



Samburu County SMART Survey Report

June 2019



Acknowledgement

Samburu County SMART survey 2019 was made successful through the contribution of a number of partners. The survey was led by the County Department of Health.

The County is indebted by immense contribution by partners who tirelessly made this year's survey a success. The following partners are highly appreciated for their contribution.

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Special thanks to the Samburu County Nutrition Technical Forum and National Nutrition Information Technical Working group for their technical guidance during the survey. Finally the County government of Samburu for creating an enabling environment during the data collection exercise and the Samburu County community for taking time to provide information which will be of importance in making informed decisions in the nutrition sector programming.

List of Abbreviations

ARI	Acute Respiratory Infection
BCG	Bacillus Calmette- Guerin
CIDP	County Integrated Development Plan
CSI	Coping Strategy Index
DHIS	District Health Information Software
ECDE	Early Childhood Development Education
ENA	Emergency Nutrition Assessment
FAO	Food and Agriculture Organization
FCS	Food Consumption Score
GAM	Global Acute Malnutrition
HDD	Household Dietary Diversity
HFA	Height for Age
IPC	Integrated food security Phase Classification
MDD-W	Minimum Dietary Diversity for Women
MNPs	Micro nutrients powders
MoH	Ministry of Health
MUAC	Mid Upper Arm Circumference
NDMA	National Drought Management Authority
OPV	Oral Polio Vaccine
ORS	Oral Rehydration Salts
SAM	Severe Acute Malnutrition
SD	Standard Deviation
SMART	Standardized Monitoring Assessment on Relief and Transition
SPSS	Statistical Package for Social Sciences
UNICEF	United Nation Children's Fund
WASH	Water Sanitation and Hygiene
WFA	Weight for Age

WFH	Weight for Height
WHO	World Health Organization
WRA	Women of Reproductive age

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Executive Summary

Introduction

Samburu County Government department of health in corroboration with nutrition sector partners carried out SMART survey which covered all the 3 sub counties in Samburu County. The survey was carried out in June 2019.

Samburu County lies in the northern part of Kenya and covers an area of 21,022.1 sq. km. The County estimated population is 300,966 people with an under-five population of 56,973 (2019 MoH projections) based on 2009 KNBS census. The purpose of this survey was to find out the nutrition status in Samburu County. The results will form a solid basis for planning appropriate future interventions. The main objective of the survey was to determine the prevalence of malnutrition among the children aged 6- 59 months old and women of reproductive age (15-49 years) in Samburu County. Specifically, the survey aimed at determining the nutrition status of children 6 to 59 months, the nutritional status of women of reproductive age (15-49 years) based on maternal mid upper arm circumference, immunization coverage; measles (9-59 months), OPV1/3 and Vitamin A for children aged 6-59months. The survey also was meant to determine deworming coverage for children aged 12 to 59 months, the prevalence of common illnesses as well to assess maternal and child health care practices, water, sanitation and hygiene practices and prevailing situation of household food security in the County.

Methodology

The survey was cross sectional and descriptive by design. Standardized Monitoring and Assessment on Relief and Transition methodology was adopted in the study. Two stage sampling was used in the survey. The first stage involved random selection of clusters from the sampling frame based on probability proportion to population size (PPS). Emergency Nutrition Assessment (ENA) for Standardized Monitoring for Assessment for Relief and Transition (SMART) July 2015 was used in calculation of sample size. Household was used as the sampling unit in the second stage sampling or basic sampling unit. The sample size obtained using ENA software (628 households) was used as the survey sample size. Based on logistical factors, it was possible to visit 14 households per cluster per day translating to a minimum of 45 clusters. Simple random sampling was used in household selection.

Data Collection was done for 6 days by 8 teams. For the data collection purpose, ODK questionnaire was used. Every team was composed of 4 members. The teams were trained for 4 days prior to field work. On the 3rd day standardization test was done. The purpose of standardization test was to test the team's accuracy and precision in taking anthropometric measurements. The data collection tool was pilot tested in a cluster not selected to be part of the survey.

Anthropometric data processing was done using ENA software version 2015 (July). The ENA software generated weight-for-height, height-for-age and weight-for-age Z scores to classify them into various nutritional status categories using WHO standards and cut-off points. All the other quantitative data were analyzed in Ms. Excel and the SPSS (Version 20) computer package.

Results Summary

Table 1: Results Summary

RESULTS SUMMARY				
ANTHROPOMETRIC RESULTS				
WHO Standards	N	% (With 95% CI)	N	% (with 95% CI)
Design Effect (WHZ= 1.30)	June 2018		June 2019	
Prevalence of GAM based on WHZ (<- 2SD) and or edema	508	15.7 % (12.4 - 19.8)	501	15.8% (12.7.- 19.5%)
Prevalence of SAM based on WHZ (<- 3 SD) and/or edema	508	4.1 % (2.6 - 6.5)		2.4% (1.4 – 4.2%)
Prevalence of stunting based on HFA (<-2SD)	486	35.8 % (30.9 - 41.0)	481	29.3% (25.1 – 33.9)
Prevalence of Severe stunting based on HFA (<-3SD)		9.7 % (7.0 - 13.2)		8.3% (6.0 – 11.5%)
Prevalence of underweight based on WFA(<-2 z score)	503	31.6 % (26.0 - 37.8)	500	28.2% (24.1 – 32.7%)
Prevalence of severe underweight based on WFA(<-3 z score)		7.4 % (5.2 - 10.4)		6.6% (4.7 – 9.2%)
CHILD MORBIDITY (Based on 2 weeks recall)				
Indicator	Type of illness	% June 2018	n(June 2019	% June 2019
Illness in the last 2 weeks prior to the survey	All	42.9	136	27%
	Fever with chills	26.4	136	24%
	ARI	64	136	64%
	Watery diarrhea	12.7	136	11.8%

	Bloody diarrhea	1.0	136	0.7%
Therapeutic Zinc supplementation for diarrhea management		84%		56.3%

VITAMIN A SUPPLEMENTATION AND DEWORMING

Indicator	No. of times	% (June 2018)	n(June 2019)	% June 2019
Vitamin A Supplementation (6-11m)	Once	54.7		66.7%
Vitamin A Supplementation 12-59m)	Once	41.5		73.6%
Vitamin A supplementation 12 to 59 m)	Twice	28.6		30.3%
Vitamin A supplementation 6-59 months	Once	43		72.6%
Deworming (12- 59 m)	Once	59.3		73.6%
Deworming (12- 59 m)	Twice	26.7		30.3%

IMMUNISATION

Antigen	Means of Verification	%(June 2018)	n(June 2019)	%(June 2019)
BCG	Presence of Scar	93.9	504	89.88%
OPV1	Card and Recall	93	504	82.73%
OPV3	Card and Recall	90	504	84.92%
Measles at 9 months	Card and Recall	84.8	365	78.15%
Measles at 18 months	Card and Recall	57.4	476	48.67%

MATERNAL NUTRITION

Indicator	Description	% June 2018)	n(June 2019)	% June 2019)
MUAC < 21.0 cm	Women of reproductive age	10.4	496	12.3%
MUAC < 21.0 cm	Pregnant and lactating	10.2	271	11.4%
Women supplemented with FeFo	Mothers of children less than 2 years	72.2	232	81.12%
Pregnant women consuming FeFo	270 days	0	7	2.4%
Pregnant women consuming FeFo	90 days and above	53	47	16.4%
Average time for IFA consumption (days)	Mean No. of days FeFo was consumed	85.6 days		67.7 days

WATER HYGIENE AND SANITATION

Indicator	Description	% June 2018	n(June 2019)	% June 2019
Households obtaining drinking water from safe sources		26.5	612	42%
Households obtaining water from sources less than 500 m		45	596	41%
Household treating their drinking water		16.5		12.6%
Handwashing in the 4 critical times		26	612	11.8%

HOUSEHOLD AND WOMEN DIETARY DIVERSITY

Indicator	Description	%June 2018	n(June 2019)	%June 2019
Households consuming more than 5 food groups		35.5		37.6%

Women consuming more than 5 food groups (MDD-W)		34.02		31%
FOOD CONSUMPTION SCORE AND COPING STRATEGY INDEX				
Households with acceptable FCS		68.1		69.1%
Coping Strategy Index	Index is given as a number not Percentage	18.6		16.58%

Conclusion

Overall the nutrition Status of children in Samburu County remained stable in comparison with similar period previous year as per the SMART Survey 2019. The nutrition status of children in the County was HIGH based on the new threshold classification at a global acute malnutrition of 15.8% with Severe Acute Malnutrition of 2.4%. There was no significant wasting difference between the boys and the girls with wasting rate of 16.1% and 15.4% respectively. However, there was notable difference in severe acute malnutrition between the Boys and Girls at a SAM rate of 3.1% and 1.7% respectively.

There was insignificant decrease in proportion of underweight children in comparison to similar period in 2018 at 31.6% with underweight in 2019 being 28.2%. Underweight was evenly distributed among the boys and girls. There was significant decrease in stunting among children aged 6-59 months in 2019 at stunting rates of 29.3% compared to 2018 at 35.8%. However, the stunting rate remain HIGH based on the new prevalence classification.

In terms of morbidity as a major contributor to malnutrition, the situation improved significantly compared to the previous year. The proportion of children reported ill 2 weeks before the study significantly dropped from 40.9% in 2018 to 27% in 2019 indicating a relatively more healthy population. Among the children reported ill, major ailments included ARIs at 64%, Malaria at 24% and watery diarrhea at 11.8%. Other condition accounted for 2.9% with bloody diarrhea at 0.7%.

Poor water and sanitation hygiene conditions in the county were major contributor to childhood illnesses mainly diarrhea. Despite a slight reduction in open defecation in comparison to previous year, open defecation in the County remained high at 72.6% in 2019. This coupled with other poor hygiene practices including proportion of households treating water at 12.6%, proportion of people washing hands in the 4 critical times at 11.8% depict a deterioration in appropriate hygiene practices hence contribution highly to high malnutrition rates in the county

Immunization of children as a preventive measure to high morbidity rates in the county improved compared to similar period in 2018. Proportion of children aged 6-11 months supplemented with Vitamin A improved from 47.6% in 2018 to 66.7% in 2019. A slight increase though in children aged 12-59 month supplemented was noted from 71% in 2018 to 73.6% in 2019. Total proportion of children supplemented with Vitamin A twice improved from 26.8% to 30.3% in 2019. Improved supplementation was attributed to integration of supplementation in ECD centers.

Quantification of maternal nutrition status was largely based on MUAC measurement among women of reproductive age (15 -49 years) as well as iron and folic acid consumption among mothers to children under two years. There was a slight deterioration on maternal nutrition with more women of reproductive age malnourished at 12.3% in 2019 compared to 2018 at 10.4%. This was also the case for pregnant and lactating women where a slight increase of malnourished women was noted at 11.4% in 2019 up from 10.2% in 2018. A significant increase in proportion of pregnant women supplemented in 2019 at 81.1% was noted down from 77% in 2018. However, despite a high rate of supplementation, only 67.7% consumed the capsules. In addition, majority at 62.2% of those who consumed the IFAS only consumed for a less than 90 days. 16.4% consuming for a period between 90-180 days.

There was a general improvement in food security indicators in 2019 compared to similar period in 2018. Majority of households were more at an acceptable food secure status with a food consumption score of 69%. The household coping strategy index reduced to 16.6% compared to 2018 at 18.6%. Only a significantly low proportion of households at 37.6% consumed an acceptable diet from more than >5 food groups. Women of reproduction age who consumed foods acceptable diets from >5 food groups was equally low at 31% in 2019 up from 34% in 2018.

Recommendations

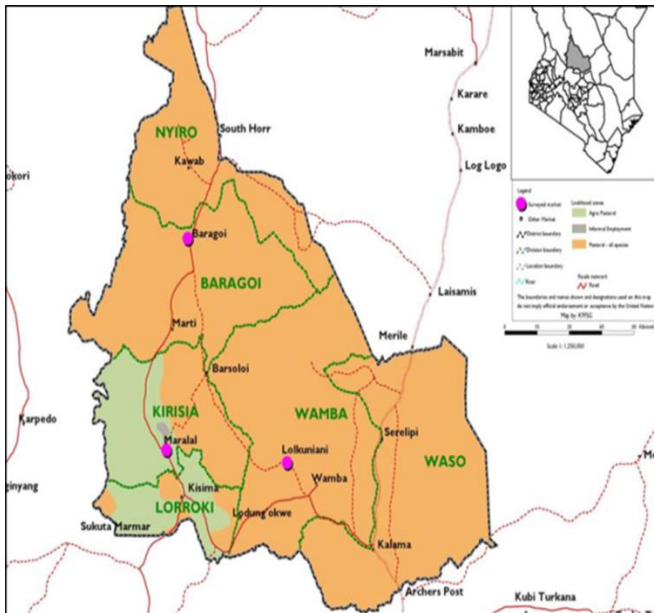
Based on the survey findings the following actions were recommended

- Strengthening health education package on latrine coverage and hand washing to minimize gap between knowledge and practice.
- Intensifying Community Led Total Sanitation in the three sub counties (Samburu North, East and Central)
- Develop a bill on latrine coverage at household level, institutional level and social places
- Improving access to safe water – through water trucking, boreholes in Samburu east and north sub counties.
- Provision of water storage containers to households at treatment chemicals at household level
- Up scaling of Integrated outreaches in hotspots
- Strengthen HINI Service delivery in all health facilities in the county
- Strengthen defaulter tracing mechanism for malnourished children
- Strengthen active case finding and referral systems at community units
- Promote and Strengthen growth monitoring in all ECDE centres and health facilities
- Up scaling baby friendly Community Initiatives in community units
- Strengthen Nutrition Multi- sectoral platform coordination
- Promote child care practices with focus to alcoholism
- Contextualize and communicate key health and Nutrition messages
- Promote effective agricultural practices on production and post-harvest management through Capacity building of farmers
- Improve market infrastructure, road networks and security.
- Promote dietary diversification through Kitchen gardening, dietary formulation and cooking demonstration.

1.0. Introduction

1.1 Background

Samburu County is situated in the Northern part of Great Rift Valley and covers an area of



approximately 21,022.2 sq KMs. The county borders five counties; Turkana County to the Northwest, Baringo County to the Southwest, Marsabit County to the Northeast, Isiolo County to the East and Laikipia County to the South.

The County estimated population is 300,966 people with an under-five population of 56,973 (2019 MoH projections)

It has three sub-counties namely Samburu North, Samburu East and Samburu Central and three main livelihood zones: pastoral all species (57%), agro-pastoral (37%) and formal employment/casual waged labour (6%) (SRA Report Feb 2019)

Figure 1: Samburu County Map

1.2 Justification of the Survey


SMART survey carried out in June 2018 in Samburu County had classified the county at Critical state with a Global Acute Malnutrition (GAM) of 15.7% with Severe Acute Malnutrition (SAM) of 4.1%. There was need to estimate the prevalence of GAM for 2019 to inform the current phase classification of the county in term of acute malnutrition.

February 2019 Short Rains Assessment classified Samburu County as Stressed food insecurity phase (IPC Phase 2) with localized pockets in none/Minimal (IPC Phase). In the same period preceding the survey, April 2019 National Drought Management Authority (NDMA) Early Warning bulleting classified the county at Alert and worsening with Samburu East worst affected at Alarm worsening. Following the worsening drought in the county, milk production continued to deteriorate in April compared to previous month and largely below long term average due to carrier effects. Subsequently, milk consumption at household level significantly.

The SMART surveys results gave a clear picture of the County nutrition situation and especially across the three sub counties. The results were used to inform the July August 2019 long rains assessment as well as informing nutrition and health programing in future.

1.3 Survey Timing

The survey was conducted after the end of long rains in the month of June 2019. June of every month is a designated calendar period to conduct County SMART Surveys in Samburu which allows for comparison with previous surveys. (Source: National Drought Management Authority)



Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Season	Drought			Long Rains		Continental Rains		Short Rains				

Table 2: SMART Survey timing

1.4 Survey Objectives

Main objective of the study was to determine the prevalence of malnutrition among the children aged 6- 59 months old and women of reproductive age (15-49 years) in Samburu County.

