KAJIADO COUNTY

SMART Survey Report

February 2018

Compiled by Mark Murage (mgathii@gmail.com

Acknowledgement

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

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.

- United Nations Children Fund (UNICEF) for financial and Technical support
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Special thanks to the Nutrition Information Technical Working Group special SMART taskforce for their technical guidance during the survey. Last but not least the County government of Kajiado for creating an enabling environment during the data collection exercise and the Kajiado County community for taking time to provide information which will be of importance in making informed decisions in the nutrition sector programming.

Acronyms and Abbreviations

AIDS	Acquired Immune Deficiency Syndrome
ARI	Acute Respiratory Infections
ANC	Ante Natal Care
BCG	Bacillus Calmette- Guerin
CHVs	Community Health Volunteers
CLTS	Community Led Total Sanitation
CSI	Coping Strategy Index
ENA	Emergency Nutrition Assessment
FAO	Food and Agriculture Organization
FCS	Food Consumption Score
FeFo	Iron and Folic Acid
GAM	Global Acute Malnutrition
HIV	Human Immune Virus
HFA	Height for Age
HH	Household
ITN	Insecticide Treated Nets
IVM	Integrated vector Management
KDHIS	Kenya District Health Information Software
LLINS	Long Lasting Insecticidal Nets
MAM	Moderate Acute Malnutrition
MDD-W	Minimum Dietary Diversity for Women
MUAC	Mid Upper Arm Circumference
NDMA	National Drought Management Authority
NITWG	Nutrition Information Working Group
OPV	Oral Polio Vaccine
ORS	Oral Rehydration Salts
PLW	Pregnant and Lactating Women
PPS	Proportion to Population Size

SAM	Severe Acute Malnutrition
SMART	Standardized Monitoring Assessment on Relief and Transition
UNICEF	United Nations Children Fund
WFA	Weight for Age
WFH	Weight for Height
WFP	World Food Programme
WHO	World Health Organization
WRA	Women of Reproductive Age

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Introduction

Kajiado County Department of Health Services with the support of UNICEF and other partners carried out a SMART Survey in 4 sub Counties of Kajiado County namely; Kajiado South, Kajiado East, Kajiado Central and Kajiado West. The survey was carried out in the lean period of the year in January and February 2018.

The purpose of this survey was to find out the nutrition situation in Kajiado 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 in Kajiado 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 (646 households) was used as the survey sample size. Based on logistical factors, it was possible to visit 15 households per cluster per day translating to a minimum of 44 clusters. Simple random sampling was used in household selection.

Data Collection was done for 7 days by 7 teams. For the data collection purpose, ODK questionnaire was used. Every team was composed of 4 members. The team was 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. Table 1 below summarizes the survey results.

Table 1: Results Summary

RESULTS SUMMARY				
Anthropometric Results (WHO Standards)				
Indicator	**N**	**% (with 95% CI)**	**N**	**% (with 95% CI)**
Design Effect WHZ = 1.61 (Feb 2018)	2011		February 2018	
Prevalence of GAM based on WHZ (<-2SD) and or oedema	776	8.6(6.7- 11.0)	629	10.0 (7.3-13.5)
Prevalence of SAM based on WHZ (<-3SD) and or oedema		0.5(0.5- 1.8)		1.4(0.7- 3.0)
Prevalence of GAM based on MUAC <125mm and or oedema		5.3%(4.0- 7.0)	646	2.6 % (1.7 - 4.1)
Prevalence of SAM based on MUAC <115mm and or oedema		0.4%(0.1- 1.2)		0.2%(0.0-1.1)
Prevalence of stunting based on HFA (<-2SD)		19.7(15.7- 24.6)	608	25.3% (21.3-29.8)
Prevalence of Severe stunting based on HFA (<-3SD)				6.1% (4.3-8.5)
Prevalence of underweight based on WFA(<-2 z score)		12.1(9.8- 14.9)		22.5(17.9-27.8)
Prevalence of severe underweight based on WFA(<-3 z score)				5.6(3.6- 8.6)
CHILD MORBIDITY (Based on 2 weeks Recall				
Indicator	**Type of Illness**	**% April 2011**	**n(Feb 2018)**	**% Feb 2018**
Illness within the last 2 weeks prior to the Survey	All	37.6	260	40.2
	Fever with chills	6.7	62	23.8
	ARI	23.3	174	66.9
	Watery diarrhoea	5.5	65	25.0
	Bloody diarrhoea		5	1.9
Therapeutic Zinc Supplementation for diarrhea management			36	55.4
VITAMIN A SUPPLEMENTATION AND DEWORMING				
Indicator	**No. of times (over the last year)**	**% April 2011)**	**n(Feb 2018)**	**%(Feb 2018)**
Vitamin A Supplementation (6- 11m)	At least once		47	50.5
Vitamin A Supplementation 12- 59m)[1]	At least once	60.8	316	57.1
Vitamin A supplementation 12 to 59 m)	At least twice		115	20.8
Vitamin A supplementation 6- 59 months	At least once		363	56.2
Vitamin A supplementation 6- 59 months	At least twice	19.5	117	18.1
Deworming (12- 59 m)	Once	32.6	348	62.9
Deworming (12- 59 m)	Twice		69	12.5
IMMUNISATION				
Antigen	**Means of Verification**	**% April 2011**	**n(Feb 2018)**	**% Feb. 2018)**
BCG	Presence of scar		580	89.8

OPV1	Card and recall	98.7	627	97.1
OPV3	Card and recall	96.8	603	93.3
Measles at 9 months	Card and recall	90.1	497	82.9
Measles at 18 months	Card and recall		224	47.2
MATERNAL NUTRITION				
Indicator	**Description**	**% April 2011**	**n(Feb 2018**	**% Feb 2018**
MUAC< 210mm	Women of reproductive age (N[2] = 509)		25	4.9
MUAC, 210mm	Pregnant and Lactating (N= 261)		19	7.3
Women supplemented with FeFo	Women who had given birth to a live child within the last 24 months		260	95.9
Pregnant women consuming FeFo	270 days		0	0.0
Pregnant women consuming FeFo	90 days and above		89	37.9
Mean IFA Consumption (days	Mean no. of days			66.5 days
WATER HYNGIENE AND SANITATION				
Indicator	**Description**	**% April 2011**	**n(Feb 2018)**	**% Feb 2018**
Households obtaining water from sources < 500m			235	38.5
Household treating their drinking water		24.7	187	30.6
Households consuming 15 litres or more per day			605	99.0
Mean household water consumption per day	Average water consumed in liters	40.8 Liters		64.7 Liters
Handwashing in 4 critical moments	Households with a child under 2 years were analysed to cater for those who wash hands after taking a child to toilet (N= 239		39	16.3
Households practicing open defecation		38.2	362	59.2
HOUSEHOLD AND WOMEN DIETARY DIVERSITY				
Indicator	**Description**	**% April 2011**	**n(Feb 2018**	**% Feb 2018**
High Household Dietary Diversity	Households consuming more than 5 food groups out of 12		532	57.6
Women Minimum Dietary Diversity (W-MDD)	WRA consuming more than 5 food groups out of 10 (N= 469)		243	51.8
FOOD CONSUMPTION SCORE AND COPING STRATEGY INDEX				
HHds with Acceptable FCS			524	85.8

[2] N (for the Feb 2018 survey)

Coping strategy Index	No not Percentage[3]			19.0

Conclusion

Overall the acute nutrition status is at the **serious** phase (IPC phase 3) with GAM of 10.0% (7.3- 13.5, 95% CI). The situation has shifted lower compared to alert phase in 2011. The stunting levels equally remained high at 25.3% (21.3- 29.8, 95% C.I) compared to April 2011 SMART survey where the prevalence was 19.7% (15.7- 24.6, 95% CI) which was statistically significant (p= 0.0375). Equally underweight prevalence was also high (22.5%) compared to 12.1% in 2011.

Morbidity could be attributed to the current status of acute malnutrition since it remained quite high at 40.2%. The main diseases that affected children included; acute respiratory infections, diarrhea and fever. Among those children who were sick during the survey period, 66.9% of them suffered from ARI, while 25.0% suffered from watery diarrhea and 23.8% from fever with chills. The incidences of dysentery were low at 1.9%.

On dietary intake, taking women minimum dietary diversity as a proxy indicator for dietary intake, almost half of the women of reproductive age (48.2%) did not meet the minimum dietary intake based on the 24 hour food recall. At the household level; 11.6% of the households consumed less than 3 food groups while 31.1% consumed 3 to 5 food groups. The main food groups consumed were cereals, oils and fats, vegetables, sugars, milk and milk products with very minimal intake of protein based foods such as meats, eggs and fish and also fruits. In terms of food consumption score, 39.8% of the household had their FCS classified as poor or borderline.

As far as coping strategies are concern, 44% of all household can be classified as food insecure as they within 1 week prior to the survey did not have enough foods or money to buy food. This forced majority of them to borrow food and rely on less preferred or less expensive foods as well as limit their portion sizes. Overall the weighted CSI was 19.0. From the analysis dietary intake could be a contributory factor to the current **serious** status of malnutrition.

In terms of underlying causes (insufficient health services and unhealthy environment), Kajiado County experienced low coverage of vitamin A and deworming with only 50.5% of children 6 to 11 months being supplemented with vitamin A. while 56.2% of children 6 to 59 months were supplemented with vitamin A, only 18.1% were supplemented twice. Equally, the proportion of children dewormed are low with 69.2% of children 12 to 69 months being dewormed once and 12.5% who were dewormed once as recommended. Although the Proportion of children immunized with most of the antigens surpassed 80%, a relatively low percentage (47.2%) were immunized with the second dose of measles (at 18 months) which is a health concern.

The water hygiene and Sanitation situation in the County is also an area of concern. Some of the notable issues of concern included the trekking distances to water sources where more than 50% of the households between 15 minutes to more than 2 hours to the current water source limiting the time available for child care. In addition, the proportion of the households that queue for water is 35% with Kajiado East and Central having the largest proportion at 44.0% and 51.7%.

Although majority of households store their water in closed containers only 30.6% treat their drinking water mostly by boiling. The proportion of household that are ware of handwashing is good at 86.3%, only

[3] The CSI is an index not presented as percentage but an absolute number

a few of them practiced handwashing in the four critical moments at 16.3%. majority of them used soap and water as recommended.

Open defecation is very prevalent in Kajiado County with 59.2% practicing open defecation which is a dangerous sanitation practice. Kajiado West and central had the highest proportion of households that practiced open defecation at 83.8% and 65.1% respectively.

Recommendations

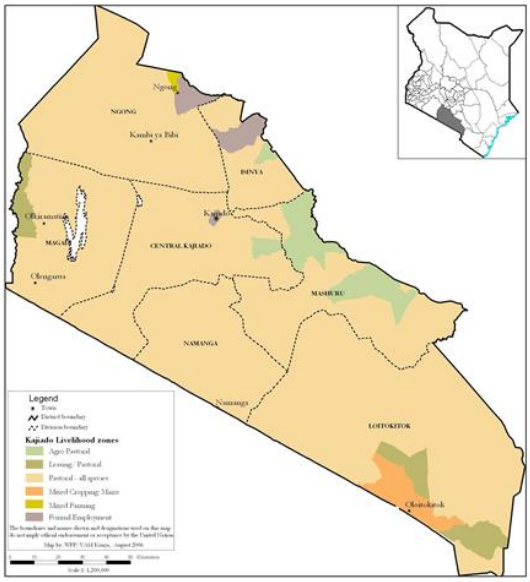
Based on the survey findings, the following actions were recommended;

- Scale up mass screening and integrated outreach services for the hard to reach areas
- Train County health volunteers on community case findings and referral of malnourished children
- Activate IMAM surge activities in the County.
- Address the care health environment including improvement on food security (diversification of diet)
- Address hygiene and sanitation issues at household and community level
- Develop/scale up strategies to increase access to health care.
- Strengthen documentation of Vitamin A Supplementation through sensitization of all health workers and frequent support supervision by county and sub county health management
- Integration of vitamin A supplementation to the outreach services
- Scale up of vitamin A supplementation at the community level by sensitizing the community members to take their children for vitamin A supplementation at the health facilities
- Use of mobile phone technology (m health) to boost immunization and vitamin A coverage
- Sensitize the pregnant women on the recommended immunization schedule during ANC
- Continue educating the caregivers on immunization schedule
- Engage CHVs to refer children who have attained the immunization age to the health facilities
- Sensitize the community on the importance of water treatment and how to do it
- Engage the community through the community conversation approaches for them to come up with the most affordable and acceptable water treatment options
- Support the community by supplying them with water treatment agents
- Develop sanitation and Hygiene Key Messages
- Conduct Community Sensitization
- Scale up CLTS activities
- Strengthen health education during ANC visits
- Provide health education through use of CHVs.
- Promote agri-nutrition initiatives in the County
- Support sustainable livelihoods especially for pastoral drop outs and strengthen market for livestock
- Food or cash based intervention for the food insecure HHs with emphasis on asset creation

1.0. Introduction

1.1. Background Information

Kajiado County is located in the Southern Side of Kenya, and is one of the Counties in Kenya where the Great Rift Valley passes through. The County bonders the Kenya Capital; Nairobi as well as other Counties which include Machakos and Makueni Counties to the North Eastern Side, Kiambu and Nakuru Counties to the North and North Western Side, Taita Taveta County to the Eastern Side, Narok County to the Western Side and the Republic of Tanzania to the Southern Side. The County Covers an area of approximately 21,902 square kilometers and has approximately 687, 312 based on the KNBS 2009 census. With a population growth of 5.5%, the County is projected to have a population of one million people.



