MANDERA COUNTY HEALTH DEPARTMENT

SMART SURVEY REPORT

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At last nut not least our thanks goes to all the survey respondent's and data collectors for their kind cooperation in providing the information required for the study

Abbreviations & Acronyms

BCG	Bacillus Calmette–Guérin
CHMT	County Health Management Team
CI	Confidence Interval
CMR	Crude Mortality Rate
CSI	Coping Strategy Index
ENA	Emergency Nutrition Assessment
EPI	Expanded Program on Immunization
FSL	Food Security and Livelihood
GAM	Global Acute Malnutrition
HAZ	Height for Age Z-score
ID	Index of Dispersion
IDP	Internally Displaced Persons
IFAS	Iron Folate Supplementation
IMAM	Integrated Management of Acute Malnutrition
MAM	Moderate Acute Malnutrition
MIYCN	Maternal Infant and Young Child Nutrition
MUAC	Mid Upper Arm Circumference
NIWG	Nutrition Information Working Group
ODK	Open Data Kit
OPV	Oral Polio Vaccine
PPS	Probability proportional to size
SAM	Severe Acute Malnutrition
SD	Standard Deviation
SMART	Standardized Monitoring and Assessment in Relief and Transitions
U5MR	under Five Mortality Rate
UNICEF	United Nations Children's Fund
VAS	Vitamin A supplementation
WAZ	Weigh for Age Z-score
WFP	World Food Program
WHO	World Health Organization
WHZ	Weight for Height Z-score

Executive Summary

Mandera County department of health in collaboration with nutrition partners and Nutrition Information Working Group (NIWG) conducted a County SMART survey covering all six sub counties in July 2017. The main goal of the survey was to determine the prevalence of malnutrition among the children aged 6-59 months old and women of reproductive age (WRA) in Mandera County.

The specific objectives of the survey were;

1. To determine the prevalence of acute malnutrition among under five year old children and women of reproductive age
2. To determine the immunization coverage for measles, Oral Polio Vaccines (OPV 1 and 3), and vitamin A supplementation in children aged 6-59 months;
3. To estimate coverage of iron / folic acid supplementation during pregnancy in women of reproductive age
4. To determine de-worming coverage for children aged 12 to 59 months;
5. To determine the prevalence of common illnesses;
6. To collect information on possible underlying causes of malnutrition such as household food security, water, sanitation, and hygiene practices.

The Standardized Monitoring of Relief and Transitions (SMART) methodology was used which included a two-stage cluster sampling. A total of 559 children aged 6-59 months from 673 households in 45 clusters were selected for anthropometric measurements.. Household related data that includes; food security and livelihoods, water sanitation and hygiene as well as access to health care were also collected in the 456 households during the survey

The survey covered the entire Mandera County except five villages -Damasa, Elram, Harwale, Burjon and Wante - that were excluded from the sampling frame due to insecurity. The survey was carried out from 28th June to 10th July, 2017. The population involved were children 6-59 months for anthropometry survey with the primary respondents being mothers/care takers of the children in the household for the household and mortality questionnaires. In addition, the nutrition status of mothers, women aged 15-49 years was also determined

The prevalence of Global Acute Malnutrition (GAM) rate for the County was **24.6 % (21.6 - 27.8 95% C.I.)** and the severe acute malnutrition (SAM) rate was **5.2 % (3.8 - 7.0 95% C.I.).** Compared to the June 2016 and Feb 2017 rapid survey results the decrease in GAM rates and increase in SAM rates were not statistically significant.

The percentage of children who had reportedly suffered from one or more illness in the two weeks prior to the survey was 27.6%. Given that recent illness is closely related to malnutrition this level of morbidity depicts an alarming trend given the deteriorating food security situation (depicted by increasing MAM rates). The common illnesses mentioned were; fever (13.74%), ARI/cough 19.38% and watery diarrhea (10.01%). Vitamin A supplementation was very low compared to the national target

of >80%, with 65.5% of the sampled children 12-59 months had received the recommended two doses of vitamin A in the last one year.

In conclusion the nutrition situation in Mandera County remains in a *very critical* phase according to WHO classification for severity of nutrition situation. The risk factors for acute malnutrition such as low coverage of health services, poor child care practices, dietary diversity, sanitation and hygiene must be addressed as part of comprehensive recovery strategy in the county.

The results of key indicators are summarized in table 1 below.

Table 1: Summary of Key findings

Demographic Household Characteristics	n	Findings
Nutritional Status (6 – 59 months) Weight- for-Height Z – scores (Wasting) WHO 2006 Standards		
Global Acute Malnutrition (<-2 Z-score)	180	24.6 % (21.6 - 27.8 95% C.I.)
Severe Acute malnutrition (<-3 Z-score)	38	5.2 % (3.8 - 7.0 95% C.I.)
Nutritional Status (6 – 59 months) Weight- for-Age Z – scores (Underweight) WHO 2006 Standards		
Prevalence of Global Underweight (<-2 Z-score)	209	28.1 % (25.0 - 31.5 95% C.I.)
Prevalence of Severe Underweight (<-3 Z-score)	60	8.1.8% (6.3 – 10.3 95% C.I.)
Nutritional Status (6 – 59 months) Height- for-Age Z – scores (Stunting) WHO 2006 Standards		
Prevalence of Global Stunting (<-2 Z-score)	176	24.0 % (21.1 - 27.2 95% C.I.)
Prevalence of Severe Stunting (<-3 Z-score)	49	6.7 % (5.1 – 10.5 95% C.I.)
Immunization coverage (6-59 months)		
BCG		97.2%
OPV1		38.1%
OPV3		38%

Measles > 9 months		36.2%
Vitamin A (6-11 months)		85.7%
Vitamin A (12-59 months)		Once -36.7% Twice – 19.9%
Deworming (12-59 months)	722	Once – 36.7% Twice – 19.9%
Child Morbidity (0 – 59 months)		
Sickness two weeks prior to survey	852	27.6%
Acute Respiratory Infection /cough		19.38%
Fever with chill		13.74%
Watery diarrhoea	78	10.01%
Bloody diarrhoea		
Others –Cholera, Vomiting		
Maternal malnutrition based on MUAC of <210mm		
Females15-49 years		6.3%
Pregnant women		24.8%
Lactating women		41.4%
Maternal nutrition status of women of reproductive age		
Iron folate coverage	234	78.01%
Iron folate supplementation Duration	234	<90 days -98.1% 91-180 days -1.9% >180 days- 0

1 INTRODUCTION

1.1 Geographic Description of the Survey Area

Mandera County is located in the North Eastern part of Kenya and it borders Ethiopia to the North, Somalia Republic to the East and Wajir County to the South and South West. It's divided into 6 sub- counties; Mandera East, Mandera North, Lafey, Mandera South, Mandera West and Banisa Sub-counties. It's located between longitudes 400 40' 0.12" East and Latitude 30 25' 0.01" North in the arid lands of Kenya. Mandera County covers an area of 25,991.5Km2 which is sparsely populated making accessibility of resources a challenge for the populations living in the county. It has 1300 km of classified road network of earth surface which becomes impassable when impounded with rains.

It is characterized by low lying rocky hills located on the plains that rise gradually from 400 meters above sea level in the south at Elwak to 970 metres above sea level on the border of Ethiopia. The rest of topography is low lying, characterized by dense vegetation with thorny shrubs of savannah type found along foots of isolated hills. The flat plains make drainage very poor, causing floods during heavy rain downpours. Mandera County has three main livelihood zones i.e. a pastoral economy zone in the east and agro-pastoral economy zone in the west and an irrigated cropping zone in the north along the Daua River. Mandera County has a population of 1,025,756 people according to the 2009 National census. The population ratio in these zones represent pastoral zone of 28.4%, agro pastoral zone of 39.2% and irrigated cropping zone of 32.4% (there is mixed livelihood of agro-pastoralism). Rainfall is scanty and unpredictable averaging at 255mm per year. It has hot temperatures ranging at a mean annual average of 240C in July to a high of 420C in February. The county is prone to unpredictable climate changes, leading to either severe droughts or heavy rains.

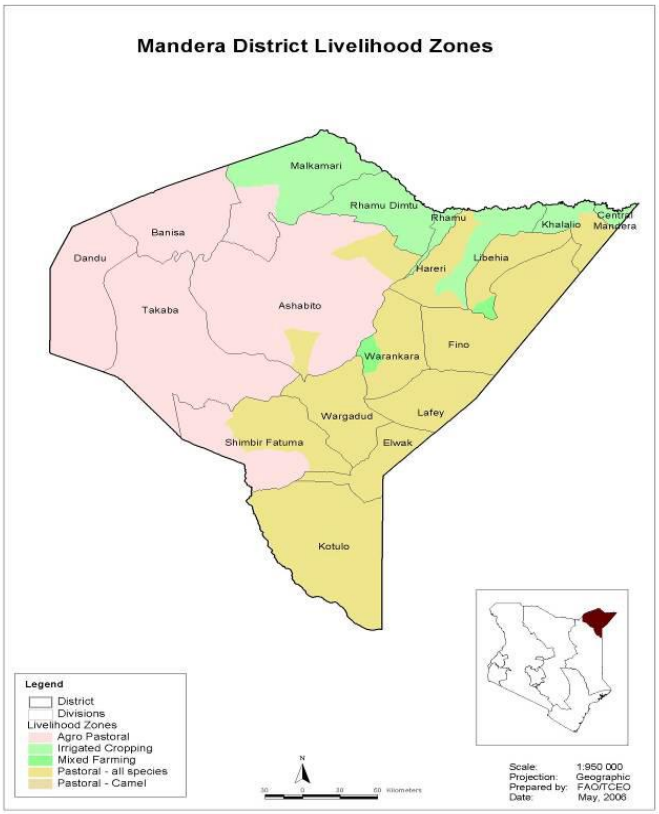


Figure 1.1: Mandera county livelihood zones

1.2 Health and Nutrition situation:

The nutrition status of the community is associated with many factors that range from poor socio-economic and civil security, food insecurity, poor child care practices and limited access

to healthcare, water, sanitation and hygienic infrastructure which lead to a cycle of malnutrition that only reduces slightly during the post rain season. The county's health, social and economic infrastructure is improving; there is increasing operationalization of healthcare centres and recruitment of health workers. Though these is happening, disease specific challenges exist as a result of limited health system infrastructure, lack of access to services at the community level, limited specialized health care workers and high staff turnover which inhibits county efforts to improve quality of health care. Currently the county also receives cases from neighboring countries – Somalia and Ethiopia, increasing the number of severe malnutrition cases in treated through the County referral hospital in Mandera, health centers and dispensary along the boundaries.

1.3 Justification

The Rapid SMART Nutrition survey conducted in February 2017 showed an insignificant increase in GAM level from 22.6% to 32.8% depicting a very nutrition critical situation, thus the need to assess the effects of ongoing emergency response interventions on nutrition and health status of children under five year. Since nutritional status frequently deteriorates due to several factors including poor food access, availability and utilization, poor MIYCN practices, use of unsafe water, limited sanitation facilities as well as high morbidity among the affected populations, there is need for constant monitoring of the nutrition situation in Mandera County to further inform the government and partners for planning better health service to the community.

A SMART nutrition survey is therefore critical to assess the current health and Nutrition status for the community. This survey assessed the impact of ongoing interventions and indicated the extent of anticipated vulnerability as well as recommend appropriate actions to mitigate the effects of malnutrition. The results will feed into the long rains assessment. The findings of the standard nutrition survey will also be used to understand the overall nutrition, food security and health status across the county and give recommendations for planning and decision making from county to national level.

1.4 Survey Objectives

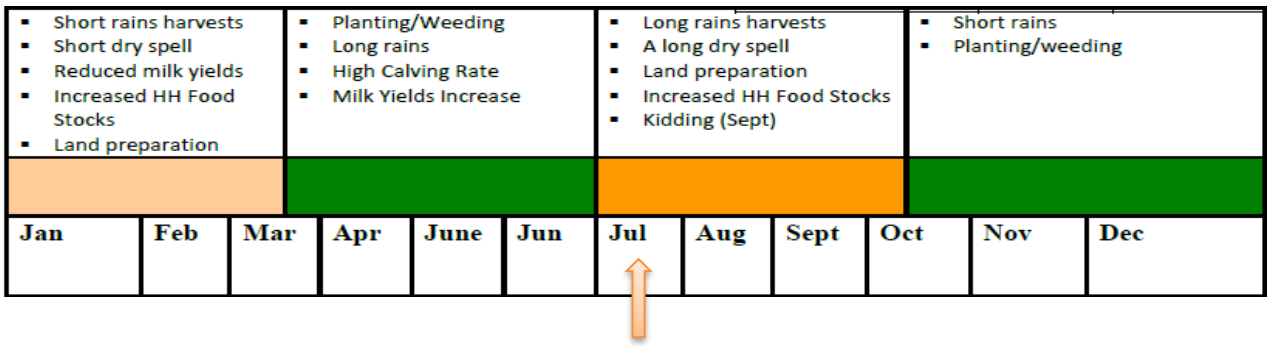
The overall objective of the survey was to determine the prevalence of acute malnutrition in children aged between 6-59 months in Mandera County

Specific Objectives were:
The survey objectives were:

1. To estimate the prevalence of acute malnutrition in children aged 6-59 months
2. To determine the coverage of immunization (BCG, Measles and OPV1 and OPV 3) of children aged 0-59 months.
3. To estimate the coverage of Vitamin A supplementation, deworming and Zinc supplementation among the targeted children
4. Estimate the coverage of iron folate supplementation for women of reproductive age

5. To estimate the retrospective morbidity rate amongst children 0-59 months
6. To determine the nutrition status of women of reproductive age based on MUAC
7. To collect information on possible under lying causes of malnutrition such as household food security, water, sanitation and hygiene practices
8. To recommend appropriate interventions based on survey findings.

1.5 Survey timing



Survey conducted at the end of the long rain season

2 METHODOLOGY

The SMART Method was used to conduct the survey in planning, training, data entry and analysis. Other data sets collected concurrently included data on Water Sanitation and Hygiene (WASH) and Food security and livelihood (FSL).The entire exercise was done in consideration with all guidelines as stipulated by the MoH at county and national level. The survey methodology was presented to the County Steering Group (CSG) and National Nutrition Information Working Group (NIWG) for validation before commencement of data collection.

2.1 Sample size

The Sample size was determined using ENA for SMART software (9thJuly 2015). The table below outlines factors considered when determining the sample size calculation. The parameters used were drawn from the SMART survey conducted in June 2016 and Rapid SMART in Feb 2017 Mandera County. The table below summarizes the sample size calculations.