1.5 Specific Objectives

- ❖ To determine the prevalence of acute malnutrition among children aged 6-59 months
- ❖ To determine the nutrition status of women of reproductive age (15 to 49 years) based on MUAC
- ❖ To determine the coverage of IFAS among women with children below 24 months.
- ❖ To determine minimum dietary diversity for women of reproductive age
- ❖ To determine the immunization coverage for measles, Oral Polio Vaccines (OPV 1 and 3), and vitamin A supplementation in children aged 6-59 months
- ❖ To determine de-worming coverage for children aged 12 to 59 months
- ❖ To estimate the use of zinc in diarrheal treatment in children
- ❖ To determine the prevalence of common illnesses e.g. diarrhea, measles, ARI.
- ❖ To collect information on possible underlying causes of malnutrition such as household food security, water, sanitation, and hygiene practices.

2.0. Methodology

2.1 Survey Design

The survey was cross sectional and descriptive by design. Standardized Monitoring and Assessment on Relief and Transition methodology was adopted in the study. The study applied quantitative approach.

2.2 Sampling Plan

2.2.1 Sampling Population

The study population included the entire population in Samburu County. It was estimated that the County had 292,200 people based on the Census 2009; County department of health projections for 2019. The same projections for children 0 -59 months indicated a population of 55,313 children. All villages (clusters/sampling units) in Samburu County which were accessible, secure or not deserted were included in the primary sampling frame.

2.2.2 Sample Size Calculation

Anthropometric Sample Size Calculation

Parameters	Estimates	Rationale
Estimate (GAM)	19.8%	Upper limit of CI for June 2018 SMART survey where GAM was 15.7% (12.4% – 19.8%) due to deteriorating situation compared to similar period in 2018 based on NDMA monthly bulletins (April 2019).
Precision	4.0%	Rule of thumb
Design Effect	1.25	Based on the previous 2018 survey to cater for heterogeneity.
Estimated Number of Children	519	As calculated using the ENA for SMART software
Average HH Size	5.0	Based on previous SMART Survey 2018
Non-Response Rate	3.0%	Based on 2018 SMART Survey Experience
Proportion of Children Under 5	18.93%	From DHIS
Estimated Number of Households	628	As calculated using the ENA for SMART software
Number of Households per Day	14	Based on 2018 SMART Survey Experience
Number of Cluster	45	Computed from the Number of HHs per Day

Number of Teams	8	
Number of Days	6	Based on the Number of Teams to be Recruited

Two stage sampling was used in the survey. The first stage involved random selection of clusters from the sampling frame based on probability proportion to population size (PPS). Emergency Nutrition Assessment (ENA) for Standardized Monitoring for Assessment for Relief and Transition (SMART) July 2015 was used in calculation of sample size. Table 1 below illustrates the values used in ENA for sample size calculation and the rationale of using each value.

2.3 Sampling Methods

The survey applied a two-stage cluster sampling using the SMART methodology.

2.3.1 First Stage Sampling

The first stage involved selection of clusters from a sampling frame (list of all updated clusters/villages with their respective populations). All villages along with their respective updated populations were entered into the ENA software (9th July 2015) to obtain the clusters. The sample size obtained (628 Households) using ENA software was used as the survey sample size. Based on logistical factors (time taken to arrive from the clusters, introductions, sampling, inter household movement, lunch and time back to the base), it was possible to visit 14 households per cluster per day translating to a minimum of 45 clusters.

2.3.2 Second Stage Sampling

Simple random sampling was used in household selection. Led by a village guide, the survey teams developed a sampling frame in each of the village sampled during the 1st stage sampling in case such a list never existed. From the list the survey teams randomly selected 14 households where they administered household questionnaire (in all households) and anthropometric, morbidity and immunization questionnaire in household with children aged 6 to 59 months.

2.4 Data Collection

The entire survey was 11 days (18th June to 28th June 2019) broken down into two phases; Training including a pretest exercise was conducted 4 days (18th – 21st June 2019) and Data collection done for 7 days (22nd – 28th June 2019). The teams were trained on various survey aspects including the survey objectives, methodology, malnutrition diagnosis, anthropometric measurements, sampling methods, data collection tools, ODK data collection process as well as interviewing skills. A role play was included in the training to equip the teams with data collection experience/Skills. On the 3rd day standardization test was done for teams to practice anthropometric data collection and test the team's accuracy and precision in taking anthropometric measurements. Pilot data collection was done at ng'ari a village not selected for actual survey data collection. Additionally, during the piloting the enumerators were required to undertake the entire process of the survey which included household selection, taking anthropometric measurements and also filling of the data collection forms.

The overall coordinator of the survey was Samburu County Nutrition Coordinator with the 3 sub county coordinators supporting in coordination. Supporting partners program officers also supported in supervision as well as offering technical guidance. Each of the supervisors was attached to one team to ensure thorough supervision throughout the survey. The supervisor's main responsibilities were to ensure that the methodology was followed, measurements were taken appropriately and tackling any technical issue which came up during data collection. On daily basis plausibility checks were done and gaps noted were communicated to all the teams before going to the field every morning.

Moving from Household to Household: During movement from one household to another within a sampled cluster, the teams were guided by the local guide who was selected by the teams through the help of the Village Elder or a local administrator in every sampled cluster.

Participating organizations: MoH, County Special Programme, World Vision, NDMA, Feed the Children, NHPplus, Afya Timiza and UNICEF

2.6 Data Collection Tools and Variables

For the data collection purpose, electronic questionnaire was used. Each questionnaire consisted of identification information, household information, demographic information, anthropometric information, morbidity, immunization, maternal, WASH and food security data. Household, demographic and food security information were collected in all the sampled households. The rest of the data was collected from only households with children aged 6 to 59 months and women of reproductive age (15-49 years).

2.7 Variables Measured

Age: The exact age of the child was recorded in months. Calendar of events, health cards and birth certificates were used to determine age.

Weight: Children weight measurements were taken using a digital weighing scale

Height: Length measurements was taken for children less than 87cm or less than 2 years of age while height measured for those greater or equal to 87 cm or more than 2 years of age.

MUAC: Mid Upper Arm Circumference (MUAC) on the left arm of children 6-59 months and that of women of reproductive aged 15-49 years was measured on the left arm. Determination of the midpoint of the upper arm of the left arm was done while the arm was at 90 degrees. MUAC reading was done while the arm was straight.

Morbidity: Information on two-week morbidity prevalence was collected by asking the mothers or caregivers if the index child had been ill in the two weeks preceding the survey and including the day of the survey. Illness was determined based on respondent's recall and was not verified by a clinician.

Immunization status: data on immunization status of all children 6-59 months was collected mainly on; BCG, OPV1, OPV3 and measles vaccinations status. Main verification for immunization status was by use of health cards and recall from caregivers.

Vitamin A supplementation status: Data on vitamin A supplementation for all children aged between 6-59 months of age was collected using child health and immunization campaign cards and recall from caregivers.

Iron-Folic Acid supplementation: For all female caregivers, information was collected on IFA supplementation and number of days (period) they took IFA supplements in the pregnancy of the last birth that was within 24 months.

De-worming status: Information was solicited from the caregivers as to whether children 12-59 months of age had received de-worming tablets or not in the previous one year, . This information was verified by health care where available.

Household water consumption and utilization: The indicators used were main source of drinking and household water, time taken to water source and back, cost of water per 20-litre jerry-can and treatment given to drinking water.

Sanitation: Data on household access and ownership to a toilet/latrine, occasions when the respondents wash their hands were also obtained.

Mosquito nets ownership and utilization: Data on the household ownership and use of mosquito nets was collected and analyzed.

Food security status of the households: Food consumption score, Minimum dietary diversity score women source of predominant foods and coping strategies data was collected.

Minimum dietary diversity score women (MDD-W): using a 24 hour food consumption recall questionnaire on all women of reproductive Age (15-49 years). Foods consumed in the last 24 hours were enumerated and analyzed. Women consuming more at least five of the ten food groups were categorized to meet the MDD-W.

Household food consumption score (FCS). Data on the frequency of consumption of different food groups by a household during 7 days before the survey was collected and analyzed using SPSS.

2.8 Data Analysis

Data analysis was conducted in a 3 days (1st -3rd July 2019) analysis workshop. The workshop participants for the workshop were drawn from nutrition specific and nutrition sensitive stakeholders mainly to create capacity among participants on data analysis procedures, interpretation and report writing.

The county World Health Organization Growth Standards (WHO-GS) data cleaning and flagging procedures were used to identify outliers. This enabled data cleaning as well as exclusion of discordant measurements from anthropometric analysis. Anthropometric data analysis was done using ENA software version 2015 (July). The ENA software generated weight-for-height, height-for-age and weight-for-age z scores to classify them into various nutritional status categories using WHO standards and cut-off points.

All the other quantitative data was analyzed using Ms. Excel and the SPSS (Version 20) computer package.

2.9 Data Quality Control Measures

To ensure data collected was valid and reliable for decision making, a number of measures were put in place. They included;

- ✚ Thorough training of survey teams was done for 4 days. The training focused on SMART methodology, survey objectives, interviewing techniques and data collection tools.
- ✚ Ensuring all anthropometric equipment's were functional and standardized. On daily basis each team was required to calibrate the tools.
- ✚ Teams were issued with new batteries to use as from day 3 to ensure accuracy of the weigh scales
- ✚ During the training exercise, standardization test was done; in addition, piloting of tools was done to ensure all the information was collected with uniformity.
- ✚ Conducting a review of data collection tools during training and after the pilot test.
- ✚ All the survey teams were assigned a supervisor during data collection.

- ✚ The anthropometric data collected was entered daily on ENA software and plausibility check was run. Any issues noted were communicated to the teams before they proceeded to the field the following day.
- ✚ Teams were followed up by the supervisors to ensure all errors were rectified on time. More attention was given to the teams with notable weaknesses.
- ✚ Adequate logistical planning beforehand and ensuring the assigned households per clusters where be comfortably surveyed.

3.0. Results

3.1 General Characteristics of the Population

3.1.1 Summary of children and households

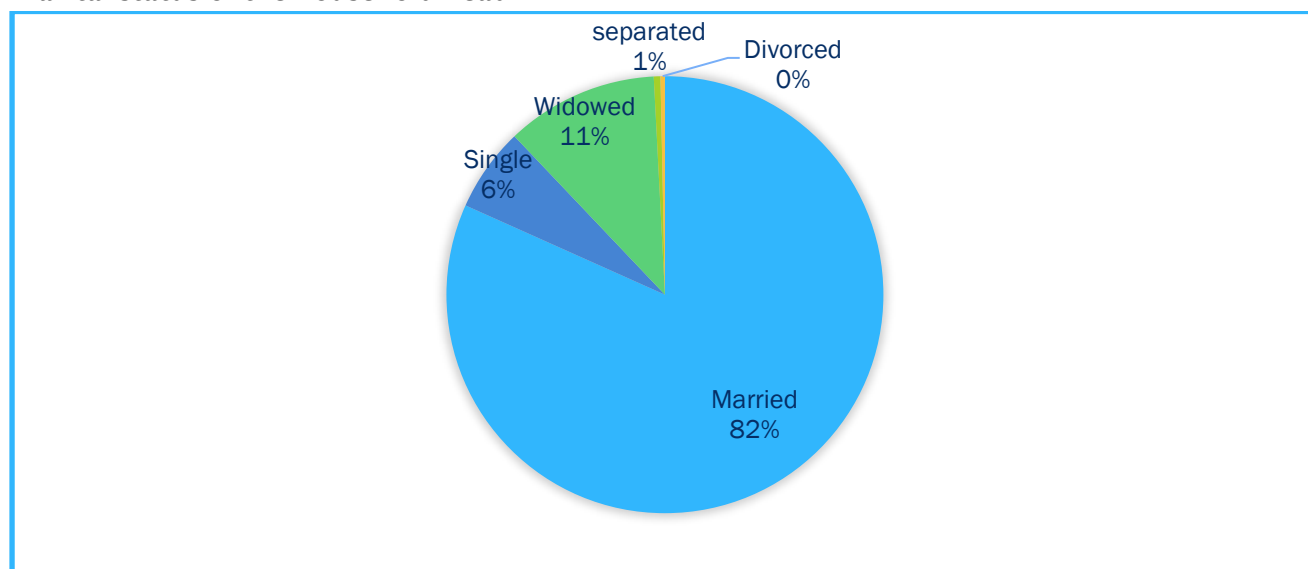
The survey planned to collect information from 519 children aged 6 to 59 months from 628 households as sampled in the ENA. However, 504 (97.11%) children participated in the survey with 15 children either absent or chose not to participate in the survey. The household questionnaire was administered in 612 (97.5%) households as opposed to 628 sampled households. The non-response rate for the entire survey was therefore 3%. Based on household data, where information of 3340 household members were collected in 612 households, the average household size was 5.6.

Survey Zone	Target per the survey plan			Actual No Reached		
	No. of HH	No. of Children	Number of Clusters	No. of HH questionnaires filled	No. of Children	Total Household Members
Samburu County	628	519	45	612	504	3340

3.1.2 Marital and Residency of the Respondents

From the survey, 99.8% of the study respondents were residents in Samburu County and 0.2% were non-residents/migration. Majority of the respondents were married at 88%, Widowed at 11% and singles at 6%. 0% percent of respondents were divorced.

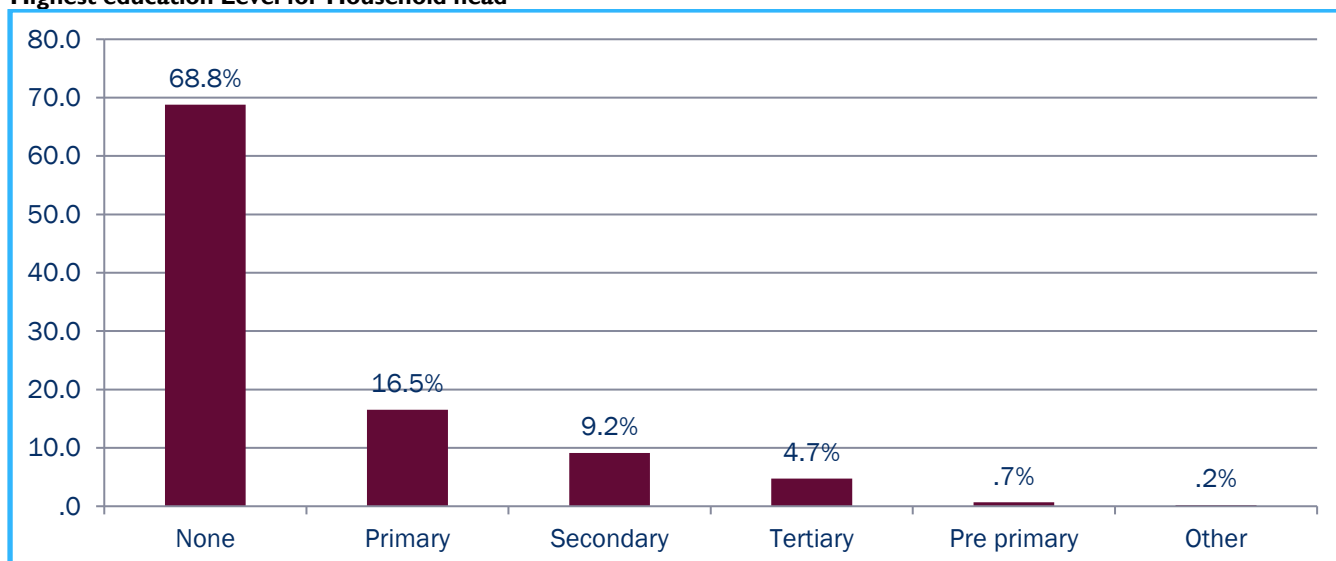
Marital status of the household head



3.1.3 School enrollment and Highest Education level for adults

The majority of the household members surveyed older than 18 years had no education at 68.8% indicating a high illiteracy level in the county. 16.5% had completed primary level of education with 9.2% having schooled up to secondary education. Only 4.7% of respondents had tertiary education.