Administratively; Kajiado County is subdivided in to 5 sub counties namely; Kajiado North, Kajiado West, Kajiado Central, Kajido East and Kajiado South.

The main physical features include beautiful plains, valleys, volcanic hills, scares vegetation in low lying areas which increases with altitude. The County is water stressed where community members sometimes walk up to 10km in search of water (Kajiado County government website).

Kajiado County has three main livelihood zones. These include; pastoral (all species) which account for 52%, agro pastoral (31%) and mixed farming (12%).

Figure 1: Kajiado County Livelihood zone maps

1.2. Justification of the Survey

According to the immediate last SMART survey carried out in Kajiado County (2012), the prevalence of acute malnutrition was 4.7%. There is no current information on acute malnutrition prevalence in the County. With the current drought situation (which is in alarm phase and worsening as per December 2017 NDMA early warning bulletin). The County has experienced three consecutive failed seasons which have calumniated to livestock mass migration and elevated livestock mortalities mostly affecting the pastoral livelihood zone. The county is experiencing moderate vegetation condition index with Kajiado South recording severe vegetation deficit. Pasture is depleted in pastoral livelihood zones. According to 2017 Long Rains Food security assessment, the County was classified at Stressed (IPC Phase 2).

The nutrition survey provided a snapshot of the actual situation and impact of the current drought condition being experienced in the County. The findings will guide the development of a response plan and future development plans to mitigate against impact of drought.

1.3. Survey Timing

Kajiado County SMART Survey was done in January and February 2018, which is the lean period of the year and will be used in the analysis of short rain performance assessment.

Table 2: Seasonal Calendar for Kajiado County

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Season			Long rains in Kajiado Central and North/Short rains in Loitoktok			The period is dry and dusty with high temperature				Long rains in Loitoktok/ Short rains in Kajiado Central and North		
Activitiy	Harvesting of beans and potatoes											

1.4. Survey Main Objective

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 in Kajiado County

1.5. Specific Objectives

- To determine the nutrition status of children 6 to 59 months
- To determine the nutritional status of women of reproductive age (15-49) years based on maternal mid upper arm circumference (MUAC).
- To determine immunization coverage; measles (9-59 months), OPV1/3 and Vitamin A for children aged 6-59months.
- To determine deworming coverage for children aged 12 to 59 months.
- To determine the prevalence of common illnesses (diarrhea, measles and ARI).
- To assess maternal and child health care practices.
- To assess water, sanitation and hygiene practices.
- To assess the prevailing situation of household food security in the County.

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 Procedure

2.2.1. Survey Population

The study population included the entire population of 4 sub counties of Kajiado County (Kajiado North Sub County was excluded due to the urban nature of its population with quite a number of them working in Nairobi County. Malnutrition in Kajiado North are due to chronic rather than the current drought crisis in the County. It is estimated that the County has 1 million people. Villages (clusters/sampling units) in the County which were accessible, secure or not deserted were included in the primary sampling frame.

2.2.2. Sampling Methods and Sample Size Calculation

Anthropometric Sample Size Calculation

Three stage sampling was used for the entire survey. The first stage involved random selection of clusters (Sub locations since the updated list of villages with their respective population was not available) from the sampling frame based on probability proportion to population size (PPS). Villages were randomly sampled (Stage 2) from the respective sub locations that had been selected in stage 1. Emergency Nutrition Assessment (ENA) for Standardized Monitoring for Assessment for Relief and Transition (SMART) July 2015 was used in calculation of sample size. Table 3 below illustrates the values used in ENA for sample size calculation and the rationale of using each value.

Table 3: Sample Size Calculation

Sample size calculation parameter	Value	Rationale
Estimated Prevalence (GAM)	8.6%	Estimate as per 2011 SMART survey as the situation looks the same
Desired Precision	3.0%	From SMART global project rule of thumb based on the estimated Prevalence
Design Effect	1.5	Expected heterogeneity
Average Household size	6	Based on 2011 SMART survey Results
Non Response rate	3.0%	Based on 2011 SMART Survey Results
Proportion children under 5 years	16.2%	Data from DHIS
Estimated Children Sample size	**548**	
Estimated Households Sample Size	**646**	

2.3. Sampling Methods

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). Since the updated list of villages was not available, a list of sub locations with their respective populations was used. The sample size obtained using ENA software (646 households) 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 15 households per cluster per day translating to a minimum of 44 clusters. The list of sub locations provided was entered in ENA software where 44 clusters were sampled. Since village was the smallest sampling unit, one or two villages were randomly sampled from the respective sub locations as selected by ENA software in respect to PPS principle.

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 15 households using Random UX android app, 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

Data Collection was done for 7 days (from 28th January to 3rd February 2018) by 7 teams. Every team was composed of 4 members who included 1 team leader and 3 Enumerators. One community guide appointed by the village leader guided the survey team in households' identification. All survey teams were trained for 4 days at a central place (Kajiado ACK Hall) prior to field work. The teams were trained on, 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 give the teams practical skills on data collection. 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. 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 Kajiado County Nutrition Coordinator supported by the Nutrition and Dietetics Unit and UNICEF Personnel. The Ministry of Health (National and the County) as well as the UNICEF technical team supervised the data collection process on daily basis. 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.

2.5. 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.

2.6. Data Analysis

Anthropometric data processing was done using ENA software version 2015 (July). World Health Organization Growth Standards (WHO-GS) data cleaning and flagging procedures was used to identify outliers which would enable data cleaning as well as exclusion of discordant measurements from anthropometric analysis. 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 and exported to SPSS for further analysis. All the other quantitative data were analyzed in Ms. Excel and the SPSS (Version 20) computer package.

2.7. 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 was done in 4 days for all survey participants, the training dwelt 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.
- 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 were be comfortably surveyed.

3.0. Results

3.1. General Characteristics of study population

3.1.1. Summary of Children and Households Surveyed

The survey involved collection of information from 646 children aged 6 to 59 months in 611 households. Thirty five households sampled did not participate in the survey as they were found absent upon repeat visits. The non-response rate was therefore 5.4%. Based on household data, where information of 2912 household members were collected in 611 households, the average household size was 4.8. Table 4 below summarizes the number of household, children and clusters reached as compared to the target. Figure 2 below is a map of households and clusters visited.

Table 4: Summary of children and household reached compared to the target

	Target as per protocol			Actual Reached (Survey)				
Survey area	Households	Children (6- 59m)	Clusters	Households	Children (6- 59m)	Clusters	Household Members	Response rate (%)
Kajiado County	646	548	44	611	646	44	2912	94.6

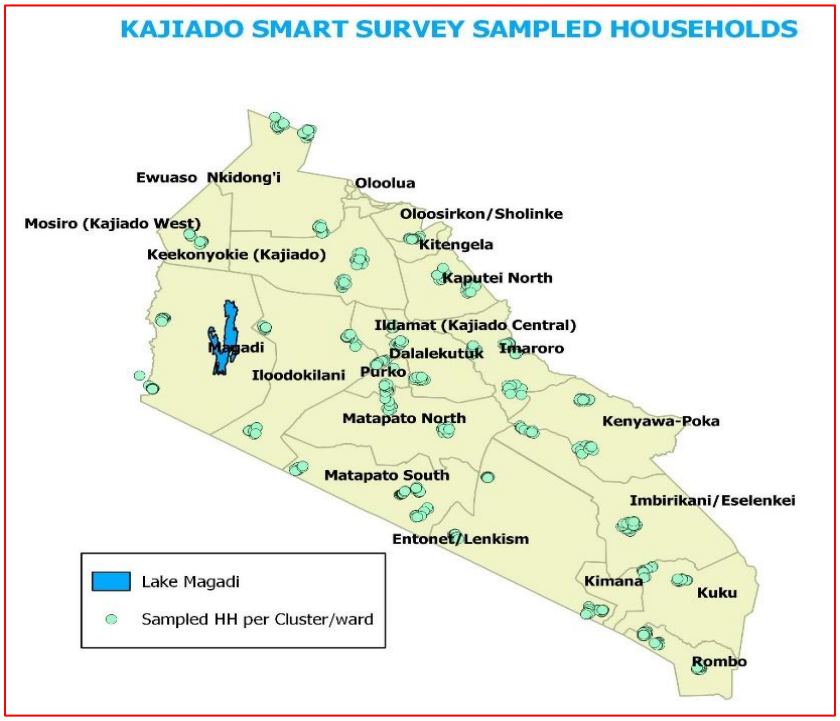


Figure 2: Households sampled

3.1.2. Marital and Residency Status

99.8% of the respondents were residents during the time of the survey. Majority of the respondents (88.7%) were married, 8.7% were windowed while 1.6% were single and 1.0% were separated.

3.1.3. School Enrollment for Children and Highest Education Level for Adults

Overall 80.5% of children aged 3 to 18 years were enrolled in school. Among those who did not attend school, majority of them indicated that they did not do so due to their parents' perceptions that the children had not attained the school going age (51.8%) and the distance to the nearby school (15.6%). Other reasons mentioned are as shown in table 5 below.

Table 5: Reasons for Non Enrollment to school

Reasons for Non- enrollment	Number	Percent
Child too young	133	51.8%
No school Near by	40	15.6%
Too poor to buy school items e.t.c	23	8.9%
Others	15	5.8%
Family labour responsibilities	13	5.1%
Household doesn't see value of schooling	13	5.1%
Married	10	3.9%
Migrated/ moved from school area	4	1.6%
Insecurity	3	1.2%
Chronic Sickness	2	0.8%
Working outside home	1	0.4%

As far as the highest education level attained by adults is concerned, 54.5% of the adults had none with 19.5% having attained primary education as the highest education level and 12.2% had secondary education as shown in figure 3 below.

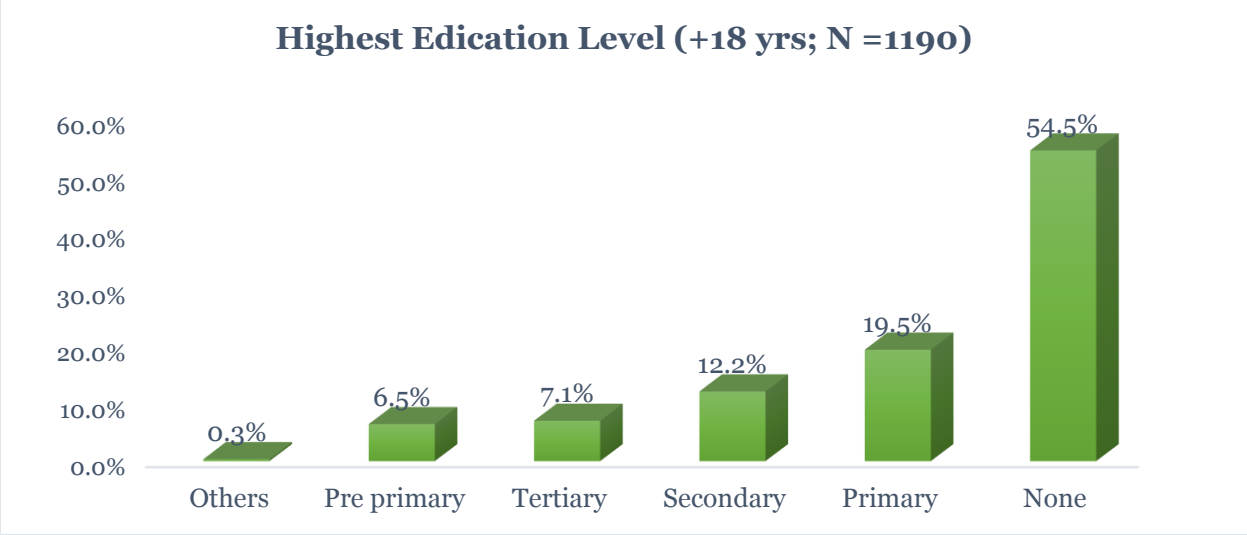


Figure 3: Highest Education Level

3.1.4. Main Household Occupation and Income Sources

The main occupation of most household heads was livestock herding (31.9%) and waged or casual labor (25.9%). Sale of livestock and casual labor formed bulk of income source for most house hold with 29.8% and 29.1% respectively implying that the current drought situation may have a significant impact on the households' income sources and eventually households' food insecurity. Table 6 below is a summary of other sources of income by household heads.