Table 2: Sample size calculation for anthropometric

Survey parameter	Anthropometry sample	Rationale
Estimated prevalence	24.7%	Deterioration of situation as per Feb Rapid SMART
Desired Precision	5%	Limits of CI do not influence decision

		making/control quality hence reduce bias and previous survey values
Design effect	1.34	Based on June 2016 survey
Average household size	6.0	Based on KDHS estimates
% under five children	16.7%	Based KDHS estimates
% non-response	3%	Due to cluster variations/ based on June 2016 survey
Children to be included	559	
Households to be included	673	
Number of clusters	45	

2.2 Survey Design

A cross-sectional descriptive nutrition SMART survey was conducted for children aged 6-59 months for the anthropometric measurements and mothers of children below 5 years of age as primary respondents to the household questionnaires. The study covered both the residents and internally displaced persons (IDPs) within the six sub counties. Quantitative data was captured by taking children's physical anthropometric measurements using calibrated weighing scales, height boards and MUAC tapes. The readings were recorded in the tablet.Validated semi structured questionnaires in built in the ODK software, were used to collect data on child health, food security WASH and mortality. Qualitative data was collected through observation and interviews with key informants. Taking into account the time spent on travelling to each household, introductions and breaks, 14 households were sampled per cluster.

2.3 Sampling

The study area and population were drawn from the entire residents/ inhabitants of the six sub-counties of Mandera County. A multi stage sampling technique was used for this purpose. The first stage was assignment of clusters based on proportion to population size (PPS), the population for each location/ village was established based on the 2009 census projected by 3.0% growth per annum. Clusters were defined as villages within Mandera County. A sampling frame of 152 villages was used and based on PPS, 45 clusters were randomly generated using ENA for SMART. However, six villages were excluded from the sampling frame due to insecurity reasons.

2.3.1 Sampling procedure:

The second stage involved random selection of households, and selection was done as per the National guidelines for Nutrition Assessments in Kenya. Simple random method was employed to select the surveyed households.

Upon entry into the household the survey team leader did introduction, clearly explaining the objectives of the survey and as well assuring household members of confidentiality as well as identify survey respondent.

2.3.2 Selection of the households

The definition of a household was a shelter or more whose residents ate from the same "cooking pot". Updated list of households in the villages were developed in conjunction with the village chiefs and elders, while excluding abandoned households. Using a table of random numbers 14 households were randomly selected from the updated household lists. In case the village had a large number of households, segmentation was done after which one segment would be randomly selected to represent the village.

2.3.3 Selection of children for anthropometry

All children between 6-59months of age staying in the selected household were included in the sample. In cases where there was no eligible child, the household was still considered part of the sample and only the household questionnaires (general questionnaires) were administered. The respondent was the primary caregiver of the index child/children. If a child and/or the caregiver were temporarily absent, then the survey team re-visited the household to collect the data at an appropriate time.

2.3.4 Selection of women for determination of nutritional status

All women within the reproductive age (15-49years) in the identified households were enlisted in the study and their MUAC measurements taken.

2.4 Case Definitions

In all selected households, all children 6-59 months were included in the anthropometric survey. The age of the children was determined using a local historical and seasonal calendar of events (*Appendix 3)* and birth record if available. If there were no children 6-59 months in the household, the household was still interviewed for WASH and Food Security and Livelihoods (FSL). Data on, morbidity, WASH and food security was collected by recall.

The following case definitions were used in the assessment:

- **Household**: Group of persons who live together under the same roof and eat from the same pot for at least a period of 3 months preceding the assessment. In homes with multiple spouses, those living and eating in different houses are considered as separate households. Wives living in different houses but eating from the same pot are considered as one household.
- **Head of household:** One who controls and makes key decisions on household resources (livestock, assets, income, and food), health and social matters for and on behalf of the household members
- **Respondent:** The person responsible for food preparation on the recall day. For the child, this refers to the mother or caregiver.

- **Diarrhoea:** having three or more loose or watery stools per day
- **Measles vaccination**: a shot in the upper arm given to children after 9 months of age at health clinics or by mobile health teams
- **Meal**: food served and eaten at one time (excluding snacks) and includes one of the three commonly known: - breakfast, lunch and supper/dinner
- **Oedema**: Swollen limbs leaving depression 3 seconds after pressing on both feet (bilateral)

2.4.1 Indicators, guidelines and formulas used in acute malnutrition

Weight for Height (WHZ) index

This was estimated from a combination of the weight for height (WHZ) index values (and/or oedema) and by sex based on WHO standards 2006. This index was expressed in WHZ indices in Z-scores, according to WHO 2006 reference standards.
Z-Score:
Severe acute malnutrition is defined by WHZ < -3 SD and/or existing bilateral oedema
Moderate acute malnutrition is defined by WHZ < -2 SD and >-3 SD and no oedema.
Global acute malnutrition is defined by WHZ < -2 SD and/or existing bilateral oedema.

Mid Upper Arm Circumference (MUAC)

MUAC measurements was also undertaken to determine the nutrition status of eligible children and mothers/caretaker (15-49 years of age) from sampled households. The following MUAC criteria were applied.

Table 3: MUAC Guideline Children 6 - 59 Months

MUAC Guideline	Interpretation
MUAC< 115mm and/ or bilateral oedema	Severe acute malnutrition
MUAC > 115mm and <125mm (no bilateral oedema)	Moderate acute malnutrition
MUAC > 125MM and 135mm (no bilateral oedema)	At Risk of Malnutrition
MUAC >135 MM	Adequate nutrition

Table 4: MUAC Guideline PLWs

Maternal MUAC Cut off	Interpretation
MUAC< 21cm	Malnourished
MUAC >21 and <23 cm	At risk of malnutrition
MUAC > 23cm	Normal

- **Global Acute Malnutrition (GAM):** weight-for-height Z scores less than -2 and/or presence of oedema (WHZ<-2 and/oedema)
- **Severe Acute Malnutrition (SAM):** weight-for-height Z scores less than -3 and/or presence of oedema (WHZ<-3 and/oedema)
- **Global Acute Malnutrition based on MUAC (GAMMUAC**): Mid Upper Arm Circumference less than 125 mm and/or presence of oedema (MUAC<125 mm and/oedema); and severe acute malnutrition as MUAC<115 mm and/oedema
- **Wasting**: weight-for-height Z scores less than -2 (WHZ<-2); and severe wasting as WHZ<-3.
- **Underweight**: weight-for-age Z scores less than -2 (WAZ<-2); and severe underweight as WAZ<-3.
- **Stunting**: height-for-age Z scores less than -2 (HAZ<-2); and severe stunting as HAZ<-3.

2.3 Survey team

The survey was coordinated by the County Nutrition Coordinator and supervised by members from MOH and Save the children staff.. The team was supported by officers from implementing partners and the Human Nutrition and Dietetics Unit-National MoH)/UNICEF. The survey was undertaken by 5 teams that comprised of 2 enumerators and 1 team leader.

2.5 Questionnaires, Training and data collection

2.5.1 Survey Questionnaires/ tools

The survey adopted the data collection tools recommended by the Nutrition Information Working Group (NIWG) for conducting standard integrated nutrition surveys but converted to Open Data Kit (ODK) format to enable data collection using android smart phones. The questionnaires were written in English and the enumerators translated them to Somali/Garre language during the training and used the same in the field. The annexed sets of structured questionnaires were used (Appendix 4). The questionnaire included Anthropometry (6-59 months); household questionnaire (maternal; food security and livelihoods; Water, Sanitation and Hygiene practices; Morbidity; food consumption and dietary diversity).

Age: Determined from child card where available, using a local historical and seasonal calendar of events in case no card was available.

Weight: was measured using a bathroom Scales for children between 6 to 59 months. The reading was done by an enumerator and verified by team leader then recorded to nearest 0.1kg.

Height/Length: was measured using a standard UNICEF height/length board – taking a standing height for children 24-59 months (or >87 cm) and recumbent length for children 6-23 months (or <87 cm). Both height and length were measured to the nearest 0.1 cm.

Measurement was done by a measurer and recorder with assistance from the child's mother/caretaker.

MUAC: Mid-upper arm circumference measurements for children 6-59 months were taken using a flexible and non-stretch tape (UNICEF) in cm to the nearest 0.1 cm.

2.5.2 Survey Team Composition

The survey had ten teams of three members each (1 team leader and 2 survey measurers). Selection of enumerators was done from Ministry of health to enable them gain skills in conducting surveys. At the village level, the team was joined by a village guide who is knowledgeable of the village. Each team visited 14 households for anthropometry and household survey in a cluster. The survey teams visited one cluster per day. All children aged 6-59 months in all selected households were measured regardless of attaining the required number of children per cluster for the last household.

2.5.3 Survey Team Training and supervision

A four day training workshop was held from 28th June to 1st July 2017 at Takaba town. The training focused on: the purpose and objectives of the survey; familiarization with the questionnaire by reviewing the purpose for each question; recording of data using ODK software; how to take accurate anthropometric measurements; cluster and household selection. Demonstrations on how to take anthropometric measurements were conducted. Enumerators training also emphasized on field procedures, measurements, interviewing techniques as well as anthropometric standardization as recommended by SMART methodology. The protocol and tools were reviewed and discussed for a better understanding by the survey team. Possible problematic situations that might arise during the training were described and solutions for them given.

Pre testing of the survey questionnaire was conducted on the last day of the training in one of the cluster not sampled, using ODK. This was to gauge the enumerator's level of understanding, ability to follow sampling procedures and ease in use of tablets; take and record measurements correctly as well as interact effectively with respondents. After the pre-testing, a debriefing session with the survey team was held where difficulties that arose were addressed.

2.6 Data Collection

Data collection took 6 days starting on 3rd to 8th July 2017 under the supervision of 3 CHMT members and four officers from both Save the Children and Kenya Red Cross. During data collection, all the field procedures were followed to select eligible households, identify children for anthropometric measurement as well as the respondents for the interviews.

Survey teams first reported to the area chief or village elder for the respective selected clusters/villages updated the list of households and were then assigned a village guide. Using table of random numbers, households to be visited were randomly selected. Village guide then took teams around the village to the selected households.

Each day after data collection, all the teams were able to submit the data electronically. A central data manager was on stand-by to be able receive, review, export data, filter and give feedback teams through the field supervisor

2.7 Variables Measured

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

Weight: Children were measured using a digital weighing scale

Height: Recumbent length was taken for children less than 87cm or less than 2years of age while height measured for those greater or equal to 87cm or more than2 years of age.

MUAC: Mid Upper Arm Circumference (MUAC) was measured on the left arm, at the middle point between the elbow and the shoulder, while the arm was relaxed and hanging by the body's side. MUAC was measured to the nearest Cm. MUAC measurements were taken for children 6-59months of age and for women in the reproductive age (1545 years of age).

Bilateral oedema: Assessed by the application of normal thumb pressure for atleast3seconds to both feet at the same time. The presence of a pit or depression on both feet was recorded as oedema present and no pit or depression as oedema absent.

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: For allchildren6-59months, information on BCG, OPV1, OPV3 and measles vaccinations status was collected using health cards and recall from caregivers. When estimating measles coverage, only children 9 months of age or older were taken into consideration as they are the ones who were eligible for the vaccination.

Vitamin A supplementation status: For all children6-59monthsofage, information on Vitamin A supplementation in the 6 months prior to the survey date 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 towhetherchildren12-59 months of age had received de-worming tablets or not in the previous one year. This information was verified by health card where available.

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

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 per20-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 of mosquito nets and their utilisation was collected

Minimum dietary diversity score women (MDD-W): A 24 hour food consumption recall was administered to all women of reproductive Age(15-49 years).All foods consumed in the last 24 hours were enumerated for analysis. All food items were combined to form 10 defined food groups and all women consuming more at least five of the ten food groups were considered to meet the MDD-W.

Household food consumption score (FCS). Data on the frequency of consumption of different food groups consumed by a household during 7 days before the survey was collected. The Table below shows WFP corporate thresholds for FCS used to analyse the data.

Table 5: FCS thresholds

Food Consumption Score	Profile
<21	Poor
21.5-35	Borderline
>35	Acceptable

Coping strategy index (CSI): Data on the frequency of the five reduced CSI individual coping behaviours was collected. The five standard coping strategies and their severity weightings used in the calculation of Coping Strategy Index are:

1. Eating less-preferred foods (1.0),
2. Borrowing food/money from friends and relatives (2.0),
3. Limiting portions at mealtime (1.0),
4. Limiting adult intake (3.0), and
5. Reducing the number of meals per day (1.0)

CSI index per household was calculated by summing the product of each coping strategy weight and the frequency of its use in a week (no of days).

2.7 Data Processing & Analysis

Anthropometric data entry and processing was done using the ENA for SMART software 9th July 2015 where the World Health Organization Growth Standards (WHO-GS) data cleaning and flagging procedures were used to identify outliers which enabled data cleaning as well as exclusion of discordant measurements from anthropometric analysis. The SMART/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.

Additional data for children aged 6-59 months, women aged 15-49 years, WASH, and food security indicators were cleaned and analysed using Epi-Info, ENA Epi Info and Excel.
The result of this survey was compared to WHO standard cut-off points

Table 6: Definition of boundaries for exclusion

1. If sex is missing the observation was excluded from analysis.
2. If Weight is missing, no WHZ and WAZ were calculated, and the programme derived only HAZ.
3. If Height is missing, no WHZ and HAZ were calculated, and the programme derived only WAZ.
5. For any child records with missing age (age in months) only WHZ was calculated.
6. If a child has oedema only his/her HAZ was calculated.

2.8 Survey Limitations

The main challenges were:

a) Determining the exact age of some children was a major challenge particularly with the use of calendar of events. The main difficulties relate to accuracy on recall (recall bias) and at some villages, respondents could not relate well with some of the events. The challenge in determination of accurate age may impact of some survey findings.
b) There was poor recording of vitamin A, Iron folate and de-worming in the health cards and recall issues. Some of the mothers indicated that their children had received Vitamin A and de-worming while it was not recorded in the health cards.
c) During sampling six villages - Damasa, Elram, sheikh barow, falama,Omar jilow and Alungu - were excluded from the sampling frame due to insecurity.

2.9 Ethical considerations

Sufficient information was provided to the local authorities about the survey including the purpose and objectives of the survey, the nature of the data collection procedures, the target group, and survey procedures. Verbal consent was obtained from all adult participants and parents/caregivers of all eligible children in the survey. The decision of caregiver to participate or withdrawal was respected. Privacy and confidentiality of survey respondent and data was protected.