Highest education Level for Household head



77.5% of the school going children were enrolled in school while 22.5% were not enrolled in any school. Major reasons for non-enrolment to school were Family labour responsibilities at 68.5%.

Reasons for not attending school

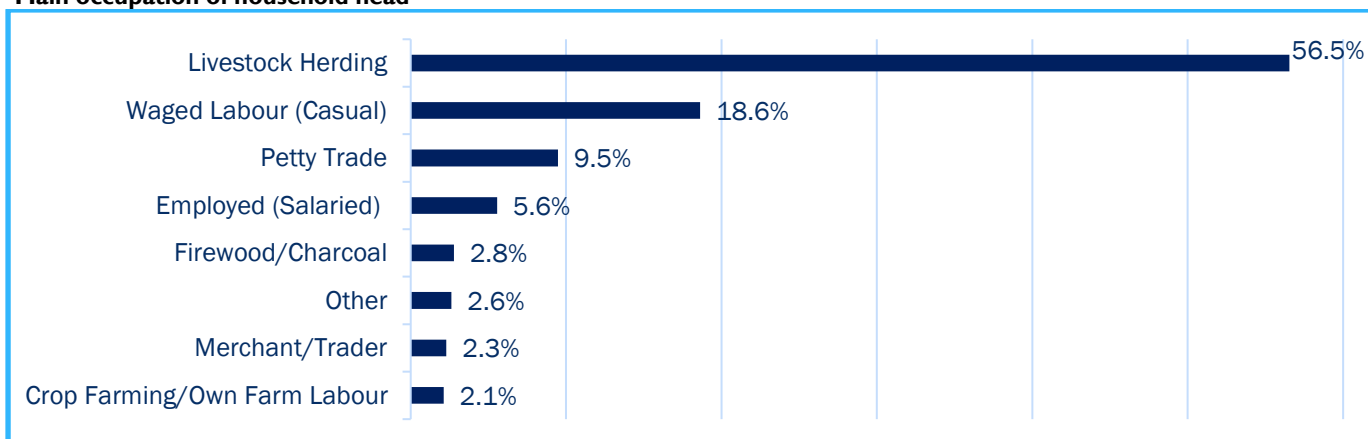
Reason for not being in School	n	%
Chronic Sickness	7	1.9
Weather (rain, floods, storms)	2	0.5
Family labour responsibilities	250	68.5
Working outside home	1	0.3
Teacher absenteeism	2	0.5
Too poor to buy school items e.t.c	2	0.5
Household doesn't see value of schooling	10	2.7
No food in the schools	1	0.3
Migrated/ moved from school area	16	4.4
No school Near by	19	5.2
Married	9	2.5
too young	37	10.1
Other	9	2.5

3.14 Income Source & Main Occupation

Occupation of the household head

The main occupation of for household heads in majority of household surveyed was livestock herding (56.5%) and waged labour (18.6%). Petty trade at 9.5% and employed (salaried) 5.6% was significant occupation for household heads. Other occupation for household heads were Sale of firewood and charcoal at 2.8%, Marchant/trade at 2.3% and crop forming at 2.1%. Other forms of occupation accounted for 2.6%.

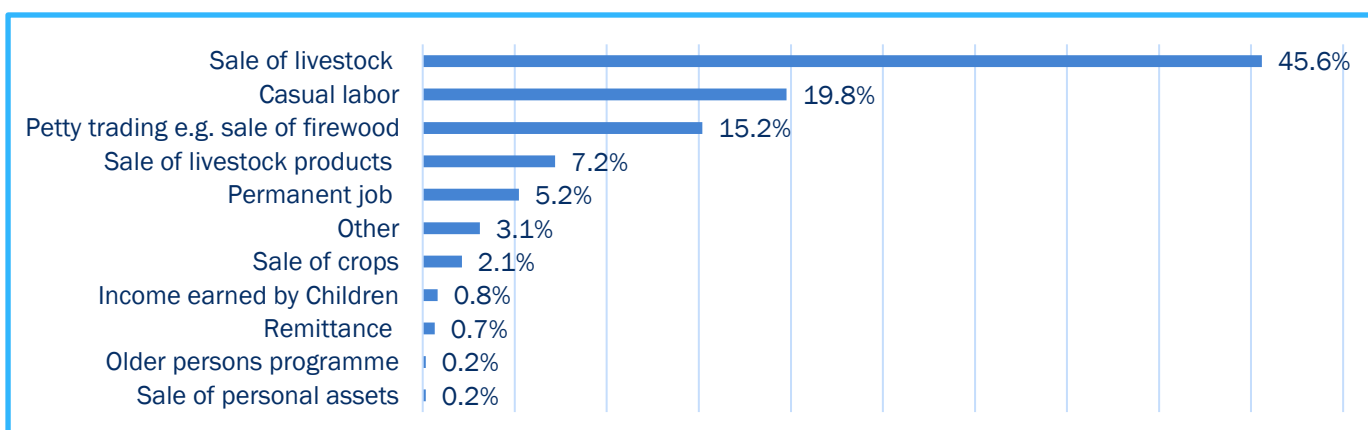
Main occupation of household head



Main household Source of income

The main source of household heads was sale of livestock with majority of household heads 45.6% selling livestock for income. Other significant source of incomes for the household heads were casual labour (19.8%), petty trading and sale of firewood at 15.2% and sale of livestock products at 7.2%. other key sources of incomes were permanent job, sale of crops, income by children, remittances and older persons programs as illustrated by the figure below.

Income source of household head



3.2 Child Nutrition Status

3.2.1 Acute Malnutrition (Wasting)

UNICEF nutrition glossary (2012), malnutrition has defined malnutrition as a state in which the body does not have enough of the required nutrients (under nutrition) or has excess of the required nutrients (over nutrition). Acute malnutrition is defined as low weight for height in reference to a standard child of a given age based on WHO growth standards. This form of malnutrition reflects the current form of malnutrition. Acute malnutrition can further be categorized as severe acute malnutrition and moderate acute malnutrition. Severe acute malnutrition is defined as weight for height < -3 standard deviation in comparison to a reference child of the same age. It also includes those children with bilateral oedema as well as those with MUAC less than 11.5cm. Moderate Acute

Malnutrition on the other hand is defined as weight for height ≥ -3 and < -2 standard deviation in comparison to a reference child of the same age and sex, but also include those children with MUAC < 12.5 cm and ≥ 11.5 cm. The Sum of all children with moderate and severe acute malnutrition is referred as global acute malnutrition (GAM).

Prevalence of Acute Malnutrition based on Weight for Height by sex

Anthropometric data of children aged 6-59 months in sampled households were taken and recorded during the survey. Data analyzed was of 501 (261 boys and 240 girls) children aged 6 - 59 months. From the assessment, the Global Acute Malnutrition (GAM) rate for the County based on Weight for height Z scores was **15.8% (12.7 – 19.5 95% C.I.)** while Severe Acute Malnutrition (SAM) rate was **2.4 % (1.4 – 4.2, 95% C.I.)** as indicated in the below. There was no significance shift in GAM ($p=0.9685$) compared to similar period in the previous year 2018 and the county nutrition situation was classified as **CRITICAL**. There is no significant difference between proportion of malnourished boys and the girls through boys are slightly more malnourished at 16.1% compared to girls at 15.4%.

The proportion of severe acute malnourished children however decreased significantly to 2.4% in 2019 compared to similar period at 4.3% in the previous year 2018.

Prevalence of acute malnutrition based on Weight for Height z-score (WHO 2006 Standards)

Indicator	All n = 501	Boys n = 261	Girls n = 240
Prevalence of global malnutrition (GAM) (< -2 z-score and/or oedema)	(79) 15.8 % (12.7 - 19.5 95% C.I.)	(42) 16.1 % (12.2 - 20.9 95% C.I.)	(37) 15.4 % (11.7 - 20.1 95% C.I.)
Prevalence of severe malnutrition (SAM) (< -3 z-score and/or oedema)	(12) 2.4 % (1.4 - 4.2 95% C.I.)	(8) 3.1 % (1.5 - 6.0 95% C.I.)	(4) 1.7 % (0.6 - 4.3 95% C.I.)

Prevalence of Acute Malnutrition by MUAC

Global Acute Malnutrition analysis based on Middle Upper arm Circumference (MUAC) data collected from 504 children (264 boys and 240 Girls) classified the county at **ALERT** with a GAM **3.6%** with a Severe Acute malnutrition (SAM) of **0.2%**). However, unlike by GAM by Weight for weight, more Girls were malnourished at 4.2% compared to boys at 3.0% as illustrated in the table below

Prevalence of Acute Malnutrition by MUAC

Indicator	All n = 504	Boys n = 264	Girls n = 240
Prevalence of global malnutrition (< 125 mm and/or oedema)	(18) 3.6 % (2.1 - 6.0 95% C.I.)	(8) 3.0 % (1.5 - 6.1 95% C.I.)	(10) 4.2 % (2.1 - 8.1 95% C.I.)

Prevalence of severe malnutrition (< 115 mm and/or oedema)	(1) 0.2 % (0.0 - 1.4 95% C.I.)	(1) 0.4 % (0.1 - 2.7 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)
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3.2.2 Prevalence of Underweight based on WFA

Underweight is defined as low weight for age relative to National Centre for Health and Statistics or World Health Organization reference median. In this survey, the later was used. Children with weight for age less than -2 SD in relation to a reference child are classified as underweight while those with less than -3 SD are classified as severe underweight. Underweight is a composite form of under nutrition and has elements of both acute under nutrition (wasting) as well as chronic under nutrition (stunting). There was significant reduction in prevalence of underweight (P= 0.2907) among children aged 6 to 59 months in Samburu County in 2019 at 28.2 % (24.1 – 32.7, 95% C.I.) compared to similar period in 2018 at 31.6%. There was also significant reduction in severe underweight in 2019 at 6.6% compared to 2018 which was 7.4% as illustrated in table below

Prevalence of Underweight based on WFA

Indicator	All n = 500	Boys n = 260	Girls n = 240
Prevalence of underweight (<-2 z-score)	(141) 28.2 % (24.1 - 32.7 95% C.I.)	(83) 31.9 % (26.6 - 37.7 95% C.I.)	(58) 24.2 % (19.4 - 29.7 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(33) 6.6 % (4.7 - 9.2 95% C.I.)	(21) 8.1 % (4.9 - 13.1 95% C.I.)	(12) 5.0 % (2.9 - 8.4 95% C.I.)

3.2.3 Prevalence of Chronic Malnutrition (Stunting) based on (HFA)

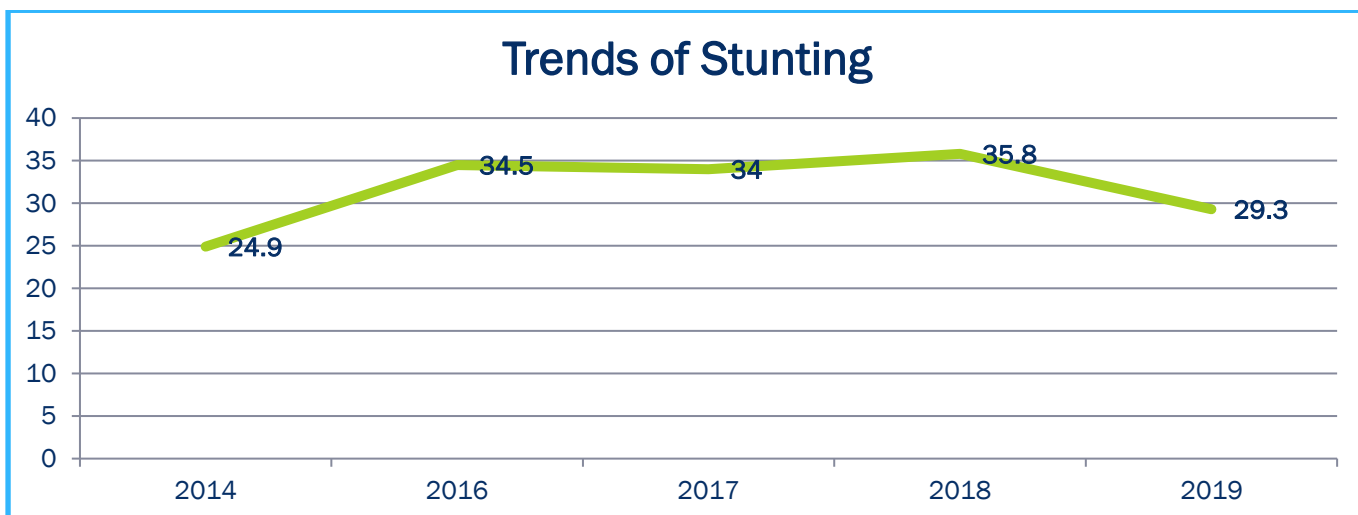
Stunting, or low height for age, is caused by long-term insufficient nutrient intake and frequent infections. Stunting generally occurs before age two, and effects are largely irreversible. These include delayed motor development, impaired cognitive function and poor school performance.

Analysis of stunting prevalence based on height for age revealed a significant reduction in stunting rate among children aged 6-59 months in 2019 at 29.3% (25.1 - 33.9 95% C.I.) compared to 2018 which was 35.8%. This shift was mainly attributed to increased multi sectoral approaches in the county to curb malnutrition.

Prevalence of Stunting based on Height for Age z- score and by sex

Indicator	All n = 481	Boys n = 247	Girls n = 234
Prevalence of stunting (<-2 z-score)	(141) 29.3 % (25.1 - 33.9 95% C.I.)	(79) 32.0 % (26.1 - 38.5 95% C.I.)	(62) 26.5 % (21.9 - 31.7 95% C.I.)

Prevalence of severe stunting (<-3 z-score)	(40) 8.3 % (6.0 - 11.5 95% C.I.)	(29) 11.7 % (8.6 - 15.9 95% C.I.)	(11) 4.7 % (2.4 - 8.9 95% C.I.)
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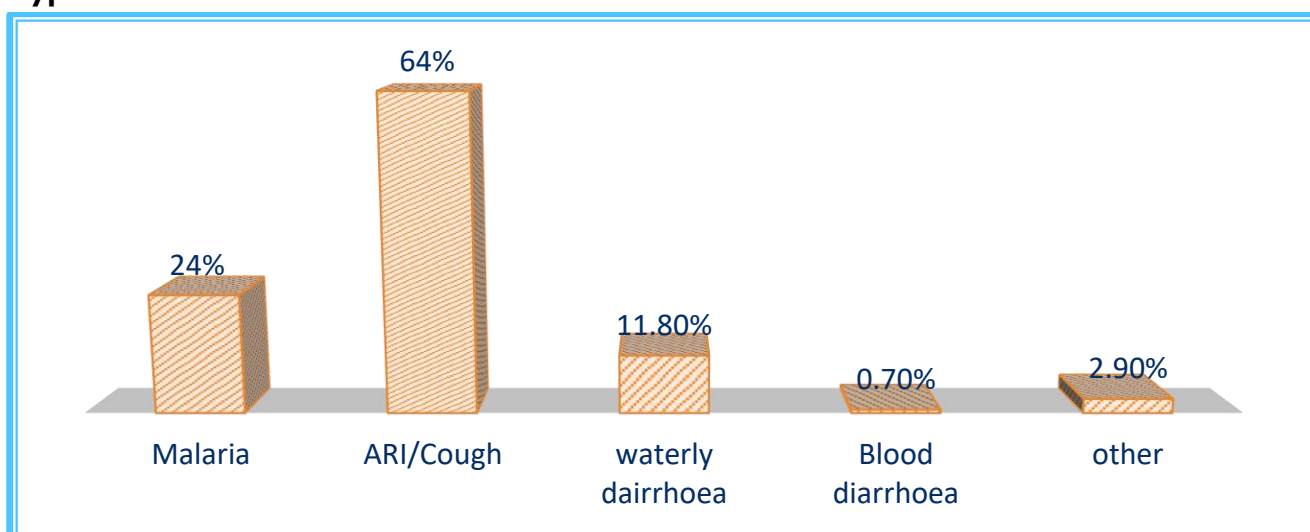


3.3 Children Morbidity, Zinc supplementation and Health Seeking behavior

3.3.1 Prevalence of Morbidity and Zinc supplementation

From the result 27% of the children were reported to have been ill 2 weeks prior to the survey. Among those who were ill 64% had ARI/Cough, 24% had malaria and 11.8% had watery diarrhea. 56.3% of children with reported watery diarrhea were supplemented with Zinc

Type of disease the under-five suffered



3.3.2 Health Seeking Behavior

Among the households whose their children became ill in the past one week 77.2% sought assistance in various places. It was found out that 89.6% sought assistance from appropriate centers namely public clinics, private clinics or pharmacy, mobile clinics and FBO/NGO Hospitals as shown by the table below.