Table 6: Household head main occupation and income sources

Household head Main Occupation			Main Income Sources		
Livestock herding	195	31.9%	Sale of livestock	182	29.8%
Waged labour (Casual)	154	25.2%	Casual labor	178	29.1%
Own farm labour	75	12.3%	Sale of crops	69	11.3%
Petty trade	65	10.6%	Petty trading e.g. sale of firewood	52	8.5%
Employed (salaried)	57	9.3%	Permanent job	51	8.3%
Other Personal businesses	22	3.6%	No income	28	4.6%
Other Personal businesses	21	3.4%	Personal Business	22	3.6%
Merchant/trader	16	2.6%	Sale of livestock products	20	3.3%
Firewood/charcoal	6	1.0%	Sale of personal assets	4	0.7%
			Others	3	0.5%

3.1.5.Mosquito net Ownership and Usage

According to Kenya Malaria strategy 2009- 2018, Malaria is a major public health concern and fighting the disease is a National priority requiring a focused, comprehensive and consistent approach because three-quarters of the population are at risk of malaria. Children under the age of five, pregnant women, the chronically ill and immune-compromised persons, such as those living with HIV and AIDS, are considered to be at highest risk. Kajiado County is classified as a high (Parts of Kajiado West) to Low risk zone (Kajiado South). The first objective of the National Malaria Strategy is to have at least 80% of people living in Malaria risk zones using appropriate interventions by 2018. These interventions include vector control through LLINS, IRS and IVM. LLINs are distributed through mass campaigns every three years in endemic and epidemic-prone areas through ANC for pregnant women; child welfare clinics for children under one year and retail points that sell subsidized or full-price nets.

Less than half of the households surveyed (38.3%) owns at least one mosquito net. Only 35% of children under 5 slept under the mosquito net prior to the survey date, with almost the same proportion of pregnant women (34.1%) sleeping under the mosquito net as illustrated in table 6 below.

Table 7: Household members who slept under the mosquito nets

	N	n	Percent
Children under 5	698	244	35.0%
Children 5- 18 years	1023	165	16.1%
Adults (+18 years)	1190	310	26.1%
Pregnant Women	44	15	34.1%

3.2. Children Nutrition Status

3.2.1. Children distribution of Age and Sex

A total of 645 children under age of 6 to 59 months were assessed during the survey. They included 321 boys (49.8%) and 324 girls (50.2%) representing a sex ratio of 1.0 (p= 0.906) meaning that, overall boys and girls are equally represented. Age ratio of 6-29 months to 30-59 months: 0.88 (The value should be around 0.85).p-value = 0.655 (as expected). Table 7 below is a summary of sex distribution of boys and girls assessed. Figure 4 illustrates the age sex distribution of children. Under five nutrition status was assessed using anthropometric measurements. These included weight, height and MUAC. Analysis was based on 2006 WHO reference standards.

Table 8: Age and Sex distribution for children 6 to 59 months

	Boys		Girls		Total		Ratio
AGE (mo)	no.	%	no.	%	no.	%	Boy:girl
6-17	84	48.6	89	51.4	173	26.8	0.9
18-29	69	53.5	60	46.5	129	20.0	1.1
30-41	77	47.5	85	52.5	162	25.1	0.9
42-53	63	51.2	60	48.8	123	19.1	1.0
54-59	28	48.3	30	51.7	58	9.0	0.9
Total	321	49.8	324	50.2	645	100.0	1.0

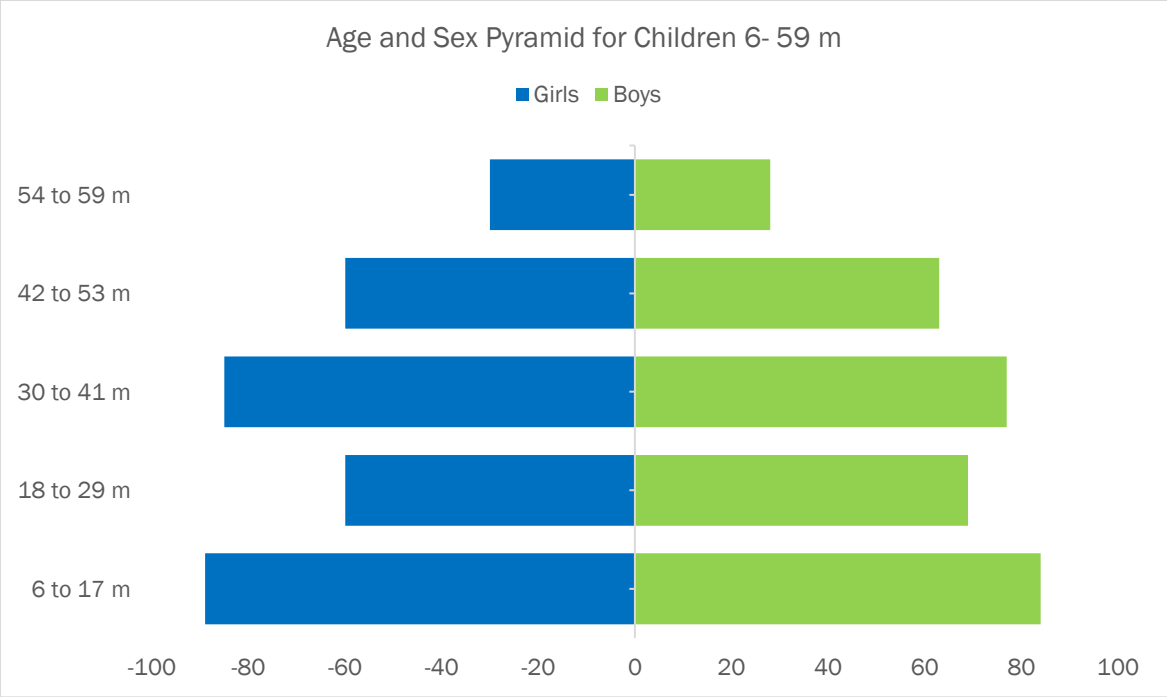


Figure 4: Age and Sex Pyramid for children 6 to 59 m

3.2.2. Prevalence of Acute Malnutrition (Wasting)

According to UNICEF nutrition glossary (2012), malnutrition is defined 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

Analysis of acute malnutrition included 629 (311 boys and 318 girls) children aged 6 to 59 months with exclusion of 17 children who were flagged off as outliers. From the assessment the GAM rate for Kajiado County was **10.0% (7.3 – 13.5, 95% C.I.)** while SAM rate was **1.4% (0.7- 3.0, 95% C.I.)** as indicated in table 6 below. There was no significant difference between boys and girls in terms of acute malnutrition (p= 0.8438). The prevalence of acute malnutrition by oedema was 0.0%.

Table 9: Prevalence of acute malnutrition by Weight for Height and by Sex

	All n = 629	Boys n = 311	Girls n = 318
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(63) 10.0 % (7.3 - 13.5 95% C.I.)	(32) 10.3 % (6.7 - 15.6 95% C.I.)	(31) 9.7 % (7.1 - 13.2 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(54) 8.6 % (6.4 - 11.5 95% C.I.)	(27) 8.7 % (5.7 - 13.1 95% C.I.)	(27) 8.5 % (6.1 - 11.7 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(9) 1.4 % (0.7 - 3.0 95% C.I.)	(5) 1.6 % (0.7 - 3.7 95% C.I.)	(4) 1.3 % (0.5 - 3.2 95% C.I.)

Figure 5 below is a graphical representation of distribution of weight for height of children surveyed in relation to the WHO standard curve (reference children). The curve slightly shifts to the left with a mean of -0.68 (SD ±1.05) an indication of under nutrition in comparison to reference children.

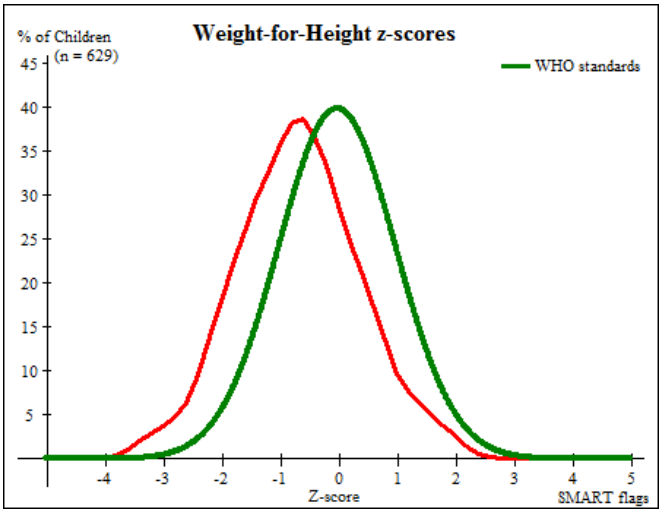


Figure 5: Graphical Representation of WFH for children assessed compared to WHO (2006) reference children

Analysis of Acute Malnutrition by Age

Further analysis was done on prevalence of acute malnutrition based on sex and age as indicated in table 9 below. From the analysis older children (30 to 59 months) were more affected by severe and moderate malnutrition as compared to younger children (6 to 29 months).

Table 10: Prevalence of Acute Malnutrition by age based on WFH- Z score and/or Oedema

		Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mo)	Total no.	No.	%	No.	%	No.	%	No.	%
6-17	164	1	0.6	8	4.9	155	94.5	0	0.0
18-29	125	1	0.8	12	9.6	112	89.6	0	0.0
30-41	159	3	1.9	10	6.3	146	91.8	0	0.0
42-53	123	3	2.4	17	13.8	103	83.7	0	0.0
54-59	57	1	1.8	7	12.3	49	86.0	0	0.0
Total	**628**	**9**	**1.4**	**54**	**8.6**	**565**	**90.0**	**0**	**0.0**

Analysis of Acute Malnutrition based on Presence of Oedema

Presence of bilateral edema is a sign of severe acute malnutrition. Analysis was therefore done based on this indicator. As shown in table 10 below, no edema case was recorded among the children surveyed.

Table 11: Distribution of Acute Malnutrition and Edema based on Weight for Height

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 19 (2.9 %)	Not severely malnourished No. 626 (97.1 %)

Prevalence of Acute Malnutrition by MUAC

Malnutrition can also be diagnosed using MUAC. MUAC is a good indicator of muscle mass and can be used as a proxy of wasting (United Nation System Standing Committee on Nutrition). It is also a very good predictor of the risk of death. Very low MUAC (< 11.5 cm for children 6 to 59 months), is considered a high mortality risk and is a criteria for admission of outpatient therapeutic or in patient therapeutic program (when accompanied with complications) for treatment of severe acute malnutrition. A MUAC reading of 11.5 cm to <12.5 cm is considered as moderate malnutrition. Analysis of the nutrition status for children aged 6 to 59 months based on MUAC and or presence of oedema resulted to GAM of 2.6% (1.7- 4.1, 95% C.I.) and SAM of 0.2% (0.0- 1.1, 95% C.I.) as indicated in table 11 below.

Table 12: Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex

	All n = 646	Boys n = 322	Girls n = 324
Prevalence of global malnutrition (< 125 mm and/or oedema)	(17) 2.6 % (1.7 - 4.1 95% C.I.)	(7) 2.2 % (1.1 - 4.4 95% C.I.)	(10) 3.1 % (1.7 - 5.6 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(16) 2.5 % (1.5 - 4.0 95% C.I.)	(7) 2.2 % (1.1 - 4.4 95% C.I.)	(9) 2.8 % (1.4 - 5.3 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(1) 0.2 % (0.0 - 1.1 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(1) 0.3 % (0.0 - 2.2 95% C.I.)

3.2.3. Prevalence of Underweight based on Weight for Age z- scores

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. As indicated in table 12 below, the prevalence of underweight among children aged 6 to 59 months in Kajiado County was 22.5% (17.9 – 27.8, 95% C.I.) while severe underweight was 5.6% (3.6- 8.6, 95% C.I.).

Table 13: Prevalence of Underweight based on Weight for Height z- scores and by sex

	All n = 628	Boys n = 314	Girls n = 314
Prevalence of underweight (<-2 z-score)	(141) 22.5 % (17.9 - 27.8 95% C.I.)	(71) 22.6 % (17.2 - 29.1 95% C.I.)	(70) 22.3 % (17.4 - 28.0 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(106) 16.9 % (13.6 - 20.7 95% C.I.)	(52) 16.6 % (12.5 - 21.6 95% C.I.)	(54) 17.2 % (13.2 - 22.1 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(35) 5.6 % (3.6 - 8.6 95% C.I.)	(19) 6.1 % (3.5 - 10.1 95% C.I.)	(16) 5.1 % (2.9 - 8.9 95% C.I.)