3 SURVEY RESULTS

3.1 Household Demographic Characteristics

3.1.1 Distribution of Children by Age and Sex

A total of 2567 household members were assessed during the survey period, 43.9% were over 18 years and 22.9% were between 5-17 years while 33.2% were below five years as shown in figure below.

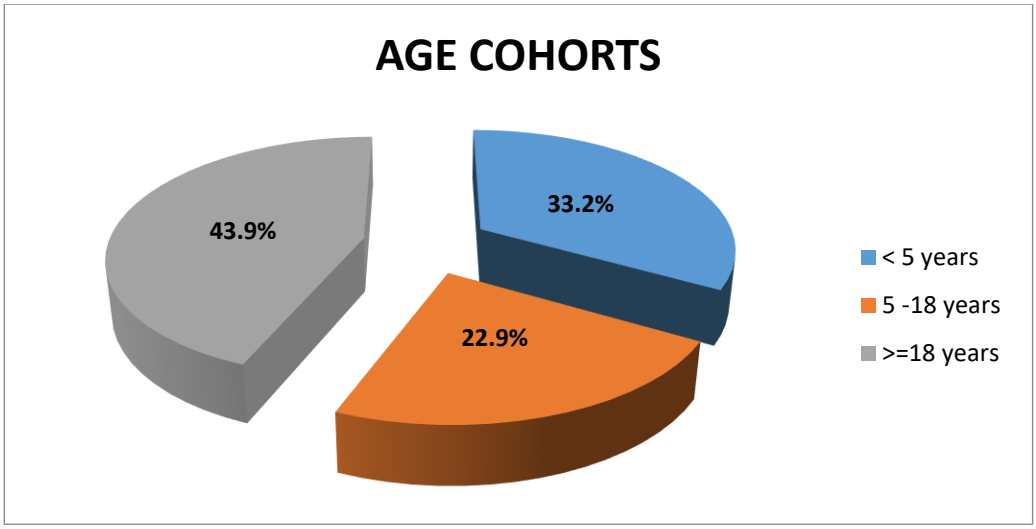


Figure 2: Proportion of age groups for households sampled

3.1.2 Residency and marital Status

96.2 % of the respondents were residents of Mandera County. In addition, 90.6% of the respondents were married followed by divorce at 4.1%. Figure 3 and 4 below shows a summary of household residency and caretakers' marital status respectively.

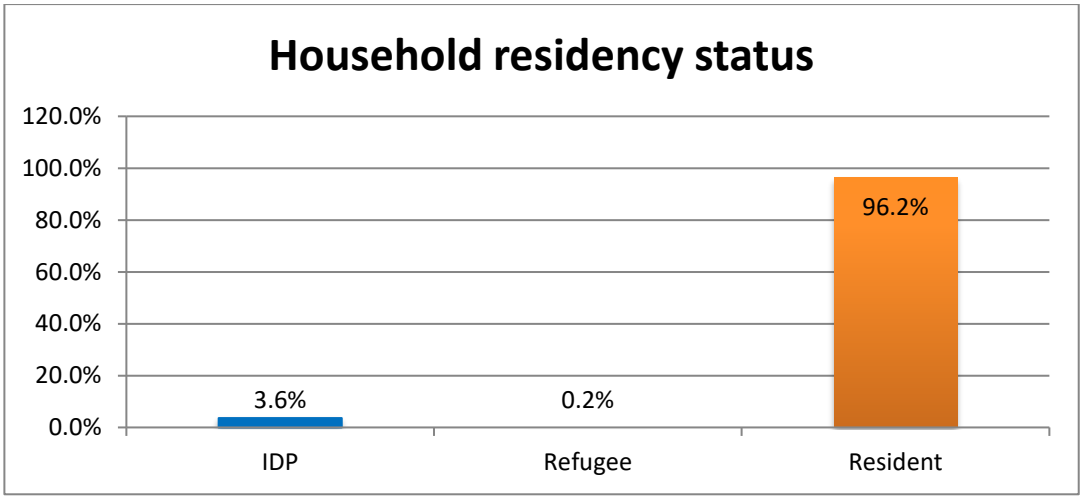


Figure 3: Household residency:

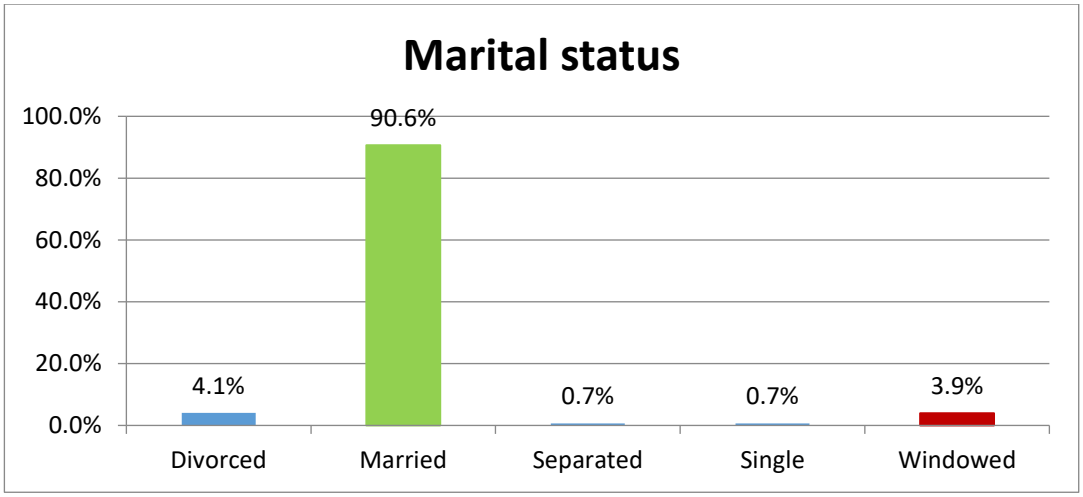


Figure 4: Caretaker marital status

3.1.3 Main Sources of Income

The main source of income was sale of livestock products at 32.7% followed by casual labour (25.1%), only a small percent (0.7%) said they had no income.

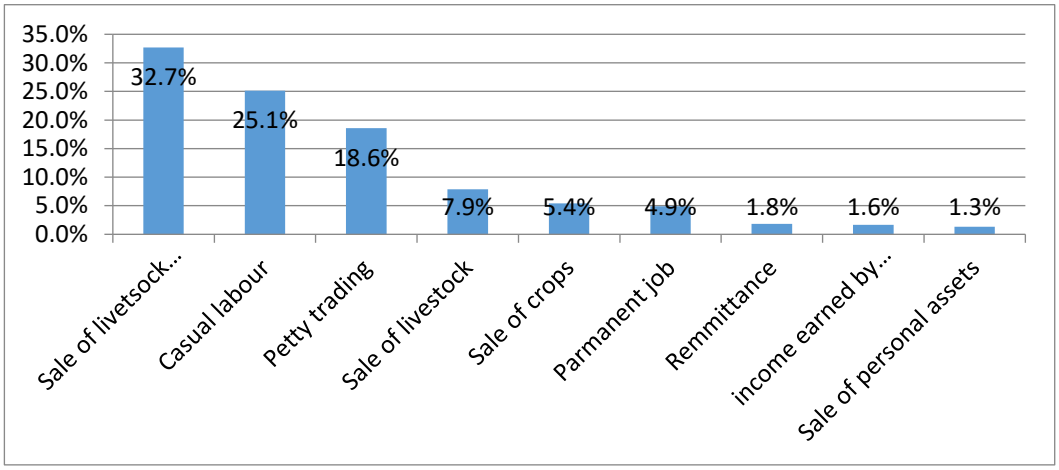


Figure 5: Main source of income in Mandera County.

3.1.4 School enrolment and Level of Education

The survey revealed that 59.77 % of children aged 3-17 years were enrolled in school while 40.23% were not, majority (12.4%) citing that household does not see value of schooling, family labour responsibilities (4.75%) and no school nearby (3.43%).

On caretakers' level of education, more than 90% had no education at all with only 4.2% having primary education.

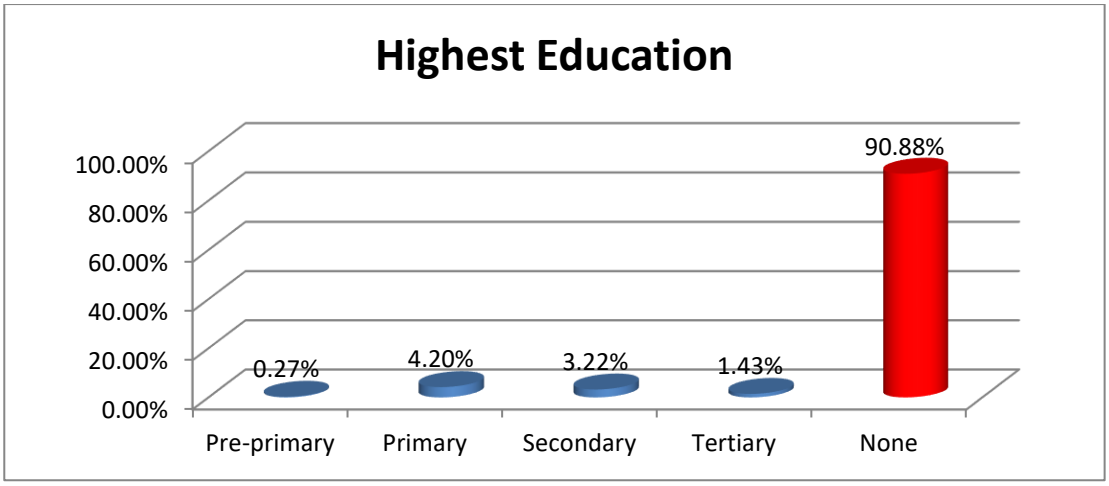


Figure 6: Caretaker level of education

3.2 Anthropometric Results

The survey targeted 559 children between the ages 6 – 59 months, however, the survey managed to collect anthropometric assessment from 852 children between the ages 6 – 59 months; 49.3% being male while female were 50.7%. A total of 622 households were surveyed. The majority of the households were residents (96.2%), 3.6% IDP and Refugee 0.2% respectively. The average household size for the sampled households was six persons.

3.2.1 Distribution by age and sex

Anthropometric measurements were taken on a total of 852 children (376 boys and 394girls) aged 6-59 months to assess acute malnutrition. The distribution of the assessed children by age and sex shows that the younger (6-29 months) and older (30-59 months) were equally represented as were boys and girls, both with the ratio of around 1.0 as expected. The age distribution according to Table 3.1 below is within the expected limits which show that there was no selection bias during data collection process.

Table 7: Distribution of age and sex of sample

	Boys		Girls		Total		Ratio
AGE (mo)	**no.**	**%**	**no.**	**%**	**no.**	**%**	**Boy: Girl**
6-17	78	48.4	83	51.6	161	20.7	0.9
18-29	102	50.5	100	49.5	202	25.9	1.0
30-41	81	45.3	98	54.7	179	23.0	0.8
42-53	87	54.4	73	45.6	160	20.5	1.2
54-59	36	46.8	41	53.2	77	9.9	0.9
Total	384	49.3	395	50.7	779	100.0	1.0

3.2.2 Prevalence of acute Malnutrition based on Weight-for-Height Z scores (WHZ)

The prevalence of Global Acute Malnutrition (GAM) rate for the County was **24.6 % (21.6 - 27.8 95% C.I.)** and the severe acute malnutrition (SAM) rate was 5.2 % **(3.8 - 7.0 95% C.I.).** In this assessment, no cases of oedema were observed. The findings indicate a *critical* GAM phase of malnutrition according to WHO classification. Nutrition situation has slightly deteriorated though not statistically significant (p=0.61) when compared to the same period in 2016 which had a GAM level of 22.6% and SAM of 4.3% respectively. See Table 8

Table 8: Prevalence of acute malnutrition based on weight-for-height z-scores and/or oedema and by sex

	All n = 732	**Boys n = 365**	**Girls n = 367**
Prevalence of global malnutrition (<-2 z-score and/or oedema)	**(180) 24.6 % (21.6 - 27.8 95% C.I.)**	**(105) 28.8 % (24.4 - 33.6 95% C.I.)**	**(75) 20.4 % (16.6 - 24.9 95% C.I.)**
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	**(142) 19.4 % (16.7 - 22.4 95% C.I.)**	**(81) 22.2 % (18.2 - 26.7 95% C.I.)**	**(61) 16.6 % (13.2 - 20.8 95% C.I.)**
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	**(38) 5.2 % (3.8 - 7.0 95% C.I.)**	**(24) 6.6 % (4.5 - 9.6 95% C.I.)**	**(14) 3.8 % (2.3 - 6.3 95% C.I.)**

The prevalence of oedema is 0.0 %

The findings indicate a shift to the left of the sample curve, with a mean score of -1.08 and a standard deviation of -127, which indicates that overall, the population exhibits a poor nutritional status compared with the WHO reference population.

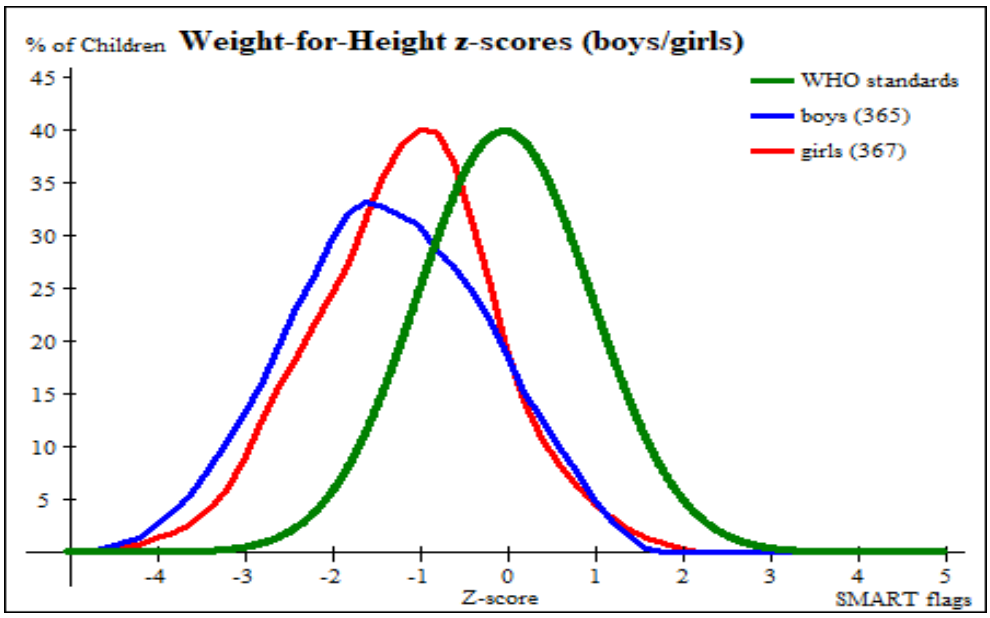


Figure 7: Weight for height z-scores curve

The prevalence of acute malnutrition (WHZ<-2 and/or oedema) by age is presented in Figure 2 and shows a higher proportion of acutely malnourished among the children aged 18-29 months. This could be attributed to declining child care practices as mothers concentrated on the younger children.