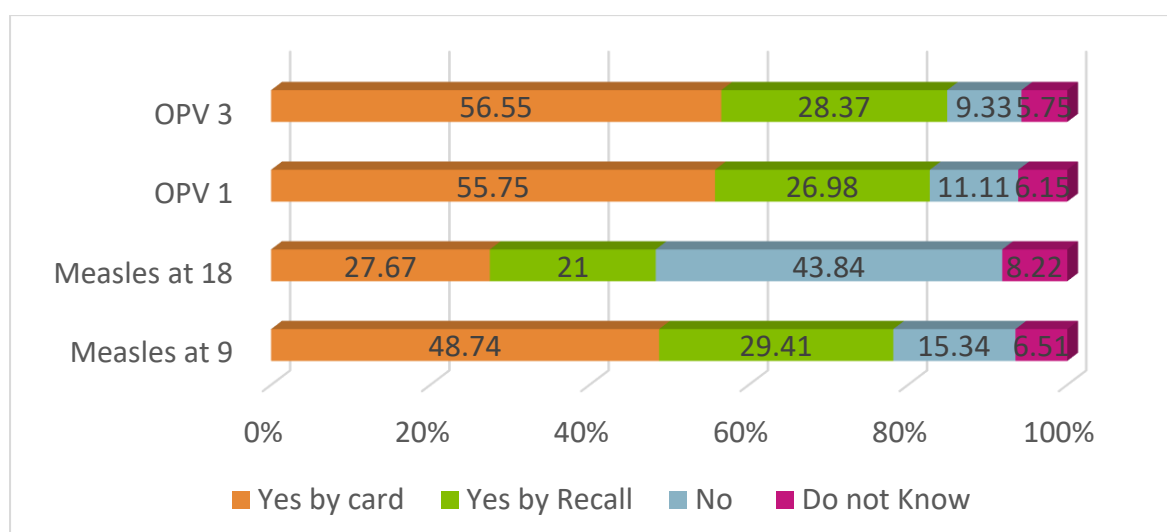
Where sought assistance	Percent
Traditional healer	0%
Community health worker	2.90%
Private clinic/ pharmacy	10.50%
Shop/kiosk	1.90%
Public health facility	77.10%
Mobile clinic	1%
Relative or friend	0%
Local herbs	7.60%
NGO/FBO	1%

3.4 Child Immunization, Vitamin A supplementation and Deworming

3.4.1 Immunization

Immunisation is a simple and effective way of protecting children from serious diseases. It not only helps protect individuals, it also protects the broader community by minimising the spread of disease. Vaccines work by triggering the immune system to fight against certain diseases. If a vaccinated person comes in contact with these diseases, their immune system is able to respond more effectively, preventing the disease from developing or greatly reducing its severity. High immunisation rates in the community have led to many of diseases becoming rare. However, they still exist and the risks of side-effects or complications from these diseases are far greater than the very small risks of side effects from vaccination. The survey used three antigens as a proxy for immunization coverage. These were; BCG, Oral Polio vaccination (1 and 3) and measles vaccine (1 and 2).

From the results 89.88% of children had been immunized of BCG as confirmed by the presence of a scar, , 82.73% had received OPV1, 84.92% had received OPV3, 78.15% had received measles at 9m and 48.67% had received measles at 18m



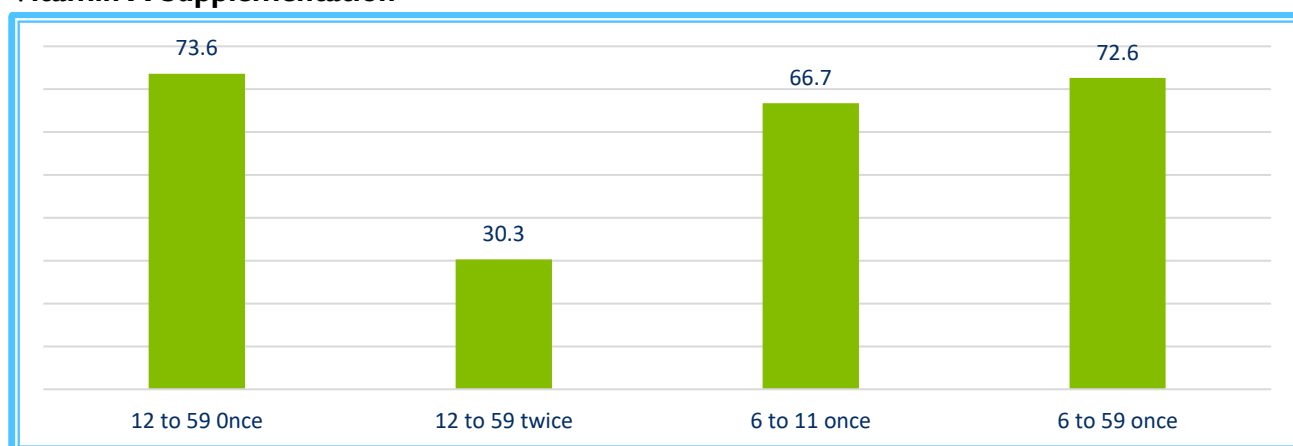
3.4.2 Vitamin A Supplementation and Deworming Coverage

Over 140 million children are at greater risk of illness, hearing loss, blindness and even death if urgent action is not taken to provide them with life-saving vitamin A supplements. Two doses of vitamin A every year can save thousands of children’s lives. According to the new UNICEF report; “Coverage at a crossroads: New directions for vitamin A supplementation programmes”¹, global coverage of vitamin A supplementation (VAS) has dropped to a six-year low, leaving more than one third of children unprotected from the devastating impacts of vitamin A deficiency. Currently, the future of VAS hangs in the balance and more work is needed to make programmes sustainable. As the world mobilizes towards the 2030 Agenda for Sustainable Development – and particularly the target of ending preventable deaths in children under age 5 – there has never been a more urgent time to reprioritize this safe, cost-effective and evidence-based intervention.

Furthermore, The Lancet medical journal lists vitamin A large-scale supplementation has proven potential to reduce the number of preventable child deaths each year (Jones et al, 2003). Improving the vitamin A status of deficient children enhances their resistance to disease and can reduce mortality from all causes by approximately 23 per cent (UNICEF, 2007). During much of early childhood – from 6 months to 5 years of age – two high-dose supplements of vitamin A per year, spaced four to six months apart, can strengthen the immune systems and improve chances of survival (WHO, 2018). Vitamin A supplementation among children below the age of 5 years offers protection against common childhood infections and substantially reduces mortality hence improving the child’s survival.

From the findings 73.6% of children aged 12 to 59 months had been supplemented once and 30.3% had been supplemented twice. Further 72.6% of the children aged 6 to 59 months had been supplemented once and 66.7% of children aged 6 to 11 months had been supplemented once.

Vitamin A Supplementation



De-worming

De-worming is an essential intervention in controlling parasites including helminths, schistosomiasis (bilharzias) and prevention of anaemia. WHO recommends that children in

¹ UNICEF. Coverage at a Crossroads: New directions for vitamin A supplementation programs, New York, 2018.

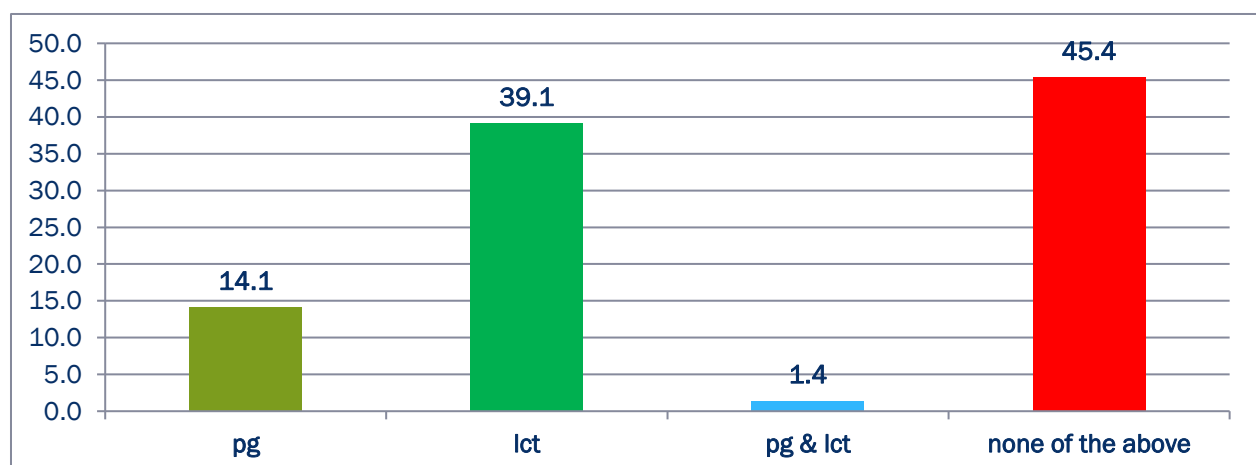
developing countries exposed to poor sanitation and poor availability of clean safe water to be de-wormed once every 6 months. From the findings 73.6% of children aged 12- 59 months were dewormed at least once in the past one year, 30.3 only % were dewormed at least 2 times as recommended

3.5 Maternal Nutrition

Evidence shows that the current total deaths in children younger than five years can be reduced by 15% if populations can access ten evidence-based interventions when implemented at scale with a coverage of 90% (Bhutta, et.al. 2013). One of these strategies, has a positive effect on child survival during ‘the window of opportunity’ which is also referred to as the 1st 1000 days (from conception to two years of age). One of them is optimal maternal nutrition during pregnancy, an enhanced nutrition package for the infant and young child focusing on promotion of exclusive breastfeeding. Pregnancy and lactation imposes a big nutrient-need load on mothers, which in the absence of adequate extra nutrients leads to utilization of body nutrient reserves leading to malnutrition. Gestational malnutrition leads to low birth weights and may ultimately culminate in poor child growth and development, thus there is an urgent need to address high rates of malnutrition among pregnant women. Household food insecurity is a key indicator/determinant for poor adult nutritional status. A high number of malnourished PLWs increase the risk of growth retardation of the fetus and consequently an increase in low birth weight and malnutrition burden spreads to both U5 children and caretakers from the same household faced with food insecurity and related vulnerabilities, a common scenario during nutrition emergency episodes.

3.5.1 Women physiological status

Majority 45.4% of the women were neither pregnant nor lactating, 39.1% were lactating and 14.1% were pregnant.



3.5.2 Maternal nutrition

Maternal malnutrition is usually associated with high risk of low birth weights and it is recommended that before, during and after birth, the maternal nutrition status should be adequate. Maternal nutrition was assessed by measuring MUAC of all women of reproductive age (15 to 49) in all sampled households. Analysis was further focused on pregnant and lactating women.

The maternal malnutrition was defined as women whose MUAC measurements were < 21.0cm while women whose MUAC measurements were between 21.0 <23.0cm were classified as at risk of malnutrition.

Indicator	2018	2019	N
MUAC <21.0 cm for all women	10.4%	12.3%	496
MUAC <21.0 cm for PLW	10.2%	11.4%	271

The findings indicated that women nutrition deteriorated in the year 2019, 12.3% of the women of reproductive age had MUAC <210mm compared to 10.4% in 2018.

3.5.3 Iron and Folic Acid Supplementation

During pregnancy, women have increased need for additional iron to ensure they have sufficient iron stores to prevent iron deficiency. Iron supplementation is recommended in resource limited settings as strategy to prevent and correct iron deficiency and anaemia among pregnant women WHO recommends daily consumption of 60mg elemental iron and 0.4mg folic acid throughout the pregnancy². These recommendations have since been adopted by Kenya government in its 2013 policy guidelines on supplementation of iron folic acid supplementation (IFAS) during pregnancy.

From the findings 81.12% of women surveyed who carried full term pregnancy in the past 2 years prior to the survey were supplemented with iron and folic acid. The mean number of days for iron and folic acid consumption was 67.7 days. Majority of the women at 62.2% took IFAS for a period of 90 day and 16.4% took IFAS for a period of 91-180 days

Categories of IFA Consumption (In Days)	No of women	Proportion (%)
0-90 Days	178	62.2%
91 -180 Days	47	16.4%
181- 270 Days	7	2.4%

3.6 Water Hygiene and Sanitation

International human rights consider access to water and sanitation as a human right.³ This means that all individuals are entitled to have access to an essential amount of safe drinking water and to basic sanitation facilities. The human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic use. Water and sanitation are deeply interrelated. Sanitation is essential for the

² WHO. Guideline: Daily iron and folic acid supplementation in pregnant women. Geneva, World Health Organization, 2012.

³ The UN committee on economic, Cultural and Social rights states in its General Comment of November 2002

conservation and sustainable use of water resources, while access to water is required for sanitation and hygiene practices.

Furthermore, the realization of other human rights, such as the right to the highest attainable standard of health, the right to food, right to education and the right to adequate housing, depends very substantially upon the implementation of the right to water and sanitation. Research has shown that poor WASH indicators are linked to under nutrition and more so on High Stunting levels. Diarrhea, the leading killer of young children is closely linked to poor/inadequate WASH (Pruss-Ustun et al, 2014), which often causes under nutrition, which in turn reduces a child’s resistance to subsequent infections, thus creating a vicious circle. An estimated 25% of stunting is attributable to five or more episodes of diarrhea before 24 months of age (Checkley et al, 2008).

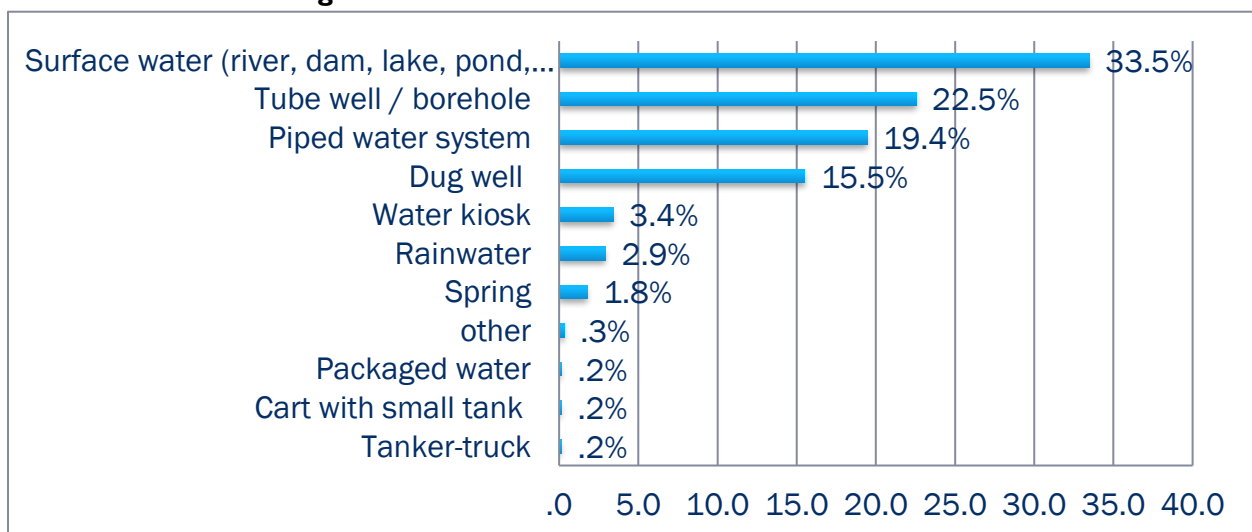
3.6.1 Main Water Sources

Accessibility to improved water sources is of fundamental significance to lowering the faecal risk and frequency of associated diseases. Its association with other socioeconomic characteristics, including education and income, makes it a good universal indicator of human development. Drinking water coverage is presented as a two-step ladder that includes the proportion of the population using:

- Unimproved drinking water sources which include: Unprotected dug well, unprotected spring, cart with small tank/drum, tanker truck, and surface water (river, dam, lake, pond, stream, canal, irrigation channels), bottled water
- Improved drinking water sources also piped water which include: Public taps or standpipes, tube wells or boreholes, protected dug wells, protected springs and rainwater collection, Piped household water connection located inside the user’s dwelling, plot or yard.