3.2.4.Prevalence of Stunting based on Height for Age

World Health Organization defines stunting as height for age less than – 2 SD from median height for age of reference population. Childhood stunting is an outcome of maternal undernutrition as well as inadequate infant and young child feeding. It is associated with impaired neurocognitive development, a risk maker of non-communicable diseases and reduced productivity later in life (WHO 2013). Analysis of stunting prevalence based on height for age revealed an overall stunting rate of 25.3% (21.3- 29.8, 95% C.I.) and a severe stunting (HFA< -3 in reference to standard population) rate of 6.1% (4.3- 8.5, 95% C.I.) as shown in table 13 below. Children 6 to 29 months were equally stunted as the older children aged 30 to 59 months as shown in table 14.

Table 14: Prevalence of Stunting based on height for age z-scores and by sex

	All n = 608	Boys n = 302	Girls n = 306
Prevalence of stunting (<-2 z-score)	(154) 25.3 % (21.3 - 29.8 95% C.I.)	(80) 26.5 % (21.6 - 32.0 95% C.I.)	(74) 24.2 % (19.1 - 30.1 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(117) 19.2 % (16.0 - 22.9 95% C.I.)	(57) 18.9 % (15.2 - 23.3 95% C.I.)	(60) 19.6 % (14.9 - 25.3 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(37) 6.1 % (4.3 - 8.5 95% C.I.)	(23) 7.6 % (5.0 - 11.4 95% C.I.)	(14) 4.6 % (2.8 - 7.4 95% C.I.)

Table 15: Prevalence of Stunting by age

		Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
Age (mo)	Total no.	No.	%	No.	%	No.	%
6-17	164	8	4.9	28	17.1	128	78.0
18-29	115	8	7.0	28	24.3	79	68.7
30-41	158	11	7.0	24	15.2	123	77.8
42-53	116	7	6.0	28	24.1	81	69.8
54-59	54	3	5.6	8	14.8	43	79.6
Total	607	37	6.1	116	19.1	454	74.8

Figure 6 below shows the graphical representation of distribution of HFA of surveyed children in relation to reference children (based on WHO standards). There is a slight drift to the left implying that the surveyed children were stunted in comparison to WHO standard curve with a mean± SD of – 1.21±1.18.

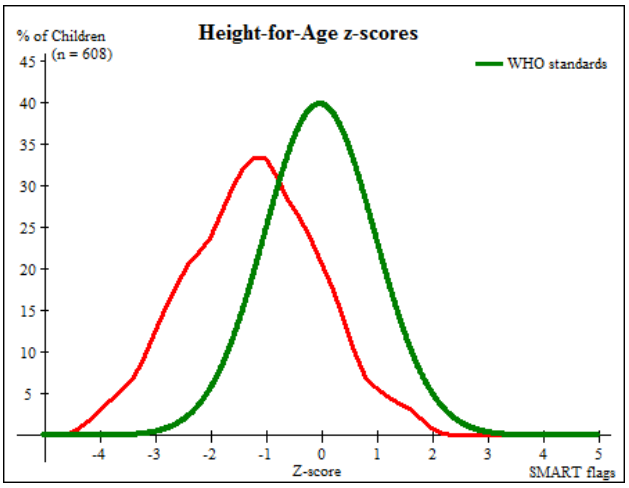


Figure 6: Graphical representation for Height for Age distribution in comparison with WHO reference

3.3. Child Morbidity and Health Seeking

3.3.1. Prevalence of child Morbidity

Based on the UNICEF conceptual framework of the causes of malnutrition, disease is categorized as one immediate cause alongside inadequate diet. There is a relationship between the two whereby disease may alter food intake while inadequate intake of some key nutrients may lead to infection. Ultimately they all lead to one outcome; malnutrition.

Assessment was done on the diseases that affected children 6 to 59 months in the past 2 weeks. Caregivers were asked whether their children had been ill in the past 2 weeks prior to the survey date. Those who answered affirmatively were further probed on what illness affected their children and whether and where they sought any assistance when their child/children were ill. Those who indicated that their child/children suffered from watery diarrhea were probed on the kind of treatment that was given to them.

Among the children assessed, 40.2% had been ill in the past 2 weeks prior to the survey date. Among those who were sick, majority of them (66.9%) suffered from ARI, followed by watery diarrhea (25.0%) and fever with chills (23.8%). Table 15 below is a summary of morbidity of children surveyed.

Table 16: Prevalence of common illnesses among children aged 6 to 59 months

Illness	n	Percent
All illnesses	260	40.2%
Fever with chills	62	23.8%
ARI	174	66.9%
Watery diarrhoea	65	25.0%
Bloody diarrhoea	5	1.9%
Other Illnesses (Skin infections, Eye Infections, pneumonia, ear infection)	29	11.2%

3.3.2. Therapeutic Zinc Supplementation for diarrhea Management

Based on compelling evidence from efficacy studies, zinc supplementation reduces the duration and severity of diarrhea. In 2004 WHO and UNICEF recommended incorporating zinc supplementation (20 mg/day for 10-14 days for children 6 months and older, 10 mg/day for children under 6 months of age) as an adjunct treatment to low osmolality oral rehydration salts (ORS), and continuing child feeding for managing acute diarrhea. Kenya has adopted these recommendations (Innocent report 2009). According to Kenyan policy guideline on control and management of diarrheal diseases in children below five years in Kenya, all under-fives with diarrhea should be given zinc supplements as soon as possible. The recommended supplementation dosage is 20 milligrams per day for children older than 6 months or 10 mg per day in those below the age six months, for 10–14 days during episodes of diarrhea.

This survey sought to establish the number of children who suffered from watery diarrhea and supplemented with zinc. Slightly more than half (55.4%) of those who suffered from watery diarrhea were supplemented with zinc while 64.6% were supplemented with ORS.

3.3.3. Health Seeking Places

Among those caregivers whose children were reportedly sick in the past 2 weeks, 76.2% sought some assistance. Among those who sought assistance, majority did it in a public clinic (65.7%) while 29.3% did it from a private clinic or pharmacy 4.0% did so from shop or kiosk. Overall 96.5% of those who sought assistance did so from appropriate places where they were likely to obtain treatment and proper care such as public clinic, private clinic or pharmacy, mobile clinic, NGOs and FBOs as illustrated in figure 5 below.

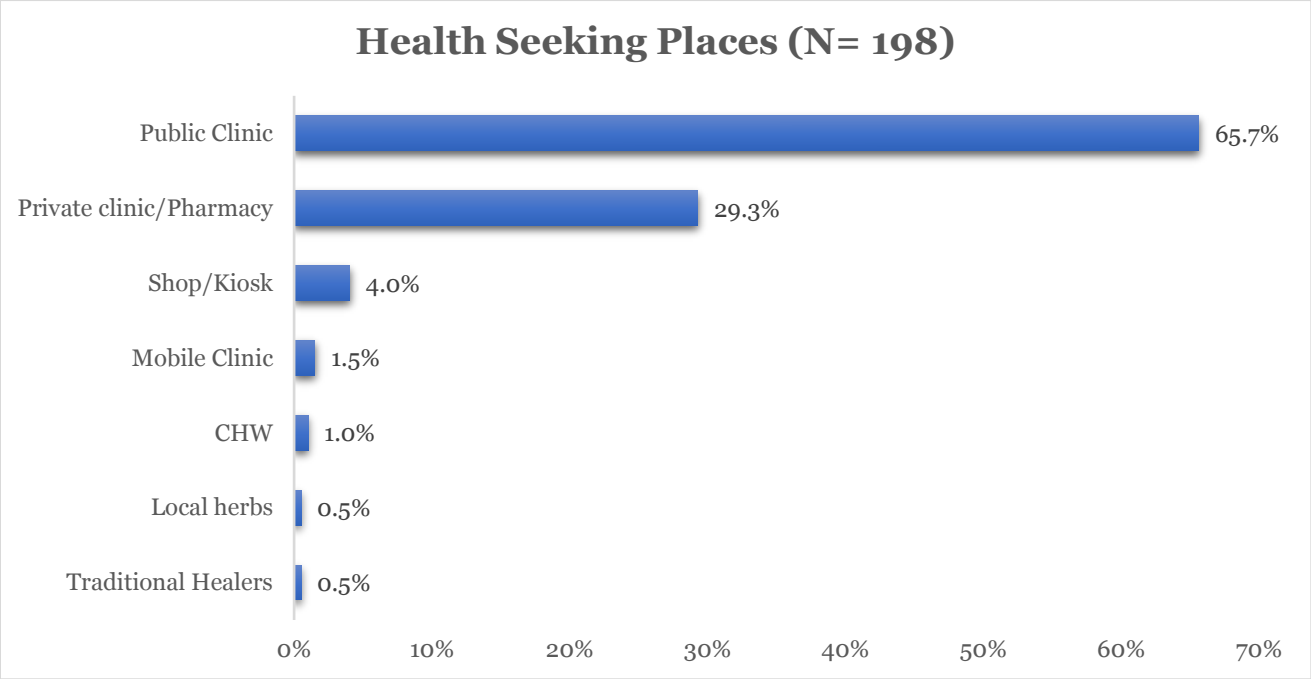


Figure 7: Health Seeking Places

3.4. Child Immunization, Vitamin A Supplementation and Deworming

3.4.1. Child Immunization

As a member of a highly networked global community, it is in the interest of the Government of Kenya that its citizens are adequately protected against as many life- threatening communicable diseases as possible. Vaccination has been shown time and again to be very cost effective in the prevention or amelioration of disease. It is envisioned that where the opportunity arises to provide this protection at the earliest possible age, it should be through the availability of safe, efficacious and relevant vaccines. The Kenya guideline on immunization define a fully immunized child is one who has received all the prescribed antigens and at least one Vitamin A dose under the national immunization schedule before the first birthday.

This survey assessed the coverage of 4 vaccines namely, BCG, OPV1, OPV3, and measles at 9 and 18 months. From this assessment, 89.8% of children were confirmed to have been immunized by BCG based on the presence of a scar. Those who were immunized by OPV1 and OPV3 were 97.1% and 93.3%

respectively while 82.9% had been immunized for measles. However less than half of the eligible children (partly 47.2%) would confirm to have been immunized with the second dose of measles antigen at 18 months as indicated in figure 8 below.

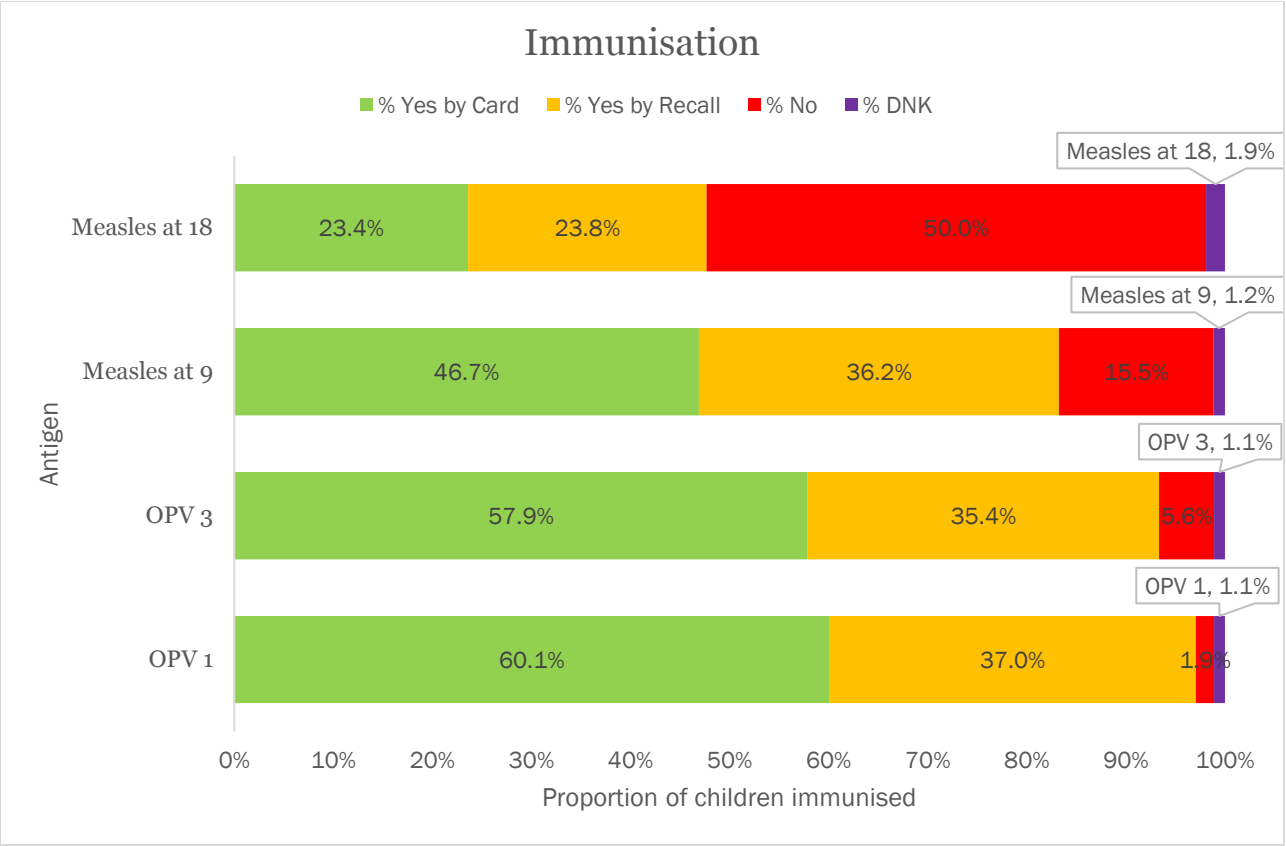


Figure 8: Immunization Coverage

3.4.2. Vitamin A supplementation and Deworming

Evidence shows that, giving vitamin A supplements to children reduces the rate of mortality and morbidity. Vitamin A reduces mortality risk by 24% (WHO 2011). Guaranteeing high supplementation coverage is critical, not only to eliminating vitamin A deficiency as a public-health problem, but also as a central element of the child survival agenda. Delivery of high-dose supplements remains the principal strategy for controlling vitamin A deficiency. Food-based approaches, such as food fortification and consumption of foods rich in vitamin A, are becoming increasingly feasible but have not yet ensured coverage levels similar to supplementation in most affected areas (UNICEF 2007).