Table 9: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema

		Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	137	8	5.8	23	16.8	106	77.4	0	0.0
18-29	199	11	5.5	35	17.6	153	76.9	0	0.0
30-41	176	9	5.1	29	16.5	138	78.4	0	0.0
42-53	153	7	4.6	29	19.0	117	76.5	0	0.0
54-59	67	3	4.5	26	38.8	38	56.7	0	0.0
Total	732	38	5.2	142	19.4	552	75.4	0	0.0

Table 10: Distribution of acute malnutrition and oedema based on weight-for-height z-scores

	<-3 z-score	**>=-3 z-score**
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)

Oedema absent	Marasmic No. 45 (5.8 %)	Not severely malnourished No. 734 (94.2 %)

There was no case of marasmic kwashiakor or kwashiakor reported

3.2.3 Prevalence of acute Malnutrition based on Mid Upper Arm Circumference (MUAC)

MUAC is the best indicator for mortality and is used in the community (for screening) to identify individual children in need of referral and as an admission criterion for feeding programmes. Generally, MUAC usually tends to indicate lower GAM levels compared to WFH z-scores. The prevalence of malnutrition using MUAC is significantly lower compared to using Weight for Height Z-scores. This could be associated with the physiology of this population in Mandera, similar to the Somali and South Sudanese, with a high cormic index. As shown in Table 12 below, the prevalence of global acute malnutrition based on MUAC (<125 mm) and/or oedema was 7.4 % (5.7 - 9.5 95% C.I.) and of severe acute malnutrition MUAC<115 mm and/or oedema) was 0.8 % (0.4 - 1.7 95% C.I.). Table 13 shows the distribution of acute malnutrition based on MUAC by age. The mean MUAC for the measured children was 140.3 mm with a standard deviation (SD) of ±11.1 for the sample n=747children aged 6-59 months. From the GAM prevalence by MUAC, boys seemed to be more malnourished than girls were though not statistically different.

Table 11: Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex

	All n = 747	**Boys** n = 375	**Girls** n = 372
Prevalence of global malnutrition (< 125 mm and/or oedema)	(55) 7.4 % (5.7 - 9.5 95% C.I.)	(28) 7.5 % (5.2 - 10.6 95% C.I.)	(27) 7.3 % (5.0 - 10.4 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(49) 6.6 % (5.0 - 8.6 95% C.I.)	(27) 7.2 % (5.0 - 10.3 95% C.I.)	(22) 5.9 % (3.9 - 8.8 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(6) 0.8 % (0.4 - 1.7 95% C.I.)	(1) 0.3 % (0.0 - 1.5 95% C.I.)	(5) 1.3 % (0.6 - 3.1 95% C.I.)

Table 12: Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema

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

Age (mo)	Total no.	No.	%	No.	%	No.	%	No.	%
6-17	143	4	2.8	25	17.5	114	79.7	0	0.0
18-29	207	1	0.5	15	7.2	191	92.3	0	0.0
30-41	177	1	0.6	7	4.0	169	95.5	0	0.0
42-53	153	0	0.0	1	0.7	152	99.3	0	0.0
54-59	67	0	0.0	1	1.5	66	98.5	0	0.0
Total	747	6	0.8	49	6.6	692	92.6	0	0.0

3.2.4 Prevalence of Underweight based on Weight-for-Age Z scores (WAZ)

The weight-for-age (WFA) index provides a composite measure of wasting and stunting and is commonly used to monitor the growth of individual children in Mother-child booklet since it enables mothers to easily visualize the trend of their children's increase in weight against age. A low WFA is referred to as underweight. The prevalence of children underweight was 28.2 % (25.0 - 31.5 95% C.I.) while severely underweight was 8.1 % (6.3 - 10.3 95% C.I.) (Table 14) There was significant difference in underweight rates between boys and girls.

Table 13: Prevalence of underweight based on weight-for-age z-scores by sex

	All n = 742	**Boys** n = 372	**Girls** n = 370
Prevalence of underweight (<-2 z-score)	(209) 28.2 % (25.0 - 31.5 95% C.I.)	(118) 31.7 % (27.2 - 36.6 95% C.I.)	(91) 24.6 % (20.5 - 29.2 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(149) 20.1 % (17.4 - 23.1 95% C.I.)	(78) 21.0 % (17.1 - 25.4 95% C.I.)	(71) 19.2 % (15.5 - 23.5 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(60) 8.1 % (6.3 - 10.3 95% C.I.)	(40) 10.8 % (8.0 - 14.3 95% C.I.)	(20) 5.4 % (3.5 - 8.2 95% C.I.)

Table 14: Prevalence of underweight by age, based on weight-for-age z-scores

		Severe underweight (<-3 z-score)		**Moderate underweight (>= -3 and <-2 z-score)**		**Normal (> = -2 z score)**		**Oedema**	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	140	8	5.7	23	16.4	109	77.9	0	0.0
18-29	206	29	14.1	44	21.4	133	64.6	0	0.0
30-41	176	19	10.8	28	15.9	129	73.3	0	0.0
42-53	153	4	2.6	38	24.8	111	72.5	0	0.0
54-59	67	0	0.0	16	23.9	51	76.1	0	0.0
Total	742	60	8.1	149	20.1	533	71.8	0	0.0

3.2.5 Prevalence of Stunting based on Height-for-Age Z scores (HAZ)

Height for Age (HFA) measures linear growth and is therefore a reflection of the cumulative effects of long-term nutritional inadequacy and or recurrent chronic illness episodes. It is not affected by seasonality but is related to the long-term effects of socio-economic development and long-standing food insecurity situations. The survey findings indicate a prevalence of 24.0 % (21.1 - 27.3 95% C.I.) (HAZ<-2) with severe stunting (HAZ<-3) at 6.7 % (5.1 - 8.7 95% C.I.). This according to WHO classification indicates serious levels of malnutrition. The results showed that boys were more stunted as compared to girls. In 2016 survey, the prevalence of stunting was at (HAZ<-2) at 16.0 (12.7 - 20.0 95% C.I) which is poor according to WHO classification.

Table 15: Prevalence of stunting based on height-for-age z-scores and by sex

	All n = 732	**Boys** n = 365	**Girls** n = 367
Prevalence of stunting (<-2 z-score)	(176) 24.0 % (21.1 - 27.3 95% C.I.)	(99) 27.1 % (22.8 - 31.9 95% C.I.)	(77) 21.0 % (17.1 - 25.4 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(127) 17.3 % (14.8 - 20.3 95% C.I.)	(72) 19.7 % (16.0 - 24.1 95% C.I.)	(55) 15.0 % (11.7 - 19.0 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(49) 6.7 % (5.1 - 8.7 95% C.I.)	(27) 7.4 % (5.1 - 10.5 95% C.I.)	(22) 6.0 % (4.0 - 8.9 95% C.I.)

Table 16: Prevalence of stunting by age based on height-for-age z-scores

		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	139	6	4.3	19	13.7	114	82.0
18-29	200	29	14.5	38	19.0	133	66.5
30-41	173	13	7.5	37	21.4	123	71.1
42-53	153	1	0.7	29	19.0	123	80.4
54-59	67	0	0.0	4	6.0	63	94.0
Total	732	49	6.7	127	17.3	556	76.0

The mean Z scores for wasting (WHZ), underweight (WAZ) and stunting (HAZ) were - --1.25±1.07; -1.44±1.02 and -0.95±1.31 respectively, all indicating poorer nutrition situation compared to WHO reference population. The standard deviations for WHZ, WAZ and HAZ were within the acceptable range of 0.8-1.2. The sample design effect values of all was (WHZ), (WAZ) and HAZ) was 1.0, showing there is no much inter cluster variability.

Table 17: Mean z-scores, Design Effects and excluded subjects

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	732	-1.25±1.07	1.00	0	15
Weight-for-Age	742	-1.44±1.02	1.00	1	4
Height-for-Age	732	-0.95±1.31	1.00	1	14

* contains for WHZ and WAZ the children with oedema.

3.3 Children's Morbidity and health seeking behaviour

According to UNICEF conceptual framework on causes of malnutrition, disease is an immediate cause of malnutrition. It also affects food intake, which is also categorized as an immediate cause. It is important therefore to assess morbidity and whether it had some effect on malnutrition. During the survey period, 27.6% of children 6-59 months were reported to have been ill two weeks prior to survey. Most children (13.74%) suffered from fever, followed by ARI at 19.38% and diarrhea (10.01%). Table 19 summarizes the reported illnesses.

Table 18: Prevalence of reported child illness and health-seeking behavior

Child Morbidity in two weeks prior to survey (N=852)	**n**	**%**
Prevalence of reported illness (6-59 months)	167	**27.6%**
Children reported ill		
Fever	107	13.74%
ARI/Cough	151	19.38%
Watery Diarrhoea	78	10.01%
Bloody diarrhea	0	0.0%

During the survey period, 27.6 % of children 6-59 months were reported to have been ill two weeks prior to survey. Most children (19.38%) suffered from ARI, followed by fever at 13.74% and diarrhea (10.01%). Majority of the caregivers 77.67% with sick children sought treatment. This is better than 2016 which had a figure of 58.4% which could be attributed to commitment of caregivers and presence of outreach services .For the care givers who sought treatment majority (80.47%) are likely to seek treatment from appropriate places i.e. public health clinics (51.63%) and community healthcare workers (8.37%). Figure 3.14 below summarizes health seeking behaviors. From such places, they are likely to get assistance from trained health personnel with proper diagnosis and treatment being done.

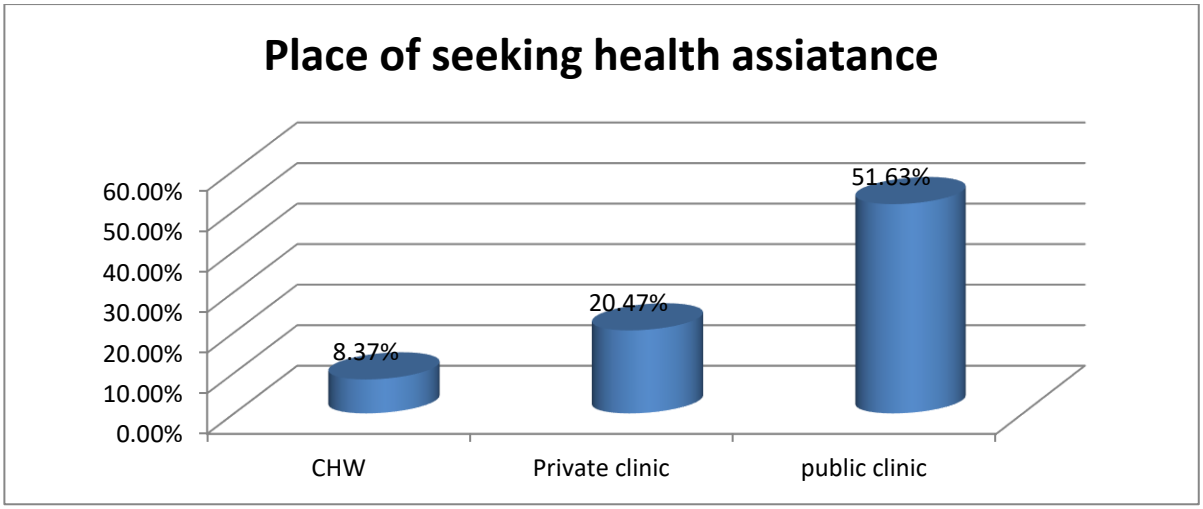


Figure 8: Health seeking practices

Slightly less that than half of the children (42.2%) were reported to have slept under a mosquito net the night before the survey. The use of treated mosquito nets increased from 39% in 2016 to 83.14% in 2017.

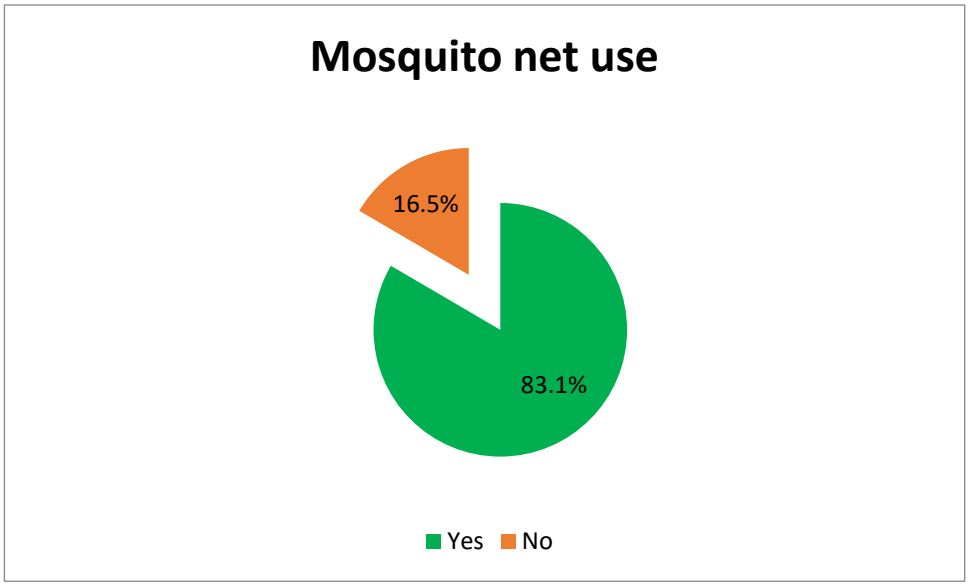


Figure 9: mosquito net use

3.4 Micronutrient supplementation and Deworming

3.4.1 Vitamin A supplementation

Improving the vitamin A status of deficient children through supplementation enhances their resistance to disease and can reduce mortality from all causes by approximately 23 per cent. Therefore, vitamin A supplementation is critical, not only for eliminating vitamin A deficiency as a public-health problem, but also as a central element for child survival.

