	**Moderate wasting (>= 115 mm and < 125 mm)**	**Normal (> = 125 mm)**	**Oedema**

4 Comparison of Mid-Upper Arm Circumference and Weight-for-Height to Diagnose Severe Acute Malnutrition: A Study in Southern Ethiopia, 11th March 2017

Age (mo)	Total no.	No.	%	No.	%	No.	%	No.	%
6-17	222	5	2.3	13	5.9	204	91.9	0	0.0
18-29	221	1	0.5	4	1.8	215	97.7	0	0.0
30-41	255	2	0.8	5	2.0	248	97.3	0	0.0
42-53	196	0	0.0	3	1.5	192	98.5	0	0.0
54-59	73	0	0.0	0	0.0	73	100.0	0	0.0
Total	967	8	0.8	25	2.6	934	96.6	0	0.0

3.2.3.4 Combined GAM and SAM

Further analysis of the prevalence of combined global acute malnutrition (GAM) and severe acute malnutrition (SAM) among children 6 to 59 months was done considering multiple anthropometric indicators including weight-for-height Z-score (WHZ), mid-upper arm circumference (MUAC), and presence of edema. Overall, the prevalence of combined GAM was 16.4% (13.8 – 19.3 95% C.I.), while the prevalence of combined SAM was 2.7 % (1.7 - 4.2 95% C.I.). When disaggregated by gender, girls had a slightly higher prevalence of both combined GAM (17.2 % (14.0 - 21.0 95% C.I.)) and combined SAM (2.6 % (1.5 - 4.6 95% C.I.)) compared to boys, whose combined GAM and SAM prevalence is 15.5% (11.9 - 20.1 95% C.I.) and 2.7 % (1.5 - 4.9 95% C.I.) respectively. This kind of analysis underscores the importance of considering multiple indicators to accurately assess and address malnutrition among children 6 to 59 months.

Table 21: Prevalence of combined GAM and SAM based on WHZ and MUAC cut off's (and/or oedema) and by sex*

	All n = 970	**Boys** n = 476	**Girls** n = 494
Prevalence of combined GAM (WHZ <-2 and/or MUAC < 125 mm and/or oedema)	(159) **16.4 %** (13.8 - 19.3 95% C.I.)	(74) 15.5 % (11.9 - 20.1 95% C.I.)	(85) 17.2 % (14.0 - 21.0 95% C.I.)
Prevalence of combined SAM (WHZ < -3 and/or MUAC < 115 mm and/or oedema	(26) **2.7 %** (1.7 - 4.2 95% C.I.)	(13) 2.7 % (1.5 - 4.9 95% C.I.)	(13) 2.6 % (1.5 - 4.6 95% C.I.)

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

Table 22: Detailed numbers for combined GAM and SAM

	GAM		**SAM**	
	no.	**%**	**no.**	**%**
MUAC	17	1.8	3	0.3
WHZ	126	13.0	18	1.9
Both	16	1.6	5	0.5
Edema	0	0.0	0	0.0
Total	159	16.4	26	2.7

Total population: 970

3.2.3.5 Chronic Malnutrition Prevalence based on Height-for-Age Z-scores

Stunting refers to a state of being too short for one's age. Stunting is associated with diminished mental abilities and limited physical work capacity, resulting in continued economic hardships for families and Garissa County at large. The causes of stunting are multiple and cuts across different sectors. Studies reveal that there is need to embrace multi-sectoral approaches, which recognize the role of other sectors such as agriculture, water, sanitation, social protection and education in addressing malnutrition in order to address stunting. Further, there's need to support efforts such as Scaling Up Nutrition which has a multi-sectoral approach to addressing stunting.5

Chronic malnutrition, or stunting, among children aged 6-59 months was assessed using height-for-age Z-scores (HAZ). The survey findings revealed stunting prevalence of 8.4% (6.8 – 10.4 95% C.I) and 1.7% (1.1 – 2.8 95% C.I) respectively. The stunting prevalence, which is an observed decrease from 11.0 % (8.9 - 13.5 95% C.I.) reported in July 2023 with no significant difference (p=0.0794), is classified as **low (2.5 - <10)** according to the revised WHO classification on chronic malnutrition. When stratified by gender, boys exhibited a slightly higher prevalence of stunting at 10.4%, compared to 6.2% among girls.

Table 23: Prevalence of Chronic Malnutrition by HAZ by Severity and Sex among Children 6-59 months (SMART exclusions)

Indicator	**All** n = 927	**Boys** n = 458	**Girls** n = 469
Prevalence of **Stunting** (<-2 z-score)	(78) **8.4 %** (6.8 - 10.4 95% C.I.)	(49) 10.7 % (7.8 - 14.4 95% C.I.)	(29) 6.2 % (4.2 - 8.9 95% C.I.)
Prevalence of **moderate Stunting** (<-2 z-score and >=-3 z-score)	(62) 6.7 % (5.3 - 8.4 95% C.I.)	(39) 8.5 % (6.0 - 11.9 95% C.I.)	(23) 4.9 % (3.3 - 7.3 95% C.I.)
Prevalence of **severe Stunting** (<-3 z-score)	(16) **1.7 %** (1.1 - 2.8 95% C.I.)	(10) 2.2 % (1.2 - 4.1 95% C.I.)	(6) 1.3 % (0.6 - 2.7 95% C.I.)

Further analysis of stunting by age cohorts shows that children aged 6 to 17 months have a higher proportion of moderate stunting at 2.4%, while those aged 18 to 29 have a higher proportion of severe stunting at 8.1%.

Table 24: Prevalence of Chronic Malnutrition per HAZ by Severity and Age Group (SMART exclusions)

Age (mo)	Total no.	Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
		No.	**%**	**No.**	**%**	**No.**	**%**
6-17	211	5	2.4	17	8.1	189	89.6
18-29	201	6	3.0	14	7.0	181	90.0

5 Stunting, Wasting, and Micronutrient Deficiency Disorders - Laura E. Caulfield, Stephanie A. Richard, Juan A. Rivera, Philip Musgrove, and Robert E. Black.

30-41	248	4	1.6	17	6.9	227	91.5
42-53	189	1	0.5	8	4.2	180	95.2
54-59	73	0	0.0	5	6.8	68	93.2
Total	**922**	**16**	**1.7**	**61**	**6.6**	**845**	**91.6**

Table 25: Trends in Stunting Prevalence

	2021	**2022**	**2023**	**2024**
Prevalence of stunting (<-2 z-score)	**6.0 %**	**2.2 %**	**11.0 %**	**8.4%**
Prevalence of severe stunting (<-3 z-score)	**0.2 %**	**0.8 %**	**1.2 %**	**1.7%**

3.2.3.6 Prevalence of underweight based on weight-for-age z-scores

Underweight is a composite of acute and chronic malnutrition, a compound index for both WHZ (wasting) and HAZ (stunting) that occurs when a child fails to attain the appropriate weight relative to age. It is defined as inadequate low weight relative to age (weight-for-age z-scores-WHO 2021)6. The survey examined the prevalence of underweight among children aged 6-59 months using weight-for-age Z-scores (WAZ). Results revealed an underweight prevalence of **11.1 %** (8.8 – 13.9 95% C.I.), a slight deterioration compared to 9.7% (7.2 – 12.8 95% C.I.) recorded in July 2023, with no significant difference (p-value is 0.9180). Among these, 10.1% experienced moderate underweight (WAZ between -3 and -2 SD), while 1.0% faced severe underweight (WAZ below -3 SD). Current underweight level is classified as **poor (10 - <20)** according to the revised WHO classification on undernutrition. The prevalence of underweight was slightly higher among boys, with 12.7% classified as underweight compared to 9.6% among girls.

Table 26: Prevalence of Underweight by WAZ by Severity and Sex among Children 6-59 months (WHO exclusions), WHO 2006 Reference

	All **n = 961**	**Boys** **n = 471**	**Girls** **n = 490**
Prevalence of underweight (<-2 z-score)	(107) **11.1 %** (8.8 - 13.9 95% C.I.)	(60) 12.7 % (9.6 - 16.7 95% C.I.)	(47) 9.6 % (7.1 - 12.9 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(97) 10.1 % (8.0 - 12.6 95% C.I.)	(52) 11.0 % (8.4 - 14.4 95% C.I.)	(45) 9.2 % (6.7 - 12.5 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(10) **1.0 %** (0.6 - 1.8 95% C.I.)	(8) 1.7 % (0.9 - 3.2 95% C.I.)	(2) 0.4 % (0.1 - 1.7 95% C.I.)

Analysis by age indicated that age groups of 6 to 17 months were more severely underweight than the rest of the age groups, while those aged between 18 to 29 were more moderately underweight than the other age groups.

6 Malnutrition Key Facts, WHO, March 1, 2024 Issue

Table 27: Prevalence of underweight by age, based on weight-for-age z-scores

		Severe underweight (<-3 z-score)		Moderate underweight (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	219	4	1.8	19	9.1	196	89.5	0	0.0
18-29	217	2	0.9	25	11.5	190	87.6	0	0.0
30-41	253	2	0.8	27	10.7	224	88.5	0	0.0
42-53	195	2	1.0	20	10.2	173	88.7	0	0.0
54-59	73	0	0.0	5	6.8	68	93.2	0	0.0
Total	957	10	1.0	96	10.1	851	88.9	0	0.0

Table 28: Trends in Underweight Prevalence

	2021	**2022**	**2023**	**2024**
Prevalence of underweight (<-2 z-score)	**8.7 %**	**13.6 %**	**9.7 %**	**11.1%**
Prevalence of severe underweight (<-3 z-score)	**1.6 %**	**2.2 %**	**1.6 %**	**1.0%**

3.2.3.7 Prevalence of overweight

Overweight is a condition of excessive fat deposits. For children under 5 years of age, overweight is weight-for-height greater than 2 standard deviations above WHO Child Growth Standards median; and obesity is weight-for-height greater than 3 standard deviations above the WHO Child Growth Standards median7. From the SMART survey findings, overweight prevalence was found to be neglible in Garissa County, at 0.4%, with boys being the only ones recording overweight.

Table 29: Prevalence of overweight based on weight for height cut off's and by sex (no oedema)

	All n = 970	**Boys** n = 476	**Girls** n = 494
Prevalence of overweight (WHZ > 2)	(4) 0.4 % (0.2 - 1.1 95% C.I.)	(4) 0.8 % (0.3 - 2.2 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)
Prevalence of severe overweight (WHZ > 3)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)

Analysis by age indicated that no age group was found to be categorized in severe overweight. However, children in the age category of 18 to 29 months were more moderately underweight than the rest of the age groups.

Table 30: Prevalence of overweight by age, based on weight for height (no oedema)

		Overweight (WHZ > 2)		Severe Overweight (WHZ > 3)	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**
6-17	222	1	0.5	0	0.0

7 Malnutrition Key Facts, WHO, March 1, 2024 Issue

18-29	221	2	0.9	0	0.0
30-41	254	0	0.0	0	0.0
42-53	196	1	0.5	0	0.0
54-59	73	0	0.0	0	0.0
Total	966	4	0.4	0	0.0

3.2.3.7 Trends of Acute Malnutrition Over Time

The current GAM prevalence indicates that acute malnutrition improved from critical to serious (IPC acute malnutrition classification since 2019). Garissa County has been recording critical levels (>15%) of acute malnutrition since 2019 with the highest level being 20.3% reported in July 2022. Stunting levels have remained low except in July 2023 when the levels were medium. The underweight levels have also remained poor (10 - <20) according to the revised WHO classification on undernutrition.

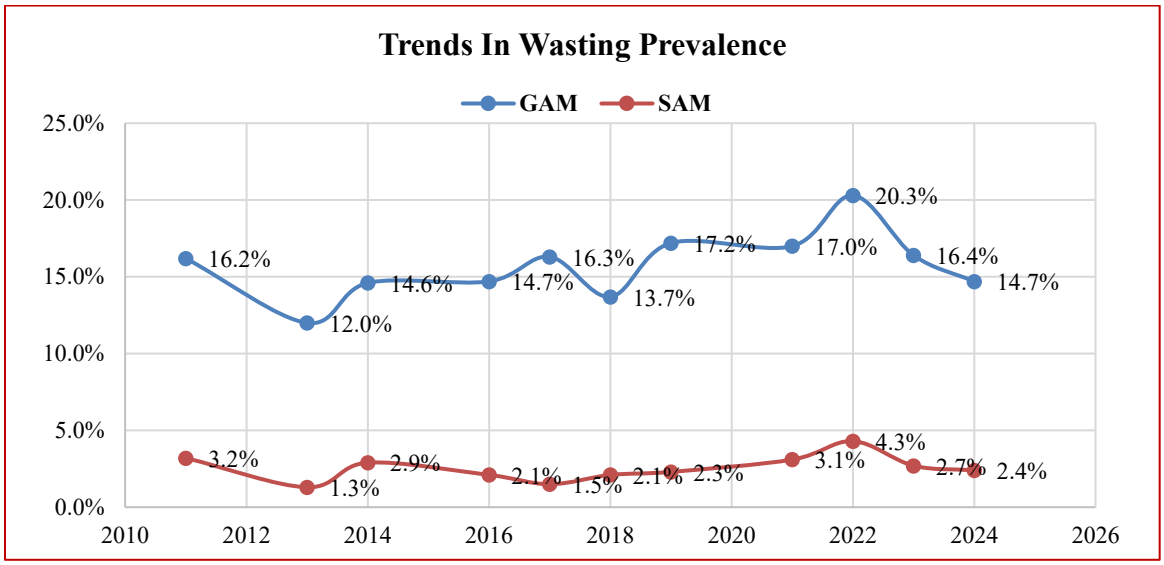


Figure 18: Trends In Wasting Prevalence

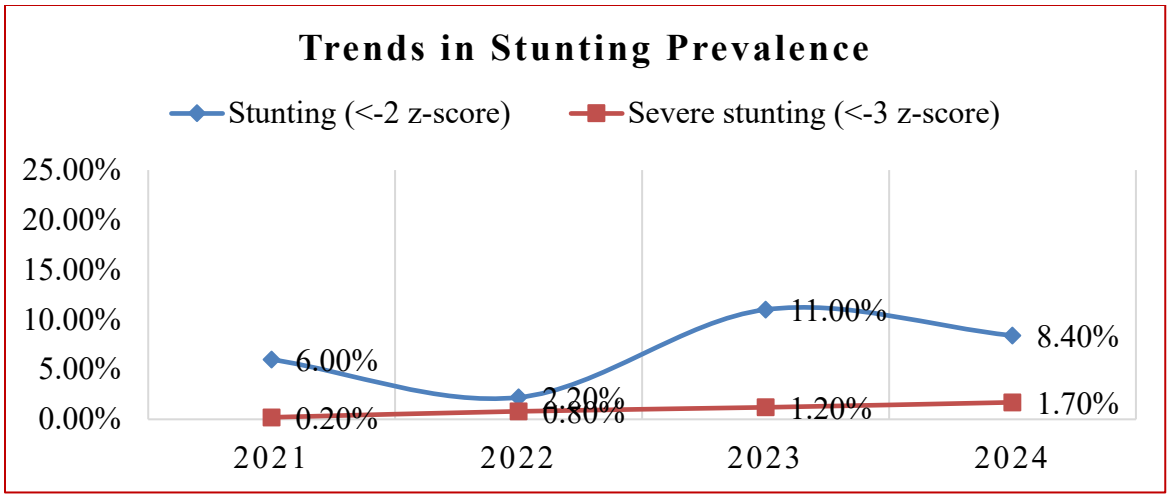


Figure 19: Trends in Stunting Prevalence

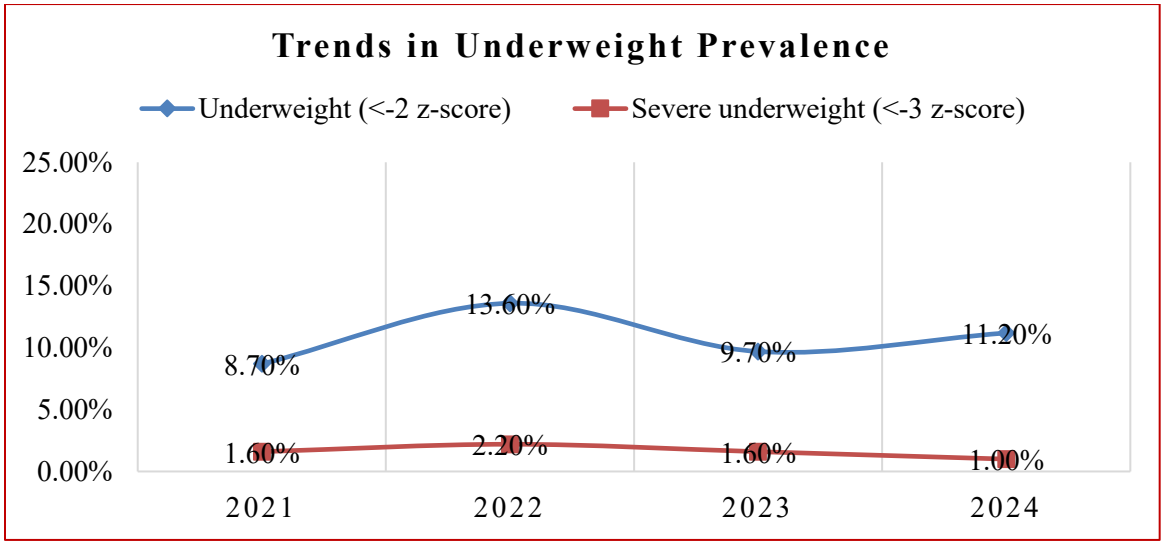


Figure 20: Trends in Underweight Prevalence

3.3 Nutrition and Health

3.3.1 Proxy (Indirect) Coverage for Integrated Management of Acute Malnutrition Program

This involved assessing indirectly IMAM program coverage by confirming whether acutely malnourished children were admitted in the right treatment program for management. 970 children 6 to 59 months assessed for malnutrition using MUAC and weight-for-height z – score. Out of 84 children 6 to 59 months were found to have acute malnutrition only 52 (61.9%) were enrolled in IMAM program for treatment of acute malnutrition, 18 in OTP (32.7%) and 34 in SFP (65.4%). Those found not in program were referred by the survey teams to the nearest health facility offering IMAM services.

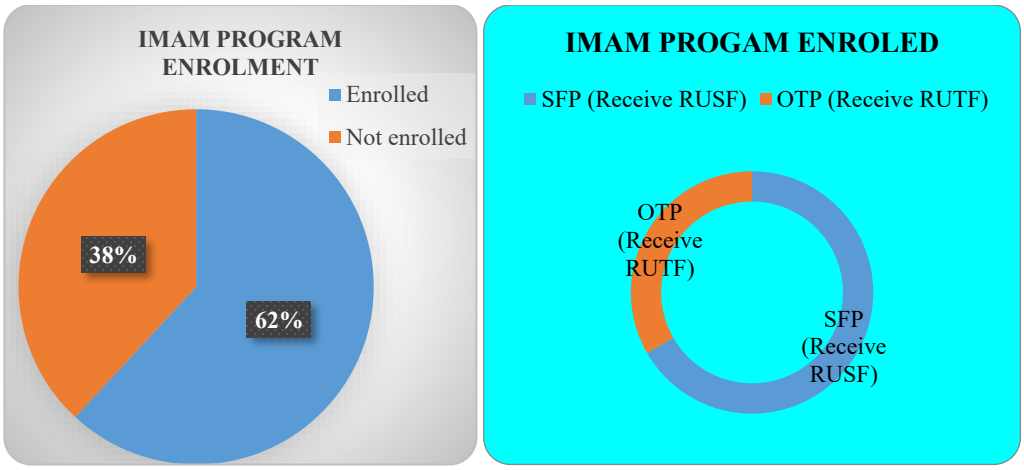


Figure 21: Proportion of malnourished cases enrolled into IMAM program

3.3.2 Child Morbidity

3.3.2.1 Prevalence and Incidence of Child Morbidity

Malnutrition can make a person more susceptible to infection, and infection contributes to malnutrition, which causes a vicious cycle of malnutrition and infections. A sick person's nutrition is further aggravated by diarrhea, mal-absorption, loss of appetite, diversion of nutrients for the immune response, and urinary nitrogen loss, all of which lead to nutrient losses and further damage to defense mechanisms. These, in turn, cause reduced dietary intake. It is important therefore to assess morbidity and whether it had some effect on malnutrition8. Morbidity was assessed among children aged 6-59 months by cross-checking the mother and child health cards if the child was sick in the last 2 weeks. Where the card was missing, inquiry was made to the caregivers to recall whether the child was ill or not in last 14 days. Those who confirmed illness in the past two weeks were further probed on the type illness that affected their children and whether or not they sought any assistance when their child/children were ill and where. Those who indicated that their child/children suffered from watery diarrhea were probed on the kind of treatment that was given to them. The survey showed slight reduction in the proportion of children reporting illness within the past two weeks prior to the Integrated SMART Survey in Garissa from 36.7% in July 2024 to the current 34.5%. There is high incidence of Acute Respiratory Tract Infection (ARI) and Fever with chills like malaria at 78.2% and 31.9% a slight increase compared to 56.6% and 13.7% respectively, reported in July 2023. The incidence of watery diarrhea also observed to increase from 11.0% reported in July 2023 to the current 13.1%.