From the survey results majority (58.01%) of households were getting drinking water from unprotected sources in Samburu County.

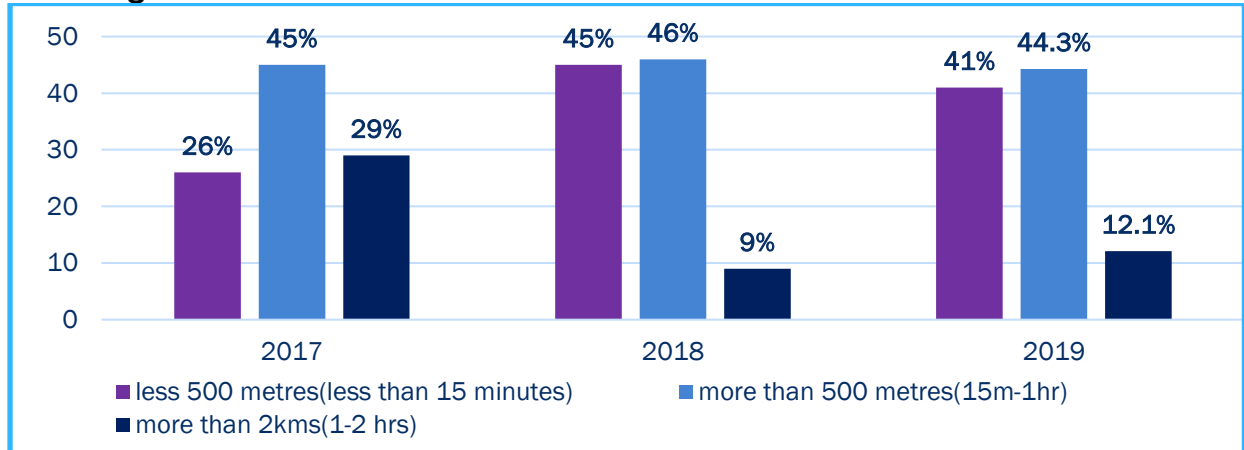
Main Source of drinking water



3.6.2 Distance to Water Source and Queuing Time

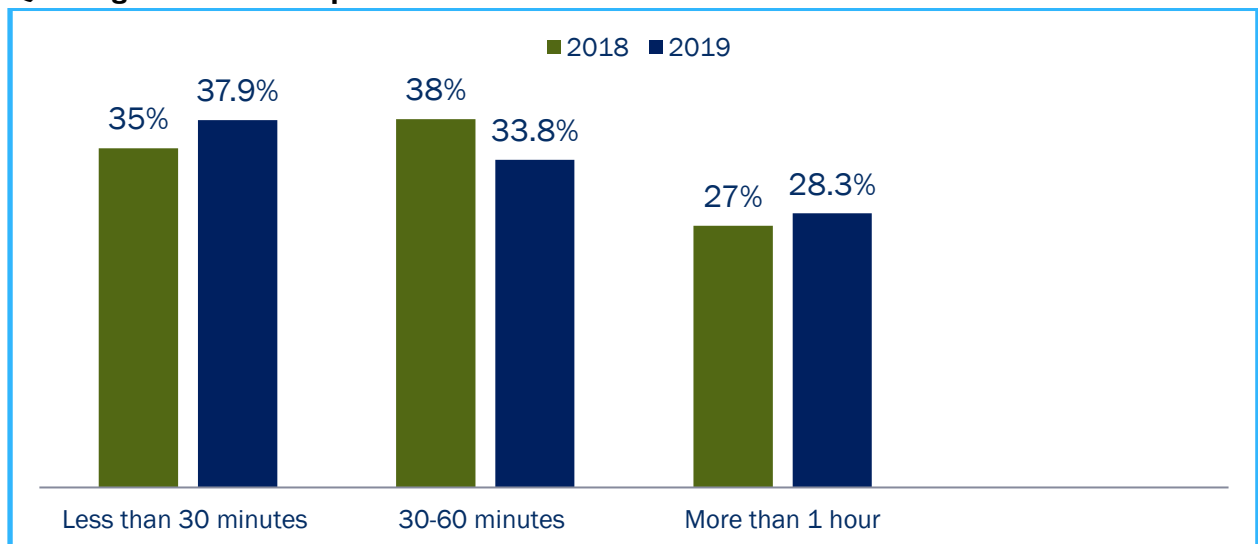
According to SPHERE handbook for minimum standards for WASH, the maximum distance from any household to the nearest water point should be 500 meters. It also gives the maximum queuing time at a water source, which should be not more than 15 minutes, and it should not take more than three minutes to fill a 20-litre container.

Trekking distances to the water sources



Trekking distance reduced compared to the previous year, this can be attributed to good performance of long rains that refilled water sources

Queuing time at water point



Majority (71.7%) are queuing for less than 1hr, there was a slight increase of (1.83%) of households queuing for more than 1 hour in this year as compared to 2018.

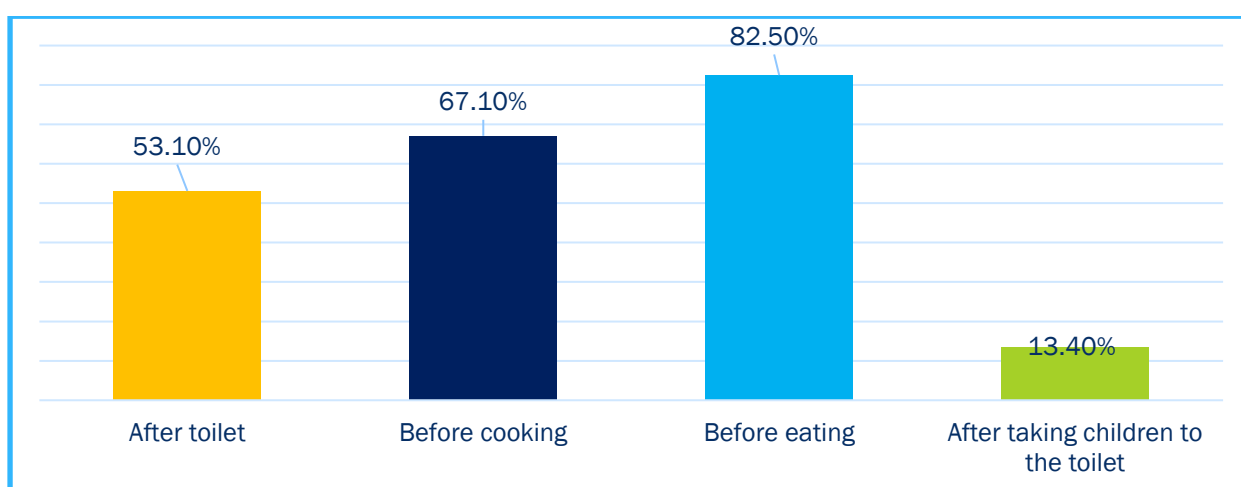
3.6.3 Water Treatment, Storage Payment and Consumption

Majority at 92% of the households stored water in a closed container. Small proportion (16.8%) of households are accessing the recommended amount of water (15 litres) per person per day according to sphere standard compared to 4.2% in 2017. Water treatment being important, 12.6% of household treated their water before drinking.

3.6.4 Hygiene and sanitation

Handwashing with soap is one of the most effective and inexpensive interventions for preventing diarrheal diseases and pneumonia, which together account for 3.5 million child deaths annually worldwide.⁴ Handwashing is important for good health. Effective washing can be practiced with alternatives to soap and using a variety of different hygienic facilities. Overall, interventions to promote handwashing might save a million lives a year. Each person should be able to wash hands with water and soap after toilet use, before food preparation, before eating and after cleaning babies.

A bigger proportion of 84.0 % of the households were aware of hand washing practices. Among those who were aware of hand washing 82.5% washed their hands before eating, 67.1% washed hands before cooking, 53.1% washed hands after visiting toilet and 13.4% washed hands after taking children to the toilet.



The findings showed a decrease in proportion of respondents washing hands in all 4 critical times which was at 11.8% compared to 26% in 2018. The households used various items to wash their hands. For instance 77.4% used soap and water, 15.9% used only water, 6.5% used soap when they can afford it and 0.2% used

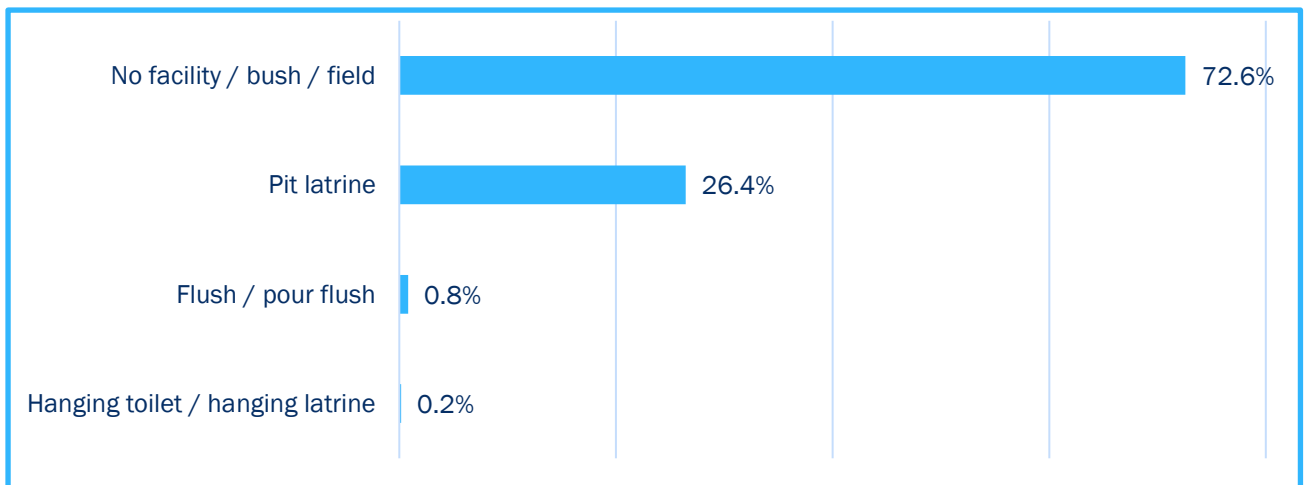
People with at least basic sanitation services are considered to have safely managed sanitation services if the excreta from their homes is transported through sewers and treated off-site. Poor management of excreta is linked to transmission of diseases such as cholera, diarrhoea, dysentery, hepatitis A, typhoid and polio, and also contributes to malnutrition. Inadequate sanitation is estimated to cause 280 000 diarrhoeal deaths annually and is a major factor in several neglected tropical diseases, including intestinal worms, schistosomiasis, and trachoma. Proper sanitation facilities (for example, toilets and latrines) promote health because they allow people to dispose of their waste appropriately.

Sanitation Facilities are classified as:

- Improved sanitation, which include:
 - ✓ Flush toilet
 - ✓ Connection to a piped sewer system
 - ✓ Connection to a septic system

⁴ Cairncross, S. and Valdmanis V. (2006) Chapter 41: Water Supply, Sanitation, and Hygiene Promotion. In D.T. Jamison, J.G. Breman, A.R. Measham, et al. (Editors), Disease Control Priorities in Developing Countries, 2nd edition (771-792). Washington (DC): World Bank.

- ✓ Flush / pour-flush to a pit latrine
- ✓ Pit latrine with slab
- ✓ Ventilated improved pit latrine (abbreviated as VIP latrine)
- ✓ Composting toilet
- Unimproved Sanitation which include:
 - ✓ Public or shared latrine (meaning a toilet that is used by more than one household)
 - ✓ Flush/pour flush to elsewhere (not into a pit, septic tank, or sewer)
 - ✓ Pit latrine without slab
 - ✓ Bucket latrines
 - ✓ Hanging toilet / latrine
 - ✓ No facilities / bush / field (open defecation)



Open defecation was evident in the county since 72.6% of the HH had no sanitation facility, 26.4% had pit latrine and 0.8% of the household had flush/ pour flush.

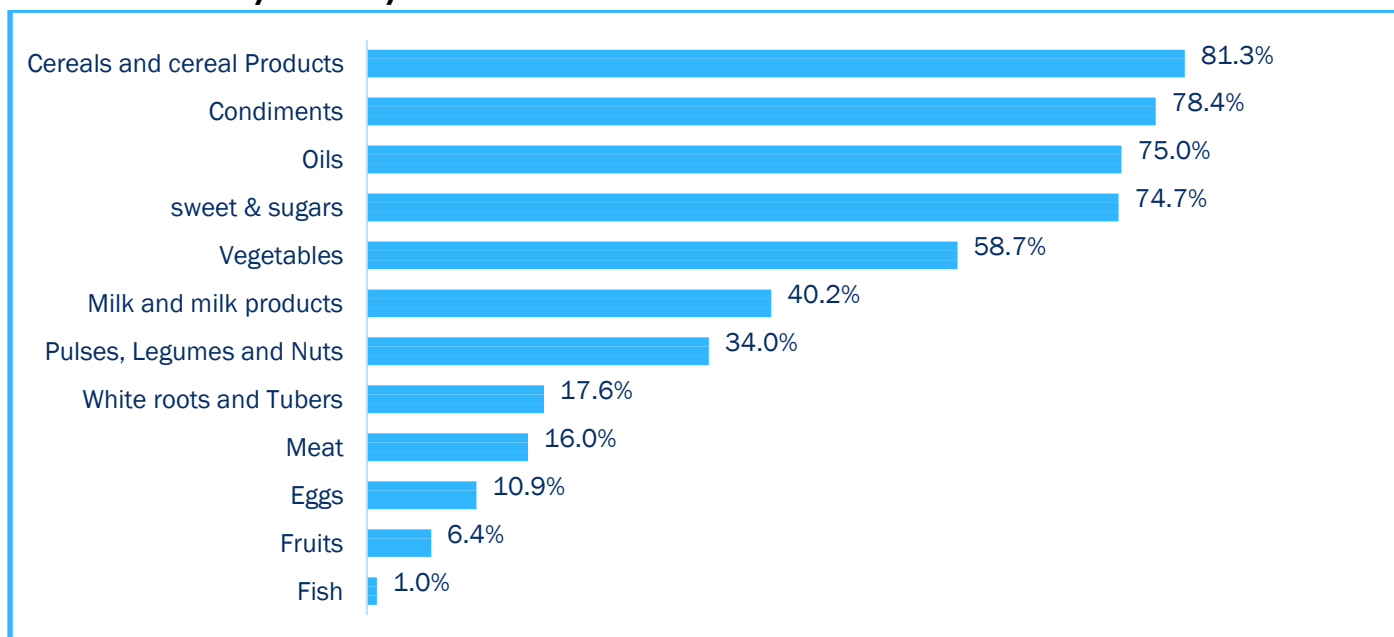
3.7 Household and Women Dietary Diversity

3.7.1 Household Dietary Diversity (HDD)

The household dietary diversity score (HDDS) is meant to reflect, in a snapshot form, the economic ability of a household to access a variety of foods. Studies have shown that an increase in dietary diversity is associated with socio-economic status and household food security (household energy availability) (FAO 2010). The HDDS is meant to provide an indication of household economic access to food, thus items that require household resources to obtain, such as condiments, sugar and sugary foods, and beverages, are included in the score. Individual dietary diversity scores aim to reflect nutrient adequacy. Studies in different age groups have shown that an increase in individual dietary diversity score is related to increased nutrient adequacy of the diet. Dietary diversity scores have been validated for several age/sex groups as proxy measures for macro and/ or micronutrient adequacy of the diet.