Poor data management on vitamin A logistics, inadequate social mobilization to improve vitamin uptake and placement of vitamin A at lower level of priority among other interventions has been cited as major challenges in achieving the supplementation targets (MOH Vitamin A supplementation Operational Guidelines for Health Workers 2012).

To assess vitamin A supplementation, parents or caregivers were probed on the number of times the child had received vitamin A in the past one year. Reference was made to the child health card and in case the card was not available recall method was applied. Among those who were supplemented, 54.6% was confirmed by the use of health cards with 45.4% who were confirmed by recall. Analysis of vitamin A supplementation for children aged 6months to 1 year indicates that 50.5% of this age group had been supplemented with vitamin A. Among those aged 12 to 59 months, 20.8% had been supplemented with vitamin A for 2 times in the past one year. In terms of deworming among children aged 12- 59 months, almost two thirds (62.9%) had been dewormed at least once. However, only a small proportion (12.5%) had been dewormed twice as recommended in the past 12 months. Table 15 below summarizes vitamin A supplementation in Kajiado County.

Table 17: Vitamin A supplementation and deworming among the under- fives

Age Category	N	n	Proportion supplemented/Dewormed
Vitamin A Supplementation			
6- 11 m	93	47	50.5%
12- 59 m (At least Once)	553	316	57.1%
12- 59 m (At least twice	553	115	20.8%
6-59 m (At least once)	646	363	56.2%
6- 59 (At least twice)	646	117	18.1%
Deworming			
12 to 59 months (At least once)	553	348	62.9%
12 to 59 months (at least twice	553	69	12.5%

3.5. Maternal Nutrition

3.5.1. Introduction

Maternal nutrition has a direct impact on child survival. Pre- pregnancy nutrition influences the ability of a woman to conceive determines the fetal growth and development and the size of the fetus and its overall health and that of the mother.

Maternal nutrition was assessed using maternal MUAC for all women of reproductive age and iron and folic acid supplementation for women with children under two years of age.

WHO recommends daily consumption of 60mg elemental iron as well as 0.4mg folic acid throughout the pregnancy (WHO 2012). These recommendations have since been adopted by Kenya government in its 2013 policy guidelines on supplementation of FEFO during pregnancy.

3.5.2. Maternal Nutrition Status by MUAC

A total of 509 women aged 15 to 49 years were assessed during the survey. Almost half of them (48.7%) were neither lactating nor pregnant while 42.6% were lactating. While 8.1% were pregnant while partly 0.6% were both pregnant and lactating. Overall 4.9 % has a MUAC of less than 21cm. Among the PLW, 7.3% had a MUAC of less than 21cm thus classified as malnourished.

3.5.3. Iron and Folic Acid Supplementation

Among mothers of children less than 24 months, 95.9% were supplemented with iron and folic acid during their pregnancy for the youngest child (below 24 months). The mean FeFo consumption period was 66.5 days. None of the surveyed women consumed FeFo for the recommended 270 days while 7% consumed FeFo for more than 180 days. Table 16 below illustrate the consumption of iron and folic acid.

Table 18: Consumption of iron and Folic acid

No of days FeFo was consumed	No of Women	Proportion (%)
Less than 90 days	146	62.1%
90 to 180 days	82	34.9%
180 to 270 days	7	3.0%

3.6. Water, Sanitation and Hygiene

3.6.1. Main Water Sources, Distance and Time to Water Sources

Everyone has the right to water. This right is recognized in international legal instruments and provides for sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses. An adequate amount of safe water is necessary to prevent deaths due to dehydration, to reduce the risk of water-related disease and to provide for consumption, cooking, and personal and domestic hygienic requirements. According to SPHERE handbook for minimum standards for WASH, the average water use for drinking, cooking and personal hygiene in any household should be at least 15 liters per person per day. 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 no more than 15 minutes and it should not take more than three minutes to fill a 20-litre container. Water sources and systems should be maintained such that appropriate quantities of water are available consistently or on a regular basis. The main source of drinking water was borehole (35.5%) followed by piped water (27.8%) while 12.9% of the households got their drinking water from water pans or dam. At the sub county level, Kajiado Central had much of their drinking water coming from either piped water system or borehole. Kajiado West had the least proportion of their drinking water from boreholes while a relatively large proportion obtained their drinking water from water pan or dam and water trucking. However much of their drinking water was obtained from piped system as illustrated in figure 9 below.

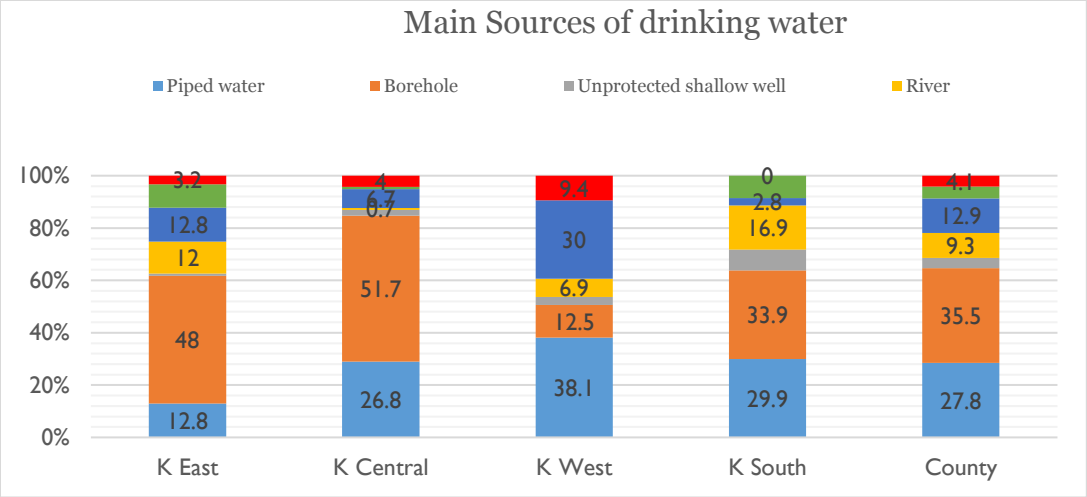


Figure 9: Main Sources of drinking water

In regard to distances to water sources, a relatively larger proportion obtained their drinking water from sources less than 500m (38.5%), with 35% obtaining their drinking water from sources between 500m and less than 2km and only 25.5% who trekked more than 2km to the water sources. Kajiado Central had the largest proportion of the households who trekked long distances to the water sources (43.6%) while Kajiado South had the least (7.3%). Kajiado West had the least proportion of the households who obtained their drinking water from the recommended distances (31.3%) as illustrated in figure 10 below.

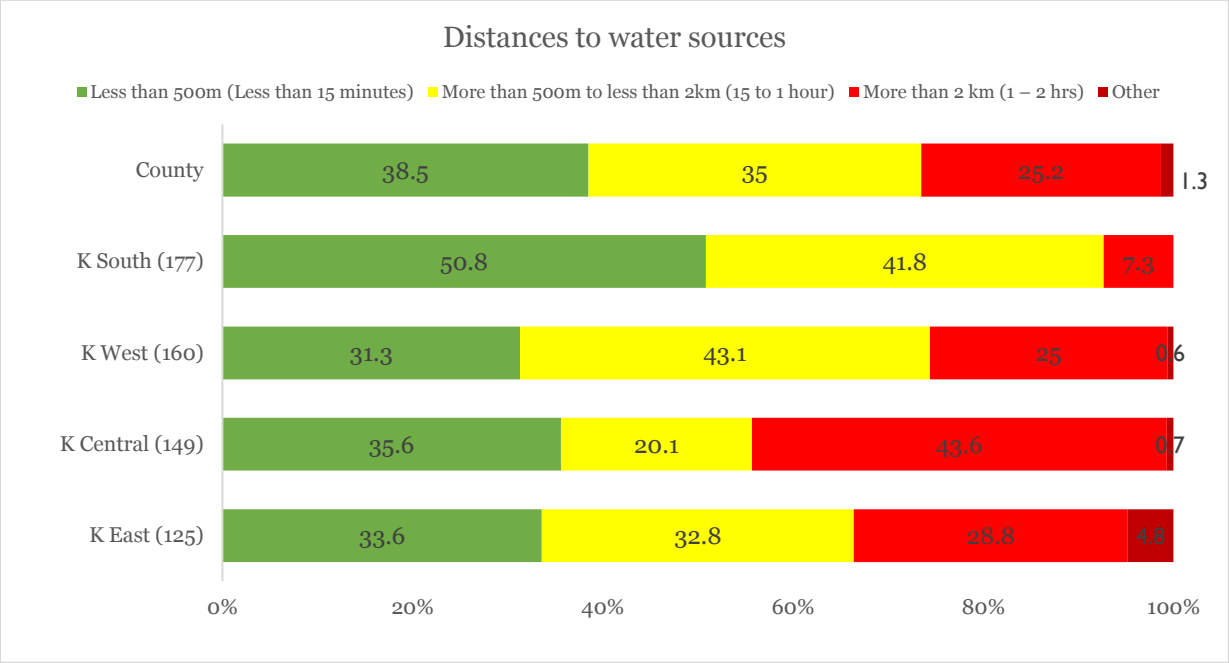


Figure 10: Trekking distances to water sources

As far as queuing time is concerned, only 35.0% of the household surveyed queued for water. Among the household that queued for water, 38.3% spent less than 30 min while 36.4% spent between half an hour to 1 hour. More than a quarter of them (25.2%) queued for more than 1 hour as indicated in table 18 below.

Table 19: Queuing time at the water sources

Queueing time (N= 214)	n	Percent
Less than 30 minutes	82	38.3%
30-60 minutes	78	36.4%
More than 1 hour	54	25.2%

3.6.2. Water Treatment, Storage, Payment and Consumption

Analysis on treatment of drinking water indicated that 30.6% of the household treated their drinking water. Among the households that treated their drinking water, majority used boiling with almost two thirds boiling their drinking water. Approximately one third used chemicals such as chlorine, Pur or water guard while a meagre 1.1% used pot filters as shown in figure 11 below.

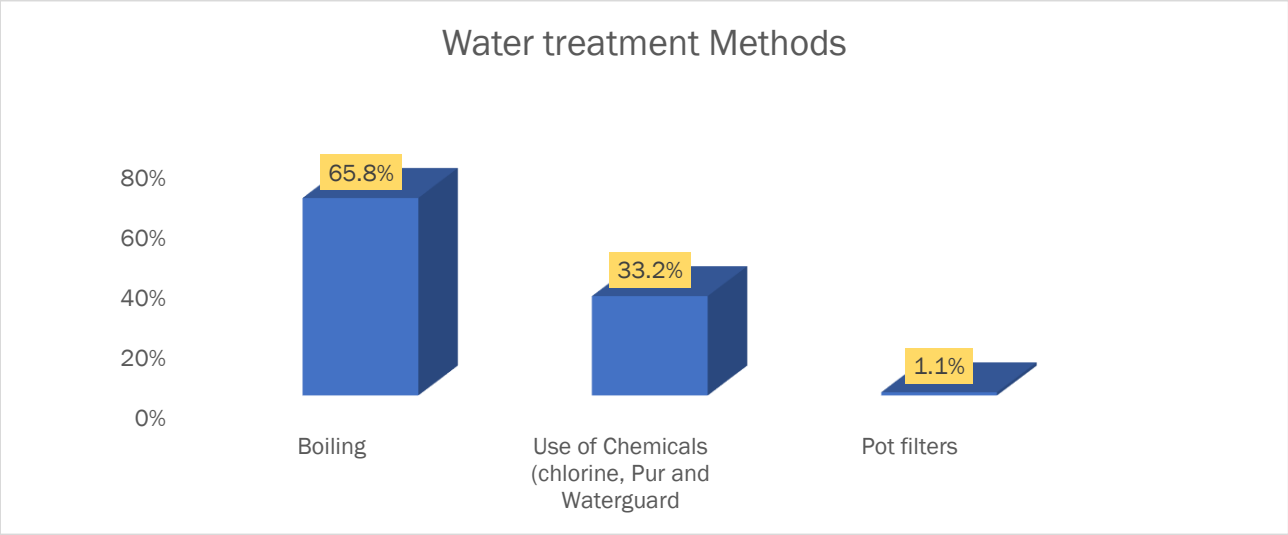


Figure 11: Water treatment Methods

Despite the fact that majority of the household surveyed not treating their water, it is apparent that they store their drinking water properly in closed containers/jerry cans (88.2%) where it is less likely to have physical water contamination. The rest (11.8%) indicated that they stored their water in open containers/jerry cans exposing it to physical contamination. A meagre 1% of the households consumed less than 15 liters of water a day prior the survey date. The mean water consumption per household was 65.5 liters which is above 15 liters recommended by the SPHERE standards

Only 33.9 % of the households paid for their water. Among those who paid for water, 59.4% did in terms of jerricans, the rest (40.6%) did so on monthly basis. The average payment per month was Ksh 746. Among those who paid per jerrican the average cost per jerrican was Ksh 14.4.