8 The Interaction between Nutrition and Infection, Peter Katona, Judit Katona-Apte, Clinical Infectious Diseases, Volume 46, Issue 10, 15 May 2008, Pages 1582–1588, https://doi.org/10.1086/587658

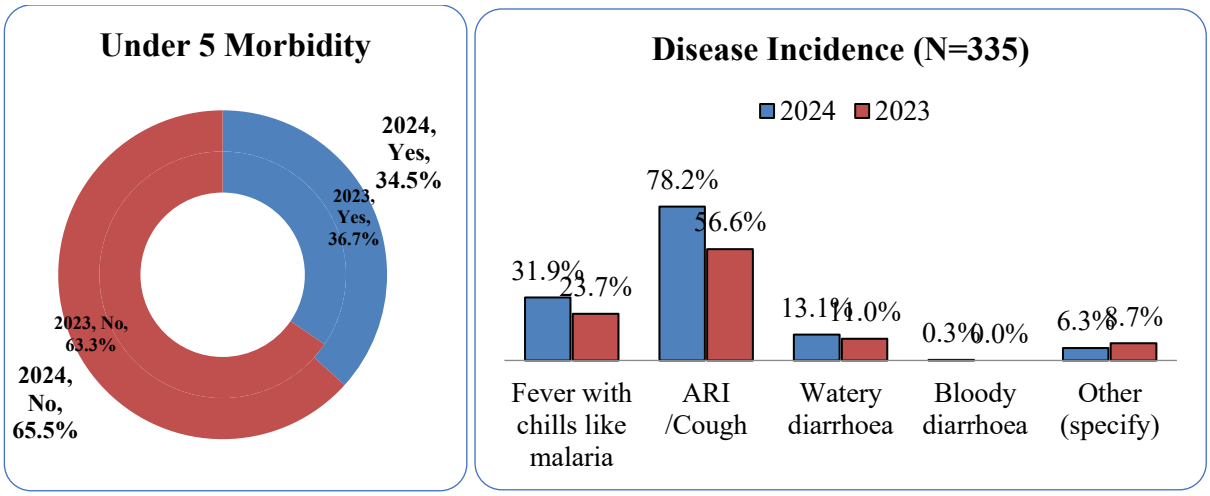


Figure 22: Incidence of Child Morbidity and type of Illiness

Similarly, the most prevalent morbidity reported were ARI/Cough and Fever with chills at 27.0% and 11.0%, with an observed increase compared to 14.7% and 6.2% respectively, reported in July 2023. The prevalence of watery diarrhea also observed to increase from 2.8% reported in July 2023 to the current 4.5%.

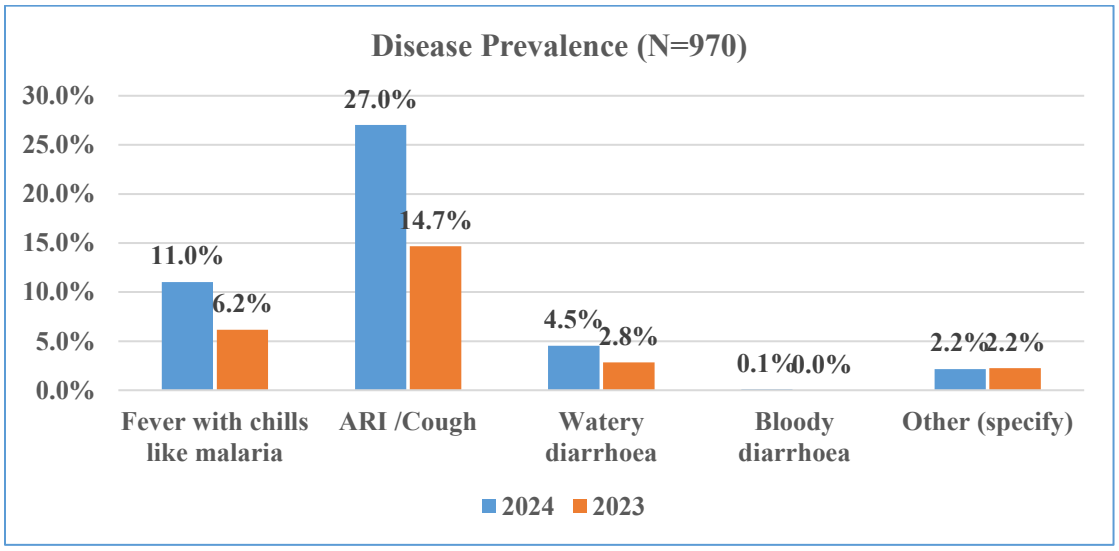


Figure 23: Prevalence of Child Morbidity and type of Illness

3.3.2.2 Health Seeking Behaviour

A bigger proportion of caregivers sought for assistance when their children were ill (335) at 79.7% (267) with 78.3% and 72.2% of children with fever and diarrhea respectively, confirming to seek assistance. The proportion of those who sought medical assistance from public health facilities improved to 61.4% compared to 52% reported in July 2023. Poor health seeking behavior could be attributed to long distances

to health facilities and high transport costs attributed to poor access and distraction of health facilities following the heavy floods experienced during the long rains. In addition, staff shortage sometimes may lead to closure of public health facilities when staff take a break.

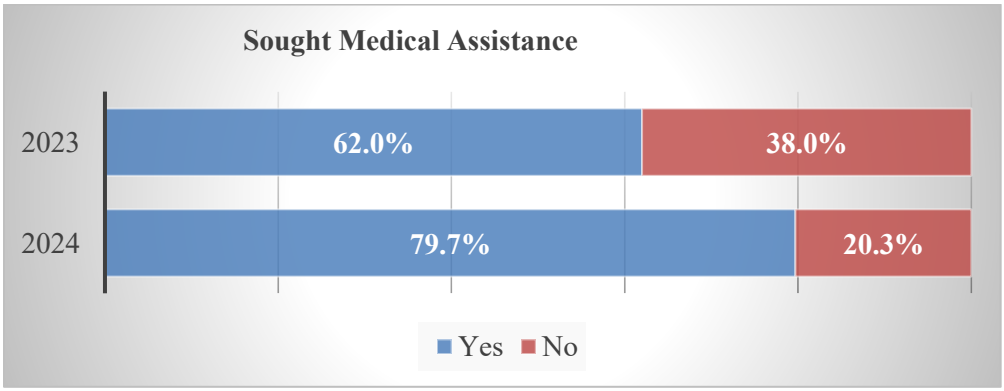


Figure 24: Proportion that sought medical attention

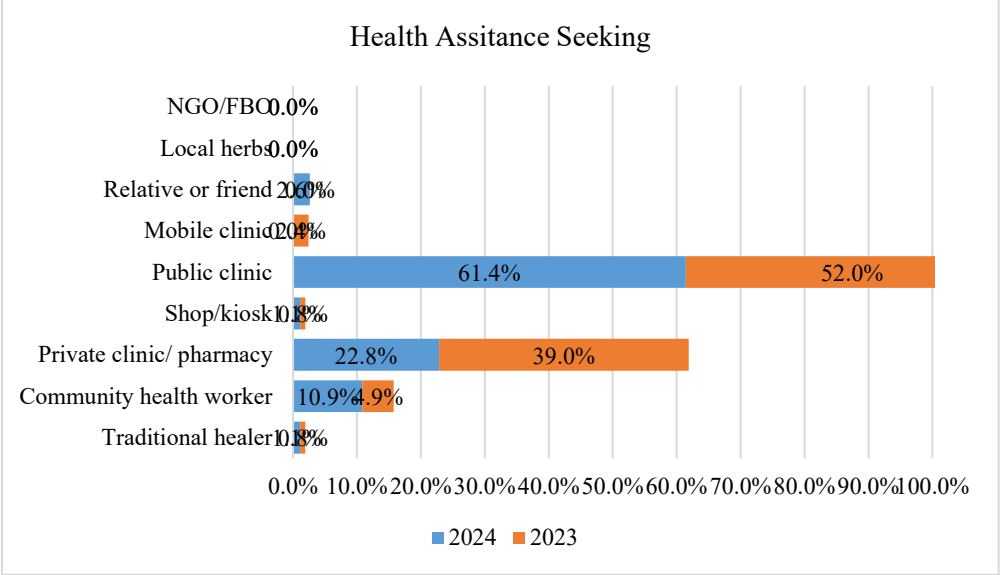


Figure 25: Place of Health assistance seeking

3.3.2.3 Zinc Supplementation in Diarrhea

Zinc supplementation remains a critical intervention for treating diarrheal episodes in children. Studies have shown that administration of zinc along with new low osmolality oral rehydration solutions / salts (ORS), can reduce the duration and severity of diarrheal episodes for up to three months. The World Health Organization (WHO) and UNICEF recommend daily 20 mg zinc supplements for 10 – 14 days for children with acute diarrhea, and 10 mg per day for infants under six months old, to curtail the severity of the episode and prevent further occurrences in the ensuing -two to three months, thereby decreasing the morbidity considerably9.

9 WHO Publication, August 2023

Majority of the caregivers of children who had diarrhea reported to have managed it using ORS only. A very small proportion of the caregivers were managing diarrhea as recommended – ORS and Zinc Tablet. Only 4 out of 10 caregivers (38.6%) of children who had diarrhea reported to have managed it using both Zinc and ORS, as recommended. This is a reduction compared to the previous 50.7% reported in July 2023.

Table 31: Diarrhea Management using Zinc and ORS

Number	**Zinc**	**ORS**	**BOTH**
n	15	17	17
N	44	44	44
Percentage	**Zinc**	**ORS**	**BOTH**
2024	34.1%	38.6%	38.6%
2023	58.2%	50.7%	50.7%

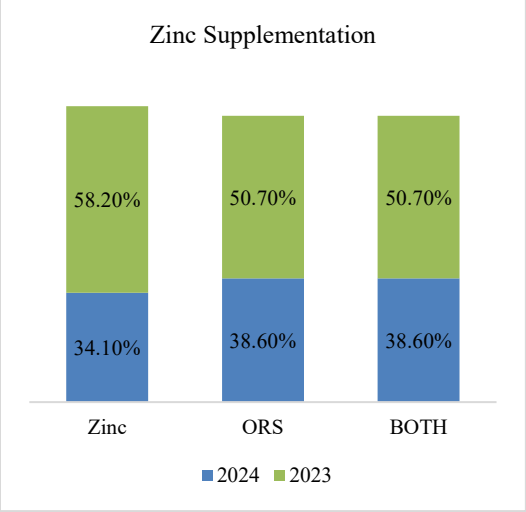


Figure 26: Supplementation in Diarrhea

3.3.3 Immunization

The BCG (Bacillus Calmette-Guérin) vaccine helps protect you against an infection called tuberculosis (TB). It's mainly given to babies and young children who are at higher risk of getting TB. In Kenya, like many countries of the world, TB is still a public health problem hence BCG is given to all children at birth as a matter of policy.10 BCG Immunization in Garissa County remained high above the national target of 80%, at 99.0% (n=990), confirmed by presence of scar.

10 Tuberculosis transmission in Kenya: results of the third National Tuberculin Survey. Kwamanga D, et al. Int J Tuberc Lung Dis. 2010. PMID: 20487606

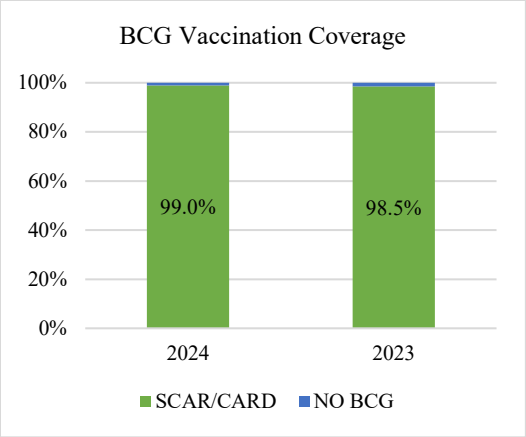


Figure 27: A comparison of BCG Vaccination Coverage

Polio has no treatment and the disease can only be prevented through vaccination. Initial symptoms of the disease are fever, fatigue, headache, vomiting, stiffness of the neck and pain in the limbs. Kenya uses oral polio virus (OPV) vaccine because it is cheap and easy to administer. Two polio vaccine doses confer lifetime immunity.11

Measles is a highly contagious disease caused by a virus. It spreads easily when an infected person breathes, coughs or sneezes. It can cause severe disease, complications, and even death. Measles can affect anyone but is most common in children. Measles infects the respiratory tract and then spreads throughout the body. Being vaccinated is the best way to prevent getting sick with measles or spreading it to other people. The vaccine is safe and helps your body fight off the virus. Globally, an estimated 136 000 people died from measles in 2022 – mostly children under the age of five years, despite the availability of a safe and cost-effective vaccine. Accelerated immunization activities by countries, WHO, the Measles & Rubella Partnership (formerly the Measles & Rubella Initiative), and other international partners successfully prevented an estimated 57 million deaths between 2000–2022. Vaccination decreased estimated measles deaths from 761 000 in 2000 to 136 000 in 202212.

Immunization coverage for both OPV vaccines and Measles antigens are above the national target (80%) with OPV1, OPV3, Measles at 9 months and Measles at 18 months at 99.8%, 96.2%, 95.3% and 84.1% respectively.

11 Ministry of Health, Public Health Department. 2018

12 Measles Vaccination in children 6–59 months of age, WHO webpage

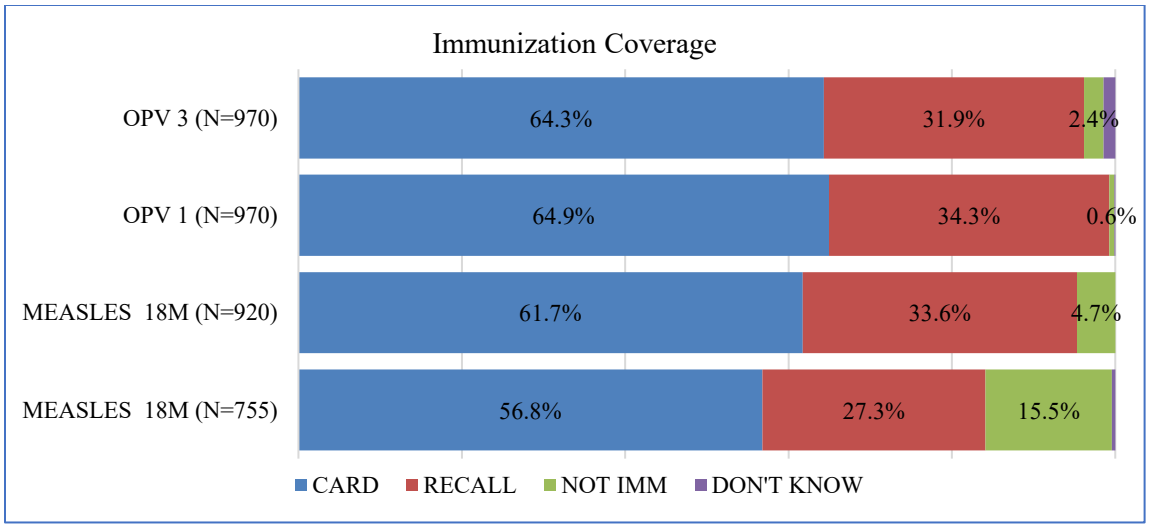


Figure 28: Immunization Coverage for Oral Polio and Measles Vaccine

3.3.4 Vitamin A Supplementation

Vitamin A is essential for the functioning of the immune system and the healthy growth and development of children, and is usually acquired through a healthy diet. Yet, vitamin A deficiency is the leading cause of preventable childhood blindness and increases the risk of death from common childhood infections, such as measles and those causing diarrhoea. In 2013, the World Health Organization classified vitamin A deficiency as a public health problem, as it was affecting about one in three children aged 6 to 59 months, with the highest rates in sub-Saharan Africa and South-East Asia13,14. In areas where vitamin A deficiency is a public health problem, routine vitamin A supplementation is recommended in infants and children 6-59 months of age as a public health intervention,15 and has been shown to reduce the risk of all-cause mortality by 12-24%.16 Kenya's ministry of health recommends that all children 6-59 months be supplemented with vitamin A after every six months. This has successfully been done at the health facility, at the medical outreach sites, community level or at the ECDE centres where VAS has been integrated with routine immunization services and vaccination campaigns. Provision of vitamin A supplements every six months is an inexpensive, quick, and effective way to improve vitamin A status and reduce child morbidity and mortality in the long term.

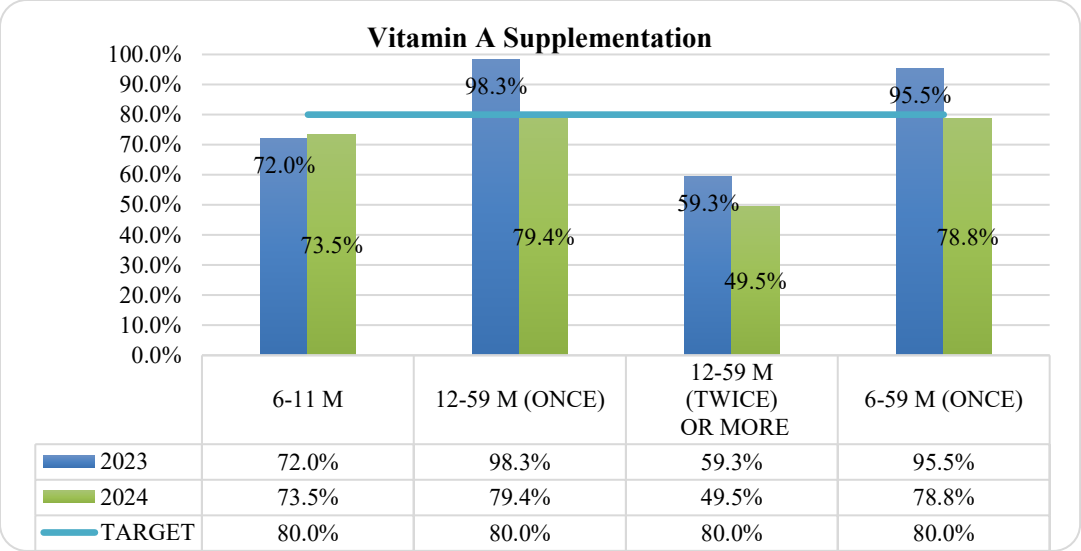
VAS for children aged 6 to 11 months recorded a slight improvement from 72.0% in July 2023 to the current 73.5%. VAS once for 12 – 59 and 6 – 59 months is below the national target of 80.0% at 79.2% and 78.8% respectively. VAS for 12 – 59 months twice or more recorded a further drop from the 59.3% recorded in July 2023 to the current 49.5%.

13 Vitamin A supplementation in infants and children 6–59 months of age, WHO webpage

14 Vitamin A deficiency UNICEF webpage.

15 Vitamin A supplementation for preventing morbidity and mortality in children from 6 months to 5 years of age. Imdad A et al. Cochrane Database of Systematic Reviews, 2010, (12):CD008524

16 WHO Guideline: Vitamin A supplementation in infants and children 6–59 months of age. Geneva, World Health Organization, 2011.



	6-11 M	12-59 M (ONCE)	12-59 M (TWICE) OR MORE	6-59 M (ONCE)
2023	72.0%	98.3%	59.3%	95.5%
2024	73.5%	79.4%	49.5%	78.8%
TARGET	80.0%	80.0%	80.0%	80.0%

Figure 29: Vitamin A Supplementation Coverage

The main source for VAS verification by both recall and card dropped from over 100% and 99% recorded in July 2023 to the current 96% and 81% respectively, while verification from health facility improved from 40% to 67%.