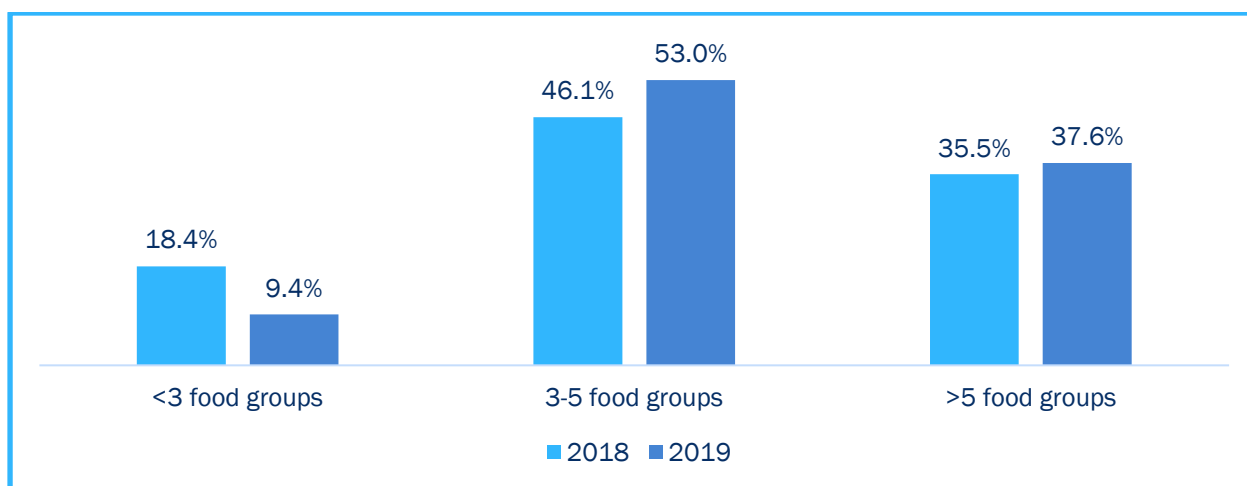
Household dietary diversity assessment was based on a 24 hour recall period. At the data collection, 16 food groups as described in FAO 2010 guideline were used.

Household Dietary Diversity based on 24 hours recall



Majority of the households consumed cereals and cereals products, condiments, oils, sweet and sugar and vegetables as shown by the figure above

Household Dietary Diversity Score based on 24 hours recall



During the survey it was found that HDD had improved in 2019 compared to similar period in 2018. This was because fewer households were consuming less than 3 food groups. About 9.4% of the households consumed less than 3 food groups, 53% consumed 3 to 5 food groups and 37.6% consumed more than 5 food groups.

3.7.2 Minimum Dietary Diversity for WRA

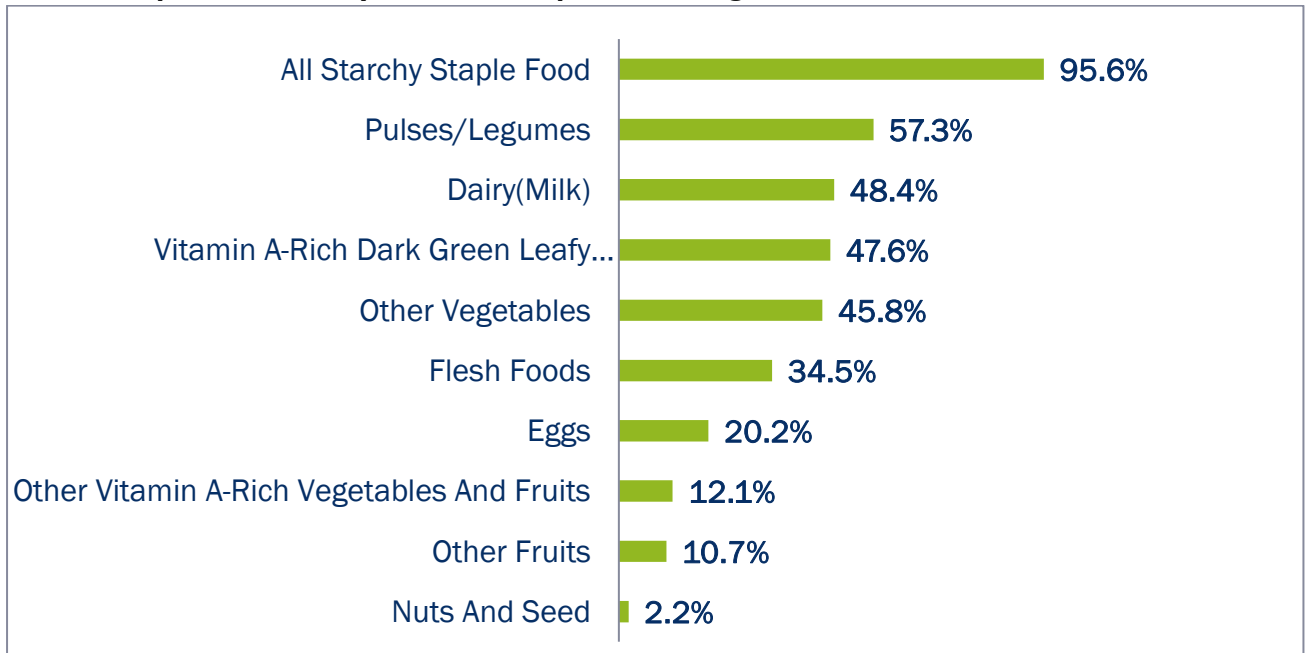
Women of reproductive age (WRA)⁵ are often nutritionally vulnerable because of the physiological demands of pregnancy and lactation. Requirements for most nutrients are higher for pregnant and lactating women than for adult men⁶. Outside of pregnancy and

⁵ For the purposes of this document and indicator, WRA are defined as those 15–49 years of age.

⁶ National Research Council, 2006; World Health Organization [WHO]/Food and Agriculture Organization of the United Nations [FAO], 2004

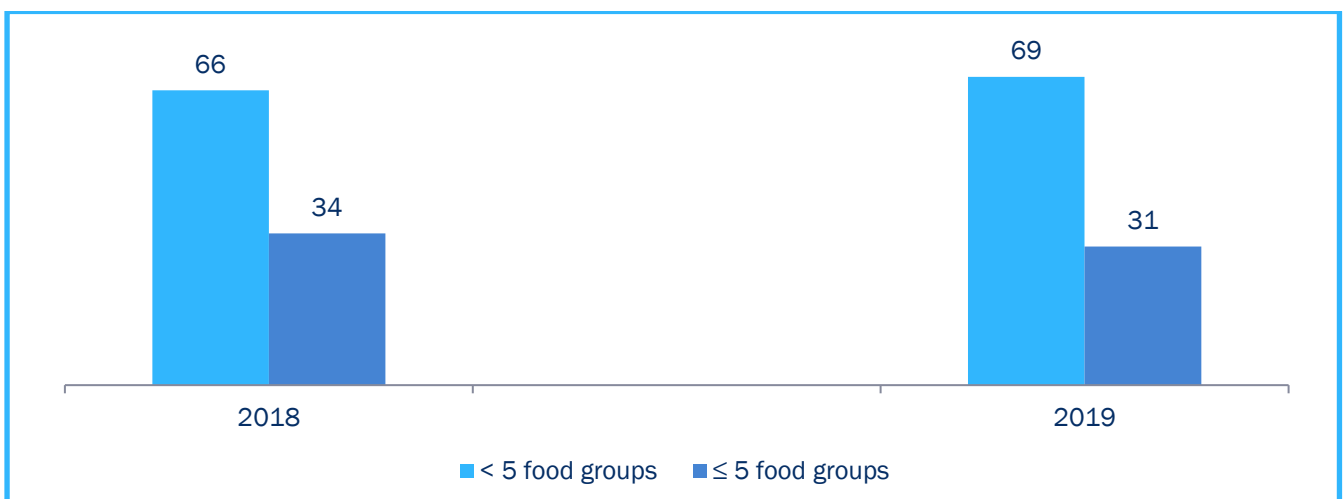
lactation, other than for iron, requirements for WRA may be similar to or lower than those of adult men, but because women may be smaller and eat less (fewer calories), they require a more nutrient-dense diet⁷ Insufficient nutrient intakes before and during pregnancy and lactation can affect both women and their infants. Yet in many resource poor environments, diet quality for WRA is very poor, and there are gaps between intakes and requirements for a range of micronutrients⁸.

Food Groups consumed by women of reproductive age



Majority of the women consumed starch staple foods, pulses/legumes, dairy vegetables and flesh foods as shown by the figure above

Women Minimum Dietary Diversity (W-MDD)



⁷ “Nutrient density” refers to the ratio of nutrients (such as vitamins and minerals) to the energy content of foods.

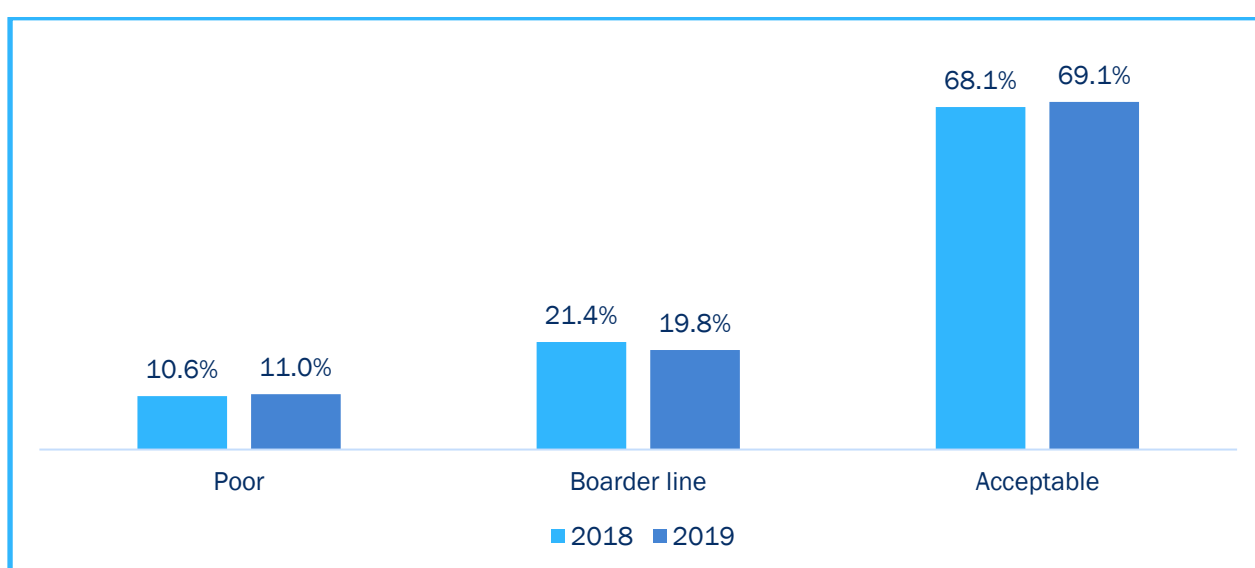
⁸ Arimond et al., 2010; Lee et al. 2013

W-MDD deteriorated in 2019 where women who took less than 5 food groups increased from 66% to 69% and who took more than 5 food groups dropped from 34% to 31% in 2019.

3.7.3 Food Consumption Score (FCS)

The Food Consumption Score is a composite score based on dietary diversity, food frequency and relative nutrition importance of different food group (WFP 2015). FCS is a proxy for household food security and is designed to reflect the quality of people’s diet. The FCS is considered as an outcome measure of household food security. Food consumption score classifies households in to 3 categories namely, poor, borderline and acceptable. In computing FCS, 16 food groups were collapsed to 8 groups namely; cereals, pulses, vegetables, fruits, meats (meats, fish and eggs), dairies, sugars and oils. The frequency of consumption (maximum 7 days) was multiplied by an assigned weight factor i.e. cereals (2), pulses (3), vegetables (1), fruits (1), meats (4), dairies (4), oils (0.5) and sugar (0.5).

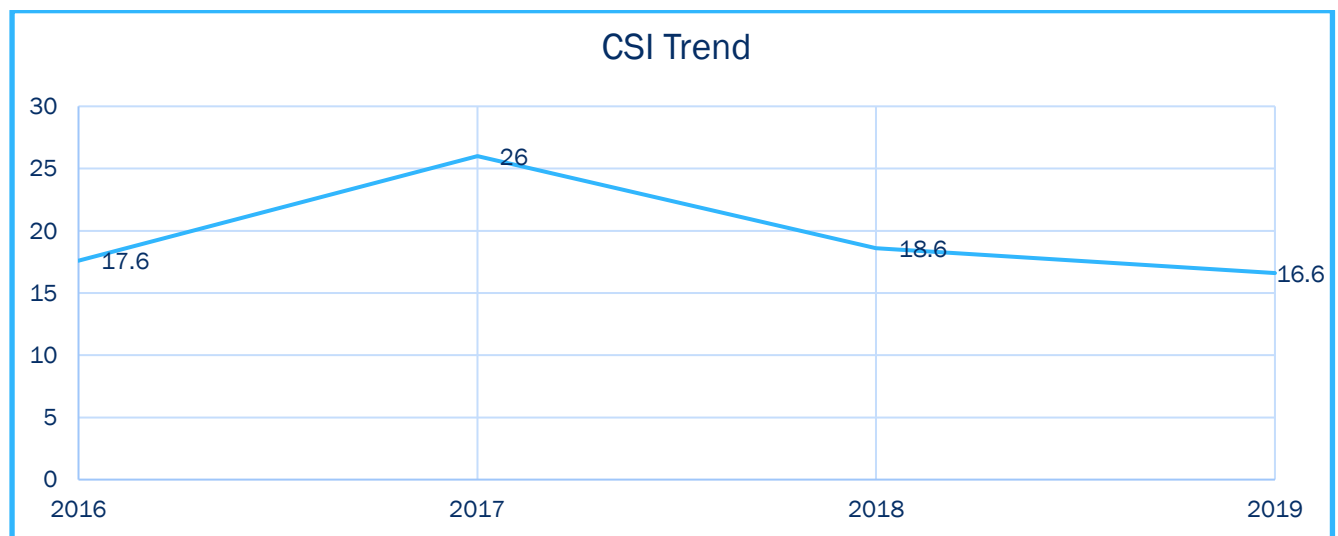
Food Consumption Score



3.7.3 Coping Strategy Index (CSI)

Coping strategy	Proportion of Hs (N= 299)	Frequency score (0-7)	Severity score (1-3)	Weighted score
Rely on less preferred and less expensive foods?	263	3.180602	1	3.180602
Borrow food, or rely on help from a friend or relative?	231	1.501672	2	3.003344
Limit portion size at mealtimes?	267	2.585284	1	2.585284
Restrict consumption by adults in order FOR small children to eat?	229	1.809365	3	5.428094
Reduce number of meals eaten in a day?	253	2.377926	1	2.377926
TOTAL CSI				16.57525

The Coping Strategies Index is a simple and easy-to-use indicator of household stress due to a lack of food or money to buy food. The CSI is based on a series of responses (strategies) to a single question: “What do you do when you don’t have adequate food, and don’t have the money to buy food?” The CSI combines, the frequency of each strategy (how many times was each strategy was adopted) and the severity (how serious is each strategy). This indicator assesses whether there has been a change in the consumption patterns of a given household. For each coping strategy, the frequency score (0 to 7) is multiplied by the universal severity weight. The weighted frequency scores are summed up into one final score (WFP 2012).