3.6.3. Handwashing

The importance of hand washing after defecation and before eating and preparing food, to prevent the spread of disease, cannot be over-estimated. Users should have the means to wash their hands after

defecation with soap or an alternative (such as ash), and should be encouraged to do so. There should be a constant source of water near the toilet for this purpose. (SPHERE Handbook 2004).

A large proportion of the respondents (86.3%) indicated that they were aware of the handwashing moments. Among those who were aware of the handwashing moments, 88.6% washed their hands before eating while 73.6% did so before cooking and 63.6 after going to toilet. Partly 19.5% did it after taking a child to the toilet with 14.6% washing their hands in the 4 critical moments. Considering only the household with a child under 2 years old, 23.4% washed their hands after taking the child to the toilet while 16.3% did so in 4 critical moments as illustrated in table 19 below. 92.8% washed their hands with soap and water.

Table 20: Handwashing

Handwashing moments (N= 527)	No of Respondents	Percent	Households with children 0 to 23 months (N= 239)	
			n	Percent
After toilet	335	63.6	122	51.0
Before cooking	388	73.6	147	61.5
Before Eating	467	88.6	179	74.9
After taking the child to toilet	103	19.5	56	23.4
Others	20	3.8	0	0
3 critical moments	248	47.1	64	26.8
4 critical moments	77	14.6	39	16.3

3.6.4.Sanitation Facilities Ownership and Accessibility

If organic solid waste is not disposed of well, major risks are incurred due to fly breeding and surface water pollution which is a major cause of diarrheal diseases. Solid waste often blocks drainage channels and leads to environmental health problems associated with stagnant and polluted surface water. Analysis of relieving points revealed that, most household are still relieving themselves in bushes and other open places. Open defecation was practiced by 59.2% of the households. Open Defecation was more prevalent in Kajiado West (83.8%) and less prevalent in Kajiado East (21.6%). Toilet ownership remained low at 40.8% as indicated in figure 12 below.

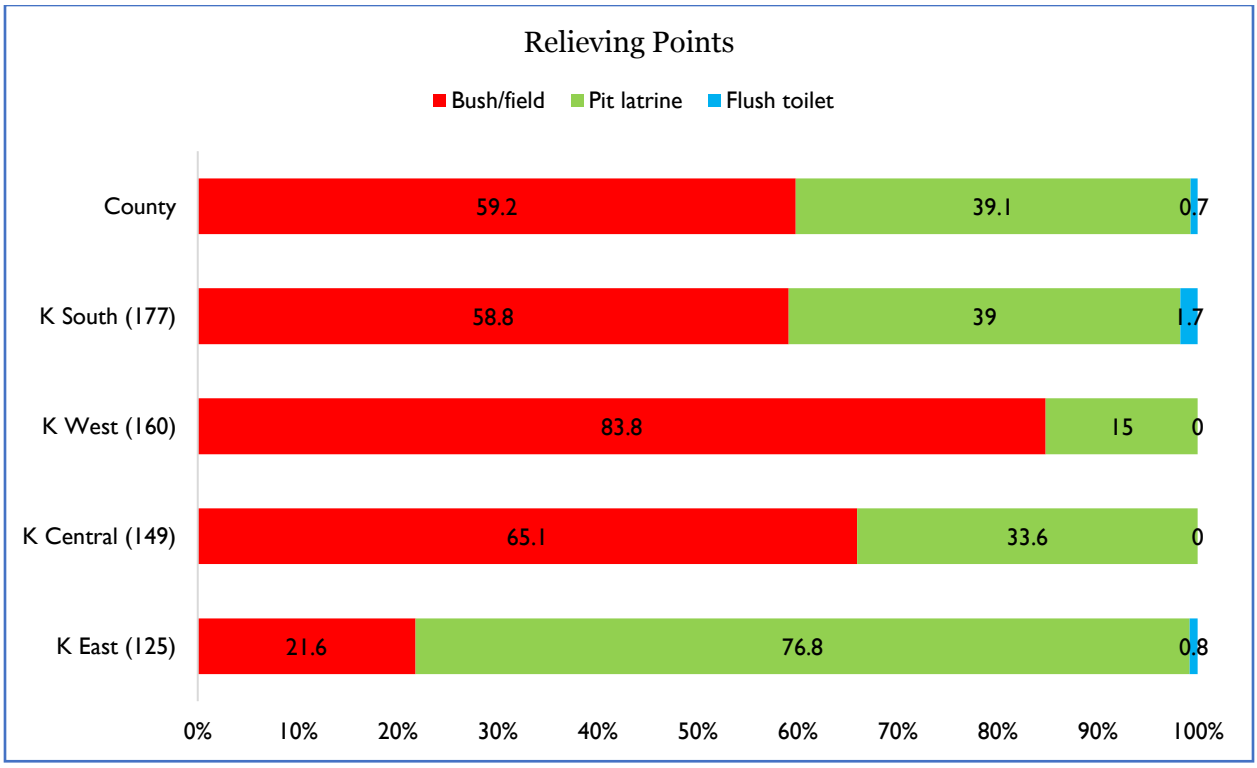


Figure 12: Relieving Places

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. The groups were combined at the analysis stage to come up with 12 food groups. As shown in figure 13 below, there was a high consumption of five food groups namely; Cereals (90%), Oils and fats (87.7%), vegetables (83.0%), oils and fats (76.9% and milk and milk products (71.8%).

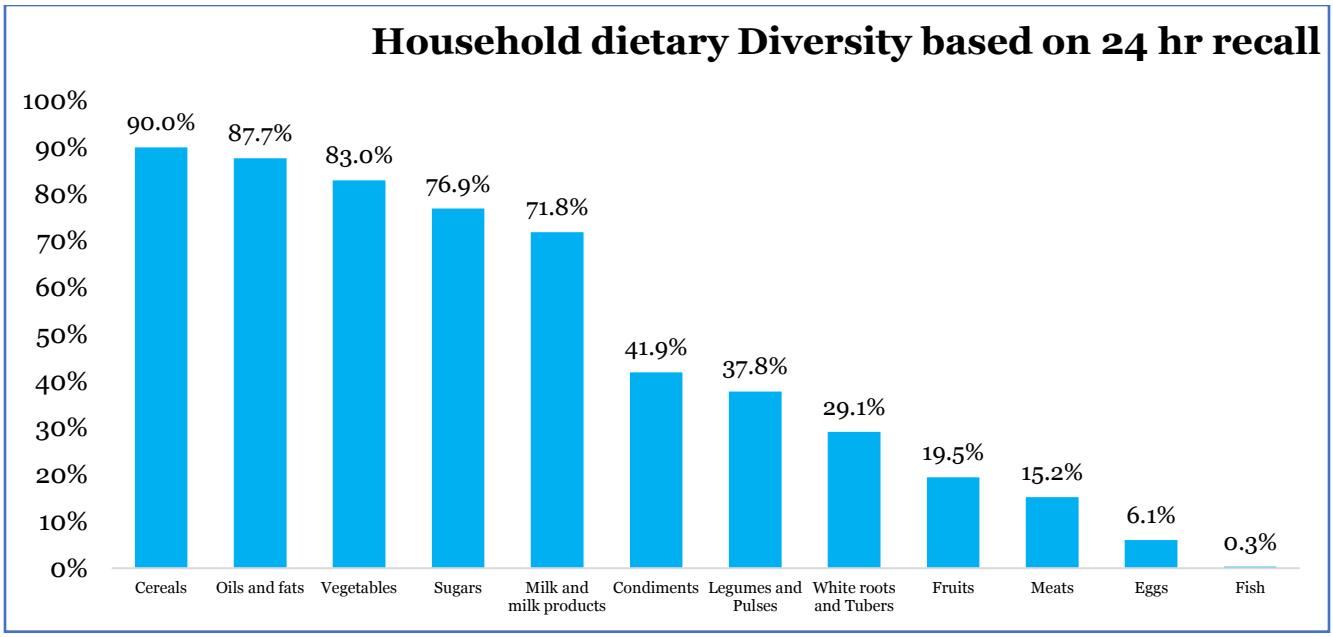


Figure 13: Household dietary diversity based on 24 hour food recall

A small proportion of households surveyed (11.6%) consumed less than 3 food groups classified as low dietary diversity. Almost a third (31.1%) consumed 3 to 5 food groups classified as medium dietary diversity while a majority (57.3%) consumed more than 5 food groups classified as high dietary diversity. However, this does not reflect the quality of diet consumed as the consumed included, sweets and sugars, cereals, milk and milk products, oils and fats and condiments. Kajiado West and South had a relative higher proportion of households that consumed less than 3 food groups at 17.5% and 16.9% respectively while Kajiado East had the least at 1.6% as illustrated in figure 14 below.

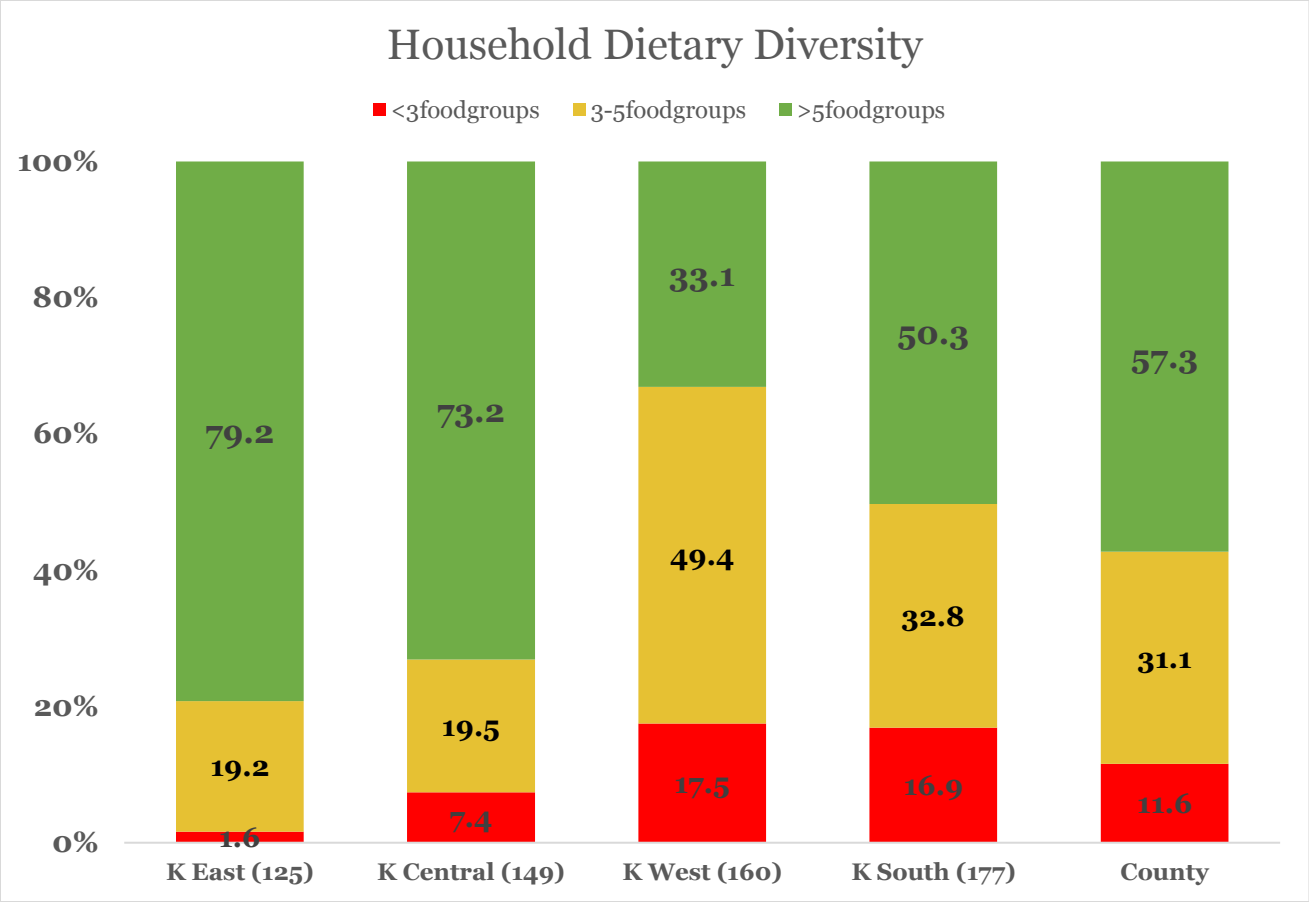


Figure 14: Household dietary diversity

3.7.2. Minimum Dietary Diversity for women (MDD-W)

The Minimum Dietary Diversity for WRA (MDD-W) indicator is a food group diversity indicator that has been shown to reflect one key dimension of diet quality: micronutrient adequacy. MDD-W is a dichotomous indicator of whether or not women 15–49 years of age have consumed at least five out of ten defined food groups the previous day or night. The proportion of women 15–49 years of age who reach this minimum in a population can be used as a proxy indicator for higher micronutrient adequacy, one important dimension of diet quality. As indicated in figure 15 below, the most of the WRA consumed grains, white roots, tubers and plantain (97.2%) which are major source of energy, pulses (80.6%) and dairies (75.5%) the latter two are protein sources. Partly 1.7% consumed nuts and Seeds.