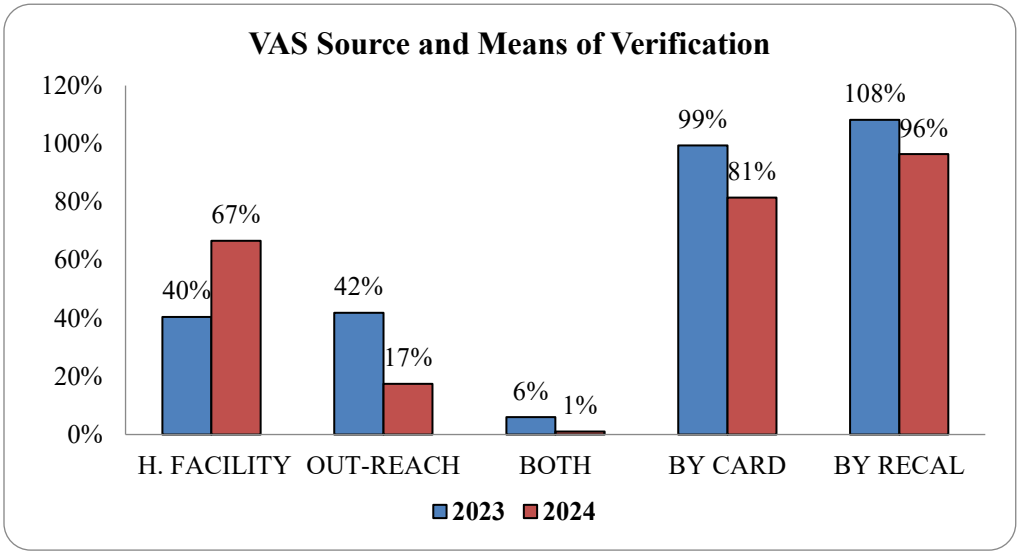


Figure 30: VAS Source and Means of Verification

3.3.5 Deworming

Worms are a very common source of illness for both adults and children, so experts recommend that deworming should be done two times a year, or every six months, beginning at the age of two years. Deworming is the process of eliminating intestinal parasites, such as worms, using medication. In places where soil-transmitted helminths are prevalent, the WHO advises periodic medication treatment to deworm all children. This suggestion is supported by research suggesting that helminths transferred through soil harm children's growth and development, as well as their cognitive growth and future economic

possibilities. According to the WHO, these anti-worm medications (often albendazole or mebendazole) allow school-age children to "earn their way out of poverty" due to the significant effects they have on cognitive and intellectual development. The most widely used deworming medication is called albendazole, and it is a secure method of treating intestinal worms that are used all over the world.17

- Children aged between one and two years should take half a tablet (200 mg), and those aged between 2 and 19 years should take one tablet (400 mg).
- Break and smash the tablets first before giving them (with water) to small children.

From Garissa Integrated SMART Survey, deworming for 12 – 59 months below the national target mark of 80%, at 73.0% slight deterioration from the previous year (74.9%). However, deworming at least twice is performing poorly in the county indicating poor utilization of the service.

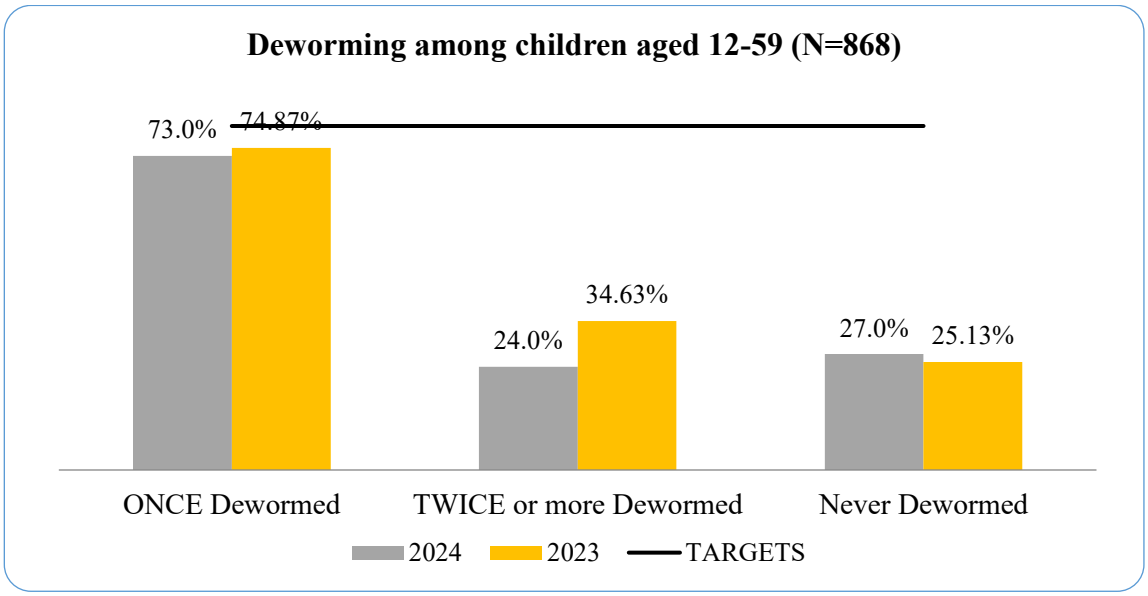


Figure 31: Deworming among children aged 12-59

17 WHO Medical Review Journal, Hansa Bhargava, MD, FAAP, September, 9 2022

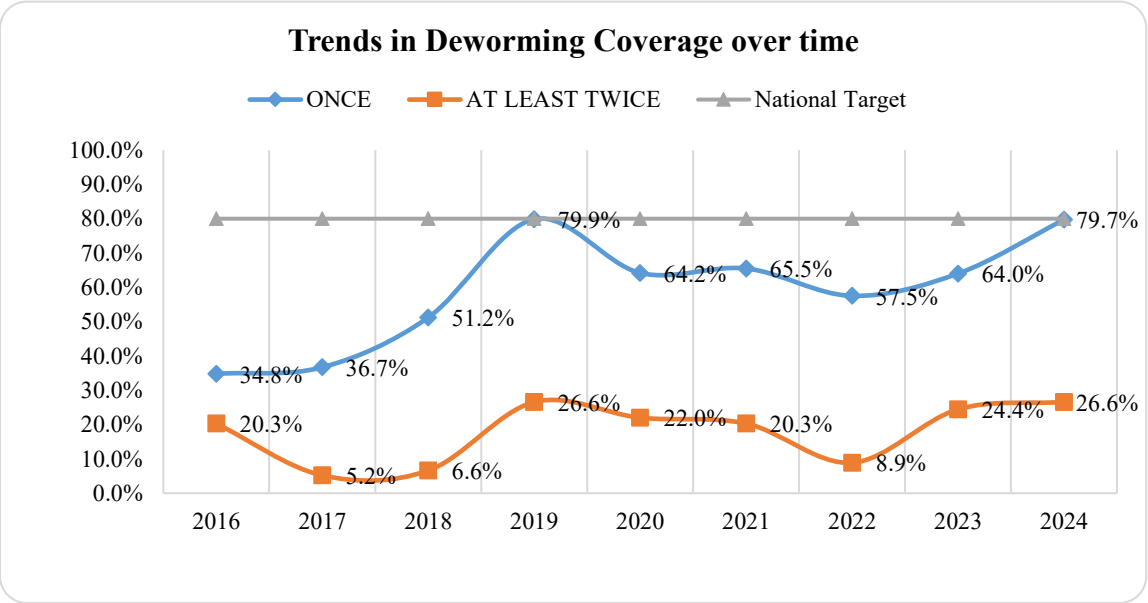


Figure 32: Trends in Deworming Coverage in Garissa over time

3.4 Community Health Services

3.4.1 Household Visitation by Community Health Promoters / Volunteers

Community health services are essential in improving health outcomes, especially in underserved areas. Community Health Promoters (CHPs) formerly Community Health Volunteers (CHVs) are the primary healthcare providers in these areas, providing a wide range of services, including health education, disease prevention, and treatment. CHS provides a cost-effective way of delivering basic health services to communities, reducing the burden on formal health systems. Moreover, CHS helps to improve the quality of healthcare services provided to the community, as CHPs are better placed to understand the specific health needs of their communities. CHPs are the first point of contact for many communities, and they help to reduce the burden on formal health systems by identifying and treating minor illnesses before they become severe. CHS is, therefore, essential in addressing health inequalities by bringing essential health services closer to the people, especially those in rural and underserved areas. CHPs are often the first point of contact for people needing health care, especially in underserved and remote areas and are a cost-effective way to deliver health care. Specifically, they: 1. Visit households to deliver key health messages on health promotion and disease prevention 2. Identify signs and symptoms of diseases, dangers and conditions, manage minor ailments like diarrhoea with support from the community health assistants and refer those outside their scope to the health facility 3. Ensure all households have good WASH status which includes a functional latrine/toilet, hand washing facilities, refuse disposal area and have access to safe drinking water 4. Promote healthcare-seeking behaviour and compliance with treatment and advice 5. Promote appropriate home-based care for the sick, supported by CHAs and link facilities 6. Acts as a link between the community and the health facility.

Garissa Integrated SMART Survey sought to assess household visits by CHPs on coverage and frequency. In addition, Family MUAC (one of the community level interventions supported by CHS) coverage as well as utilization was also assessed.

Table 32: Household Visits by CHPs

Category	n	%
Ever Visited (Coverage)		
YES	433	75.3%
NO	142	24.7%
No. of visits received (Frequency)		
1 visit	217	50.1%
2-4 visit	209	48.3%
5 or more	7	1.6%
0 visits	0	0.0%
Last visit (Visited Last Month)		
Yes	386	89.1%
No	47	10.9%

3.4.2 Family MUAC Coverage

The 'Family MUAC' approach, also known as MUAC for mothers or Mother-MUAC, trains mothers and other caregivers to identify early signs of malnutrition in their children using a simple to use Mid-Upper Arm Circumference (MUAC) tape. By moving this task to mothers (or other family members), who are able to do it as effectively as Community Health Workers (CHWs), the cases are detected earlier, leading to less hospitalizations. Mothers are empowered to manage their children's health and CHWs have more time to carry out other tasks.18

Only 43.4% (N=298) of the caregivers confirmed to have ever seen a family MUAC tape, with 30% (N=209) of these having been sensitized on Family MUAC by the CHPs. 37.9% of those who have ever seen a MUAC tape owned one and all (100%) have used it, with 56.1% of being able to correctly demonstrate the use of a MUAC tape.

Table 33: A Summary of Family MUAC Coverage

Ever seen MUAC Tape	***N***	***%***

18 Blackwell N, Myatt M, Allafort-Duverger T, Balogoun A, Ibrahim A, Briend A. Mothers Understand And Can do it (MUAC): a comparison of mothers and community health workers determining mid-upper arm circumference in 103 children aged from 6 months to 5 years. Arch Public Health. 2015;73(1):26. Published 2015 May 18. doi:10.1186/s13690-015-0074-z

Yes	**298**	**43.4%**
No	388	56.6%
Sensitized on Family MUAC	***N***	***%***
Yes	**209**	**30.5%**
No	477	69.5%
MUAC Tape Availability	***N***	***%***
Yes	**113**	**37.9%**
No	185	62.1%
MUAC Tape Used	***N***	***%***
Yes	**113**	**100.0%**
No	0	0.0%
MUAC Measurement Demonstration	***N***	***%***
Correct Demo	**69**	**56.1%**
Somehow Correct	51	41.5%
Incorrect Demo	3	2.4%

3.5 Maternal Health and Nutrition

3.5.1 Overview

Nutrition plays a major role in maternal and child health and it is widely recognized that optimum nutrition in early life is the foundation for long-term health. A healthy maternal dietary pattern, along with adequate maternal body composition, metabolism and placental nutrient supply, reduces the risk of maternal, fetal and long-term effects in the offspring. While undernutrition is mainly an issue of low-income countries, malnutrition, due to poor quality diet, is becoming a global health problem. Preconception counseling of women of childbearing age should spread awareness of the importance of maternal nutrition before and during pregnancy and should promote a cultural lifestyle change, in favor of a healthy weight before conceiving and balanced healthy diet with high-quality foods consumption. Supplementation and/or fortification can make a contribution when recommended micronutrient intakes are difficult to be met through food alone. In industrialized countries, although a balanced diet is generally accessible, a switch to a high-fat and low-quality diet has led to inadequate vitamin and mineral intake during pregnancy. Evidence do not support a routine multiple micronutrient supplementation but highlights the importance of an individualized approach, in order to recognize nutritional deficiencies of individuals, thus leading to healthful dietary practices prior to conception and eventually to tailored supplementation.19

3.5.2 Physiological status of Women of Reproductive Age

During the survey women were asked about their current physiological status on whether pregnant, lactating, pregnant and still lactating or none. The findings show that; pregnant, lactating and, pregnant and lactating were 11.9%, 42.1%, 1.7% and 44.3% respectively. More than half of the WRA assessed were neither pregnant nor lactating. WRA with children under two were only 38%. The proportion of WRA and PLWs reduced compared to the previous one.

19 The importance of maternal nutrition for health, Vol. 4 No. 2 (2015). https://doi.org/10.7363/040220
Published 2015-10-26 by Irene Cetin+ and Arianna Laoreti+

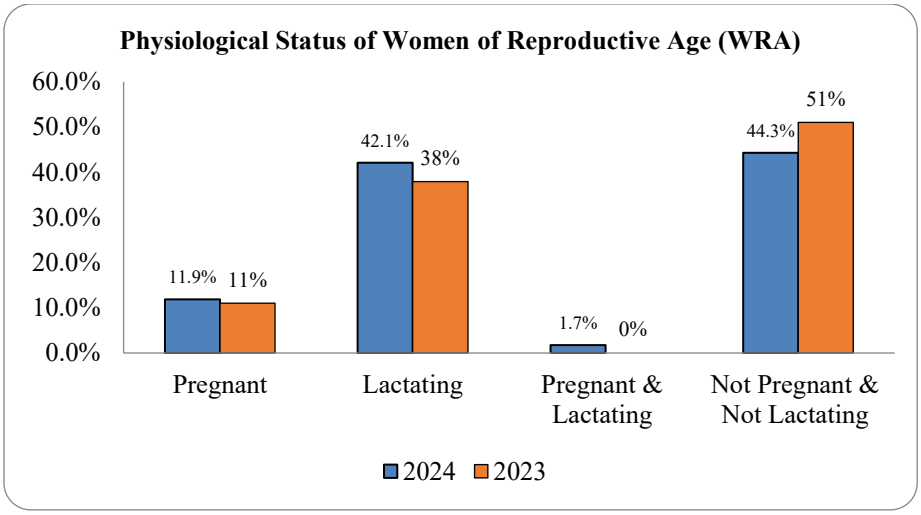


Figure 33: Physiological Status of Women of Reproductive Age (WRA)

3.5.3 Maternal Nutrition Based on Mid Upper Arm Circumference

Nutrition plays an essential role in the human physiology. Women of reproductive age require proper nutrition to improve their reproductive health. Malnutrition among women of reproductive age is an important public health issue with significant implications for maternal and child health. Malnutrition is more likely to affect women and children because of inadequate nutritional intake, unequal food distribution within the home, improper preparation and storage of food, dietary taboos, infectious diseases, and care.

In Garissa Integrated SMART Survey, Maternal nutrition was assessed by measuring the mid upper arm circumference, MUAC, a proxy indicator of maternal nutritional status of all WRA in all sampled households. Based on the survey findings, the prevalence of MUAC <230mm in all WRA and PLWs was 12.7% and 10.8% respectively, while the prevalence of MUAC <210mm in WRA and PLWs was 4.6%% and 4.3% respectively. this shows a slight increase in the proportion of PLWs in both MUAC categories compared to 7.6% for MUAC <230mm and 4.0% for MUAC <210mm reported in July 2023.

Table 34: Nutrition Status of Women of Reproductive Age

PLW	n	2024	2023
<210	15	4.6%	4.8%
<230	41	12.7%	7.4%
WRA	n	%	%
<210	25	4.3%	4.0%
<230	63	10.8%	7.6%

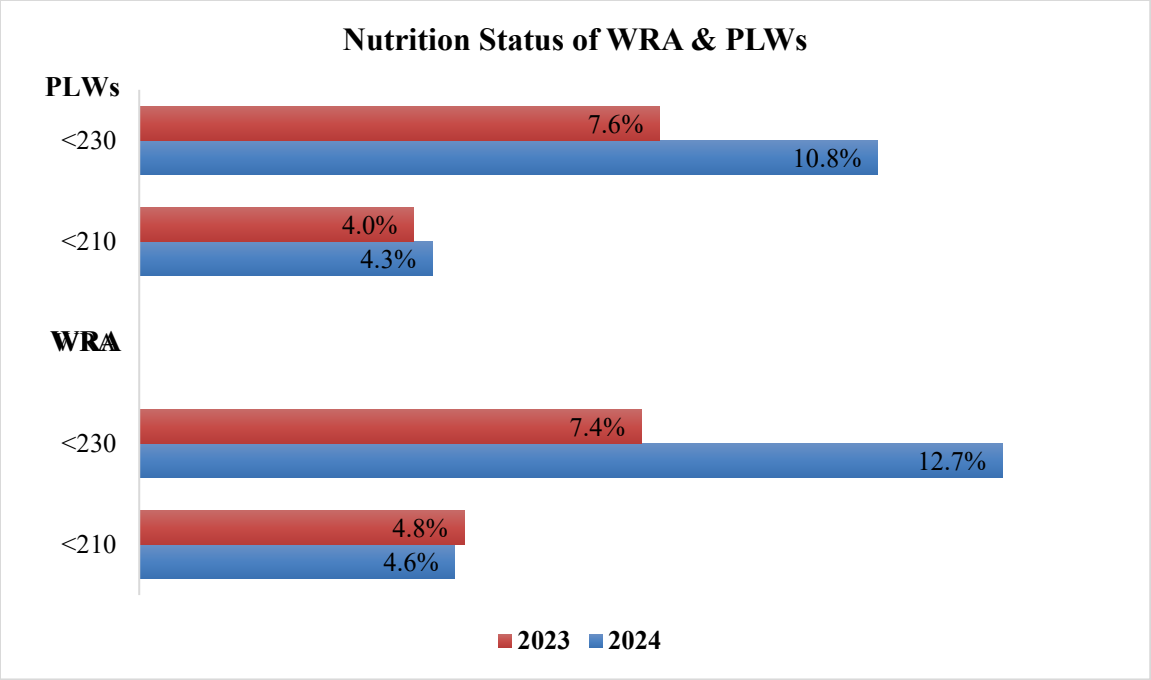


Figure 34: Proportion of Women based on the MUAC categories

3.5.4 Antenatal Care Practices

Antenatal care is essential for protecting the health of women and their unborn children. Through this form of preventive health care, women can learn from skilled health personnel about healthy behaviours during pregnancy, better understand warning signs during pregnancy and childbirth, and receive social, emotional and psychological support at this critical time in their lives. Through antenatal care, pregnant women can also access micronutrient supplementation, treatment for hypertension to prevent eclampsia, as well as immunization against tetanus. Antenatal care can also provide HIV testing and medications to prevent mother-to-child transmission of HIV. In areas where malaria is endemic, health personnel can provide pregnant women with medications and insecticide-treated mosquito nets to help prevent this debilitating and sometimes deadly disease.20

In Garissa County, 95.8% of women confirmed to have attended ANC services during the last pregnancy of their youngest child, an improvement in 2024, compared to 90.7% reported in July 2023. Most of the WRA with under twos reported to have attended their 1st ANC visit during their 2nd trimester, at 60.6%, an improvement compared to 51.4% reported in July 2023. Reduced

20 Antenatal Care Data, January 2024

attendance during the 1st and 3rd trimesters observed in June 2024 survey, at 25.9% and 13.5% compared to July 2023, at 29.3% and 19.2% respectively

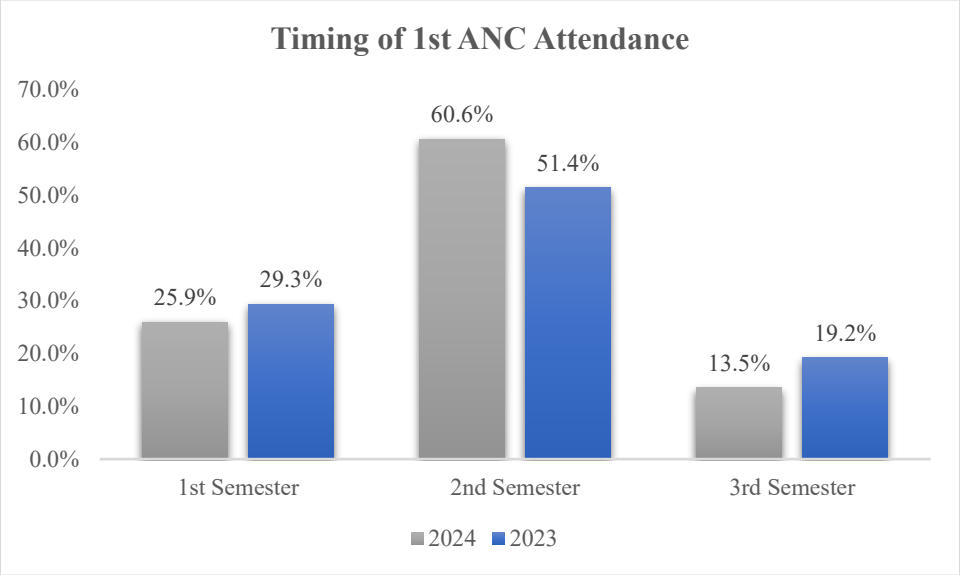


Figure 35: Timing of 1st ANC attendance

Most caregivers confirmed to have received counselling during the ANC visits and were able to identify some of the counseling topics. Majority of the WRA in the smaller proportion that never sought for ANC services during pregnancy cited distance to the service delivery points and lack of awareness of the services as the main reasons for non-attendance.