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

have 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 and caregivers were probed on whether children had been supplemented, for how many times and the place of supplementation. Reference was made to the child health card and in case the card was not available recall method was applied. In Kenya the government has adopted target of 80% coverage of vitamin A Supplementation (VAS) among children aged 6-59 months. The national guideline recommends that a child should be supplemented at-least every six months[1]. The survey established that the recommended vitamin A supplementation is at 85.7% for children 6 -11 months and 19.9% for children 12-59 months; far much below the national target. Low coverage in Mandera would be attributed to care givers not take their children for supplementation after measles vaccination, health workers not exploiting opportunities to supplement, stock outs in some health facilities and recall issues as mostly results were based on recall. Almost all the children who received vitamin A obtain them from either the health facility or during outreach sessions, however, documentation for the same is still poor.

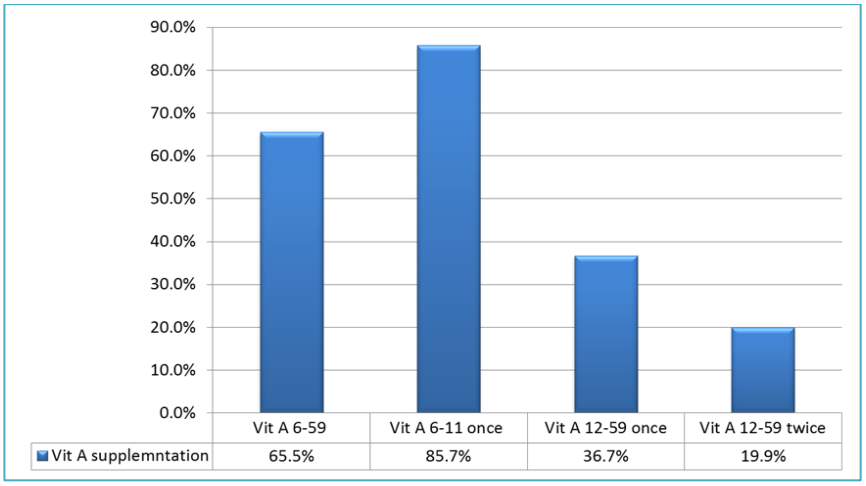


Figure 10: Vitamin A coverage among children 6-59 months

3.4.2 Zinc supplementation in diarrhoea

Zinc supplementation has been shown to reduce the duration and severity of diarrhoeal episodes as well as the prevention of subsequent episodes. Zinc supplementation in Mandera County is still suboptimal as only 68.0% of children with diarrhoea are likely to be supplemented. This is below the national target of 80% and this could be because of poor health seeking behaviour in Mandera County as 41.6% of care givers do not seek treatment for their sick child medication during diarrhoeal episodes. However, there is an increment of zinc supplementation compared to last year same period.

[1] The Kenya National Technical Guidelines for Micronutrient Deficiency control, August 2008.

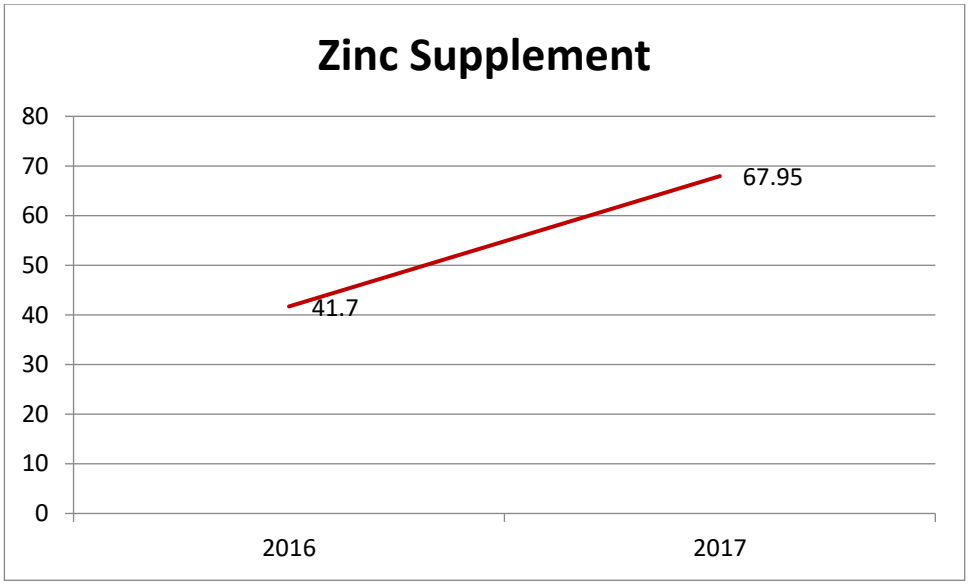


Figure 11: Zinc supplementation in diarrhoea

3.4.3 Deworming

De-worming is important in controlling parasites such as helminthes, schistosomiasis (bilharzias) and prevention of anemia. WHO recommends that children in developing countries exposed to poor sanitation and poor availability of clean safe water to be de-wormed once every 6 months. De-worming was assessed for children aged 12-59 months old. The survey estimated the deworming coverage to be at 36.7%, this is low compared to national coverage target of 80%. The low coverage could be attributed to service marketing by health workers who rarely give dewormers to children

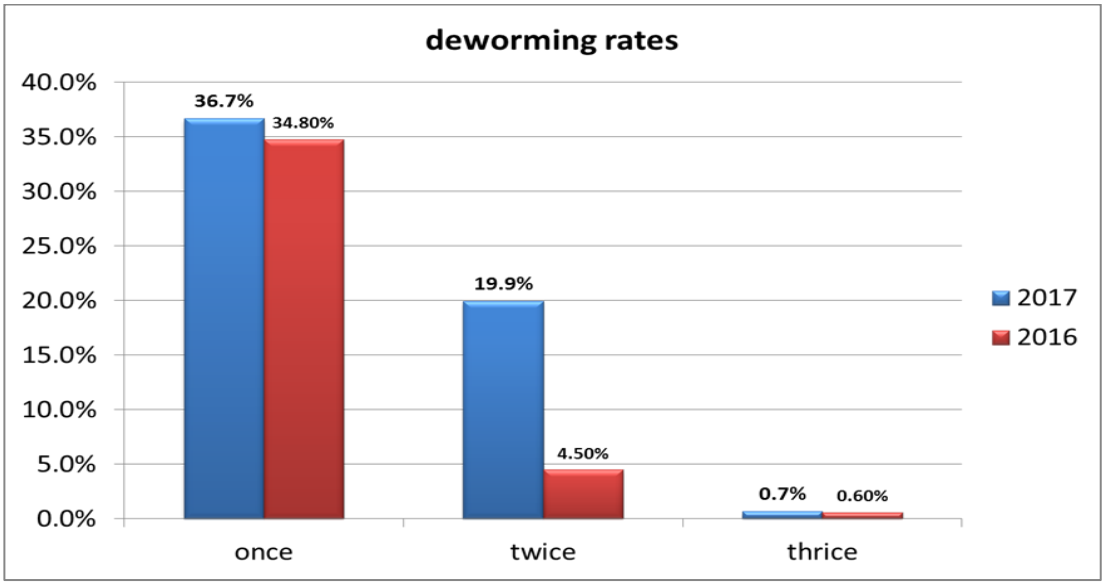


Figure 12: Deworming rates

3.5 Vaccination results

Kenya aims to achieve 90% under one immunization coverage by the end of second medium term plan (2013- 2017). The Kenya guideline on immunization defines a fully immunized child as 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 is meant to reduce child mortality and morbidity due to vaccine preventable diseases. This survey assessed the coverage of 4 vaccines namely, BCG, OPV1, OPV3, and measles at 9 and 18 months. The survey showed that BCG coverage was 97.2%, while 38.1% receive OPV 1 and 38.0% receive OPV 3. Additionally, all children aged 9 months and above ought to be vaccinated against measles. The survey results show that 0nly 36.2% receive the first does of measles with only 7% receiving a second dose at 18 months. The low coverage of measles may explain the recent outbreak of measles in Mandera West sub county due to lack to herd immunity. The low coverage of second doses of measles at 18 months may be attributed to low awareness among caregivers.

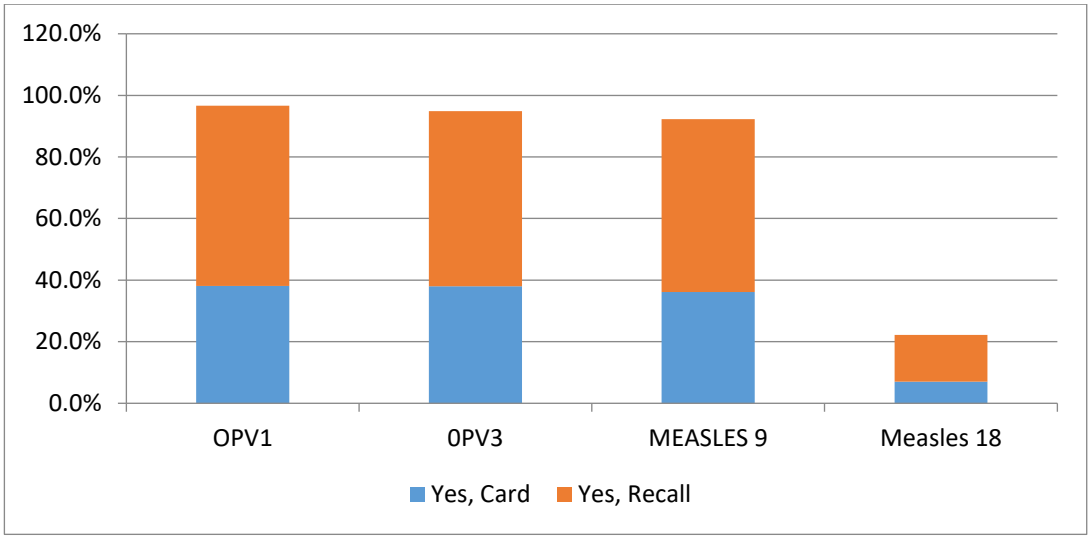


Figure 13: Vaccine coverage

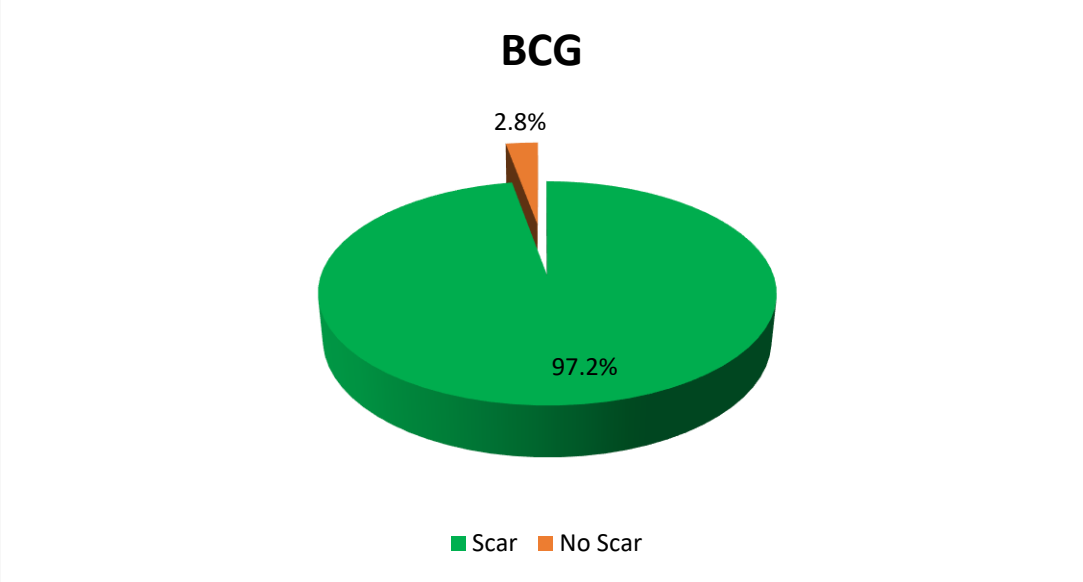


Figure 14: BCG vaccination coverage

3.6 Maternal nutrition status and Iron folate supplementation

The consequences of poor nutritional status and inadequate nutritional intake for women during pregnancy not only directly affect women's health status, but also have a negative impact on birth outcome and early development for children. 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 levels. The survey assessed iron-folate supplementation in pregnancy and maternal nutrition based on MUAC for women of reproductive age, pregnant and lactating women.

3.6.1 Acute Malnutrition

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 nutritional status of care givers as measured by MUAC showed a prevalence of malnutrition of 6.5% among PLWs. The table below shows the results for the maternal nutrition status and Figures 10 and 11 show Iron-folate supplementation coverage and duration respectively

Table 19: Women of child bearing age nutritional status based on MUAC

Physiological Status	N	MUAC < 21		MUAC 21-22.9		MUAC > 23	
		n	%	n	%	n	%

15 - 49yrs	544	21	**6.3%**	74	15.1	394	93.7
Pregnant		5	**6.2**	18	22.2	58	71.6
Lactating		14	**6.9**	50	24.6	139	68.5

3.6.2 Iron and Folic Acid Supplementation (IFAS)

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 anemia among pregnant women

WHO recommends daily consumption of 60mg elemental iron and 0.4mg folic acid throughout the pregnancy .These recommendations have since been adopted by Kenya government in its 2013 policy guidelines on supplementation of iron folic acid supplementation (IFAS) during pregnancy. During the survey, iron folic supplementation was assessed by asking mothers of children below 2 years if they consumed iron folate in their most recent pregnancy.

The assessment findings showed that 78.01% of women with children below 2 years had been supplemented with iron folate supplements during their last pregnancy.