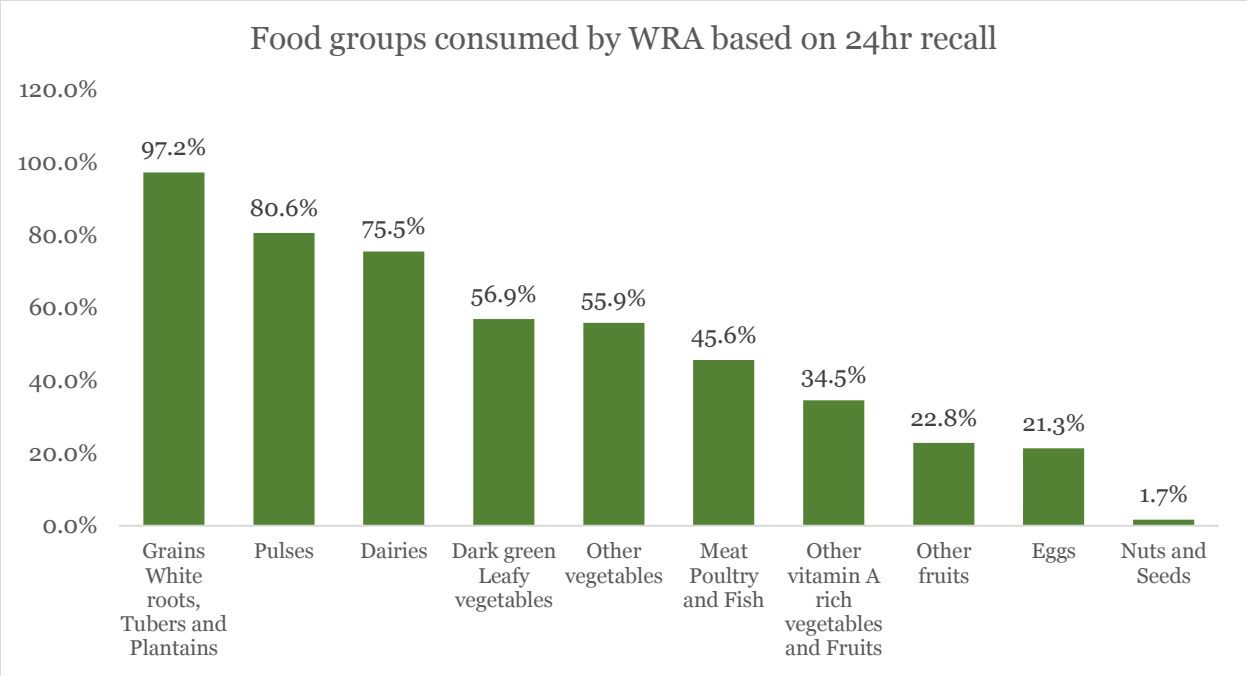


Figure 15: Food groups as consumed by WRA

Table 20 illustrated the proportion of WRA who consumed more than 5 food groups out of 10. From the analysis 51.8% of WRA met the minimum dietary diversity. The average number of food groups consumed was 4.92.

Table 21: Minimum Dietary Diversity for Women

Indicator	Number	Proportion (%)
Women consuming at least 5 food groups	243	51.8
Women consuming less than 5 food groups	226	48.2
Mean number of food groups consumed		4.92

3.7.3. Food Consumption Score

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 (FCS) was obtained by summing up the product of each food item after which classification was done as illustrated in figure 16 below. Households with a score of 0 to 21 are classified as **poor** while those with

a score of 21.5 to 35 are classified as **borderline**. Those with a score of 35.5 and above are classified as **acceptable**. As the figure illustrates, a large proportion of the households (60.2%) met the acceptable food consumption while partly 9.2% had poor food consumption score. Kajiado West had the largest proportion of households classified as poor (26.3%) and least of the acceptable FCS households (20.6%) while Kajiado East had the least of household classified as poor (0%) and highest among households that were classified as acceptable (88%).

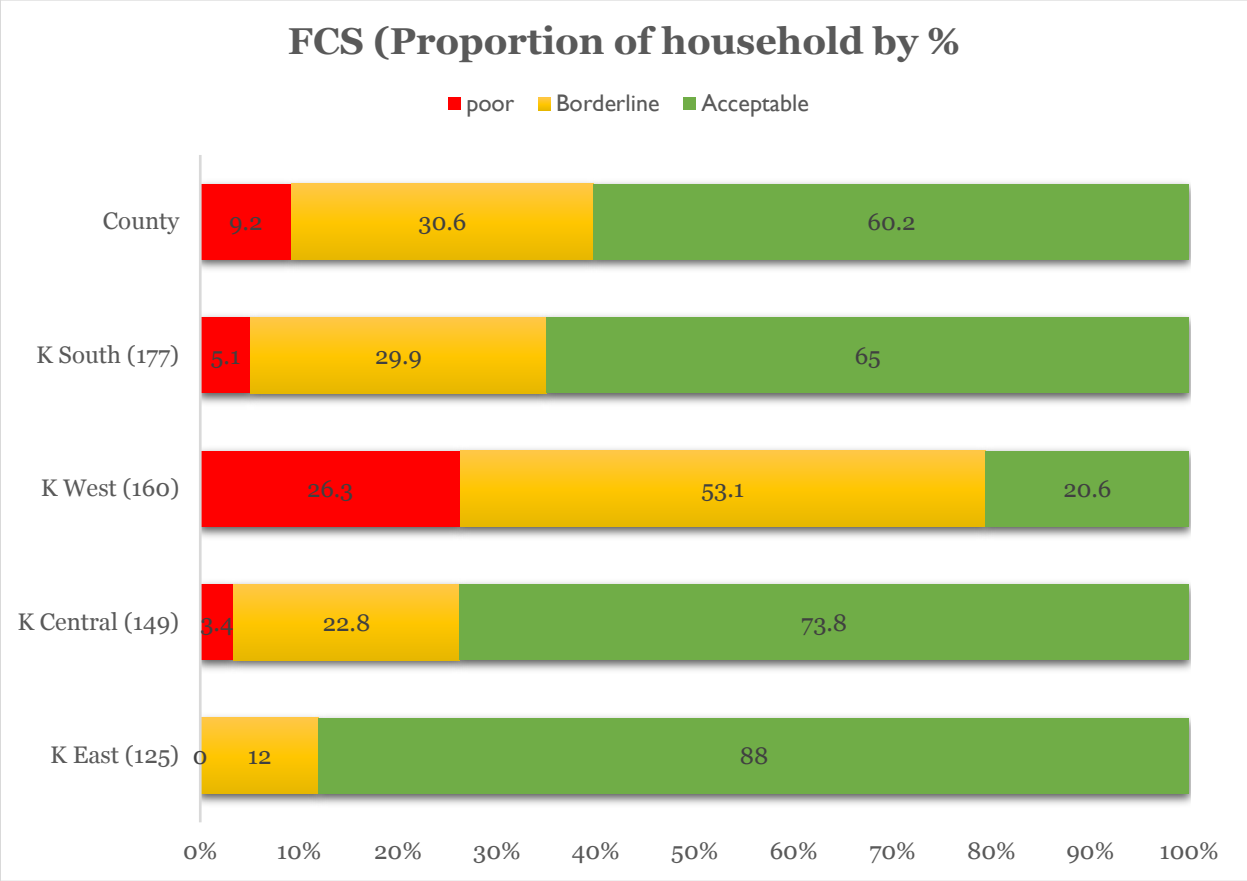


Figure 16: FCS Classification

Further analysis was done on diet quality based on vitamin A rich, iron rich and protein rich diets. As illustrated in figure 17 below, majority of households which were classified under poor and borderline categories consumed none of vitamin A and iron rich foods while they somehow consumed protein rich foods (mainly dairies). Among the households that were categorized as having acceptable consumption, 92.6% frequently consumed protein rich foods while 54.4% and 80.7% did so frequently or somehow in case of iron rich and vitamin A rich foods respectively.

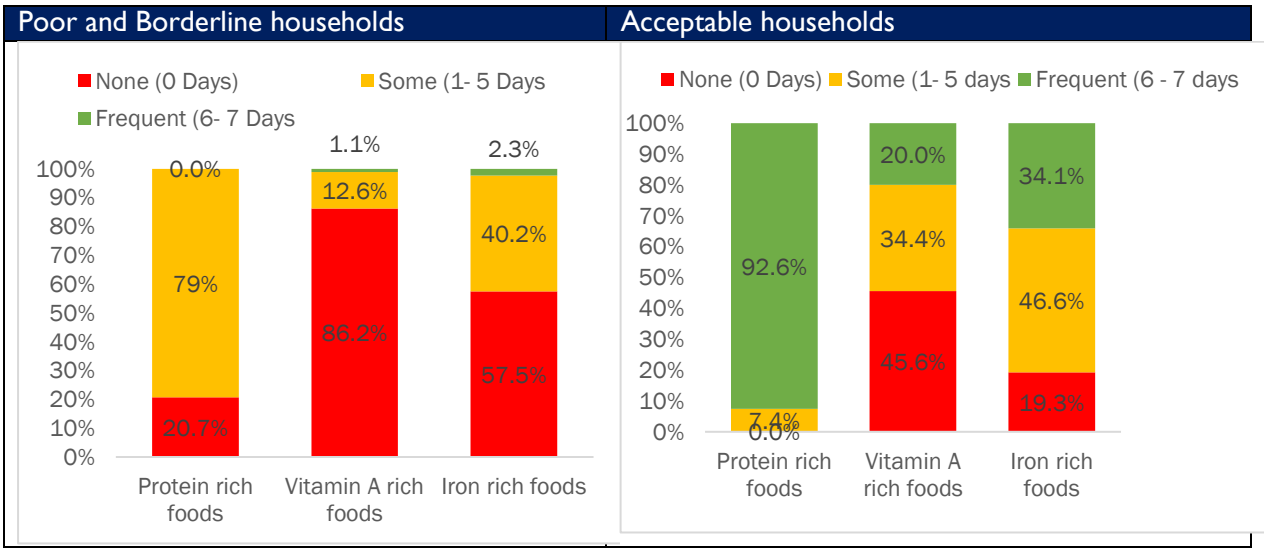


Figure 17: Household consumption of protein, vitamin A and iron rich foods in relation to FCS classifications

Coping Strategy Index (CSI)

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).

Among the household surveyed, 44.0% household were food insecure in the past 7 days (they at one point lacked food or did not have money to buy food at one point. Table 21 below summarizes the coping strategies adopted by the households in such instances.

Table 22: Coping Strategies

Coping strategy adopted	No. of HHds (N= 269)	Frequency score (0 -7)	Severity score	Weighted score
Relied on less preferred or less expensive foods	227 (84.4%)	2.8	1	2.8
Borrowed food	227 (84.4%)	2.3	2	2.6
Limit Portion sizes	208 (77.3%)	2.5	1	2.5
Restrict consumption of food by adults so that children can feed	143 (53.1%)	2.3	3	6.9
Reduced Number of meals	164 (61.0)	2.2	2.2	2.2
Total Weighted Coping Strategy Score				**19**

4.0. Conclusion and Recommendations

4.1. Conclusion

Analyzing the nutrition situation in Kajiado County using the UNICEF conceptual framework on the causes of malnutrition, the survey revealed the following; Overall the acute nutrition status is at the **serious** phase (IPC phase 3) with GAM of 10.0% (7.3- 13.5, 95% CI). Although there is no statistical significance in deterioration of the current status in comparison to April 2011 SMART survey where the drought situation is similar to the current, the situation has shifted lower to the serious phase compared to alert phase in 2011. The stunting levels equally remained high at 25.3% (21.3- 29.8, 95% C.I) compared to April 2011 SMART survey where the prevalence was 19.7% (15.7- 24.6, 95% CI) which was statistically significant (p= 0.0375). Equally underweight prevalence was also high (22.5%) compared to 12.1% in 2011.