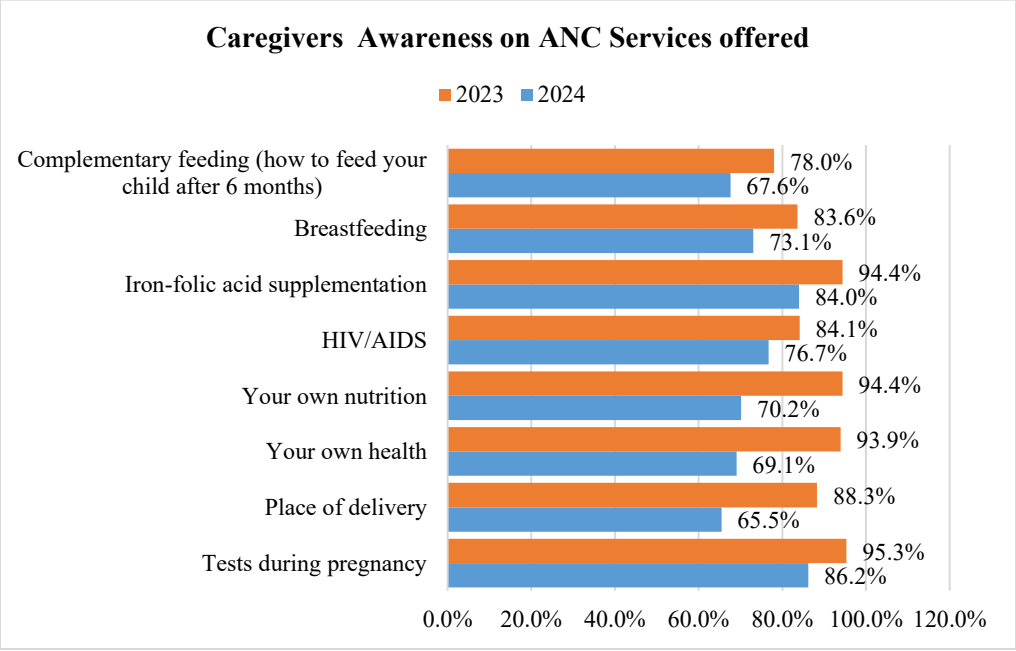


Figure 36: Awareness of ANC Services offered

Table 35: A Summary of Reasons for Not attending ANC Services

REASON FOR NO ANC ATTENDANCE	2024	2023
Not aware of existence / importance of ANC	5	4
Health Facilities are too far	6	16
Heath workers are unfriendly	0	0
TBA service is adequate enough	0	0
Cultural barriers (young or male H. Staff)	0	0
Other	1	2

3.5.5 Iron Folate Supplementation during pregnancy

It is estimated that more than 40% of pregnant women worldwide are anaemic. At least half of this anaemia burden is assumed to be due to iron deficiency. Pregnant women require additional iron and folic acid to meet their own nutritional needs as well as those of the developing fetus. Deficiencies in iron and folic acid during pregnancy can potentially negatively impact the health of the mother, her pregnancy, as well as fetal development. Evidence has shown that the use of iron and folic acid supplements is associated with a reduced risk of iron deficiency and anaemia in pregnant women. Currently, WHO recommends: Daily oral iron and folic acid supplementation with 30 mg to 60 mg of elemental iron* and 400 µg (0.4 mg) folic acid** for pregnant women to prevent maternal anaemia, puerperal sepsis, low birth weight, and preterm birth. (**The equivalent of 60 mg of elemental iron is 300 mg ferrous sulfate heptahydrate, 180 mg ferrous fumarate or 500 mg of ferrous gluconate. ** Folic acid should be commenced as early as possible (ideally before conception) to prevent neural tube defects*).

In Garissa, majority of the caregivers (96.0%) with under twos confirmed through retrospective inquiry having consumed iron folate in their last pregnancy, an improvement from 93.5% reported in July 2023. Most of the assessed mothers sourced their IFAS from public (government) health facilities, at 93.5% a slight decrease compared to 94.5% reported in July 2023. Most mothers with under twos consumed IFAS during pregnancy of the youngest child; at 43.5% and 48.9% in <90 days and between 90-180 days respectively, with a notable improvement in the category consuming 90-180 days from 20.0%. Most mothers consumed IFAS during pregnancy of the youngest child; at 82.9% (N=192) in <90 days, with a notable reduction in the category consuming 90-180 days from 48.9% to 17.3% (N=41).

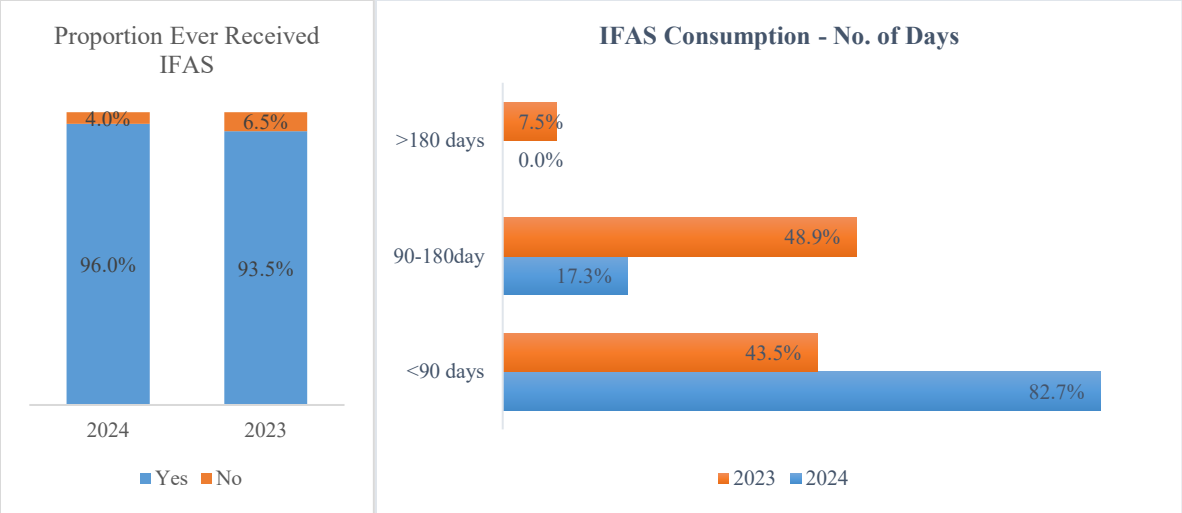


Figure 37: Proportion Ever Received IFAS

Table 36: Reasons For not Consuming IFAS

Reasons	2024	2023
Not given at health facility	0	6
Ignored advise from healthcare worker	4	0
Threw them away	2	1
React to them	4	9
Can't afford to buy	0	0
Other	0	0

3.6 FORTIFICATION

Fortification is the practice of deliberately increasing the content of one or more micronutrients (i.e., vitamins and minerals) in a food or condiment to improve the nutritional quality of the food supply and provide a public health benefit with minimal risk to health. As well as increasing the nutritional content of staple foods, the addition of micronutrients can help to restore the micronutrient content lost during processing. Fortification is an evidence-informed intervention that contributes to the prevention, reduction and control of micronutrient deficiencies. It can be used to correct a demonstrated micronutrient deficiency in the general population (mass or large-scale fortification) or in specific population groups (targeted fortification) such as children, pregnant women and the beneficiaries of social protection programmes. When the vitamins and minerals are not added to the foods during the processing but just before consumption at home or at schools or child-care facilities, it is called point-of-use fortification. Like most countries, the Government of Kenya has developed multiple strategies to reduce impacts of malnutrition especially as a result of micronutrient deficiencies, including supplementation, dietary diversification, bio fortification and industrial fortification of staple foods. Over the last 5 years, Kenya has witnessed a significant increase in the compliance status to food fortification standards with at least a 3-fold increase in compliance over all food vehicles.

During the assessment, Garissa County residents were asked whether they were familiar with the food fortification logo, whether they have seen it on flour brands in the markets and which brands are commonly consumed at household level. The findings show that only 25% (N=170) of the respondents had ever heard about food fortification, majorly through radio and TV related shows (40.6%) and training sessions attended (25.9%).

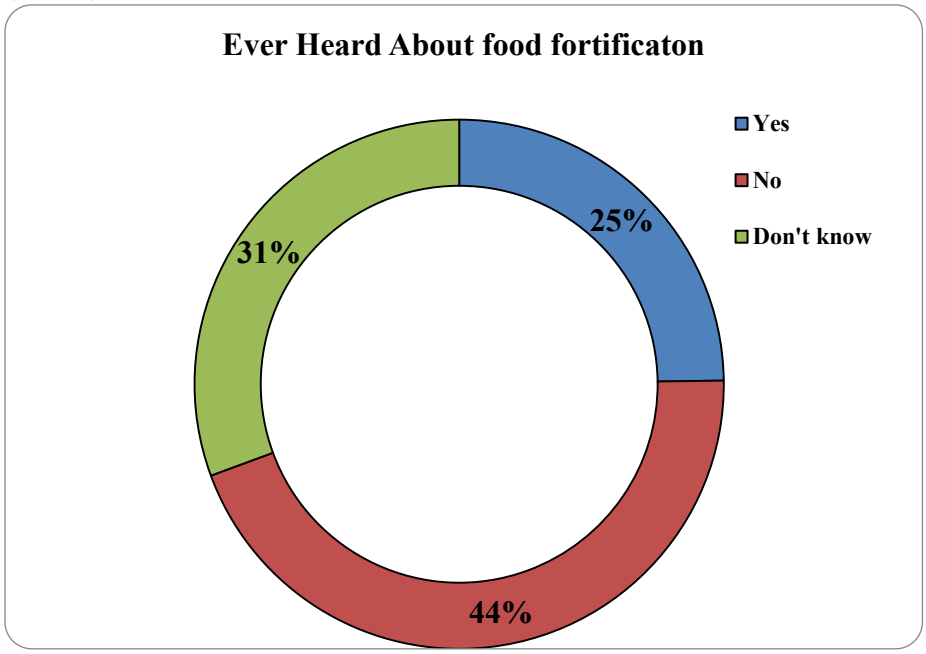


Figure 38: Proportion of respondents that ever Heard About food fortification

More than half of the population in Garissa County is not aware of the Kenyan food fortification logo and only 28% aware of the kinds of foods that are fortified. Almost all the targeted households (99.3%) consumed maize flour purchased from the retailer shops or supermarkets, with a negligible proportion (0.6%) taking maize to the posho mill for milling. The most consumed maize flour brand is Dola (29.8%), wheat flour is Ajab, cooking oil is locally repackaged Salit (48.4%) and locally repackaged sugar (17.0%).

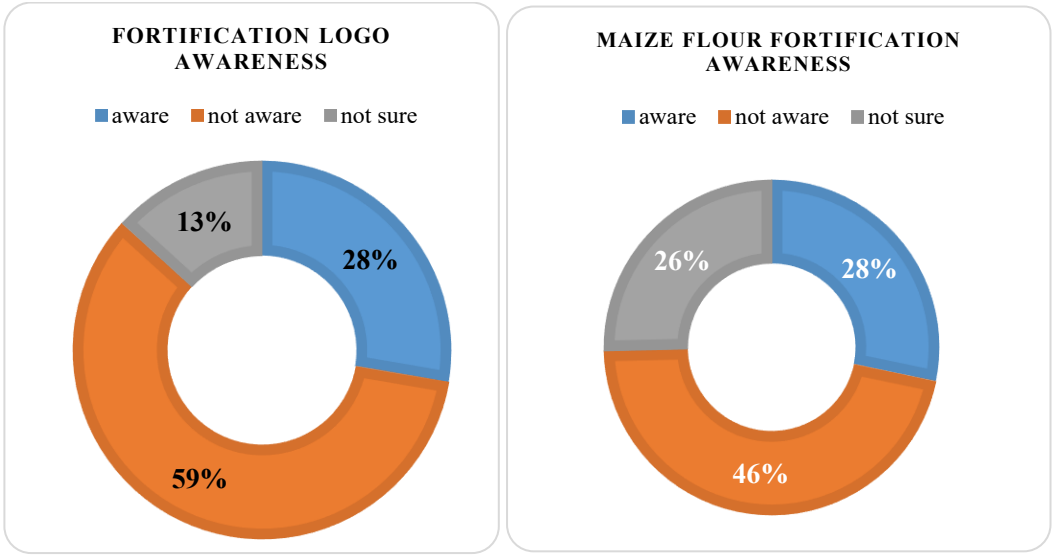


Figure 39: Proportion of respondents aware of the Food Fortification Logo and fortified foods

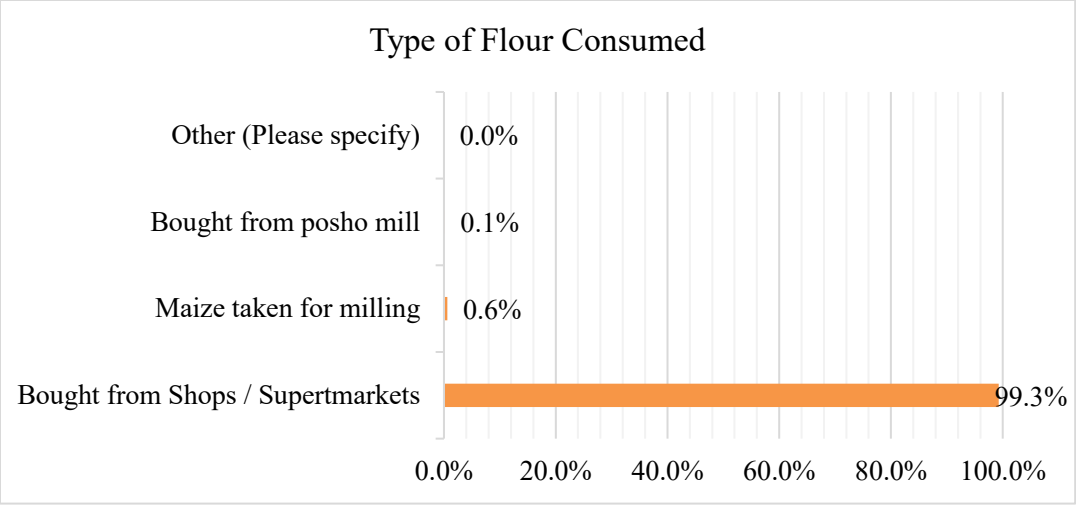


Figure 40: Proportion consuming fortified flour

3.7 WATER SANITATION AND HYGIENE

3.7.1 Water Sources

The main water sources in Garissa County are borehole or protected springs at 36.7% an increase in the proportion of the households fetching water from this particular source compared to the proportion reported in July 2023 at 15.3%. On the other hand, the proportion fetching water from piped water system decreased from 42.1% reported in July 2023 to the current 25.8%. A significant decrease in the proportion of households sourcing water from earth pan observed from 23.8% in July 2023 to the current 13.6%. In addition, there's reduction in the proportion depending water trucking from 11.4% reported in July 2023 to the current 7.1%.

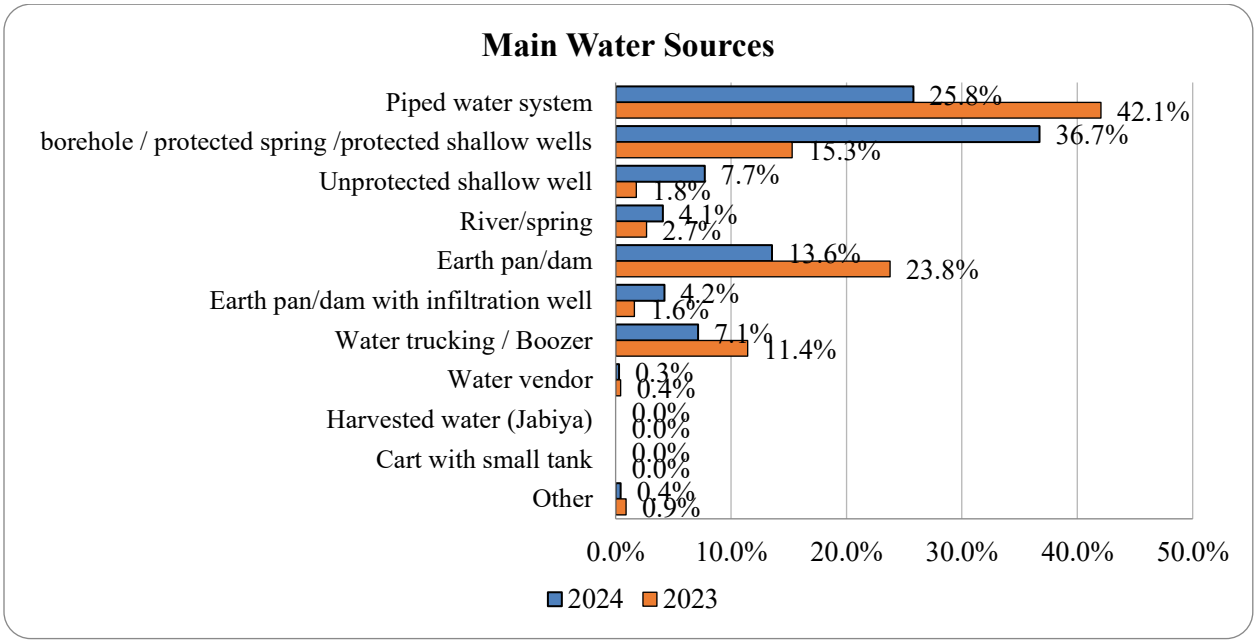


Figure 41: Proportion of Households fetching water from the main water sources

Overall, the proportion of households fetching water from safe water sources in Garissa slightly reduced from 63% reported in July 2023 to the current 57.4%. This is attributed to floods that led to destruction of some piping systems.