Figure 15: IFAS Coverage among pregnant women

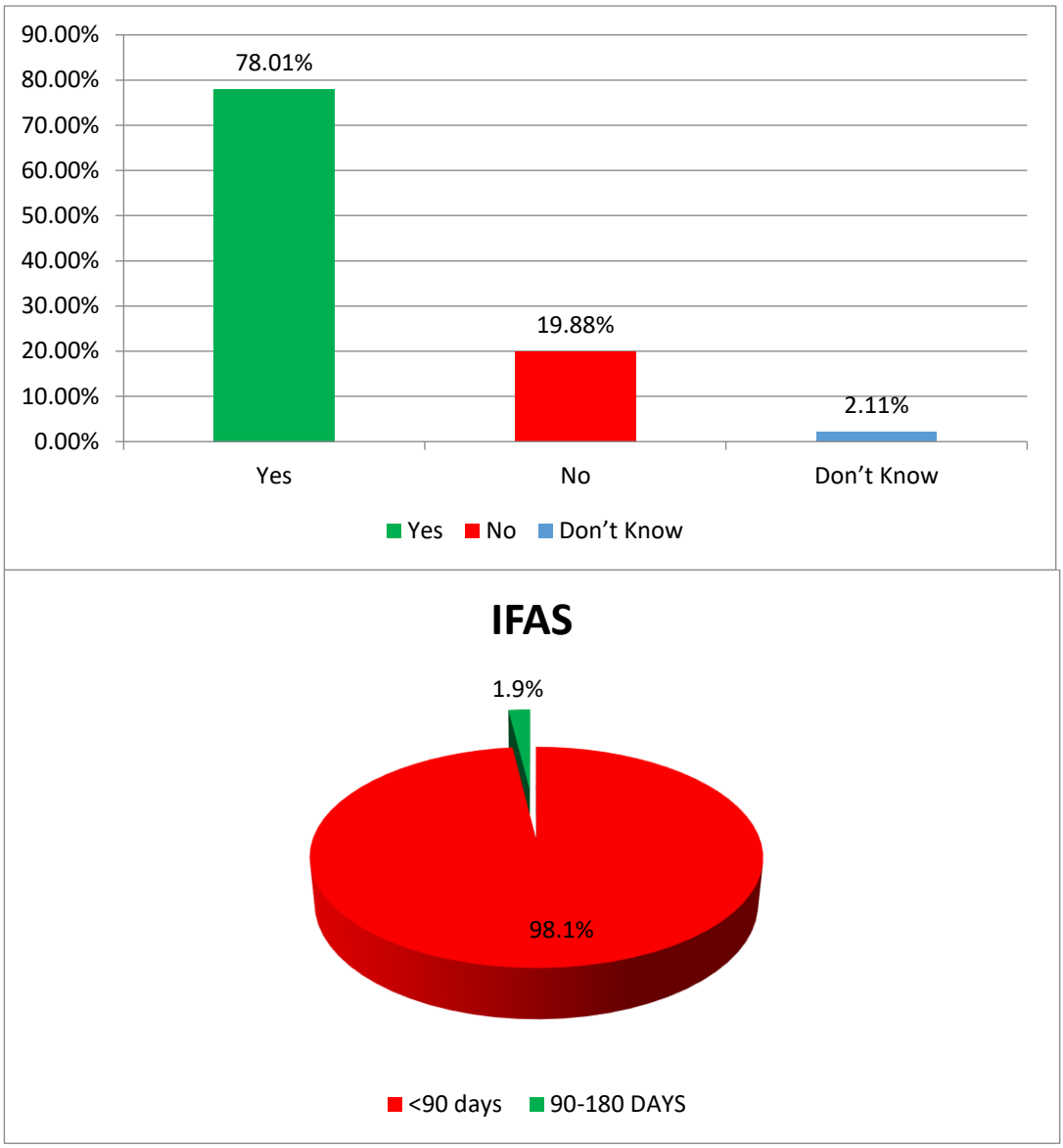


Figure 16: IFAS Supplementation days

3.7 Water, Sanitation & Hygiene (WASH)

Water and sanitation are deeply interrelated. Sanitation is essential for the 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. Increasingly current evidence on poor WASH indicators is being 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 undernutrition, which in turn reduces a child's resistance to subsequent infections, thus creating a vicious circle

3.7.1 Water Access and Quality

The main water sources (Fig 3.16) in the County are earth pan 30.2% and piped water at 13.5%. Majority of the population (98.8%) are utilizing unsafe water sources which is a risk factor for water borne diseases. Though majority of the household got water from unsafe sources, 76.19% are not treating their household water. 34.4% use boiling and 71.03% boiling and chlorination respectively as a method of water treatment for domestic use.

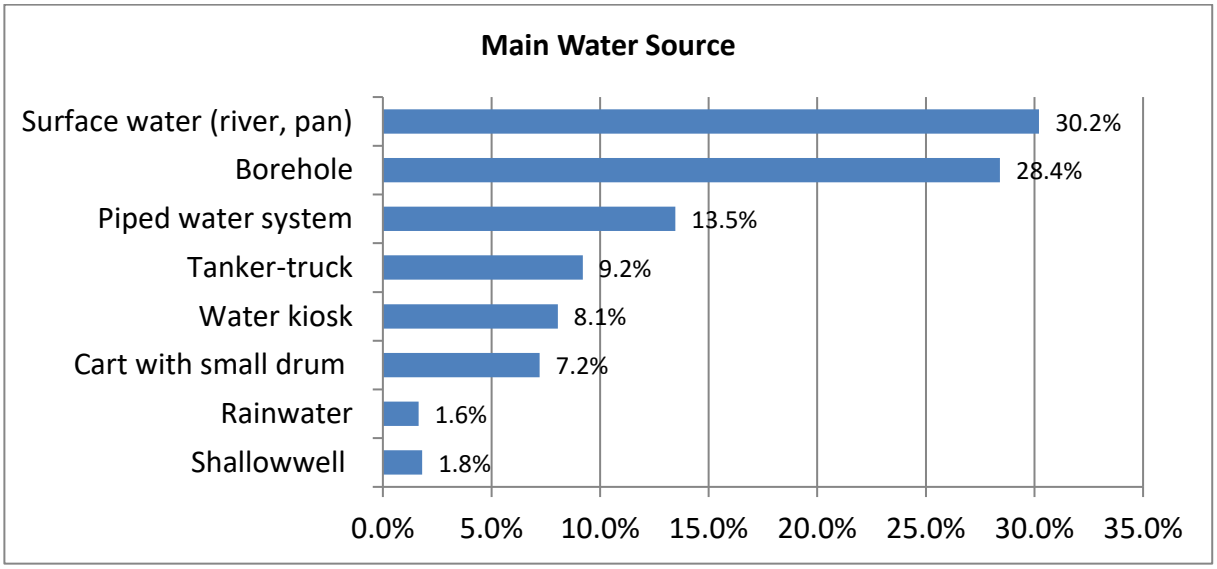


Figure 17: Water, sanitation and hygiene practices

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 no more than 15 minutes and it should not take more than three minutes to fill a 20-litre container. The survey measured time taken to collect water which incorporates queueing and travel time. 51.6% of the population is taking less than 30 minutes to travel, queue and fetch water. The time taken to fetch water is as shown in the Table 21 below. The mean household water usage is 98.75 litres of water in a day, with a majority of the households using 80 litres per day. Given an estimated household size of 6 persons, the assessed households have a mean water utilization of 16.4 litres/ person/day which is within the recommended average water requirement for drinking, cooking and personal hygiene of 15 litres/ person/day[2].

Table 20: Water, Sanitation & Hygiene Practices

WATER AND SANITATION N=429		**Results**	
Description of indicator	**Responses**	**n**	**%**
Proportion of Households with accesses to safe drinking water	Protected shallow well and borehole	609	**28.4%**

[2] The Sphere Handbook, Humanitarian Charter and Minimum Standards in Humanitarian Response, 2011

Time taken to collect water (including queuing time	<30 min >30min to <1hour >1 hours to < 2 hours	442 34 12	51.6% 44% 4.5%
Treatment method for households' drinking water:	Boiling Chemicals Pot filters	23 58 1 407	29.10% 70.15%
Proportion of caregivers who wash their hands before certain crucial events	After toilet After cleaning child feaces Before cooking Before eating	385 203 169 371	76.2 42.0 19.7 76.7
Water storage	Closed container Open container	561 48	92.12% 7.88%
Water payment	.51-100 KES >1000 kes >100-200 KES >200-500 KES >30-50 KES >501-1000 KES	10 29 14 51 12 9	8.00% 23.20% 11.20% 40.80% 9.60% 7.20%

3.7.2 Access to Sanitation Facilities

A large proportion of the surveyed households have access to sanitary facilities and most use latrines (78.8%) for defecation. However the practice of open defecation is still wide spread at 21.2%. This also is a risk factor for waterborne diseases given that majority of the household are using water from earth pan (surface run off) which is mostly untreated.

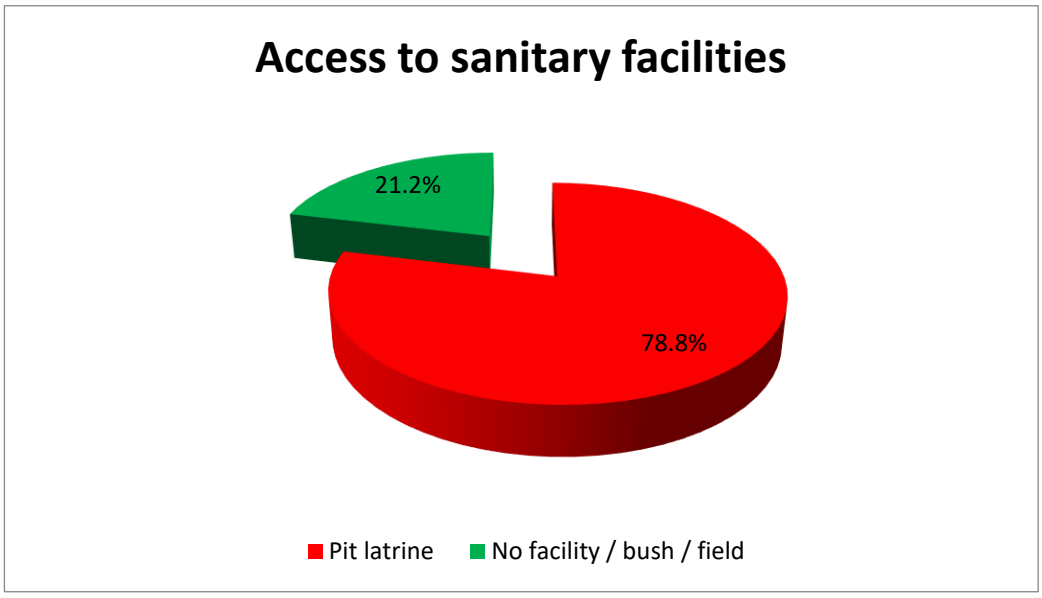


Figure 18: Access to sanitary facilities

3.7.3 Handwashing Practices

Hand washing with soap is the single most cost-effective intervention in preventing diarrhea diseases .The four critical hand washing moments include; after visiting the toilet/latrine, before cooking, before eating and after taking children to the toilet/latrine. Most households had their members wash hands before eating (76.7%) and before cooking (19.7%) with 76.2% washing hands after defecation. Hand washing practice is expected to be in at least 3 or more incidences, this practice was only reported in 13.05% of the population. Majority of the households 65.0% use water only for handwashing with only 31.0% cleaning their hands with soap and water. The practices remains unchanged compared to previous surveys thus a lot of hygiene promotion and education should be done. Figures 14 highlight the hand-washing practices.

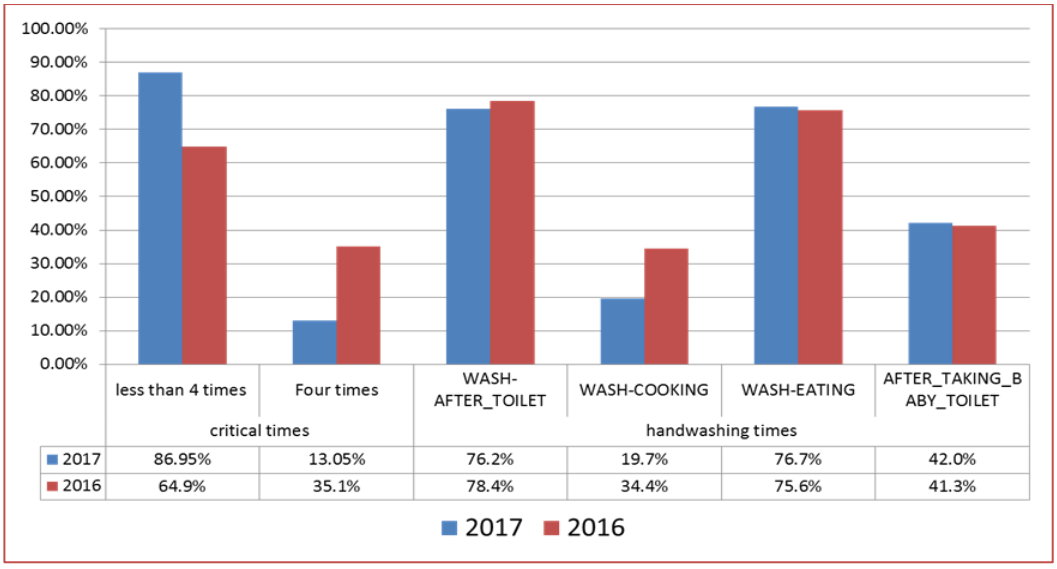


Figure 19: Handwashing at critical times

Handwashing without soap does not offer effective protection against germs. More than 65% use only water when washing hands.

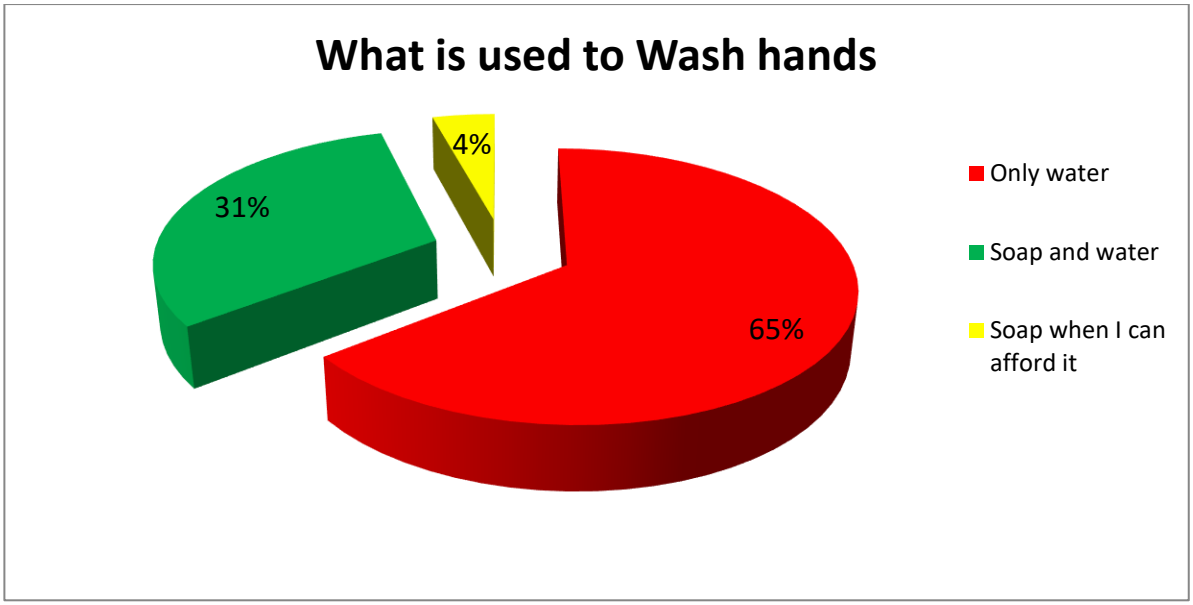


Figure 20: handwashing agents

3.8 Food Security & Livelihoods

3.8.1 Households' main occupation and Food Availability

Household occupation and income are critical to food availability at household level. The major household income within 30 days before the survey was sale of livestock products with main occupation being livestock herding; this was reported by 40.6% of the sample households. The County is mainly pastoralist and is dependent on livestock as its main occupation. This was followed by waged labour at 26.9 % and petty trading 13.6%. (Figure 21 below).