Morbidity could be attributed to the current status of acute malnutrition since it remained quite high at 40.2%. The main diseases that affected children included; acute respiratory infections. Among those children who were sick during the survey period, 66.9% of them suffered from ARI, while 25.0% suffered from watery diarrhea and 23.8% from fever with chills. The incidences of dysentery were low at 1.9%.

On dietary intake, taking women minimum dietary diversity as a proxy indicator for dietary intake, almost half of the women of reproductive age (48.2%) did not meet the minimum dietary intake based on the 24 hour food recall. This ultimately would mean even children do not meet their minimum dietary needs. At the household level; 11.6% of the households consumed less than 3 food groups while 31.1% consumed 3 to 5 food groups. The main food groups consumed were cereals, oils and fats, vegetables, sugars, milk and milk products with very minimal intake of protein based foods such as meats, eggs and fish and also fruits. In terms of food consumption score, 39.8% of the household had their FCS classified as poor or borderline this implies that they did not consume staples and vegetables on daily basis and never consumed protein rich foods such as meats and dairies. Under this category (poor) there is 9.2%. On the borderline are the households that consume staples and vegetables on daily basis accompanied by oils and pulses few times a week. Almost a third of household surveyed (30.6%) fall under this category. Disparities were noted across the County with Kajiado West having the largest proportion of households than falls under these two categories. Combined Kajiado West has 79.4% of its households falling under these two categories. Kajiado East has the least of the households falling under these two categories with only 12%.

As far as coping strategies are concern, 44% of all household can be classified as food insecure as they within 1 week prior to the survey did not have enough foods or money to buy food. This forced majority of them to borrow food and rely on less preferred or less expensive foods as well as limit their portion sizes. Overall the weighted CSI was 19.0. From the analysis dietary intake could be a contributory factor to the current **serious** status of malnutrition.

In terms of underlying causes (insufficient health services and unhealthy environment), Kajiado County experienced low coverage of vitamin A and deworming with only 50.5% of children 6 to 11 months being supplemented with vitamin A. while 56.2% of children 6 to 59 months were supplemented with vitamin A, only 18.1% were supplemented twice. Equally, the proportion of children dewormed are low with 69.2% of children 12 to 69 months being dewormed once and 12.5% who were dewormed once as recommended. Although the Proportion of children immunized with most of the antigens surpassed 80%, a relatively low percentage (47.2%) were immunized with the second dose of measles (at 18 months) which is a health concern.

The water hygiene and Sanitation situation in the County is also an area of concern. Some of the notable issues of concern included the trekking distances to water sources where more than 50% of the households between 15 minutes to more than 2 hours to the current water source limiting the time available for child care. In addition, the proportion of the households that queue for water is 35% with Kajiado East and Central having the largest proportion at 44.0% and 51.7%.

Although majority of households store their water in closed containers only 30.6% treat their drinking water mostly by boiling. The proportion of household that are ware of handwashing is good at 86.3%, only a few of them practiced handwashing in the four critical moments at 16.3%. Majority of them used soap and water as recommended.

Open defecation is very prevalent in Kajiado County with 59.2% practicing open defecation which is a dangerous sanitation practice. Kajiado West and central had the highest proportion of households that practiced open defecation at 83.8% and 65.1% respectively.

4.2. Recommendations

Based on the survey findings, the following actions were recommended;

Table 23: Recommendations

Finding	Recommendation	Actors	Timelines
Serious GAM (Wasting) levels at 10.0%	Scale up mass screening and integrated outreach services for the hard to reach areas	County Department of Health services and Partners	From March 2018
	Train the CHVs on community case findings and referral of malnourished children		
	Activate surge activities in the County		
High Levels of underweight (22.5%) and Stunting (25.3%)	Address the care environment including improvement on food security (diversification of diet)	County Department of Health Services	Medium term
	Address hygiene and sanitation issues at Household and community level	County Department of Health Services and Department of Agriculture	
	Develop/scale up strategies to increase access to health care (ANC visits to improve on supplementation and health education to mothers)	County Department of Health Services	
Poor Vitamin A supplementation(all at 56.2%) 6-11 once at 50.8%) and 12-59 twice at 20.8%	Strengthen documentation through sensitization of all health workers	County Department of Health Services	From March 2018
	Integration of Vitamin A supplementation to outreaches	County Department of Health Services	From March 2018

	Scale up VAS at the community by sensitising the community members to take their children for VAS	County Department of Health Services	
	Use of mobile phone technology (m Health) to boost VAS coverage		
Poor immunization especially for measles at 18 months at 47.2% by card and recall	Sensitize the pregnant women on the recommended immunization schedule during ANC	County department of Health Services	Immediately
	Continue educating the caregivers on immunization schedule	County department of Health Services	Every 6 months
	Engage CHVs to refer children who have attained the immunization age to the health facilities	County department of Health Services	From March 2018
	Use of mobile phone technology (m Health) to boost immunization coverage	County department of Health Services and Partners	Medium Term
Poor water treatment with only 30.7% treating their water despite high levels of open defection	Sensitize the community on the importance of water treatment and how to do it	County department of Health services	From March 2018
	Engage the community through the community conversation approaches for them to come up with the most affordable and acceptable water treatment options	County departments of Health services and Water and Partners	From March 2018
	Support the community by supplying them with water treatment agents	County departments of Health services and Water and Partners	From March 2018
Poor hand washing with hand washing at 4 critical times reported at 14.6%	Develop sanitation and Hygiene Key Messages	County departments of Health services and Partners	From March 2018
	Conduct Community Sensitization	County departments of Health services and Partners	From March 2018
High ODF at 59.2%	Scale up CLTS activities	County department of Health Services specifically public Health Unit	Medium Term
Low Minimum women dietary diversity (51.8%)	Strengthen health education during ANC visits	County Departments of Health Services and Agriculture led by CNC supported by Partners	Medium Term
	Provide health education through use of CHVs	County Departments of Health Services and	Medium Term

		Agriculture led by CNC supported by Partners	
	Promote agri-nutrition initiatives in the County		
Changing livelihoods	Support sustainable livelihoods especially for pastoral drop outs and strengthen market for livestock	County Department of Agriculture and Livestock	Medium to long term
44% percent of HHs experiencing food insecurity	Food or cash based intervention for the food insecure HHs with emphasis on asset creation	County government of Kajiado and Partners	Immediately

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Appendices

Appendix I: Plausibility check for: Kajiado_SMART_2018.as

Standard/Reference used for z-score calculation: WHO standards 2006
(If it is not mentioned, flagged data is included in the evaluation. Some parts of this plausibility report are more for advanced users and can be skipped for a standard evaluation)

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	**Score**
Flagged data	Incl	%	0-2.5	>2.5-5.0	>5.0-7.5	>7.5	
(% of out of range subjects)			0	5	10	20	**0** (2.5 %)
Overall Sex ratio	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**0** (p=0.906)
Age ratio(6-29 vs 30-59)	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**0** (p=0.655)
Dig pref score - weight	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**0** (4)
Dig pref score - height	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**0** (7)
Dig pref score - MUAC	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**2** (8)
Standard Dev WHZ	Excl	SD	<1.1	<1.15	<1.20	>=1.20	
.			and	and	and	or	
.	Excl	SD	>0.9	>0.85	>0.80	<=0.80	
			0	5	10	20	**0** (1.05)
Skewness WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**0** (0.07)
Kurtosis WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**0** (-0.05)
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<=0.001	
			0	1	3	5	**3** (p=0.002)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	**5** %

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

Appendix II: Sampled Clusters

Geographical unit	Sub County	Ward Name	Cluster .no	Sampled Village
ENKARONI	Kajiado Central	Purko	1	Ilparua
OLKILORITI	Kajiado Central	Illdamatt	2	Paranae
OLEMURKAT	Kajiado Central	Dalalekutuk	3	Olbelibel/Elelai
ISEURI	Kajiado Central	Dalalekutuk	4	Iltareto
MARKET	Kajiado Central	Illdamatt	5	Town A
BISSIL	Kajiado Central	Matapato North	6	Enkuarrii
BISSIL	Kajiado Central	Matapato North	7	Orinei
ILPARTIMARO	Kajiado Central	Matapato North	RC	Oloiyapase
ELUANATA	Kajiado Central	Matapato South	8	Nemasi
METO	Kajiado Central	Matapata South	9	Olkiu
NAMANGA	Kajiado Central	Matapato South	10	Ilngaruani
NAMANGA	Kajiado Central	Matapato South	11	Ormankeki
ARROI	Kajiado East	Imaroro	12	Kalembwani
ERANKAU	Kajiado East	Imaroro	13	Ilmenjoori
MASHURU	Kajiado East	Imaroro	14	Iloshon
IMBUKO	Kajiado East	Kenyewa/poka	15	Imbuko A
SULTAN HAMUD	Kajiado East	Kenyewa/poka	16	Olgos
OLKERIAI	Kajiado East	Maroro	17	Oloibor-Soit
ILPOLOSAT	Kajiado East	Kaputei North	18	Ilasit
SHOLINKE	Kajiado East	Kitengela	19	Sholinke
OLTUROTO	Kajiado East	Kaputei North	20	Olturoto
KUKU	Kajiado South	Kuku	21	Olkaria A
OLORIKA	Kajiado South	Kuku	22	Narok Enterit
MBIRIKANI	Kajiado South	Mbirikani Eselenkei	23	Nasipa
OLTASIKA	Kajiado South	Kuku	24	Ilchurra
LENKISIM	Kajiado South	Kimana	25	Emesera
KIMANA	Kajiado South	Kimana	26	Elerai
	Kajiado South	Entonet Lekisin	27	Loolakir
	Kajiado South	Kimana	RC	Empiron
ROMBO	Kajiado South	Rombo	28	Oleporos
	Kajiado South	Rombo	29	Orarait
ENTARARA	Kajiado South	Rombo	30	Olkaria A
	Kajiado South	Entonet Lekisin	31	Oltepesi
NJUKINI	Kajiado South	Entonet Lekisin	32	Olkungu
ENTONET	Kajiado South	Entonet Lekisin	33	Elemai
OLCHORRO	Kajiado South	Entonet Lekisin	RC	Kawaboyia

	AMBOSELI	Kajiado South	Entonet Lekisin	RC	Ikilunyeti
	KERERO	Kajiado West	Illodokilan	34	Ruya
	TOROSEI	Kajiado West	Illodokilan	35	Indepen A
	LOODARIAK	Kajiado West	EWUASO Kendong	36	Loodariak
	OLOSHO-OIBOR	Kajiado West	EWUASO Kendong	37	Enkusero Sambu
	EMBARBAL	Kajiado West	Mosiro	38	Emparbal
	INKIUSHIN	Kajiado West	EWUASO Kendong	39	Empeut
	OLGUMI	Kajiado West	EWUASO Kendong	40	Olgumi
	KORA	Kajiado West	Magadi	41	Kora
	NKURUMANI	Kajiado West	Magadi	42	Nkurumani
	PAKASE	Kajiado West	Magadi	43	Pakase
	KIPETO	Kajiado West	EWUASO Kendong	44	Kipeto
	KISANJU	Kajiado West	Isinya	RC	Olomaiyana

Appendix III: Survey Team

Team Number	Team Members	Role
1	**Colins Likam**	**Team Leader**
	Esther Pariken	Enumerator
	Ruth Silole	Enumerator
	Micah Mwangi	Enumerator
2	**Dancan Sakimpa**	**Team Leader**
	Agnes Tilikia	Enumerator
	Faith Lengele	Enumerator
	Daniel Melubo	Enumerator
3	**Daniel Pashile**	**Team Leader**
	Paul Muhia	Enumerator
	Faith Mbugua	Enumerator
	Doreen Munge	Enumerator
4	**Godfrey Ogembo**	**Team Leader**
	Jonathan Raita	Enumerator
	Catherine Naserian	Enumerator
	Angela Sintoiya	Enumerator
5	**Yunia Nyatichi**	**Team Leader**
	Rachael Wangare	Enumerator
	Joshua Punywa	Enumerator
	Nuria Mohamed	Enumerator
6	**Laisa Iris**	**Team Leader**

	Lucy Kusero	Enumerator
	Lynette Saidimu	Enumerator
	Andrew Sabeth	Enumerator
7	**Shaban Ramadhan**	**Team Leader**
	Stephen Munyi	Enumerator
	Napais Jane	Enumerator
	Eunice Kilesi	Enumerator

Coordination and Supervision

Name	Organization
Ruth Nasinkoi	Kajiado County Department of Health Services
Samuel Murage	Ministry of Health; Nutrition and Dietetics Unit
Francis Wambua	UNICEF/National Drought Management Authority
Mark Murage Gathii	UNOPS SMART Survey Consultant