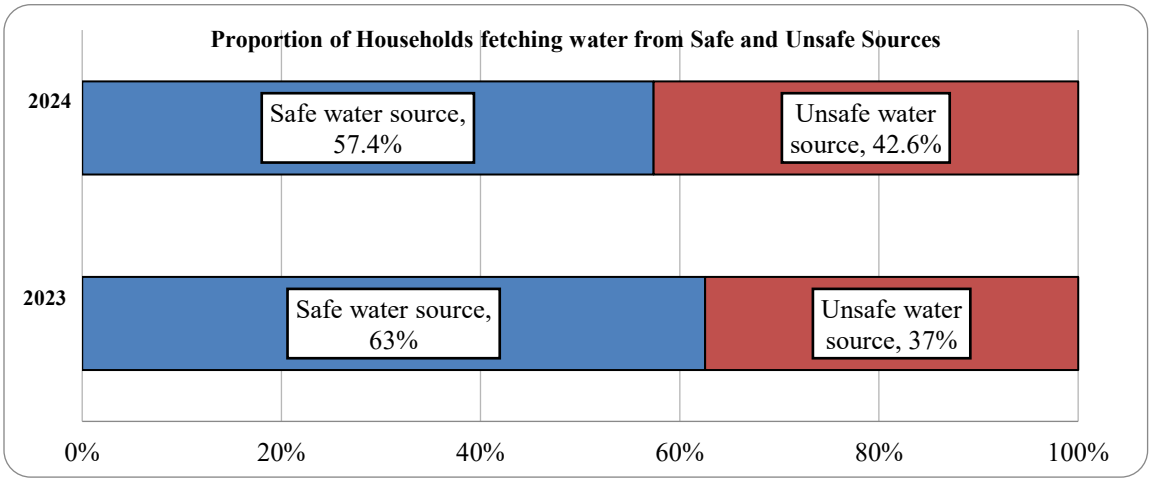


Figure 42: Proportion of Households fetching water from Safe and Unsafe Sources

3.7.2 Return Distance to and Queuing Time in the main water source

In the developing world, fetching water for drinking and other household uses is a substantial burden that affects water quantity and quality in the household. Many households in the developing world, especially in rural areas in sub-Saharan Africa, lack piped water or access to nearby community water sources. Long distances must often be traversed to collect water, particularly from an "improved" water source for drinking and other household needs. The fetching of water can represent a substantial physical and economic burden that predominantly affects women and children. Households with travel times greater than 30 minutes have been shown to collect progressively less water. Limited water availability may also reduce the amount of water that is used for hygiene in the household.[21]

The proportion of households who spent a return distance of more than 2 kilometers (>2km) to the water source increased from 2.6% reported in July 2023 to the current 7.3%, while the proportion walking between 500m to 2km slightly reduced from 66.4% reported in July 2023 to the current 63.1%. The proportion of households queuing for water has remained the same. The increased distance of more than 2 kilometers (>2km) to the water source is attributed destruction of some water sources following heavy flooding, despite expected adequate recharge.

Table 37: Return Distance to and Queuing Time in the main water source

Distance travelled	***2023***	***2024***	
<500m (<15 min)	66.4%	425	63.2%
0.5 TO 2km (15 to 1 hour)	31.1%	198	29.5%

21 United Nations The Post 2015 Water Thematic Consultation: Recognition of Outcomes, High Level Forum–World Water Day. 2013. http://www.unwater.org/downloads/Final9Aug2013_WATER_THEMATIC_CONSULTATION_REPORT.pdf Available at. [Ref list]

>2 km (1 – 2 hrs)	2.6%	49	7.3%
Others	0.0%	0	0.0%
Do you Queue for Water	***Yes***	***No***	
n	143	543	
2023	23.5%	76.5%	
2024	23.5%	76.5%	
How Long Do you Queue	***n***	***2024***	***2023***
Less than 30 minutes	88	61.5%	50.72%
30-60 minutes	37	25.9%	43.48%
More than 1 hour	18	12.6%	5.80%

3.7.3 Water Storage and Treatment

Household water treatment and safe storage (HWTS) is an important public health intervention to improve the quality of drinking-water and reduce diarrheal disease, particularly among those who rely on water from unimproved sources, and in some cases, unsafe or unreliable piped water supplies. Further, safe drinking-water is an immediate priority in most emergencies including floods and drought emergency, and HWTS can be an effective emergency response intervention. Water treatment makes an immediate difference to the lives of those who rely on water from polluted rivers, lakes and, in some cases, unsafe wells or piped water supplies.

From the survey findings, a significant decrease in the proportion of households storing water in closed containers from 78.5% in July 2023 to the current 56.7%.

Table 38: Safe and Unsafe Water Storage

Water Storage System	No of Households	2024	2023
Open container / Jerrican /brika	297	43.3%	21.5%
Closed container / Jerrican /brika	389	56.7%	78.5%

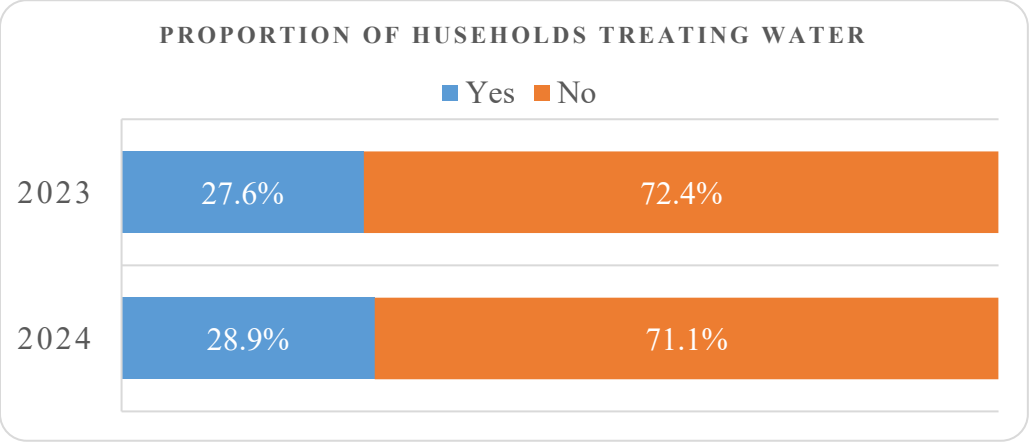


Figure 43: Water Storage System

There was observed a slight increase in the proportion of households treating water from 27.6% in July 2023 to the current 28.9%. Majority (57.1%) were using chemicals to treat water currently, a significant decrease from 80.1% reported in July 2023. Lack of the water treatment chemicals was cited as the major reason by most households (58.8%) for not treating their drinking water.

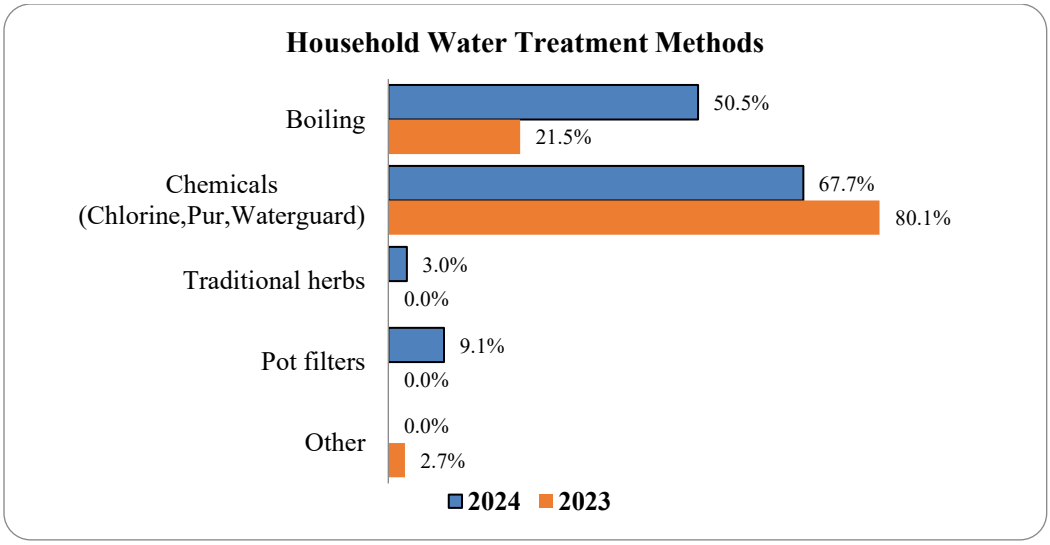


Figure 44: Household Water Treatment Methods

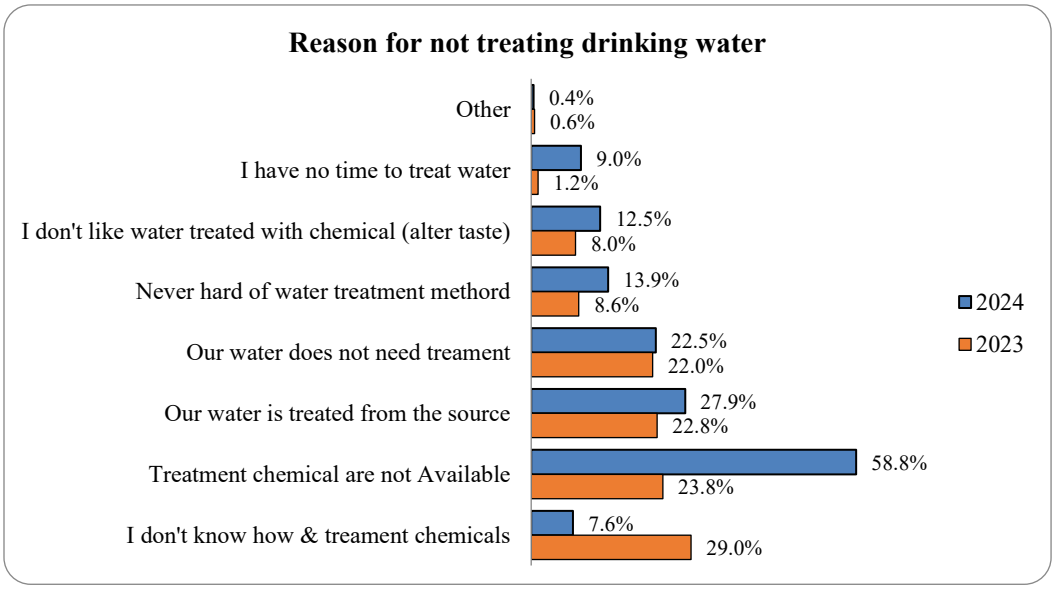


Figure 45: Reason for not treating drinking water

3.7.4 Water Consumption and Purchase

The findings showed that 55% of the surveyed households in Garissa County were purchasing water either per 20 litre Jerrican or monthly bills, a slight decrease in the proportion reported in July 2023 at 59.3%. The proportions of households purchasing water @Ksh. 18 per 20l jerrican were 24.7%, an increase in the cost compared to @Ksh. 13 per 20l jerrican reported in July 2023, while the rest were paying for water monthly at an average of Ksh. 1,749, a decrease in the average cost compared to Ksh. 1,786 reported in July 2023. Only 28.9% households are consuming the recommended amount of water of equal to or more than 15l/p/day as per the SPHERE indicator threshold, a slight improvement compared to 24.7% reported in July 2023.

Table 39: A Summary of Water Purchase

	2024	2023
Proportion of Households purchasing water		
Yes	55.0% ***(N=377)***	59.3%
No	45.0% ***(N=309)***	40.7%
Water purchase method		
20 liter Jerrican	@Ksh. 18 (24.7%)	@Ksh. 13 (53.6%)
Monthly Bill	@Ksh. 1,749 (75.3%)	@Ksh. 1,786 (46.4%)
Proportion of Per Capita Water Consumption		
<15l/p/p/d	71.1%	75.3%
Equal or >15l/p/p/d	28.9%	24.7%

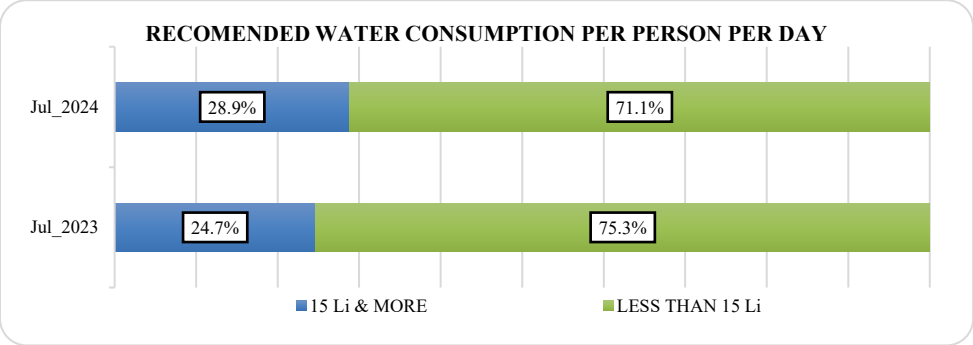


Figure 46: Proportion of Per Capita Water Consumption

3.7.5 Sanitation Practices

Diarrhea remains a major killer but is largely preventable. Better water, sanitation, and hygiene could prevent the deaths among children aged under 5 years, 395 000 in the year 2019. Open defecation perpetuates a vicious cycle of disease and poverty. The countries where open defection is most widespread have the highest number of deaths of children aged under 5 years as well as the highest levels of malnutrition and poverty, and big disparities of wealth. Appropriate sanitation practices are crucial in reducing food and waterborne diseases.22. The survey showed high proportion of households (30.0%), practiced open defecation, 65.5% used latrines while 2.8% used flush toilets. Open defecation reduced slightly from 39.7% to 30.0%. The poor sanitation practices could be attributed to migration and cultural beliefs making open defecation socially acceptable in the county especially the nomadic-pastoral communities.

Table 40: Proportion of Households for various relieving points

	n	**2024**	**2023**
Pit latrine	449	65.5%	54.5%
Flush / pour flush	19	2.8%	2.7%
Composting toilet	1	0.1%	0.0%
Bucket	0	0.0%	0.0%
Hanging toilet / hanging latrine	1	0.1%	0.4%

22 Spears D, Ghosh A, Cumming O (2013) Correction: Open Defecation and Childhood Stunting in India: An Ecological Analysis of New Data from 112 Districts. PLoS ONE 8(9)

No facility / bush / field	206	30.0%	39.7%
Other	10	1.5%	2.7%

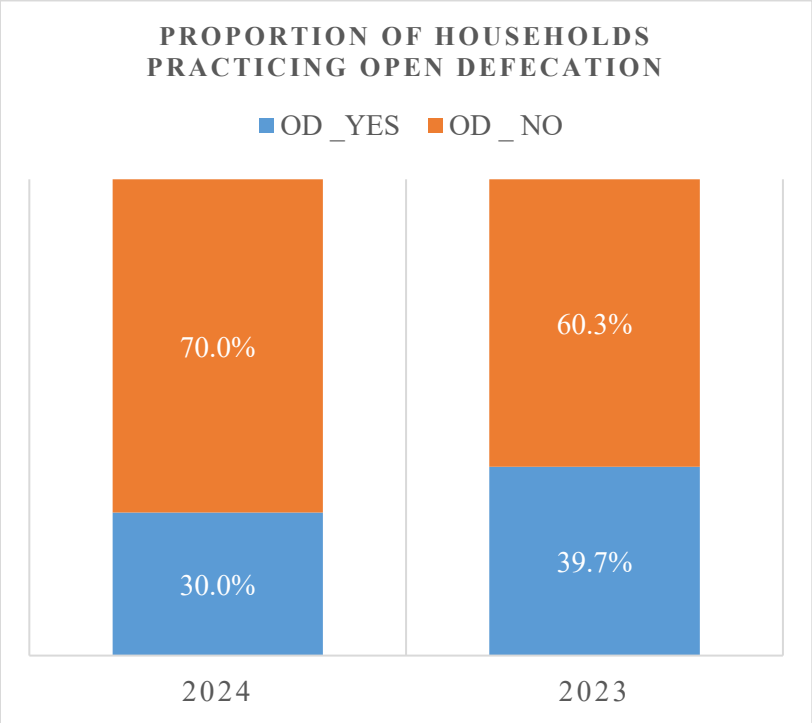


Figure 47: Proportion of households practicing Open Defecation

3.7.6 Hygiene Practices

Handwashing is a single most preventive measure for reducing the spread of contagious diseases since human hands are among the chief vehicles for transmitting infections especially diarrhea. But handwashing compliance remains a challenge all over the world. Without good handwashing practice, diseases such as diarrhea should not be expected to be reduced whereas reduction of this infection is the ultimate goal of handwashing promotion. The promotion of appropriate hand hygiene practice has been recognized as an important public health measure due to its significant contribution to preventing and controlling of most infectious diseases. The hands are central to many of our daily activities and the use of contaminated hands for cooking and eating enhances the transmission of contaminants/germs into the body through food, thereby causing different diseases. Handwashing was related to diarrhea, which is the second-largest cause of childhood mortality in developing countries. Globally, approximately 88% of deaths associated with diarrhea are the result of unsafe water, inadequate sanitation and inadequate hygiene conditions. The burden of communicable diseases in low/middle-income countries is largely driven by poor personal hygiene practices. Poor hand hygiene is estimated to result in almost 300 000 deaths each year, with the majority of deaths occurring in children under 5 years of age.23

23 Determinants of handwashing practice and its associated factors among mothers of under-5 children in Kolladiba town, Northwest Ethiopia: cross-sectional study. http://orcid.org/0000-0002-1265-6803Maereg Wolde1, Meshehsa Abate2, Gebremeskel Mandefro2, Ezedin Beru2, http://orcid.org/0000-0002-1906-9687Aysheshim Kassahun3, http://orcid.org/0000-0001-6812-1659Getayeneh Antehunegn Tesema4

Handwashing awareness in Garissa County increased from 59.1% to 76.5%, while handwashing practice has slightly increased from 14.1% reported in July 2023 to 15.3%, though still very low, indicating poor handwashing compliance. Handwashing with soap and water practice has also improved from 10.6% reported in July 2023 to the current 15.3%, though still very low.

HANDWASHING AWARENESS	**n**	**2024**	**2023**
Proportion of Households Aware of Critical Handwashing Times			
Yes	525	76.5%	59.1%
No	121	17.6%	19.8%
Don't know	40	5.8%	21.1%
Critical Handwashing times Awareness	***n***	***2024***	***2023***
After toilet	478	91.0%	99.2%
Before cooking	416	79.2%	74.1%
Before eating	497	94.7%	98.0%
After taking children to the toilet	375	71.4%	59.5%
At 4 critical times	300	57.1%	53.0%
Soap and water	336	64.0%	56.5%
Others (At Prayer time)	0	0.0%	0.0%
HANDWASHING PRACTICE			
Handwashing Practice With or Without Awareness	***n***	***2024***	***2023***
After toilet	595	27.1%	30.0%
Before cooking	523	23.8%	23.1%
Before eating	648	29.5%	30.9%
After taking children to the toilet	430	19.6%	15.9%
At 4 critical times	350	15.9%	14.1%
Soap and water	336	15.3%	10.6%
Others (At Prayer time)	0	0.0%	0.0%

3.8 Food Security and Livelihoods

3.8.1 Food Security Information

Food security exists when all people at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. A person is considered nutrition secure when she or he has a nutritionally adequate diet and the food consumed is biologically utilized such that adequate performance is maintained in growth, resisting or recovering from disease, pregnancy, lactation and physical work.24The indicators used to measure food security in the survey included FCS, rCSI, IDDS for WRA, HDDS and Household Hunger Scale (HHS).

The Early Warning Information System indicated an improved food security situation in Garissa County that could translate to improved household food security. This was attributed to improved water, pasture and milk availability following good performance of the March to May 2023 long rains. However, the

24http://www.fao.org/fileadmin/user_upload/food-security-capacity-building/docs/Nutrition/NairobiWorkshop/5.WFP_IndicatorsFSandNutIntegration.pdf Food security indicators

effects of the enhanced El nino rains which resulted to heavy flooding affecting most road infrastructures leading to inaccessibility to food and livestock markets, increased food prices and reduced market prices for livestock, could contribute majorly to slow improvement in the household food security (NDMA Bulletin May 2024).

3.8.2 Household Dietary Diversity Score

Household dietary diversity Score (HDDS) is a qualitative measure of food consumption that reflects household access to a variety of foods. The Household Dietary Diversity Score (HDDS) indicator assesses a household's economic access to food (i.e. its ability to produce, purchase or otherwise secure food for consumption by all household members). It does not provide data on the nutritional quality of a person's diet. A total of 16 food groups later aggregated to 12 were assessed. There is an improvement on the HDD score from 42.8% reported in July 2023 to the current 47.6% where households consumed more than five food groups. The food groups consumed in bigger proportions by households in Garissa County in a 24-hour recall were cereals, oils/fats, pulses/legumes and milk with fruits, Eggs and meats being least consumed food groups.