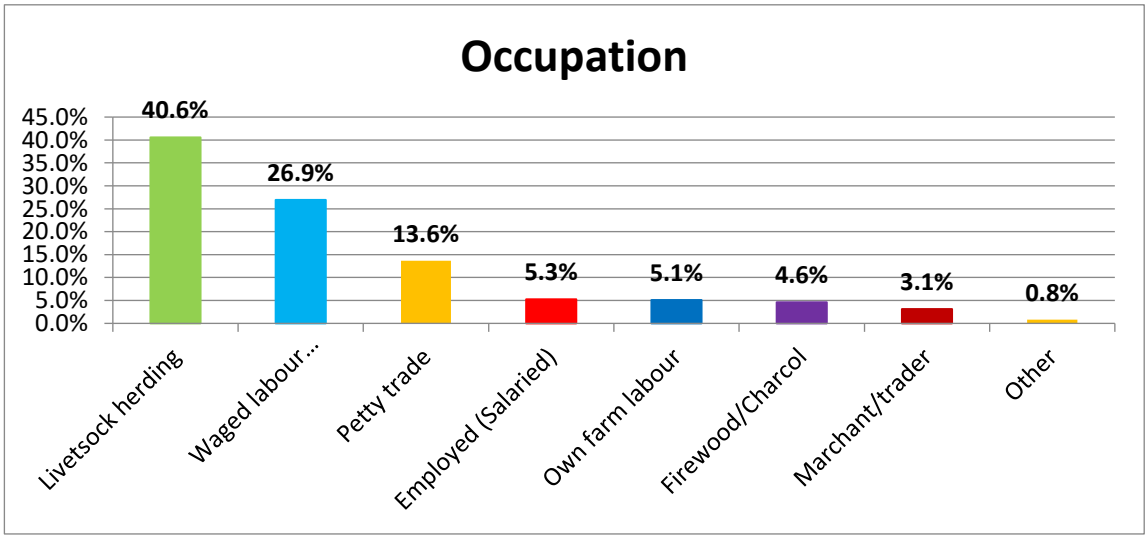


Figure 21: Household main Occupation

3.8.2 Households' Food Consumption and Dietary Diversity

The Food consumption score or "weighted diet diversity score" is a score calculated using the frequency of consumption of different food groups consumed by a household during the

7 days before the survey. The FCS is used to identify the most food insecure households. The prevalence of households with poor and borderline food consumption provides essential information on people's current diets and is helpful in deciding the most appropriate type and scale of food security intervention as well as the right target group for the assistance. Seven day recall was used to collect data on food consumption. All the food items were grouped into 16 specific food groups using the food frequency data. The food consumption score was created by multiplying the frequency of food items consumed in last 7 days by a weight given to specific food groups. Each weight has been calculated based on nutrient density. The thresholds for the food consumption groups were presented using typical thresholds as illustrated in the table below: Majority of the households (87.68.%) had acceptable score with (9.2%) falling in the borderline while 3.12% had a poor sore and are the most food insecure households as shown in figure below (Figure 17). The increase in households falling under acceptable food consumption score was attributed to Ramathan as most families were receiving remittance and food donations.

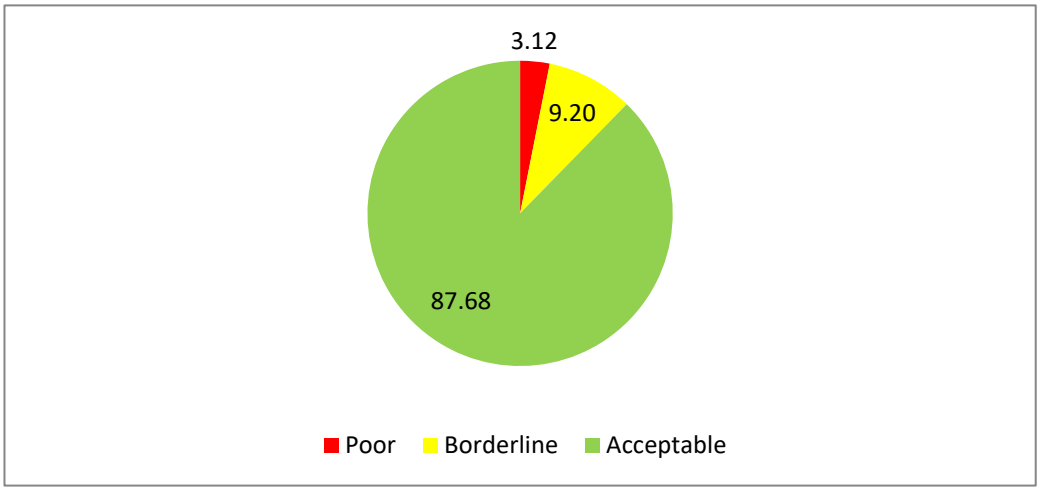


Figure 22: Household food consumption score

It was also noted that only 18.815of the households were consuming more than five food groups with 56.75% consuming 3-5 food groups while 24.44% were consuming below three food groups. A household consuming less than 3 food groups is at risk of micronutrients deficiencies and is likely to have severe food access issues.

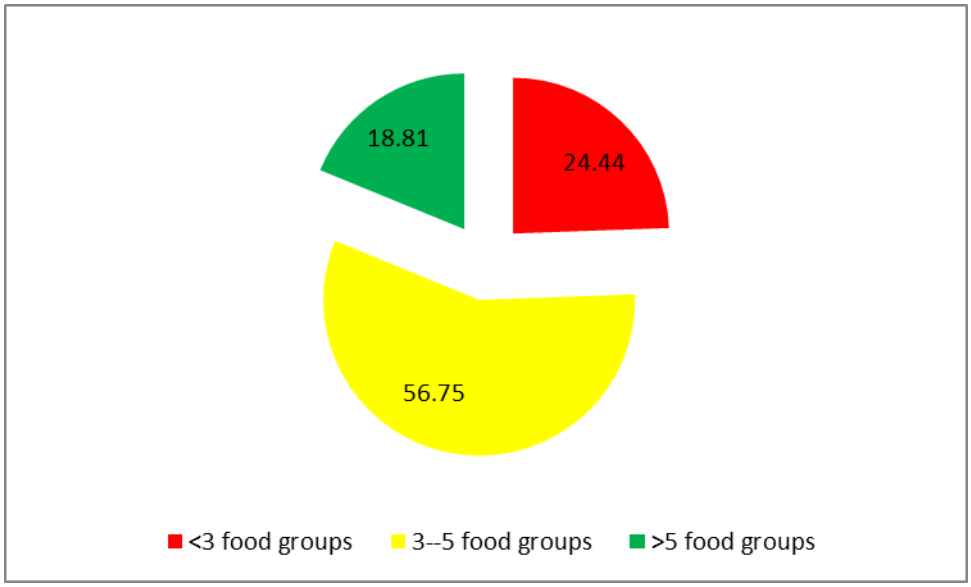


Figure 23: Household food diversity

3.7.3 Household Food Consumption Frequency

Cereals and cereal products, sugar and sweets, oils and fats were the main staple food consumed by 90.84%, 84.89% and 76.05% respectively. Eggs, vegetables and fruits are less consumed by less than 10% of the sampled households. This is because of un availability of fruits and vegetable in markets of rural locations as they are only found in big towns in the County. Less consumption of eggs in the County is as a result of the belief that it causes the foetus to grow big in the mother's womb during pregnancy and obesity in children respectively. The widespread low consumption frequency of iron rich foods in Mandera County could indicate a higher risk of iron deficiency anemia and further explaining the relatively high rates of chronic and acute undernutrition prevailing in the county.

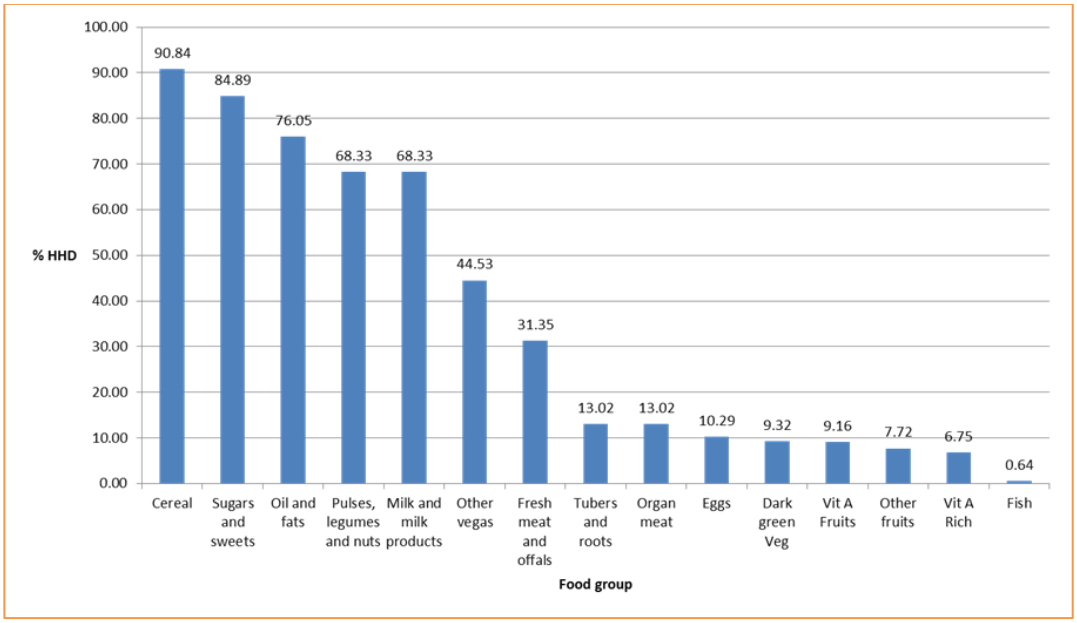


Figure 24: Food frequency

3.8.4 Minimum Dietary Diversity -Women Score (MDD-W)

More than 70% were consuming less than five food groups recommended, thus a risk factor for maternal malnutrition. Pre-pregnancy nutrition influences a woman's ability to conceive and determines the foetal growth and development.

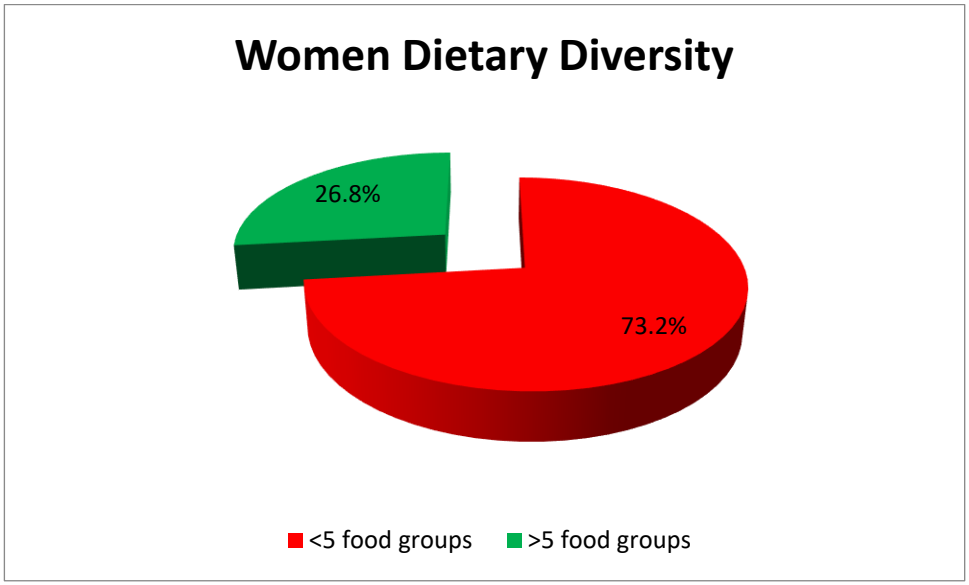


Figure 25: Women dietary diversity

3.8.5 Household's Livelihood Shocks and Coping Strategies

Assessment of coping strategies showed that 41.2% households applied at least a coping strategy in the previous. The main adopted coping strategies were; 1) Reducing the number of meals eaten in a day-94.71%, 2) Relying on les preferred and less expensive foods-87.06% and 3) Limiting portion sizes at all meales-86.47% as illustrated in the Figure 21 below.

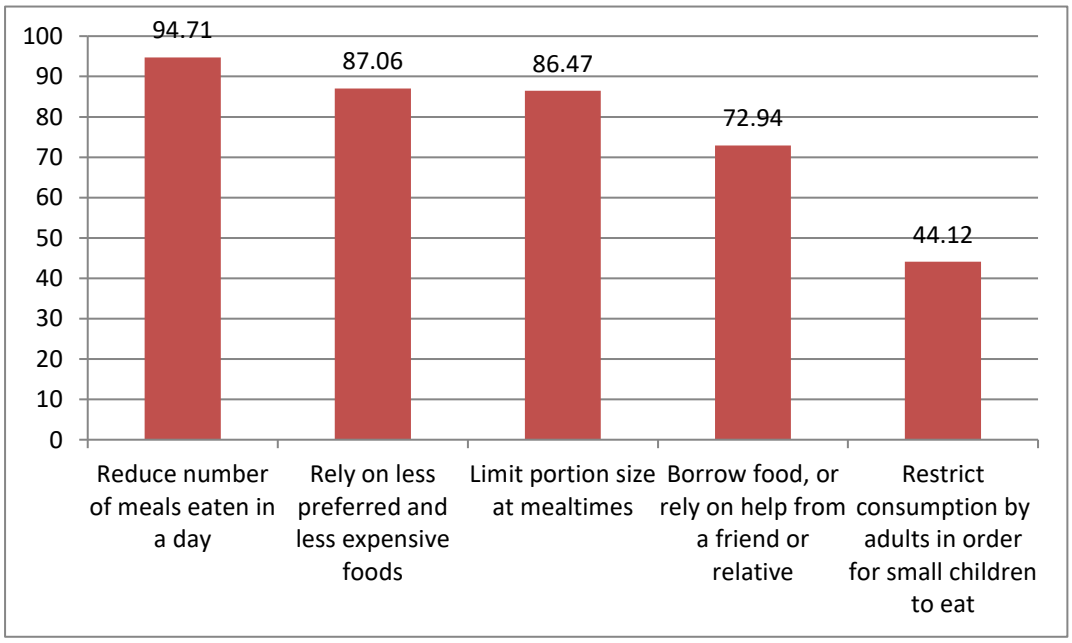


Figure 26: Coping strategy mechanisms

The mean CSI increased slightly from 10.40 in 2016 to 11.19 in 2017, an indication that households have continued to engage to different food insecurity coping strategies.