CSI reduced significantly to 16.6 in 2019 from a score of 18.6 in 2018. This implied that less Household were not applying coping strategies compared to similar period in the previous year.

Food Fortification

Fortification is adding vitamins and minerals to foods to prevent nutritional deficiencies. The nutrients regularly used in grain fortification prevent diseases, strengthen immune systems, and improve productivity and cognitive development. Wheat flour, maize flour, and rice are primarily fortified to:

- Prevent nutritional anaemia
- Prevent birth defects of the brain and spine
- Increase productivity
- Improve economic progress

Food fortification was identified as the second strategy of four by the WHO and FAO to begin decreasing the incidence of nutrient deficiencies at the global level.⁹ As outlined by the FAO, the most common fortified foods are cereals (and cereal based products), milk (and milk products), fats and oils, accessory food items, tea and other beverages, and infant formulas.¹⁰ Undernutrition and nutrient deficiency is estimated globally to cause between 3 and 5 million deaths per year.

From the survey results 9% of percent of respondents had heard about Food Fortification and had knowledge about food fortification logo and 91 % have not heard. Among those who had knowledge

⁹ World Health Organization and Food and Agriculture Organization of the United Nations Guidelines on food fortification with micronutrients. Archived 26 December 2016 at the Wayback Machine. 2006 [cited on 2011 Oct 30].

¹⁰ Micronutrient Fortification of Food: Technology and Quality Control Archived 2 September 2016 at the Wayback Machine

about food fortification 66% got the information from health talk, 37.7% heard it from radio 5.7% heard it from a training and on a TV show.

4.0 Conclusion

Overall the nutrition Status of children in Samburu County remained stable in comparison with similar period previous year as per the SMART Survey 2019. The nutrition status of children in the County was HIGH based on the new threshold classification at a global acute malnutrition of 15.8% with Severe Acute Malnutrition of 2.4%. There was no significant wasting difference between the boys and the girls with wasting rate of 16.1% and 15.4% respectively. However, there was notable difference in severe acute malnutrition between the Boys and Girls at a SAM rate of 3.1% and 1.7% respectively.

There was insignificant decrease in proportion of underweight children in comparison to similar period in 2018 at 31.6% with underweight in 2019 being 28.2%. Underweight was evenly distributed among the boys and girls. There was significant decrease in stunting among children aged 6-59 months in 2019 at stunting rates of 29.3% compared to 2018 at 35.8%. However, the stunting rate remain HIGH based on the new prevalence classification.

In terms of morbidity as a major contributor to malnutrition, the situation improved significantly compared to the previous year. The proportion of children reported ill 2 weeks before the study significantly dropped from 40.9% in 2018 to 27% in 2019 indicating a relatively more healthy population. Among the children reported ill, major ailments included ARIs at 64%, Malaria at 24% and watery diarrhea at 11.8%. Other condition accounted for 2.9% with bloody diarrhea at 0.7%.

Poor water and sanitation hygiene conditions in the county were major contributor to childhood illnesses mainly diarrhea. Despite a slight reduction in open defecation in comparison to previous year, open defecation in the County remained high at 72.6% in 2019. This coupled with other poor hygiene practices including proportion of households treating water at 12.6%, proportion of people washing hands in the 4 critical times at 11.8% depict a deterioration in appropriate hygiene practices hence contribution highly to high malnutrition rates in the county

Immunization of children as a preventive measure to high morbidity rates in the county improved compared to similar period in 2018. Proportion of children aged 6-11 months supplemented with Vitamin A improved from 47.6% in 2018 to 66.7% in 2019. A slight increase though in children aged 12-59 month supplemented was noted from 71% in 2018 to 73.6% in 2019. Total proportion of children supplemented with Vitamin A twice improved from 26.8% to 30.3% in 2019. Improved supplementation was attributed to integration of supplementation in ECD centers.

Quantification of maternal nutrition status was largely based on MUAC measurement among women of reproductive age (15 -49 years) as well as iron and folic acid consumption among mothers to children under two years. There was a slight deterioration on maternal nutrition with more women of reproductive age malnourished at 12.3% in 2019 compared to 2018 at 10.4%. This was also the case for pregnant and lactating women where a slight increase of malnourished women was noted at 11.4% in 2019 up from 10.2% in 2018. A significant increase in proportion of pregnant women supplemented in 2019 at 81.1% was noted down from 77% in 2018. However, despite a high rate of supplementation, only 67.7% consumed the capsules. In addition, majority at 62.2% of those who

consumed the IFAS only consumed for a less than 90 days. 16.4% consuming for a period between 90-180 days.

There was a general improvement in food security indicators in 2019 compared to similar period in 2018. Majority of households were more at an acceptable food secure status with a food consumption score of 69%. The household coping strategy index reduced to 16.6% compared to 2018 at 18.6%. Only a significantly low proportion of households at 37.6% consumed an acceptable diet from more than >5 food groups. Women of reproduction age who consumed foods acceptable diets from >5 food groups was equally low at 31% in 2019 up from 34% in 2018.

5.0 Recommendations

Based on the survey findings, the following actions were recommended

Findings	Recommendation	Actors	Implementation timelines
Open defecation 72.6% Hand washing at 4 critical times 11.8 % Water treatment 12.6%	Strengthening health education package on latrine coverage and hand washing to minimize gap between knowledge and practice.	MoH and MoE	June 2020
	Intensifying Community Led Total Sanitation in the three sub counties (Samburu North, East and Central)	MoH and MoE, Local administration (Chiefs and Village administrators)	June 2020
	Develop a bill on latrine coverage at household level, institutional level and social places	MoH and MoE	June 2020
	Improving access to safe water water – through water trucking, boreholes in Samburu east and North sub counties.	MoW, NDMA,	June 2020
	Provision of water storage containers to households at treatment chemicals at household level	MoH, MOW, and partners	Quarterly
Prevalence of GAM 15.8%	Up scaling of Integrated outreaches in hotspots	MoH and Partners	Quarterly
Prevalence of Underweight 28.2%	Strengthen HiNI Service delivery in all health facilities in the county	MoH and partners	June 2020
	Strengthen defaulter tracing mechanism for malnourished children	MoH, Community Units, Local administration	June 2020
	Strengthen active case finding and referral systems at community units	MoH and partners	June 2020
	Promote and Strengthen growth monitoring in all ECDE centres and health facilities	MoH and MoE and Partners	June 2020
Prevalence of stunting	Up scaling baby friendly Community Initiatives in community units	MoH, MoA	June 2020

29.3%	Strengthen Nutrition Multi- sectoral platform coordination	MoH, MoH line ministries and partners	Quarterly
	Promote child care practices with focus to alcoholism	Local administration	June 2020
	Contextualize and communicate key health and Nutrition messages	MoH, Local Administration	June 2020
Household Dietary Diversity (Households consuming foods from > 5 food groups) 31 %	Promote effective agricultural practices on production and post-harvest management through Capacity building of farmers	MoA, MoW	June 2020
	Improve market infrastructure, road networks and security.	Ministry of public works and roads, Ministry of interior and national coordination.	June 2020
	Promote dietary diversification through Kitchen gardening, dietary formulation and cooking demonstration	MoH, Home Economics,	June 2020

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Appendices

Appendix I: Plausibility check for: Samburu County

Overall data quality

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 (0.6 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	0 (p=0.285)
Age ratio (6-29 vs 30-59) (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	4 (p=0.003)
Dig pref score - weight	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	0 (4)
Dig pref score - height	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	0 (4)
Dig pref score - MUAC	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	0 (5)
Standard Dev WHZ .	Excl	SD	<1.1 and 0	<1.15 and 5	<1.20 and 10	>=1.20 or <=0.80 20	0 (1.01)
Skewness WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	0 (0.01)
Kurtosis WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	1 (-0.23)
Poisson dist WHZ-2	Excl	p	>0.05 0	>0.01 1	>0.001 3	<=0.001 5	0 (p=)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	5 %

The overall score of this survey is 5 %, this is excellent.

The overall score of this survey was 5%, this is excellent.

Appendix 2: Sampled Clusters

Sub County	Ward	Location	Sub- Location	Geographical unit
Samburu East	Wamba West	Londungokwe	Lpus	Lopikutuk
Samburu East	Waso	Waso East	Losesia	Losesia
Samburu East	Wamba North	Nairimirimo	Swari	Lkwasi
Samburu East	Waso	Waso East	Archers Post	Nakwamor
Samburu East	Wamba North	Ngilai Central	Ngilai	Noolotoro
Samburu East	Wamba West	Londungokwe	Sessia	Mabati
Samburu East	Waso	Sereolipi	Sereolipi	Sirata
Samburu East	Wamba North	Nairimirimo	Lpus Leluai	saasab
Samburu East	Waso	Ndonyo Wasin	Ndonyo Wasis	Lturoto oibor
Samburu North	El barta	El barta	Baragoi	Mnanda
Samburu North	Ndoto	Loikumkum	Loikumkum	Lchalai
Samburu North	Ndoto	El barta	Masikita	Masikita
Samburu North	Nachola	Nachola	Nachola	Lingatuny
Samburu North	Nyiro	South Horr	South Horr	Anderi
Samburu North	Nyiro	Lorjorin	Lorjorin	Lonjorin
Samburu North	Ndoto	Illaut	Illaut	Lechet
Samburu North	Nachola	Nachola	Nachola	Nachola
Samburu Central	Loosuk	Loosuk	Pura	Kutari
Samburu Central	Angata Nanyokie	Angata Nanyokie	Angata Nanyokie	Nkirenyi
Samburu Central	Loosuk	Loosuk	Loosuk	Lchingei
Samburu Central	Loosuk	Loosuk	Tinga	Lolmisigiyo
Samburu Central	Angata Nanyokie	Barsaloi	Barsaloi	Embakasi
Samburu Central	Mararal	Mararal urban	Mararal Town	Lonjonito
Samburu Central	Mararal	Mararal Town	Lpartuk	Lower Nomotio
Samburu Central	Mararal	Mararal Town	Mararal	Kosovo I
Samburu Central	Mararal	Mararal	Shabaa	Soit pus
Samburu Central	Mararal	Mararal urban	Ng'ari	Nyobit
Samburu Central	Mararal	Mararal	Nkuroto	Lareobor
Samburu Central	Mararal	Mararal Town	Mararal Town	Biashara 2
Samburu Central	Mararal	Mararal urban	Milimani	Lolkirdingai
Samburu Central	Poro	Poro	Seketet	Lpangash
Samburu Central	Poro	Sirata Oirobi	Sirata	Sirata Upper
Samburu Central	Baawa	Opiroi	Opiroi	Njiosioni
Samburu Central	Baawa	Baawa	Lkirotrit	Ikiloritng/Ngambo
Samburu Central	Suguta Marmar	Suguta Marmar	Suguta Marmar	Angata Rongai A
Samburu Central	Suguta Marmar	Suguta Marmar	Logorate	Sengei
Samburu Central	Lodokejek	Lodokejek	Lodokejek	Lkichaki
Samburu Central	Suguta Marmar	Suguta Marmar	Lomolog	ngerio/Lolmolog
Samburu Central	Suguta Marmar	Amiaya	Longewani	Lkitasingi

Samburu Central	Lodokejek	Kisima	Lmisigiyo	Lekiji
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Appendix 3: questionnaire

1.IDENTIFICATION		1.1 Data Collector		1.2 Team Leader		1.3 Survey date (dd/mm/yy)-----		
1.4 County	1.5 Sub County	1.6 Ward	1.7 Location	1.8 Sub-Location	1.9 Village	1.10 Cluster No	1.11 HH No	1.12 Team No.
1.13 Household geographical coordinates	Latitude		Longitude					

2. Household Demographics										
2.1	2.2a	2.2b	2.3	2.4	2.5	2.6	2.7a	2.7b	2.8	2.10
Age Group	Please give me the names of the persons who usually live in your household.	Please indicate the household head (write HH on the member's column)	Age (Record age in MONTHS for children <5yrs and YEARS for those ≥ 5 years's) Year s Month s	Childs age verified by 1=Health card 2=Birth certificate / notification 3=Baptism card 4=Recall 5. other _____ specify	Sex 1= Male 2= Female	If between 3 and 18 years old, Is the child attending school? 1 = Yes 2 = No (If yes go to 2.8; If no go to 2.7)	Main reason for not attending school (Enter one code from list) 1=Chronic Sickness 2=Weather (rain, floods, storms) 3=Family labour responsibilities 4=Working outside home 5=Teacher absenteeism/lack of teachers 6= Fees or costs 7=Household doesn't see value of schooling 8 =No food in the schools	2.7a, What is the child doing when not in school? 1=Working on family farm 2=Herding Livestock 3=Working for payment away from home 4=Left home for elsewhere 5=Child living on the street 6: Other specify _____	What is the highest level of education attained?(level completed) From 5 yrs and above 1 =Pre primary 2= Primary 3=Secondary 4=Tertiary 5= None 6=others(specify) Go to question to 2.9 ↓	If the household owns mosquito net/s, who slept under the mosquito net last night? (Probe- enter all responses mentioned (Use 1 if "Yes" 2 if "No and 3 if not applicable) go to question 2.11

								9 = Migrated/ moved from school area (including displacements) 10=Insecurity/ violence 11-No school Near by 12=Married 13. Pregnant/ taking care of her own child 13=others (specify).....			
< 5 YRS	1										
	2										
	3										
	4										
>5 TO <18 YRS	5										
	6										
	7										
	8										
	9										
	10										
	11										
	12										
ADULT (18 years and above)	13										
	14)										
	15										
	16										

2.9 How many mosquito nets does this household have? _____ (Indicate no.) go to question 2.10 before proceeding to question 2.11

<p>2.11</p>	<p>Main Occupation of the Household Head – HH.</p> <p>(enter code from list)</p> <p>1=Livestock herding</p> <p>2=Own farm labour</p> <p>3=Employed (salaried)</p> <p>4=Waged labour (Casual)</p> <p>5=Petty trade</p> <p>6=Merchant/trader</p> <p>7=Firewood/charcoal</p> <p>8=Fishing</p> <p>9= Income earned by children</p> <p>10=Others (Specify) <input type="text"/></p>	<p>2.12. What is the main current source of income of the household?</p> <p>1. =No income</p> <p>2. = Sale of livestock</p> <p>3. = Sale of livestock products</p> <p>4. = Sale of crops</p> <p>5. = Petty trading e.g. sale of firewood</p> <p>6. =Casual labor</p> <p>7. =Permanent job</p> <p>8. = Sale of personal assets</p> <p>9. = Remittance</p> <p>10. Other-Specify <input type="text"/></p>
<p>2.13</p>	<p>Marital status of the respondent</p> <p>1. = Married</p> <p>2. = Single</p> <p>3. = Widowed</p> <p>4. = separated</p> <p>5. = Divorced. <input type="text"/></p>	<p>2.14. What is the residency status of the household?</p> <p>1. IDP</p> <p>2.Refugee</p> <p>3. Resident <input type="text"/></p>
<p>2.15</p>	<p>Are there children who have come to live with you recently?</p> <p>1. YES</p> <p>2. NO</p>	<p>2.15b If yes, why did the child/children come to live with you?</p> <p>1= Did not have access to food</p> <p>2=Father and Mother left home</p> <p>3=Child was living on the street,</p> <p>4=Care giver died</p> <p>5= Other specify _____</p>