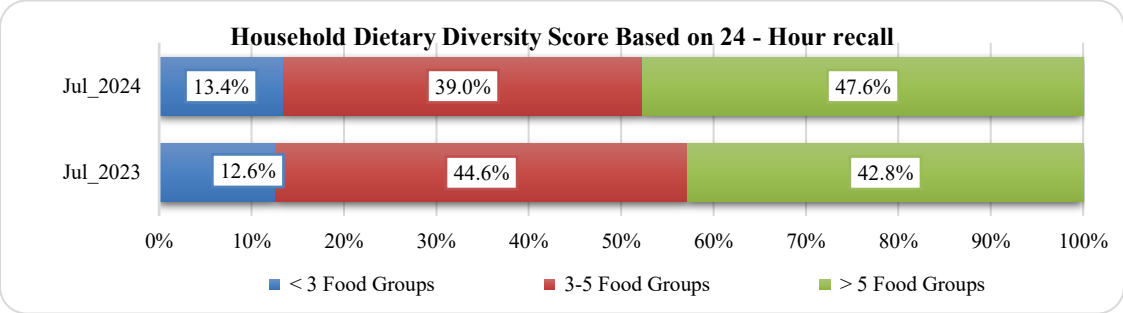


Figure 48: Household Dietary Diversity Score

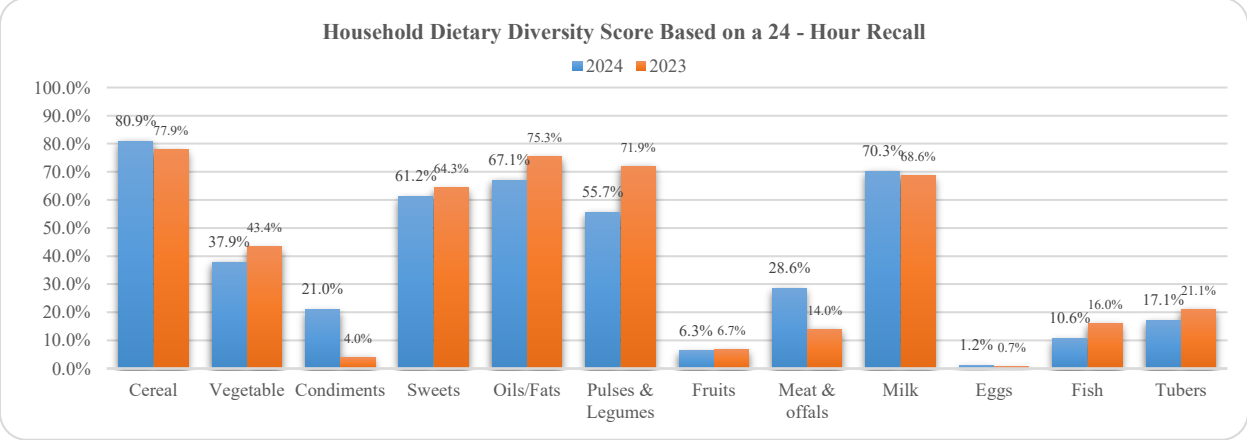


Figure 49: Proportion of household consumption per Food group

3.8.2.1 Micronutrient Consumption from Household Dietary Diversity

The most frequently (6-7 days) consumed food groups are staple and iron rich foods as reported by 97.4% and 67.5% households respectively, with a notable improvement in frequency of consumption of iron rich

foods compared to July 2023. However, Vitamin A rich food were poorly consumed with only 26.7% of the population consuming for six (6) or more days. Poor consumption of Vitamin A rich foods is highly associated to low availability and access of Vitamin A rich foods coupled with high market prices.

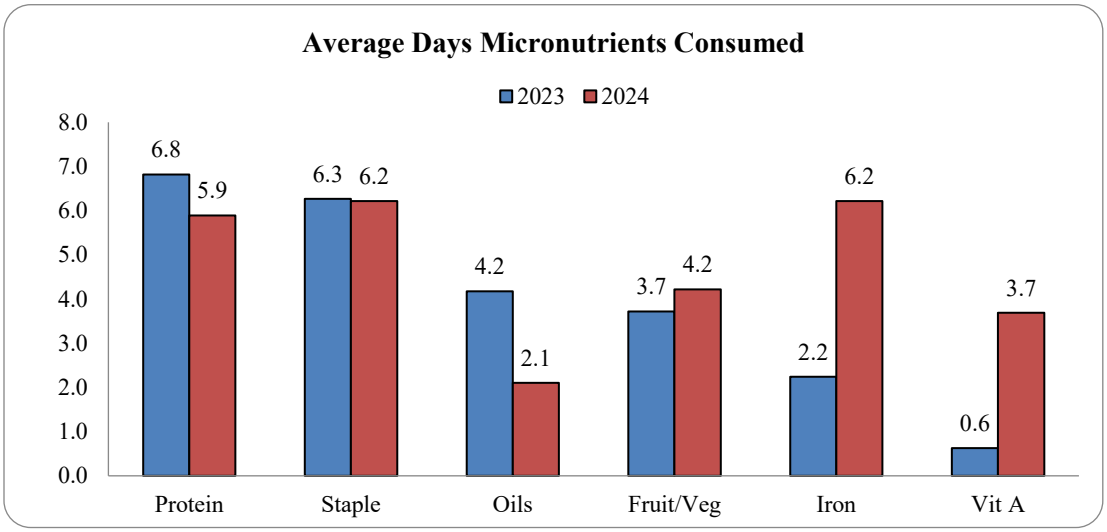


Figure 50: Average Days Micronutrients Consumed

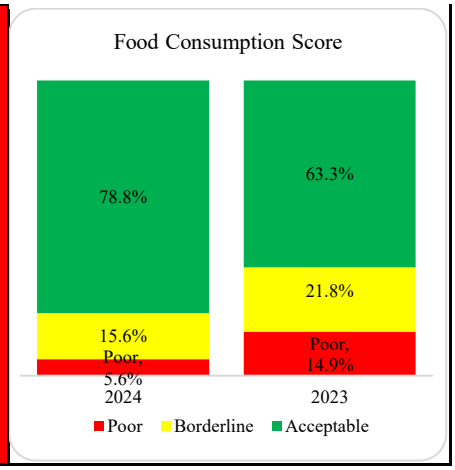
3.8.3 Food Consumption Score

This proxy indicator of household food security is a composite score based on households' dietary diversity, food consumption frequency, and relative nutritional value of different food groups. The FCS was calculated by asking how often households consume food items from the 8 different food groups (plus condiments) during a 7-day reference period. In addition to this, the FCS module collected data on sources of the consumed foods acquired by households. The survey findings show that the proportion of households in the poor and borderline categories of FCS were 5.6% and 15.6%, a reduction from 14.9% and 21.8% respectively reported in July 2023. This is an indication of an improved food consumption at household level as depicted by increase in the proportion of households in the acceptable category from 63.3% reported in July 2023 to the current 78.8%.

Food Consumption Score categories and proportion of Households

Main Threshold	Nomenclature	Proportion of Households (%)	
		2024	2023
>35.5	Good food consumption Cereal, legumes, milk, condiment, flesh meat, vegetable, oil, sugar	78.8	63.0
21.5-35	Borderline food consumption Cereal, legumes, milk, oil, sugar	15.6	22.0

0-21	Poor food consumption manly cereal and sugar	5.6	15.0



3.8.3.1 Household Food Consumption

The food groups consumed in bigger proportions by households in Garissa County in a 7-day recall were cereals, oils/fats, pulses/legumes and milk with fruits, Eggs and meats, and fruits being least consumed food groups.

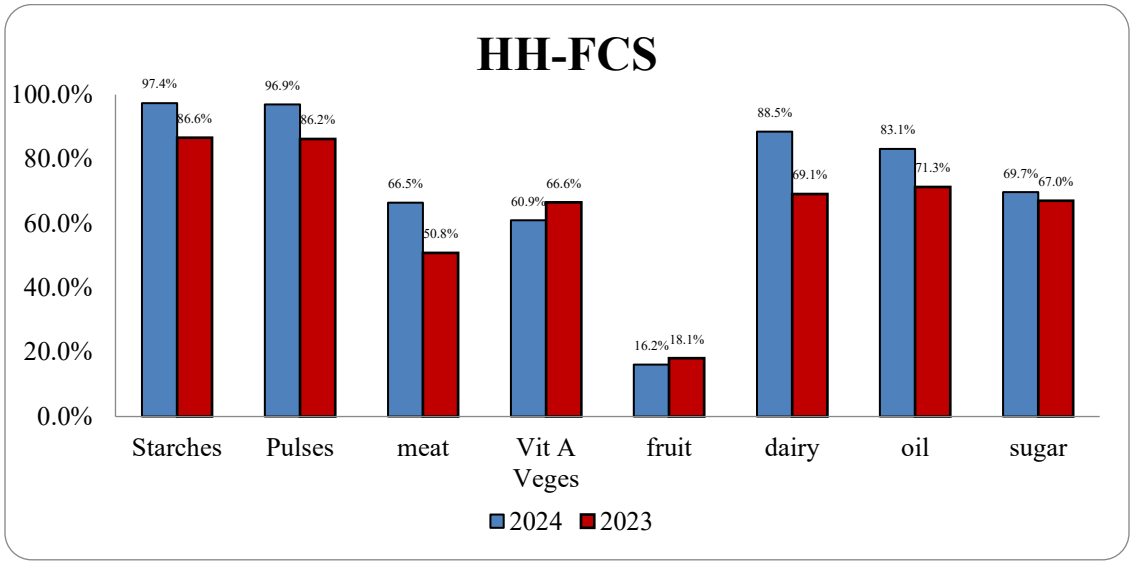


Figure 51: 1 Household Food Consumption Score

3.8.3.2 Food Micronutrient Consumption

Staple and proteins were frequently consumed. More than half of the assessed population (60%) did not consume any vitamin A rich-foods, while 32.5%, 29.7% and 38.6% did not consume iron, oils and, fruits and vegetables respectively, within the past 7 days.

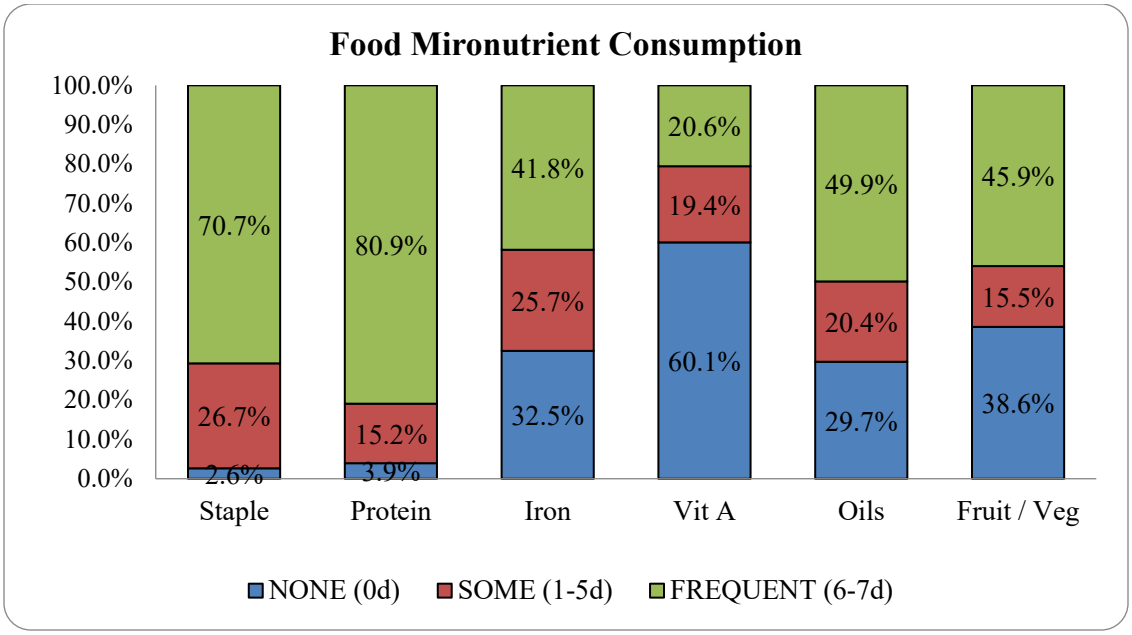


Figure 52: Proportion of Households per Food Micronutrient Consumption

3.8.4.3 Food consumption Score Frequency

Almost all the households in the acceptable category frequently consumed protein and vitamin A-rich foods at 94.4% and 92.5% respectively. Poor Iron consumption in both categories as almost all households (99.3%) in the poor/borderline category and more than half (56.5%) of the households in the acceptable category did not consume iron rich foods in the last 7 days. Almost half of the households in the poor/borderline category sometimes (1-5 days) consumed protein and vitamin A-rich foods.

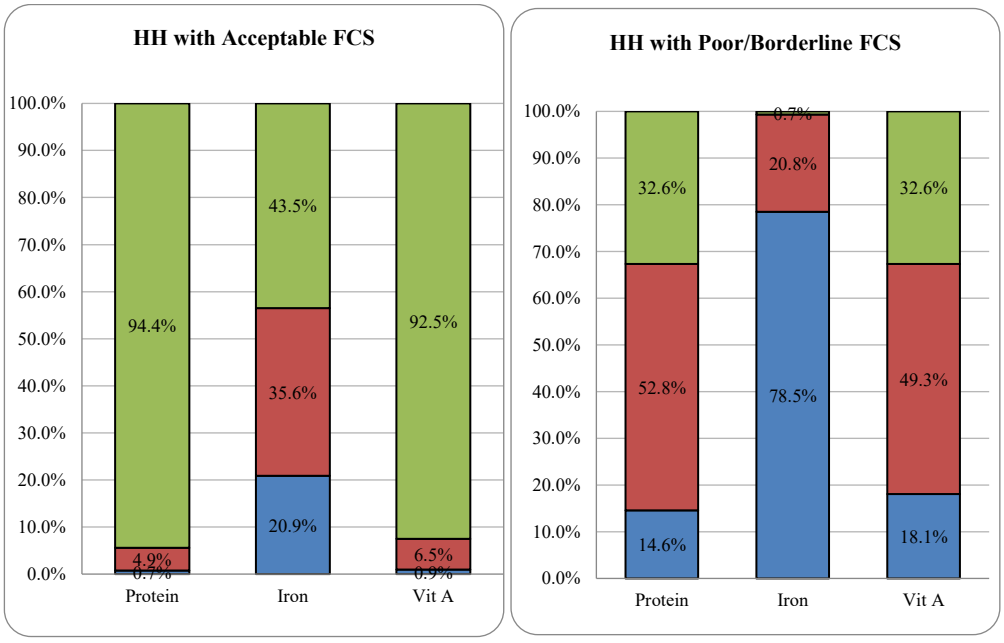


Figure 53: Food Consumption Frequency per FCS category

3.8.5 Minimum Dietary Diversity – Women

Calculated as the percentage (%) of women of reproductive age (15 - 49 years) who ate foods from ≥ 5 food groups the previous day or night, MDD-W is a Proxy for the probability of micronutrient adequacy of women's diets and reflects micronutrient adequacy, which is one critical dimension of diet quality. It is looking at 10 food groups; all foods consumed at home or outside home, within the last 24 hours. MDD-W assesses the proportion of women 15-49 years of age who have consumed at least five out of the ten pre-defined food groups the previous day or night. It is an indicator of a diet's micronutrient adequacy, an important dimension of its quality. The proportion of WRA consuming 5 or more of the recommended 8 food groups improved slightly from 24.5% reported in July 2023 to the current 28.2%. The major food groups consumed were cereals (94.5%), pulses (79.1%) and dairy / dairy products (84.7%). There is observed increase in the proportion consuming meat, poultry and fish groups from 20.0% (in July 2023) to the current 37.5%, while on the other end, a reduction in the proportion consuming other vegetables from 46.2% (in July 2023) to 32.3%. generally, there is observed improved dietary diversity for women attributed to good performance of the enhanced long rains.

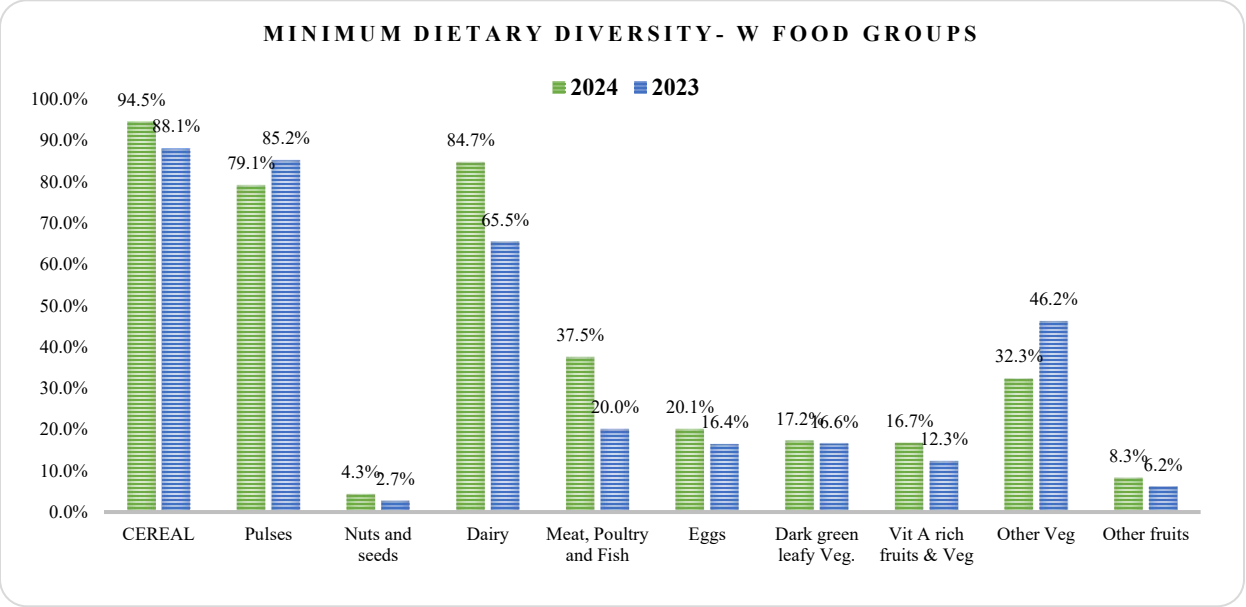


Figure 54: Minimum Dietary Diversity- W Food Groups

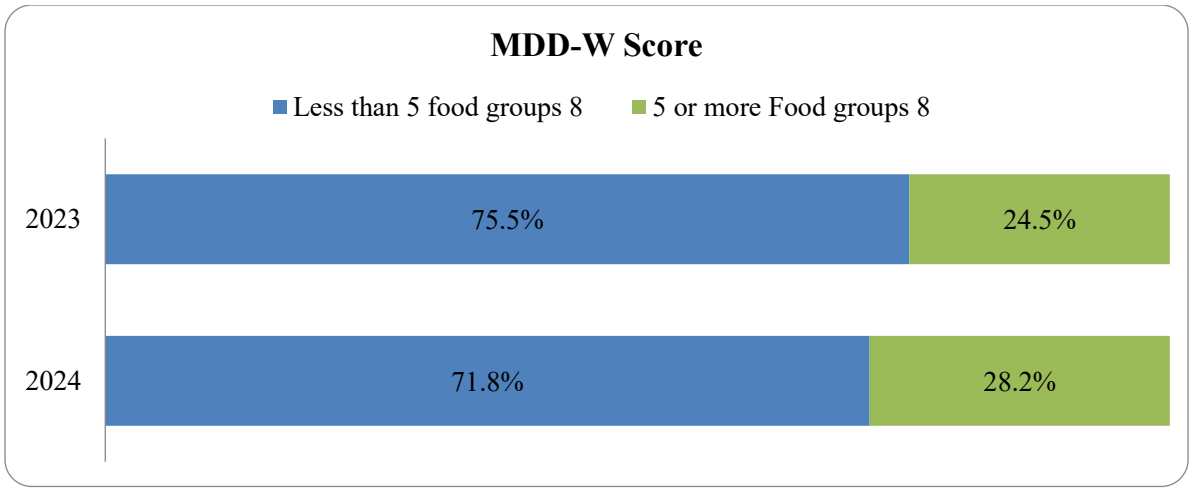


Figure 55: Proportion of women in the Minimum Dietary Diversity- W score categories

3.8.6 Reduced Coping Strategy Index

The Reduced Coping Strategies Index (RCSI), which is obtained average value of the Reduced Coping Strategies Index, is a proxy indicator of household food insecurity. It considers both the frequency and severity of five pre-selected coping strategies that the household used in the seven days prior to the survey. It is a simplified version of the full Coping Strategies Index indicator. The coping strategy index assesses how a household copes in times of food shortage or lack of food. During the survey, households were assessed based on five strategies, which were then weighted based on their severity.

The current total weighted score is 15.05, an increase compared to 13.8 reported in July 2023. An estimated 19.4% (133 households) reported to have experienced food insecurity in the past 7 days compared to 22.3% (150 HHs) reported in July 2023. The most utilized form of coping strategy by households were; rely on less preferred and less expensive food, limit portion sizes and reduce number of meals. All the households employing CSI relied on less expensive or less preferred foods. An estimated 75.9% of households employed the most severe strategy of restricting consumption of food by adults for young children to eat, an increase in the proportion compared to 65.3% reported in July 2023.

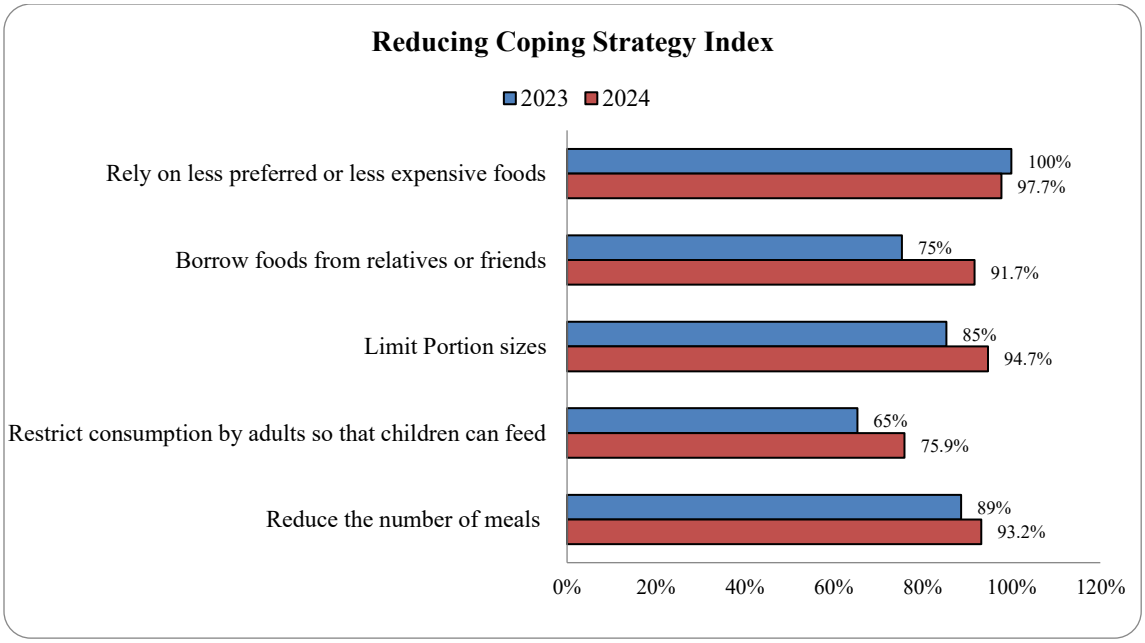


Figure 56: Proportion of Households employing Coping Strategy Index

Figure 57: Trends in Weighted rCSI Score

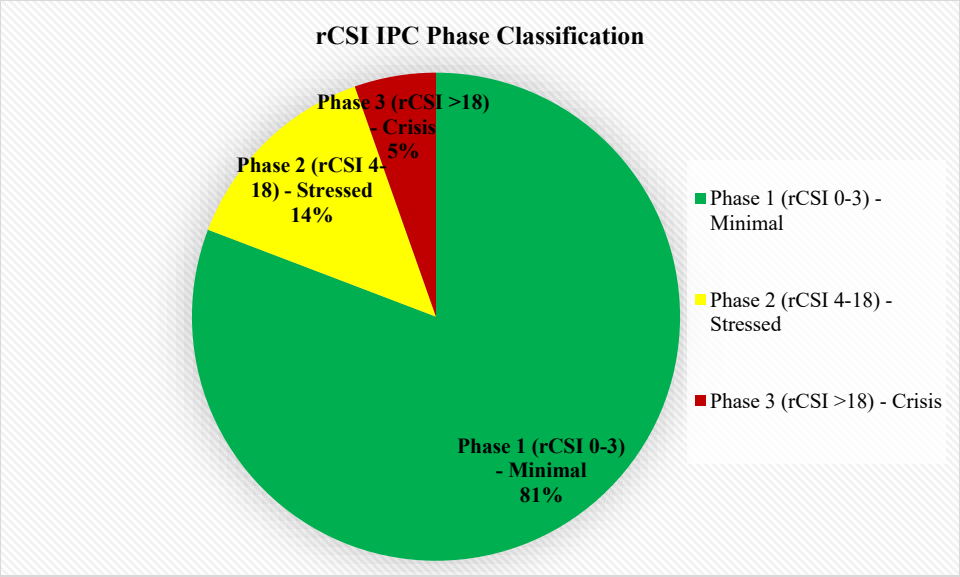


Figure 58: rCSI IPC Phase Classification

3.8.7 Household Hunger Scale

The Household Hunger Scale (HHS) serves as a crucial indicator for measuring household hunger levels, assessing food deprivation experiences over the preceding 4 weeks or 30 days. By posing three specific questions, the HHS provides valuable insights into the prevalence of hunger, enabling monitoring of trends across countries and regions to gauge progress towards international development goals. Moreover, it facilitates the evaluation of food security situations, informing policy development and program implementation aimed at addressing food insecurity and hunger. The HHS also aids in the monitoring and assessment of the effectiveness of anti-hunger policies and programs, including those supported by specific donors across diverse cultural and geographic contexts. Additionally, it plays a vital role in early warning systems for nutrition and food security, as well as informing standardized classifications for food security and humanitarian phases.

From the survey findings, an estimated 39.8% of the targeted household reported to have experienced some form of hunger; 22.9% experienced some form of hunger within 30 days, 9.6% a night hunger and 7.3% a 24 - hour hunger. Majority of the households (81.9%) were in the little to no hunger category a reduction in proportion from 88.4% reported in July 2023. However, there is an increase on the proportion of households in the moderate and severe hunger categories from 11.3% and 0.3% reported in July 2023 to the current 16.9% and 1.2%, having experienced moderate and severe food deprivation respectively, within the past 30 days.

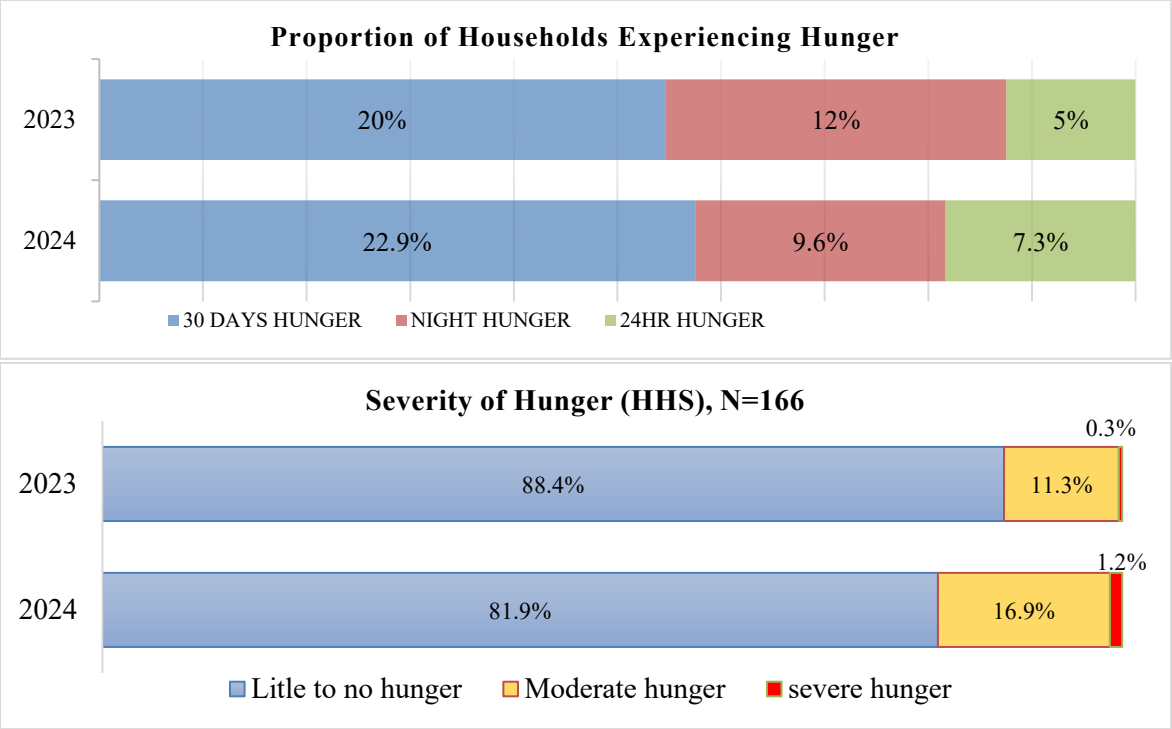


Figure 59: Proportion of Households Experiencing Hunger and severity

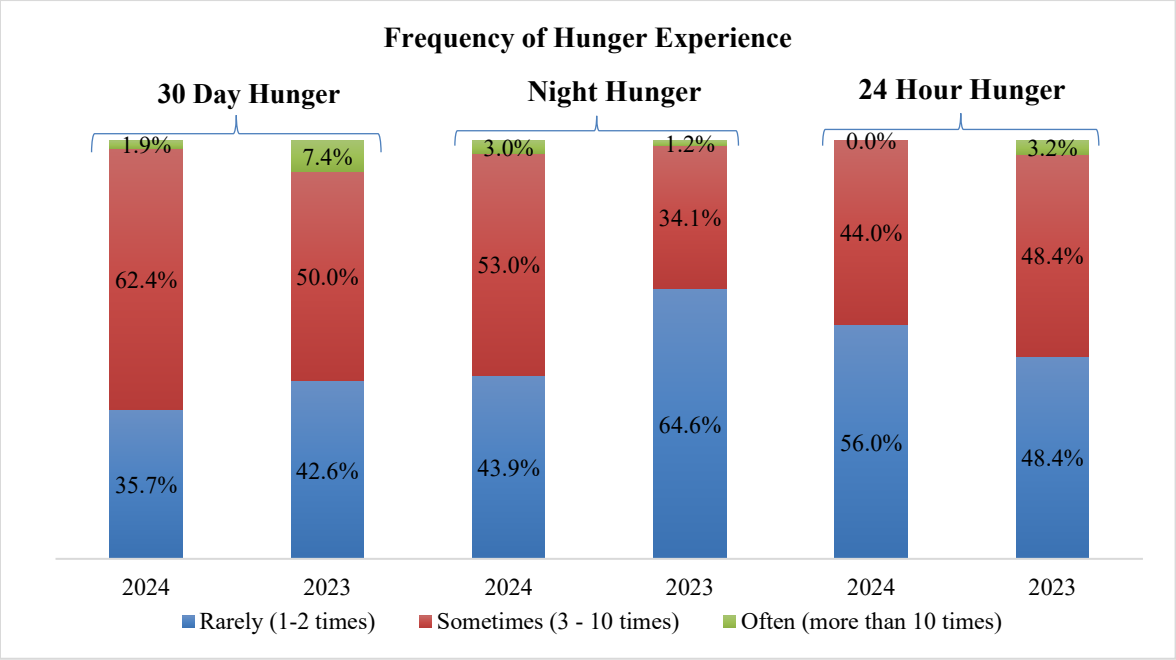


Figure 60: Frequency of Hunger Experience

4.0 DISCUSSION AND CONCLUSION

4.1 Discussion

Overall, Garissa Integrated SMART survey was successfully implemented as the team managed to meet 100% target of the planned clusters and households. The achieved sample for children 6 to 59 months was over 100%.

Child Malnutrition

Global and severe acute malnutrition prevalence of 14.7 % (12.0 - 17.9 95% C.I.) and 2.4 % (1.5 - 3.7 95% C.I.), with 0% prevalence of oedema, A slight though insignificant improvement compared to 16.4% (13.4 – 20.0 95% C.I) and 2.7% (1.7 – 4.3 95% C.I.) of GAM and SAM respectively reported in July 2023 (p – value = 0.4404). The GAM is classified as ***high*** based on the revised WHO classification of acute malnutrition and ***critical*** based on IPC classification for acute malnutrition. GAM (by MUAC < 125 mm and/or presence of oedema) and SAM (by MUAC < 115 mm and/or presence of oedema) prevalence were 3.4 % (2.3 - 4.9 95% C.I.) and 0.8 % (0.4 - 1.7 95% C.I.) respectively. A slight deterioration with no significant difference (p=0.3130), compared to GAM and SAM prevalence by MUAC of 2.4 % (1.6 - 3.6 95% C.I.) and 0.4 % (0.1 - 1.1 95% C.I.) respectively reported in July 2023. The prevalence of combined GAM and SAM was 16.4% (13.8 – 19.3 95% C.I.) and 2.7 % (1.7 - 4.2 95% C.I.). The current GAM and SAM indicates a slight improvement compared to 17.3 % (14.3 - 20.7 95% C.I.) and (24) 2.8 % (1.8 - 4.4 95% C.I.) reported in July 2023. Combined GAM analysis underscores the importance of considering multiple indicators to accurately assess and address malnutrition among children 6 to 59 months. Stunting and severe stunting prevalence of 8.4% (6.8 – 10.4 95% C.I) and 1.7% (1.1 – 2.8 95% C.I) respectively. An observed decrease, with no statistically significant difference (p – value = 0.0794) from 11.0 % (8.9 - 13.5 95% C.I.) reported in July 2023. The stunting level classified as **low (2.5 - <10)** according to the revised WHO classification on chronic malnutrition. Underweight prevalence of **11.1 %** (8.9 - 14.0 95% C.I.). A slight deterioration compared to 9.7% (7.2 – 12.8 95% C.I.) recorded in July 2023, with no significant difference (p-value is 0.9180). Current underweight level classified as **poor (10 - <20)** according to the revised WHO classification on undernutrition.

Child Health Program

Despite high coverage for most child health programs, continued utilization of the services remain sub – optimal in Garissa County hence the need to scale up. Immunization coverage for all antigens are above the national target (80%) and VAS once for 12 – 59 and 6 – 59 months is above the national target at 97.2% and 94.7% respectively. In addition, deworming for 12 – 59 months the national target of 80% an improvement from the previous year (74.9%). However, VAS for 12 – 59 months twice or more at 48.4% further drop from the previous year's (59.3%). Out of all children 6 to 59 months were found to have acute malnutrition only 52 (61.9%) were enrolled in IMAM program for treatment of acute malnutrition, 18 in OTP (32.7%) and 34 in SFP (65.4%). Those found not in program were referred by the survey teams to the nearest health facility offering IMAM services. Family MUAC approach that is meant to enhance detection for malnutrition at household level, has low coverage, with only 30% of the households confirming to have been sensitized on the same.

Food Security and Livelihoods

Generally, there is observed improved household and women dietary diversity attributed to improved food security due to good performance of the enhanced long rains. The above average performance of the March to May 2024 rains have contributed to improved food security situation due to water and pasture availability. The proportion of households in the poor and borderline categories of FCS were 5.6% and 15.6%, a reduction from 14.9% and 21.8% respectively reported in July 2023. An indication of an improved food consumption as depicted by increase in the proportion of households in the acceptable category from 63.3% (July 2023) to the current 78.8%.

However, malnutrition levels still remain critical (GAM by WHZ above 15.0%). It is evident that climatic shocks prolonged drought (La-nina) and enhanced rainfall (El Nino) have slowed down recovery of affected households, with the floods exacerbating vulnerability and destroying the already diminishing livelihoods that were gradually recovering from the prolonged severe drought of 2022 – 2023. The floods in Garissa County destroyed homes and other infrastructure leaving an estimated 6,400 families (32,000 people) displaced due to the overflow of Tana River. Flood waters submerged a 4km stretch of the Nairobi-Garissa highway, the main access road to Kenya's northern counties, including Garissa, Mandera, and Wajir, affecting the movement of goods and services affecting food markets.

Current total weighted score for reducing coping strategy index is 15.05, an increase compared to 13.8 (July 2023). Estimated 19.4% (133 households) reported to have experienced food insecurity in the past 7 days compared to 22.3% (150 HHs) reported in July 2023. The most employed form of coping strategy were; relying on less preferred and less expensive food, limiting portion sizes and reduce number of meals. All the households employing CSI relied on less expensive or less preferred foods. An estimated 75.9% of households employed the most severe strategy of restricting consumption of food by adults for young children to eat, an increase in the proportion compared to 65.3% (July 2023).

Women's Health and Protection

Before settling, displaced individuals faced heightened vulnerability to poverty, exploitation, violence, and human rights abuses, as they sheltered in overcrowded camps or temporary settlements with limited access to essential resources such as food, water, sanitation, and healthcare. This situation to some extent could contributed to health issues and malnutrition among the affected population especially young children. In such environments, there is an increased risk of violence, harassment, and trafficking.

Water Sanitation and Hygiene

Access to clean and private toilets might also have been a challenge for displaced families, posing health risks, especially for women, as the reproductive health needs of women and adolescent girls are often largely ignored in humanitarian settings. Currently, a high proportion of households (30.0%) practiced open defecation, 65.5% used latrines while 2.8% used flush toilets. Open defecation reduced slightly from 39.7% to 30.0%. Handwashing awareness increased from 59.1% to 76.5%; handwashing practice has slightly increased from 14.1% reported in July 2023 to 15.9%. there is observed improvement in handwashing with soap and water practices at 15.3%, an improvement from 10.6% reported in July 2023, as a result of heightened hygiene promotion messaging especially during the flooding period to prevent outbreak of diarrheal diseases and cholera.

4.2 Conclusion

Despite the improved situation, where the current GAM prevalence indicates that acute malnutrition improved from critical to serious, the level of wasting remains high. Garissa County has been recording critical levels (>15%) of acute malnutrition since 2019 with the highest level being 20.3% reported in July 2022. Stunting levels have remained low except in July 2023 when the levels were medium, while underweight levels have remained poor. The survey recommends the health sector and partners to maintain early detection of acute malnutrition and treatment of acute malnutrition through health facilities coupled with integrated outreaches in far to reach areas, and strengthen the multisectoral approach for addressing chronic malnutrition issues including public health promotion to improve WASH practices, scale up interventions to address maternal and child care (IYCF) practices. Medium and long term interventions would be important to prevent further deterioration of the food security situation.