Fever with Malaria: High temperature with shivering	Cough/ARI: Any episode with severe, persistent cough or difficulty breathing	Watery diarrhoea: Any episode of three or more watery stools per day	Bloody diarrhoea: Any episode of three or more stools with blood per day
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3.		4.		5. CHILD HEALTH AND NUTRITION (ONLY FOR CHILDREN 6-59 MONTHS OF AGE; IF N/A SKIP TO SECTION 3.6) Instructions: <i>The caregiver of the child should be the main respondent for this section</i> 3.1 CHILD ANTHROPOMETRY 3.2 and 3.3 CHILD MORBIDITY <i>(Please fill in ALL REQUIRED details below. Maintain the same child number as part 2)</i>											
A	B	C	D	E	F	G	H	I	J	K	3.2 a	3.2 b	3.3 a	3.3 b	3.3 c
Child No.															
	what is the relationship of the respondent with the child/children 1=Mother 2=Father 3=Sibling 4=Grandmother 5=Other (specify)	SEX FemaleF MaleM	Exact Birth Date	Age in months	Weight (KG) XX.X	Height (CM) XX.X	Oedema Y= Yes N= No	MUAC (cm) XX.X	Is the child in any nutrition program 1. Yes 2. No If no skip to questions 3.2	If yes to question J. which nutrition program? 1.OTP 2.SFP 3.BSFP Other Specify _____	Has your child (NAME) been ill in the past two weeks? 1.Yes 2. No <u>If No, skip to 3.4</u>	If YES, which illness (multiple responses possible) 1 = Fever with chills like malaria 2 = ARI /Cough 3 = Watery diarrhoea 4 = Bloody diarrhoea 5 = Other (specify)	When the child was sick did you seek assistance? 1.Yes 2. No	If the response is yes to question # 3.2 where did you seek assistance? (More than one response possible- 1. Traditional healer 2.Community health worker 3. Private clinic/pharmacy 4. Shop/kiosk	If the child had watery diarrhoea in the last TWO (2) WEEKS, did the child get: 1. ORS 2. Zinc supplementation? <i>Show sample and probe further for this component</i> <i>check the remaining drugs(confirm from mother child booklet)</i>

												See case definitions above		5.Public clinic 6. Mobile clinic 7. Relative or friend 8. Local herbs 9.NGO/FBO	
01															
02															
03															
04															

3.4 Maintain the same child number as part 2 and 3.1 above

	3.4 Maintain the same child number as part 2 and 3.1 above														
	A1	A2	B	C	D	E	F	G	H	I					

Child No.	How many times has child received Vitamin A in the past year? (show sample)	Has the child received vitamin A supplement in the past 6 months?	How many times did the child receive vitamin A capsules from the facility or out reach	If Vitamin A received how many times in the past one year did the child receive verified by Card?	FOR CHILDREN 12-59 MONTHS How many times has child received drugs for worms in the past year? <i>(show Sample)</i>	Has the child received BCG vaccination? Check for BCG scar. 1 = scar 2=No scar	Has child received OPV1 vaccination 1=Yes, Card 2=Yes, Recall 3 = No 4 = Do not know	Has child received OPV3 vaccination? 1=Yes, Card 2=Yes, Recall 3 = No 4 = Do not know	Has child received measles vaccination at 9 months <i>(On the upper right shoulder)?</i> 1=Yes, Card 2=Yes, Recall 3 = No 4 = Do not know	Has child received the second measles vaccination (18 to 59 months) <i>(On the upper right shoulder)?</i> 1=Yes, Card 2=Yes, Recall 3 = No 4 = Do not know
01										
02										
03										
04										

3.5 MNP Programme Coverage. *Maintain the same child number as part 2 and 3.1 above. Ask all the relevant questions (3.5.1 to 3.6.4) before moving on to fill responses for the next child. THIS SECTION SHOULD ONLY BE ADMINISTERED IF MNP PROGRAM IS BEING IMPLEMENTED OR HAS BEEN IMPLEMENTED*

3.5 Enrolment in an MNP program		3.6 Consumption of MNPs			
<p>3.5.1.</p> <p>Is the child enrolled in the MNP program?(show the example of the MNP sachet)</p> <p><i>(record the code in the respective child's number)</i></p> <p>Yes =1</p> <p>No=0</p> <p>If no go to 3.5.2,</p>	<p>3.5.2</p> <p>If the child, 6-23months, is not enrolled for MNP, give reason. (Multiple answers possible. Record the code/codes in the respective child's number. DO NOT READ the answers)</p> <p>Do not know about MNPs 1</p> <p>Discouraged from what I heard from others2</p> <p>The child has not fallen ill, so have not gone to the health facility3</p>	<p>3.6.1</p> <p>Has the child consumed MNPs in the last 7 days?(shows the MNP sachet)</p> <p><i>(record the code in the respective child's number)</i></p> <p>YES = 1</p> <p>NO= 0</p>	<p>3.6.2</p> <p>If yes, how frequent do you give MNP to your child? (record the code in the respective child's number)</p> <p>Every day 1</p> <p>Every other day2</p> <p>Every third day3</p> <p>2 days per week at any day4</p> <p>Any day when I remember.....5</p>	<p>3.6.3</p> <p>If no, since when did you stop feeding MNPs to your child? (record the code in the respective child's number)</p> <p>1 week to 2 weeks ago1</p> <p>2 week to 1 month ago2</p> <p>More than 1 month3</p>	<p>3.6.4</p> <p>What are the reasons to stop feeding your child with MNPs? (Multiple answers possible. Record the code/codes in the respective child's number. DO NOT READ the answers)</p> <p>Finished all of the sachets 1</p> <p>Child did not like it2</p> <p>Husband did not agree to give to the child3</p>

	If yes go to section 3.6.1	Health facility or outreach is far4 Child receiving therapeutic or supplementary foods5 Other reason, specify6 Skip to 3.7	If no skip to 3.6.3			Sachet got damaged4 Child had diarrhea after being given vitamin and mineral powder5 Child fell sick.....6 Forgot7 Child enrolled in IMAM program ...8 Other (Specify).....9
Child 1						
Child 2						
Child 3						

MATERNAL NUTRITION FOR WOMEN OF REPRODUCTIVE AGE (15-49 YEARS)(Please insert appropriate number in the box)						
3.7	3.8	3.9	3.10			3.11
Woman ID. (all women in the HH aged 15-49 years from the household demographics – section 2)	What is the mother's / caretaker's physiological status 1. Pregnant 2. Lactating 3. not pregnant and not lactating 4. Pregnant and lactating	Mother/ caretaker's MUAC reading: _____cm	During the pregnancy of the (name of the youngest biological child below 24 months) did you take the following supplements? indicate 1. Yes 2. No 3. Don't know 4. N/A			If Yes, for how many days did you take? (probe and approximate the number of days)
			Iron tablets syrup	Folic acid	Combined iron and folic acid supplements	

4.0 WATER, SANITATION AND HYGIENE (WASH)- Please ask the respondent and indicate the appropriate number in the space provided			
4.1	<p>What is the MAIN source of drinking water for the household <u>NOW</u>?</p> <p>piped water</p> <p>piped into dwelling 11</p> <p>piped to yard / plot..... 12</p> <p>piped to neighbour..... 13</p> <p>public tap / standpipe 14</p> <p>tube well / borehole 21</p> <p>dug well</p> <p>protected well 31</p> <p>unprotected well 32</p> <p>spring</p> <p>protected spring..... 41</p> <p>unprotected spring..... 42</p> <p>rainwater 51</p> <p>tanker-truck..... 61</p> <p>cart with small tank 71</p> <p>water kiosk..... 72</p> <p>surface water (river, dam, lake, pond, stream, canal, irrigation channel)..... 81</p> <p>packaged water</p> <p>bottled water 91</p> <p>sachet water 92</p> <p>1.</p>	<p>4.2 a What is the trekking distance to the current main water source?</p> <p>1=less than 500m (Less than 15 minutes)</p> <p>2=more than 500m to less than 2km (15 to 1 hour)</p> <p>3=more than 2 km (1 – 2 hrs)</p> <p>4=Other(specify) _____</p>	<p>4.2b – Who MAINLY goes to fetch water at your current main water source?</p> <p>1=Women, 2=Men, 3=Girls, 4=Boys</p>
4.2.2a	<p>How long do you queue for water?</p> <p>1. Less than 30 minutes</p> <p>2. 30-60 minutes</p> <p>3. More than 1 hour</p> <p>4. Don't que for water</p> <p>1.</p>	<p>.3 Do you do anything to your water before drinking? (MULTIPLE RESPONSES POSSIBLE) (Use 1 if YES and 2 if NO). _____</p> <p>1. Nothing</p> <p>2. Boiling..... _____</p> <p>3. Chemicals (<i>Chlorine,Pur,Waterguard</i>)..... _____</p> <p>4. Traditional herb..... _____</p> <p>5. Pot filters..... _____</p> <p>5.</p>	

4.3a		6.	
4.4	Where do you store water for drinking? 1. Open container / Jerrican 2. Closed container / Jerrican <input type="checkbox"/>	4.5 How much water did your household use YESTERDAY (excluding for animals)? <i>(Ask the question in the number of 20 liter Jerrican and convert to liters & write down the total quantity used in liters)</i> <input type="checkbox"/>	
4.6	Do you pay for water? 1. Yes 2. No (If No skip to Question 4.7.1) <input type="checkbox"/>	4.6.1 If yes, how much per 20 liters jerrican _____ KSh/20ltrs	4.6.2 If paid per month how much <input type="checkbox"/>
4.7.1a	<p>We would like to learn about where members of this household wash their hands. Can you please show me where members of your household <u>most often</u> wash their hands? <i>Record result and observation.</i></p> <p>OBSERVED</p> <p>FIXED FACILITY OBSERVED (SINK / TAP)</p> <p>IN DWELLING 1</p> <p>IN YARD / PLOT 2</p> <p>MOBILE OBJECT OBSERVED (BUCKET / JUG / KETTLE)..... 3</p> <p>NOT OBSERVED</p> <p>NO HANDWASHING PLACE IN DWELLING / YARD / PLOT 4</p> <p>NO PERMISSION TO SEE 5</p>		4.7.1b Is soap or detergent or ash/mud/sand present at the place for handwashing? YES, PRESENT 1 NO, NOT PRESENT 2
4.7.1	Yesterday (within last 24 hours) at what instances did you wash your hands? (MULTIPLE RESPONSE- (Use 1 if "Yes" and 2 if "No") 1. After toilet..... <input type="checkbox"/> 2. Before cooking..... <input type="checkbox"/> 3. Before eating..... <input type="checkbox"/> 4. After taking children to the toilet..... <input type="checkbox"/> 5. Others..... <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
4.7.2	If the caregiver washes her hands, then probe further; what did you use to wash your hands? 1. Only water	4.8 What kind of toilet facility do members of your household usually use?	

- 2. Soap and water
- 3. Soap when I can afford it
- 4. traditional herb
- 5. Any other specify

If 'Flush' or 'Pour flush', probe:

Where does it flush to?

If not possible to determine, ask permission to observe the facility.

flush / pour flush

flush to piped sewer system 11

flush to septic tank 12

flush to pit latrine 13

flush to open drain 14

flush to DK where 18

pit latrine

ventilated improved pit

latrine 21

pit latrine with slab 22

pit latrine without slab /

open pit 23

composting toilet 31

bucket 41

hanging toilet /

hanging latrine 51

no facility / bush / field 95

1. OTHER (specify) 96

5.0: Food frequency and Household Dietary Diversity

Type of food	Did members of your household consume any food from these food groups in the last 7 days? <i>(food must have been cooked/served at the household)</i>	If yes, mark days the food was consumed in the last 7 days?								What was the main source of the dominant food item consumed in the HHD?	<u>WOMEN DIETARY DIVERSITY</u>												
		0-No		1-Yes		D1		D2			D3		D4		D5		D6		D7		TOTAL		ONLY FOR WOMEN AGE 15 TO 49 YEARS. REFER TO THE HOUSEHOLD DEMOGRAPHICS SECTION Q2.3 AND Q2.5
											Please describe the foods that you ate or drank yesterday during day and night at home or outside the home (start with the first food or drink of the morning)												
											0-No												
											1-Yes												
											Woman ID.....	Woman ID.....	Woman ID.....	Woman ID.....									
5.1. Cereals and cereal products <i>(e.g. sorghum, maize, spaghetti, pasta, anjera, bread)?</i>																							
5.2. Vitamin A rich vegetables and tubers: Pumpkins, carrots, orange sweet potatoes																							
5.3. White tubers and roots: White potatoes, white yams,																							

cassava, or foods made from roots														
5.4 Dark green leafy vegetables: Dark green leafy vegetables, including wild ones + locally available vitamin A rich leaves such as cassava leaves etc.														
5.5 Other vegetables (e.g., tomatoes, egg plant, onions)?														
5.6. Vitamin A rich fruits: + other locally available vitamin A rich fruits														
5.7 Other fruits														
5.8 Organ meat (iron rich): Liver, kidney, heart or other organ meats or blood based foods														
5.9. Flesh meats and offals: Meat, poultry, offal (e.g. goat/camel meat, beef; chicken/poultry)?														
5.10 Eggs?														
5.11 Fish: Fresh or dries fish or shellfish														
5.12 Pulses/legumes, nuts (e.g. beans, lentils, green grams, cowpeas)?														
5.13 Milk and milk products (e.g. goat/camel/ fermented milk, milk powder)?														
5.14 Oils/fats (e.g. cooking fat or oil, butter, ghee, margarine)?														
5.15 Sweets: Sugar, honey, sweetened soda or sugary foods such as chocolates, sweets or candies														

5.16 Condiments, spices and beverages:														
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

6. COPING STRATEGIES INDEX		
		Frequency score: Number of days out of the past seven (0 -7).
	<p>In the past 7 DAYS, have there been times when you did not have enough food or money to buy food?</p> <p>If No; END THE INTERVIEW AND THANK THE RESPONDENT</p> <p>If YES, how often has your household had to: (INDICATE THE SCORE IN THE SPACE PROVIDED)</p>	
1	Rely on less preferred and less expensive foods?	
2	Borrow food, or rely on help from a friend or relative?	
3	Limit portion size at mealtimes?	
4	Restrict consumption by adults in order for small children to eat?	
5	Reduce number of meals eaten in a day?	
	<p>TOTAL HOUSEHOLD SCORE:</p> <p>END THE INTERVIEW AND THANK THE RESPONDENT</p>	

4.1 FOOD FORTIFICATION (FF)- Please ask the respondent and indicate the appropriate number in the space provided	
1.1	<p>Have you heard about food fortification?</p> <p>1. Yes 2. No 3. Don't know</p>
1.1.1	<p>If yes, where did you hear or learn about it? (MULTIPLE RESPONSE ARE POSSIBLE- (Use 1 if "Yes" and 2 if "No")</p> <p>6. Radio..... <input type="text"/></p> <p>7. Road show..... <input type="text"/></p> <p>8. In a training session attended..... <input type="text"/></p> <p>9. On a TV show..... <input type="text"/></p> <p>10. Others..... <input type="text"/></p>

1.2	<p>Respondent's knowledge on the food fortification logo (Show the food fortification logo to the respondent and record the response). Do you know about this sign?</p> <ol style="list-style-type: none"> 1. Yes 2. No 3. Don't know 	<p style="text-align: right;"> _ </p>
1.3	<p>What is the MAIN source of Maize flour for the household <u>NOW</u>?</p> <ol style="list-style-type: none"> 2. Bought from the shops, supermarket e.t.c 3. Maize is taken for milling at a nearby Posho Mill 4. Bought from a nearby Posho Mill 5. Other (<i>Please specify</i>) <p> _ </p>	<p>1.1b Do you know if the maize flour you consume is fortified or not?</p> <ol style="list-style-type: none"> 1. Yes 2. No 3. Don't know
1.4	<p>What brands of the following foods does your household consume?</p> <ol style="list-style-type: none"> 1. Maize flour 2. Wheat flour 3. Margarine 4. Oils 5. Fats 6. Sugar 	<p> _ </p> <p> _ </p> <p> _ </p> <p> _ </p> <p> _ </p> <p> _ </p>