RECOMMENDATIONS

Findings	Recommendations	Timeline
The nutrition situation for Garissa County is classified as Serious based on the IPC with a GAM of 14.7% and a SAM of 2.4%. A slight improvement from the previous year to phase 3	• Sustain early detection and treatment of acute malnutrition through health facilities coupled with integrated outreaches in hard-to-reach areas. • Scale up and strengthen IMAM surge from 73% to above 80% of IMAM implementing health facilities. • Conduct exhaustive mass screening for malnutrition (using both MUAC and WHZ criteria) to reach all children 6-59 months in hot spot areas.	Monthly
Increase in disease prevalence and incidence for ARI/Cough and fever with chills like malaria	• Sustain integrated medical outreaches • Equip health facilities with essential medicine • Continued Health Education on appropriate health assistance seeking	Continuous
VAS for 12 – 59 months twice or more at 48.4% further drop from the previous year (59.3%)	• Scale up VAS activities through Malezi bora initiatives and improve quality of VAS data reporting • Strengthen community mobilization and awareness campaigns for VAS.	May and Oct every year Monthly
Out of all children 6 to 59 months were found to have acute malnutrition only 52 (61.9%) were enrolled in IMAM program for treatment of acute malnutrition, 18 in OTP (32.7%) and 34 in SFP (65.4%).	• Scale up the rollout and use of family MUAC screening of malnutrition by mothers and caregivers. • Strengthen active case findings and referral by CHPs at the community level to ensure that all malnourished cases are identified and enrolled for treatment	Sep 2024 Monthly
43.4% (N=298) confirmed to have ever seen a family MUAC tape with 30% (N=209) reporting to have been sensitized on the same.	• Conduct sensitization of caregivers on the importance of family MUAC screening. • Scale up the rollout and use of family MUAC screening of malnutrition by mothers and caregivers.	Sep 2024 Oct 2024

Improved ANC attendance at 95.8% of WRA during the last pregnancy of their youngest child, an improvement in 2024, compared to 90.7% reported in July 2023 however, there is still late ANC attendance as 60.6% reported to have attended their 1st ANC visit during their 2nd trimester, an improvement compared to 51.4% reported in July 2023	• Enhance sensitization of caregivers/mothers on the importance of early ANC visits. • Provide incentives for early ANC attendance to expectant mothers	Quarterly Oct 2024
Most mothers consumed IFAS during pregnancy of the youngest child; at 82.9% in <90 days, with a notable reduction in the category consuming 90-180 days from 48.9% to 17.3%.	• Improve education and awareness on the importance of IFAS consumption for the recommended duration. • Ensure consistent supply and accessibility of IFAS in health facilities.	Monthly Quarterly
The proportion of HHs fetching water from safe water sources in Garissa slightly reduced from 63% (July 2023) to the current 57.4%, attributed to floods that led to destruction of some piping systems.	• Accelerate repair and rehabilitation of water supply infrastructure damaged by floods • Promote and support alternative safe water sources where infrastructure repair is delayed e.g. water trucking	Nov 2024
Only 28.9% of households are consuming the recommended amount of water of ≥15l/p/day as per the SPHERE standards indicator threshold, a slight improvement compared to 24.7% reported in July 2023	• Advocate for provision of adequate supply of water	Sep 2024
A high proportion of households (30.0%) practiced open defecation, with 65.5% using latrines and 2.8% using flush toilets. Open defecation reduced slightly from 39.7% to 30.0%.	• Accelerate the scale-up of Community-Led Total Sanitation (CLTS)	Quarterly
There is an observed improvement in handwashing with soap and water practices at 15.3% from 10.6% (July 2023) due to heightened hygiene promotion messaging, especially during the flooding period to prevent outbreaks of diarrheal diseases and cholera.	• Continue hygiene promotion sessions to sensitize communities on handwashing practices i.e. monthly hygiene promotion sessions • Distribute handwashing facilities and soap to households to encourage regular handwashing	Monthly Quarterly

APPENDICES

Annex 1: Garissa SMART Survey Sampled Clusters

Geographical unit	**Population size**	**Cluster**
Daidai 1	4901	1
Secondary	3624	2
Kiwanja	1376	3
Weldoni	2206	4
Bulla Gudud	1692	5
Bulla Abass	350	6
Bulla Mosque	4121	7
Bulla Gudud	4122	8
Bulla Deka	3100	9
Bulla Kadid	1802	10
Bula Iftin	*2279*	*RC*
Bula Towfiq	864	11
Bula Borehole	930	12
Hulugho Township A	12642	13
Hulugho Township B	7124	14
Gesireb North	102	15
Wardey Ijab Pry	*690*	*RC*
Wakabharey A	1200	16
Marre Centre	11647	17
Bulla Gure	222	18
Bulla Tuwer	270	19
Bulla Gumar	427	20
Bulla Balambal	202	21
Mohammed Dahir A	3447	22

Bulla Lameye	200	23
Bulla Hawa	180	24
Bulla Maah	4722	25
Balambala Township	4800	26
Hadley	1320	27
Sikley	414	28
Oman Muhumed	390	29
Sankuri	3060	30
Bulla Madina	6000	31
Bulla Riiq	4800	32
Al Farouq	1200	33
Ngamia Road	*6000*	*RC*
Bulla Adaan	3600	34
Garissa Township	10200	35
Bulla Sheikh	6600	36
Ngamia Road	6000	37
Survey	6504	38
Dekabur	3900	39
Bulla Argi	486	40
Aliemij	600	41
Kamuthe Town	1500	42
Daaddere	1600	43
Doi	700	44
Idp	4500	45
Mohamedsaid	400	46
Qurahey	*600*	*RC*
Lolol	750	47
Gora	*910*	*RC*
Jilango	1800	48
Garse	1080	49

Standardization Test Results

Standardization test results					**Precision**				**Accuracy**		**OUTCOME**			
Weight		**subjects**	**mean**	**SD**	**max**	**Technical error**	**TEM/mean**	**Coef of reliability**	**Bias from superv**	**Bias from median**			**From**	**From**
		#	kg	kg	kg	TEM (kg)	TEM (%)	R (%)	Bias (kg)	Bias (kg)			Supervisor	Median
	Supervisor	10	12.4	1.2	0.1	0.04	0.3	99.9	0	0.03	TEM good	R value good	Bias good	Bias good
	Enumerator 1	10	12.4	1.2	0.1	0.04	0.3	99.9	0.03	0.02	TEM good	R value good	Bias good	Bias good
	Enumerator 2	10	12.4	1.2	0.1	0.04	0.3	99.9	0.05	0.06	TEM good	R value good	Bias acceptable	Bias acceptable
	Enumerator 3	10	12.4	1.2	0.2	0.08	0.7	99.5	0.05	0.05	TEM acceptable	R value good	Bias acceptable	Bias acceptable
	Enumerator 4	10	12.4	1.2	0.1	0.05	0.4	99.8	0.06	0.05	TEM acceptable	R value good	Bias acceptable	Bias acceptable
	Enumerator 5	10	12.4	1.2	0.3	0.08	0.7	99.5	0.03	0.03	TEM acceptable	R value good	Bias good	Bias good
	Enumerator 6	10	12.4	1.2	0.2	0.05	0.4	99.8	0.05	0.04	TEM acceptable	R value good	Bias acceptable	Bias acceptable
	Enumerator 7	10	12.4	1.2	0.1	0.05	0.4	99.8	0.06	0.03	TEM acceptable	R value good	Bias acceptable	Bias good
	Enumerator 8	10	12.4	1.2	0.1	0.04	0.3	99.9	0.04	0.02	TEM good	R value good	Bias good	Bias good
	Enumerator 9	10	12.4	1.2	0.1	0.05	0.4	99.8	0.06	0.04	TEM acceptable	R value good	Bias acceptable	Bias acceptable
	enum inter 1st	9x10	12.4	1.2	-	0.06	0.5	99.7	-	-	TEM good	R value good		
	enum inter 2nd	9x10	12.4	1.2	-	0.07	0.5	99.7	-	-	TEM good	R value good		
	inter enum + sup	10x10	12.4	1.2	-	0.06	0.5	99.7	-	-	TEM good	R value good		
	TOTAL intra+inter	9x10	-	-	-	0.09	0.7	99.5	-	-	TEM good	R value good		
	TOTAL+ sup	10x10	-	-	-	0.08	0.7	99.5	-	-	TEM good	R value good		
Height		**subjects**	**mean**	**SD**	**max**	**Technical error**	**TEM/mean**	**Coef of reliability**	**Bias from superv**	**Bias from median**			**From**	**From**
		#	cm	cm	cm	TEM (cm)	TEM (%)	R (%)	Bias (cm)	Bias (cm)			Supervisor	Median
	Supervisor	10	93.8	4.1	0.4	0.15	0.2	99.9	0	0.04	TEM good	R value good	Bias good	Bias good
	Enumerator 1	10	93.9	4.1	0.9	0.26	0.3	99.6	0.18	0.15	TEM good	R value good	Bias good	Bias good
	Enumerator 2	10	94	4.1	0.6	0.17	0.2	99.8	0.22	0.21	TEM good	R value good	Bias good	Bias good

	Enumerator 3	10	93.8	4.1	1	0.35	0.4	99.3	0.19	0.21	TEM good	R value good	Bias good	Bias good
	Enumerator 4	10	93.9	4	0.7	0.27	0.3	99.6	0.14	0.12	TEM good	R value good	Bias good	Bias good
	Enumerator 5	10	93.8	4	0.3	0.11	0.1	99.9	0.11	0.15	TEM good	R value good	Bias good	Bias good
	Enumerator 6	10	93.9	4.1	0.4	0.17	0.2	99.8	0.16	0.13	TEM good	R value good	Bias good	Bias good
	Enumerator 7	10	93.7	4	0.7	0.26	0.3	99.6	0.16	0.14	TEM good	R value good	Bias good	Bias good
	Enumerator 8	10	93.8	4.1	0.6	0.2	0.2	99.8	0.14	0.14	TEM good	R value good	Bias good	Bias good
	Enumerator 9	10	93.8	4	0.8	0.31	0.3	99.4	0.12	0.13	TEM good	R value good	Bias good	Bias good
	enum inter 1st	9x10	93.9	4	-	0.23	0.2	99.7	-	-	TEM good	R value good		
	enum inter 2nd	9x10	93.8	4	-	0.26	0.3	99.6	-	-	TEM good	R value good		
	inter enum + sup	10x10	93.8	4	-	0.23	0.3	99.7	-	-	TEM good	R value good		
	TOTAL intra+inter	9x10	-	-	-	0.35	0.4	99.2	-	-	TEM good	R value good		
	TOTAL+ sup	10x10	-	-	-	0.33	0.4	99.3	-	-	TEM good	R value good		
MUAC		**subjects**	**mean**	**SD**	**max**	**Technical error**	**TEM/mean**	**Coef of reliability**	**Bias from superv**	**Bias from median**			**From**	**From**
		#	mm	mm	mm	TEM (mm)	TEM (%)	R (%)	Bias (mm)	Bias (mm)			Supervisor	Median
	Supervisor	10	143.1	7.9	1	0.5	0.3	99.6	0	0.35	TEM good	R value good	Bias good	Bias good
	Enumerator 1	10	143.1	7.7	3	1.02	0.7	98.2	1.3	1.38	TEM good	R value acceptable	Bias acceptable	Bias acceptable
	Enumerator 2	10	143.4	8.3	2	0.63	0.4	99.4	1.08	0.84	TEM good	R value good	Bias acceptable	Bias good
	Enumerator 3	10	142.8	8.7	5	1.5	1.1	97	1.21	1.43	TEM good	R value acceptable	Bias acceptable	Bias acceptable
	Enumerator 4	10	143.6	7.7	3	1.4	1	96.7	1.02	0.89	TEM good	R value acceptable	Bias acceptable	Bias good
	Enumerator 5	10	142.1	7.5	4	1.2	0.8	97.4	1.5	1.74	TEM good	R value acceptable	Bias acceptable	Bias acceptable
	Enumerator 6	10	144.4	8.4	4	1.3	0.9	97.6	1.5	1.27	TEM good	R value acceptable	Bias acceptable	Bias acceptable
	Enumerator 7	10	144.3	8.3	3	1.07	0.7	98.3	1.45	1.18	TEM good	R value acceptable	Bias acceptable	Bias acceptable
	Enumerator 8	10	144.1	7.6	3	1.07	0.7	98	1.35	1.07	TEM good	R value acceptable	Bias acceptable	Bias acceptable
	Enumerator 9	10	143.7	8	5	1.73	1.2	95.3	1.28	1.21	TEM good	R value acceptable	Bias acceptable	Bias acceptable
	enum inter 1st	9x10	143.5	7.8	-	1.79	1.2	94.8	-	-	TEM good	R value poor		
	enum inter 2nd	9x10	143.5	8	-	1.9	1.3	94.3	-	-	TEM good	R value poor		
	inter enum + sup	10x10	143.5	7.9	-	1.75	1.2	95.1	-	-	TEM good	R value acceptable		
	TOTAL intra+inter	9x10	-	-	-	2.23	1.6	92	-	-	TEM acceptable	R value poor		

	TOTAL+ sup	10x10	-	-	-	2.12	1.5	92.7	-	-	TEM acceptable	R value poor		

Annex 2: Survey Teams and Data Collection Movement Plan

Team 1	**Khier Yarrow**	**Awal Huud**	**Musa Hassan**			
CL No	**Sub-County**	**Ward**	**Geographical Unit**	**Population Size**	**Cluster**	**Teams**
1	Dadaab Sub County	Dadaab Ward	Daidai 1	4901	1	Team 1
2	Dadaab Sub County	Dadaab Ward	Secondary	3624	2	Team 1
3	Dadaab Sub County	Damanjaley Ward	Kiwanja	1376	3	Team 1
4	Dadaab Sub County	Dadaab Ward	Weldoni	2206	4	Team 1
5	Dadaab Sub County	Abakaile Ward	Bulla Gudud	1692	5	Team 1
6	Dadaab Sub County	Abakaile Ward	Bulla Abass	350	6	Team 1
7	Dadaab Sub County	Abakaile Ward	Bulla Mosque	4121	7	Team 1
Team 2	**Abdiaziz Rone**	**Arafat Abdiaziz**	**Nasra Ali**			
CL No	**Sub-County**	**Ward**	**Geographical Unit**	**Population Size**	**Cluster**	**Teams**
8	Dadaab Sub County	Dertu Ward	Bulla Gudud	4122	8	Team 2
9	Dadaab Sub County	Dertu Ward	Bulla Deka	3100	9	Team 2
10	Dadaab Sub County	Abakaile Ward	Bulla Kadid	1802	10	Team 2
11	Dadaab Sub County	Damanjaley Ward	Bula Towfiq	864	11	Team 2
12	Dadaab Sub County	Labisigale Ward	Bula Borehole	930	12	Team 2
47	Lagdera Sub County	Shantabaq Ward	Lolol	750	47	Team 2
48	Lagdera Sub County	Modogashe Ward	Jilango	1800	48	Team 2
Team 3	**Nasteh**	**Salah Hassan**	**Mohamed Dagane**			
CL No	**Sub-County**	**Ward**	**Geographical Unit**	**Population Size**	**Cluster**	**Teams**
13	Hulugho Sub County	Hulugho Ward	Hulugho Township A	12642	13	Team 3
14	Hulugho Sub County	Hulugho Ward	Hulugho Township B	7124	14	Team 3
15	Hulugho Sub County	Hulugho Ward	Gesireb North	102	15	Team 3
16	Hulugho Sub County	Sangailu Ward	Wakabharey A	1200	16	Team 3
17	Hulugho Sub County	Sangailu Ward	Marre Centre	11647	17	Team 3
18	Hulugho Sub County	Sangailu Ward	Bulla Gure	222	18	Team 3
19	Hulugho Sub County	Sangailu Ward	Bulla Tuwer	270	19	Team 3
Team 4	**Abdirahman Dahir**	**Mohamednathir Muktar**	**Sahara Ibrahim**			
CL No	**Sub-County**	**Ward**	**Geographical Unit**	**Population Size**	**Cluster**	**Teams**

20	Hulugho Sub County	Sangailu Ward	Bulla Gumar	427	20	Team 4
21	Hulugho Sub County	Sangailu Ward	Bulla Balambal	202	21	Team 4
23	Ijara Sub County	Masalani Ward	Bulla Lameye	200	23	Team 4
24	Ijara Sub County	Masalani Ward	Bulla Hawa	180	24	Team 4
25	Ijara Sub County	Ijara Ward	Bulla Maah	4722	25	Team 4
41	Fafi Sub County	Bura Ward	Aliemij	600	41	Team 4
44	Fafi Sub County	Dekaharja Ward	Doi	700	44	Team 4
Team 5	**Khadija Abdirahman**	**Abdullahi Abdi**	**Ishadi Mohamed**			
CL No	**Sub-County**	**Ward**	**Geographical Unit**	**Population Size**	**Cluster**	**Teams**
26	Balambala Sub County	Balambala Ward	Balambala Township	4800	26	Team 5
27	Balambala Sub County	Saka Ward	Hadley	1320	27	Team 5
28	Balambala Sub County	Danyare Ward	Sikley	414	28	Team 5
29	Balambala Sub County	Balambala Ward	Oman Muhumed	390	29	Team 5
30	Balambala Sub County	Sankuri Ward	Sankuri	3060	30	Team 5
31	Garissa Sub County	Galbet Ward	Bulla Madina	6000	31	Team 5
32	Garissa Sub County	Galbet Ward	Bulla Riiq	4800	32	Team 5
Team 6	**Fatuma Hassan**	**Abshira**	**Kauthar**			
CL No	**Sub-County**	**Ward**	**Geographical Unit**	**Population Size**	**Cluster**	**Teams**
33	Garissa Sub County	Waberi Ward	Al Farouq	1200	33	Team 6
34	Garissa Sub County	Township Ward	Bulla Adaan	3600	34	Team 6
35	Garissa Sub County	Township Ward	Garissa Township	10200	35	Team 6
36	Garissa Sub County	Galbet Ward	Bulla Sheikh	6600	36	Team 6
37	Garissa Sub County	Township Ward	Ngamia Road	6000	37	Team 6
38	Garissa Sub County	Iftin Ward	Survey	6504	38	Team 6
39	Garissa Sub County	Iftin Ward	Dekabur	3900	39	Team 6
Team 7	**David Ngige**	**Idris Ahmed**	**Riyal Abdi**			
CL No	**Sub-County**	**Ward**	**Geographical Unit**	**Population Size**	**Cluster**	**Teams**
22	Ijara Sub County	Masalani Ward	Mohammed Dahir A	3447	22	Team 7
40	Garissa Sub County	Iftin Ward	Bulla Argi	486	40	Team 7
42	Fafi Sub County	Nanighi Ward	Kamuthe Town	1500	42	Team 7
43	Fafi Sub County	Fafi Ward	Daaddere	1600	43	Team 7
45	Lagdera Sub County	Benane Ward	Idp	4500	45	Team 7
46	Lagdera Sub County	Modogashe Ward	Mohamedsaid	400	46	Team 7
49	Lagdera Sub County	Modogashe Ward	Garse	1080	49	Team 7

Annex 3: Calendar of Events in Garissa County

GARISSA COUNTY EVENT CALENDER 2019 - 2024													
MONTH	**SEASONS**	**2019**	**M**	**2020**	**M**	**2021**	**M**	**2022**	**M**	**2023**	**M**	**2024**	**M**
JAN	BONA/KILIMO/JILAL/BON A HAGEYA)		65	new yr school opening	53	school opening new year	41	Happy new year, school opening, short rains	29	school open, Garissa By-Election, AFCON	17	Happy New Year Celebration, School Opening 1st Term,	5
FEB			64	death and funeral for moi	52	Jilal, short rain,	40	Valentine day/Jilal/ malezi bora	28	Cholera vaccine	16	Valentines' Day, Wetlands, Mass screening	4
MAR	LONG RAIN (MVUA YASIKA/GUU/GANA/MASIKA)		63	covid_19 spread	51	kcpe kcse exams	39	Start ramadhan/long drought/land dispute	27	ramadhan start	15	Start of Ramadhan - 11th March	3
APR			62	covid_19 lockdown	50	easter , ramadhan f1 school opening	38	Easter/ramadhan/moi funeral/ yellow fever	26	eidul fitr, SQUEAC Survey	14	Idd Ul Fitr, Garissa Flood, Bridge Cut-off, Death of CDF Ogolla, Boat Accident in Madogo	2
MAY			61	labour day ramadhan	49	idd fitr, labour day	37	idd fitr, labour day/ 2nd term school open	25	labour day, Masalani Municipality	13	Long Rains, Floods, Schools opening postponed	1
JUN	MANGO HARVEST COLD SEASON (SIKA/SHORICH/RAGAL)		60	iddul fitri	48	polio campaign, madaraka day	36	madaraka/GSA market fire	24	eidul adhha/ Dadaab Municipality	12	Labor Day, Death of Iran PM by Chopper crash, National Tree Planting	0
JUL		smart survey	59	iddul hajj hajj	47	idd adh haa	35	labour/campaign/eid adha	23	demontration against govmt, SMART Survey	11		
AUG	WEDDING/HAVESTING/DRY SEASON (ADOLE/HAGAY/KAS	idull adhhaa census holidays	58	2nd wave of covid_19 death of duale mother	46	dry season, animal death	34	election	22	Shakahola incidence, school closure / holiday, drought, Mashujaa Day, Zakhat giving, Garissa Clan War	10		

SEP		school opening drought spell	57	dry season camel diesease	45	dry season, school opening	33	swearing of president/ 3rd term open	21	School Opening, Dry Season	9	
OCT	SHRT RAIN/MANGO HARVEST SEASON	start of short rain kcpe exam	56	school openibg for grd4 & std 8 death of duale brother	44	mashujaa day, voter registration	32	school resume / culture day / cholera/ huduma day / kcse	20	Onset of KCSE, Start of Israel & Palestin War in Gaza, Huduma Day, Mashujaa day, Bura Municipality	8	
NOV		maulid celebration kcse exam	55	drought	43	Drought, malezibora, KCPE/KCSE	31	Close school/salary stop/sangalu market demolition	19	KCSE, National Tree Planting Day, Onset of El Nino Rains, Floods, Road Network cut-off, Announcement of new sub-counties	7	
DEC		chrismas school holidays china covid_19	54	chrisma school holidays	42	Chrismas holiday, Jamuhuriday, Short rain	30	Chrismas holiday, Jamuhuriday, Short rain	18	Floods, Jamhuri Day, Christmas Holiday	6	