Table 21: Coping strategy index

Coping strategy	Percentage of HH (170)	Frequency score (0-7)	Severity score (1-3)	Weighted score =Freq*weight
Rely on less preferred and less expensive foods	87.06%	2.14	1	2.11
Borrow food or rely on help from friends or relatives	72.94%	1.42	2	3.94
Limit portion size at mealtime	86.47%	2.12	1	1.25
Restrict consumption by adults in order for small children to eat	44.12%	0.59	3	1.5
Reduce number of meals eaten in a day	94.71%	2.32	1	1.6
TOTAL CSI SCORE				11.19

4 DISCUSSION

4.1 Health and Nutrition status

The prevalence of Global Acute Malnutrition (GAM) (WHZ<-2 and/or oedema) of 25.3% (21.5-29.6 95% CI) and Severe Acute Malnutrition (SAM) rate of 5.2% (3.6- 7.4 95% CI) indicate a *very critical* phase of Malnutrition in Mandera according to the WHO classification. An analysis of the distribution of SAM prevalence indicates that there is aggregation of malnutrition cases in certain clusters, (Index of dispersion, ID=1.56 (p=0.011). When compared to the June 2016 survey results indicate no significant change (p=0.6) in phase level classification of GAM 24.7% (20.4-29.6 95% CI) but there was a shoot in SAM rate (WHZ<-3 or oedema) from 3.7% (2.3- 6.1 95% CI) to 5.2% (3.6- 7.4 95% CI).

The major drivers of the high levels of acute malnutrition in the county remain poor child care practices, inadequate utilization of child survival interventions ,poverty, unavailability of varied nutritious foods particularly fruits and vegetable in rural areas. Health system challenges resulting from frequents staff strike has paralyzed service delivery and also stock outs of nutrition commodities in the County has also led to low admissions and consistency of treatment for children in the program respectively.

Vaccinations (Measles at 9 months and DPT 3) were above 80% while vitamin A coverage was very low at 36.7% for children between 12-59 and high at 85.7% for children 6 -11 months. Measles is known to interact particularly with deficiencies of protein−energy and of vitamin

A. Children who are vitamin A deficient suffer an increased risk of death and illness, particularly from measles and diarrhoea[3]. Immunization is an essential part of child's right to the highest attainable standards of health. Immunization protect against dangerous diseases a child who is not immunized is more likely to become sick, undernourished or could die. This underscores the importance of vaccinations in children growth; poor immunization coverage could lead to increased morbidity resulting to malnutrition. Morbidity in the surveyed population showed that 27.60% of the children had been sick in the last two weeks before the survey; fever was the leading with ARI/Cough 19.38%, fever (13.74.%) and watery diarrhoea (10.01%).

Resource allocation by County government also needs to factor very critical nutrition status in the County which is currently the three highest rates of malnutrition (wasting) in the country. All actor need to work together in addressing the underlying factors as a priority with preventive measures being put in place to cushion the population from a further deterioration of the nutrition situation which has direct negative impact on their wellbeing and continues to fuel the cycle of poverty in the County from generation to generation. The county is currently having BSFP intervention in place targeting 170 668 beneficiaries.

4.2 Water and Sanitation

Access to potable water was of concern with only 28.4% of the population accessing water from infiltration wells that are considered safe, the rest had water from the earth pans, river, unprotected wells and water trucking. Though majority of the household got water from unsafe sources with 76.19% of the households not treating their household water, only 71.03% either chlorinated or boiled water for domestic use. Caregivers washed their hands mostly before eating and after visiting the toilet, though it's a good practice only 65% used only water soap when washing their hands with another 31% using water and soap. Access and use of latrine was reported by 78.8% of the respondent. The poor hygienic practices and practice of open defecation can explain the incidents of water borne diseases such as cholera and watery diarrhoea. Many illnesses can be prevented by good hygienic practices: washing hands with soap and water (or a substitute, such as ash and water) after defecating or cleaning a child who has defecated, using clean toilets or latrines, disposing of faeces away from play and living areas and water sources, washing hands before handling food, using water from a safe source, disinfecting drinking water if its safety is in question, and keeping food and water clean.
Hygiene promotion and education need to be scaled up in the county.

4.3 Food Security

Mandera County is classified under "Crisis" (IPC Phase 3) in irrigated livelihoods and the pastoral livelihoods while t agro pastoral livelihood is classified in "Stressed" (IPC Phase 3) of food security phase classification according to long rains assessment conducted in July 2017.

[3] Micronutrient Initiative: Vitamin A in child health weeks : A Toolkit for planning, implementing and monitoring

The nutritional survey conducted in July2017 indicated Global Acute Malnutrition (GAM) rates of 25.6 percent, and Severe Acute Malnutrition (SAM) rate of 5.8 percent indicating a very critical situation according to WHO classification. The household adopting livelihood coping strategy for Stress, Crisis and emergency strategy were at 53.1 percent, 23.4 percent and 17.9 percent respectively.

4.4 Possible factors triggering Malnutrition

Morbidity and dietary intake are the immediate causes of malnutrition underlain by food insecurity, poor maternal and child care and poor/unhygienic environment. Malnutrition is mainly caused by food insecurity that is persistent in the county and also illnesses caused by poor water and sanitation practices.

- Morbidity levels are aggravated by the poor WASH conditions characterized limited access of sanitation facilities and poor hand-washing practices at critical times.
- Insecurity has also contributed largely to the high malnutrition rates in the county since people move from one place to another thus disrupting livelihood. This interferes with the household food security.
- Micronutrient supplementation and deworming is low which may result to poor nutrition status of children.

5 CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusions

Overall the key underlying factors of nutrition status are morbidity, food insecurity manifested by poor dietary diversity and poor hygiene. Integrated approaches should be undertaken to reduce risk factors such as; unsafe drinking water Measures to increase access to health facilities and improved coverage of nutrition programmes would play a critical role in both preventing and treating morbidity and malnutrition. In spite of the current situation, it is important to note the role of chronic food insecurity, higher food prices and inadequate pasture which have affected the animal sales and milk availability (hence directly affecting the income of the households). Food insecurity remains a big challenge that cannot be ignored and is likely the direct cause of inadequate food intake in the households.

5.2 Recommendations

The ***very critical*** nutrition situation in the county, is attributed to multiple and interrelated factors that call for continued integrated intervention efforts to address both immediate needs in addition to developing long-term strategies to enhance access to basic services; support to

sustain livelihood systems and social protection mechanisms. Specific recommendations include:

Table 22: Recommendations

Recommendation	Activities	Time frame	Responsible person(s)	Resources needed
Scale-up implementing of integrated management of acute malnutrition (IMAM) program and where applicable start up new outreach sites to increase coverage and reach all malnourished children	• Conduct initial and quarterly mass screening for six months. • Sites remapping of outreach sites • Continuous active case finding and referral • Involvement of local leaders and CHW in defaulter tracing.	• Ongoing in Banisa, Mandera south and West • Mandera Easr, North and Lafey planned for November 2017 Ongoing	CNC, SCHMTS,SCI/KRCS	• Vehicle, fuel, • Allowance, • Personnel
Promotion of hand washing practices by use of soaps during the four critical hand washing times	• Use of social leaders to promote handwashing using soap. • On job training of CHWS on hygiene promotion. • Hygiene promotion and education in school clubs and villages on hand washing with soap • Hold sensitization campaigns during world hand washing day • Distribution of hand washing stations to health facilities and conduct demonstration during outreach and facility visits • Empower families to adopt various water treatment methods at household level	• Ongoing Done School health clubs established and training planned for them	MoH, SCI	• Vehicle • Fuel • Allowance
Scale up micronutrient	• Provision of Vitamin A, dewomwer monitor	• November	MOH/SCI	• Charts

supplementation and strengthen reporting and documentation in HMIS	charts to all health facilities. • Monitor reporting of micronutrients by all facilities. • Sensitize pregnant women to increase early and frequent visits to ANC clinics	2017		• Allowances • Vehicle and fuel
Foster increased multisectoral linkages of nutrition into WASH, social protection	• Sensitization of partners to enhance integration of activities.	• September 2017	MOH, Relevant ministries, KRCS/RACIDA, ACTED	• TOR
Capacity building on LMIS, IMAM and MIYCN for frontline and newly recruited health workers health workers to provide quality health and nutrition services	• IMAM training for newly recruited staff. • LMIS training for ordering for nutrition commodities from KEMSA. • Training on MIYCN	• IMAM Done in the County for 63 health workers • MIYCN Planned for Nov 2017 for 60 health workers • LMIS Planned for September 2017	SCI/MOH/KRCS	• Allowances • Training manuals
Local level advocacy for community to be able to demand improvement of health services	• Empower community to demand for quality health care services from skilled health care workers. • Enhance roles of CHVs as referral agents	• December 2017	MOH/SCI/KRCS	• TOR

	between community and formal health facilities			
Strengthen nutrition commodities supplies chain	• Facility transfers on nutrition commodities	• On need basis	MOH/SCI/KRCS	•

6 APPENDICES

Appendix 1: Plausibility checks Mandera County

	Indicator	Acceptable values/range	CENTRAL
1	Flagged data (% of out of range subjects)	<7.5	0 (1.7 %)
2	Overall sex ratio (significant CHI square)	>0.001	0 (p=0.694
3	Age ratio (6-29vs 30-59) Significant CHI square	>0.001	0 (p=0.715)
4	Dig. prevalence score-weight	<20	0 (2) Excel)
5	Dig. prevalence score-height	<20	0 (4) Exce)
6	Dig. prevalence score-MUAC	<20	0 (4) Excel)
7	Standard Dev..height WHZ	>0.80	0 (1.08) Excel)
8	Skewness WHZ	<±0.6	0 (-0.08) Excel)
9	Kurtosis WHZ	<±0.6	1 (-0.25) Excel)
10	Poisson WHZ -2	>0.001	0 (p=0.062) Excel)
11	OVERALL	<24	1% (**Excellent)**

Appendix 2: Assignment of Clusters

Geographical unit	Population size	Assigned cluster
BURDURASS	15385	1
GITHER	17102	2
DANDU	21900	3
ELDANABA	8275	4
DIDKURO	11574	5
LAGSURE	7025	6
HARDAHALO	12224	7
BULLA DANA	10290	8
BULLA GAMBELLA	2672	9
GUBA	11949	10
MALKARUQA	8417	11
YATANI	8577	12
KILIWAHERI	17676	13
EYMOLEY	24853	14
BANISA	37083	15,16
Bulla Hargesa	12338	17
Bulla Abakaro	3832	18

Bulla Nguvu	9970	19
Lagadi	9135	20
Qalicha	7727	21
Yabicho C	2309	22
Hawara	1099	23
Shirshir	4981	24

Bulla Dodey	13693	25
Garse	5456	26
Jabi East	4819	27
Aresa	11304	28
Libehia	17852	29
BP1	7258	30
Bulla Nguvu	4294	31
Township	13153	32

Bulla Mpya	13869	33
Lafey	32557	34,35
Bulla Afya	3925	36
Bulla Wajir	3720	37
Lafey IDP	4304	38
El Safara	6183	39
Garsesala	13533	40
Borehole 11 Centre	11688	41
Fincharo	6339	42

Elele	8307	43
DERKALE	9994	44
Shafshefy	20141	45
TARAMA	9249	RC
Khalalio	4556	RC
Barwako	2439	RC
Warankara	16621	RC
Wargadud East Kalacha	10197	RC

Appendix 3: Calendar of event 2017

MONTH	SEASON	2012	2013	2014	2015	2016	2017

January	Hot, dry. Cold nights, School opening		53: Miraa vehilce accident Lafey	41 New Year/ School opening 5 youths killed at Shangalla	29 mass recruitment by CHINA Company at Kotulo, Resettlement of IDPS from Wajir in Rhamu	17 Opening of BNS & Kiliwehiri Boys Schools	5: Opening of schools start Voter registration Inaugration of Murule Sultanate
February	Hot and dry Biral. Warm nights		52 Campaigns URP/TNA, HSNP card Registration	40 Governor's Relief Food (Rice)	28 Drilling of Darwed Borehole Death Alow Sheikh Adan	16 Opening of Elwak Air strip by Governor, Measles outbreak MW a, Formation of COE Banisa	4: Continuation of voter registration
March	- Beginning long rains		51 General Elections	39 HSNP Account opening by Equity	27 MNP registration, 2nd HSNP beneficiaries, Governors Convoy attack at Lafey	15 Mass Grave, Isnnina Death Arrest of Billow Kerow death of teacher Sala in Bus attack at KNH voter registration	3: Beginning of long rain Murder of Senior chief Omar Jilaow Chaos in Mandera County Assembly over supplementary Budget

April	long rains, Cold nights, Schools close for holidays		50 Swearing of Governor	38 Fear of clan clashes (MW)	26 Heavy rains burning of BH 11 Market	14. combined polio and Measles Campaign	2: Long rain School holiday
May	End of rains Schools open		49 Clashes btwn Garre Degodia	37 Clashes Garre/ Degodia death of Abdi Shobai at Omar jilaow	25 ID Registration Demolition of Elwak Market	13. UHURU TO Visit launch of IDP housing by County Govt at Rhamu Chikungunya & Cholera measles rubella Campaign	1: School opening Long rains Labour day celebration
June	Hot and dry, Madaraka day		48 Garre/Degodia Clashes HSNP end of registration	36 IDP from Malkamari to Banisa ,Cold dry season	24 Madaraka Day	12. KDF Airstrikes killing 4 Children at Elram, Start of Ramadhan kidnapping of Herdsman by Al-Shabaab	0: Madaraka day celebration IED attack on Governor's convoy Ramdadhan Eidul fitr
July	Cold dry(Adoles) Hagga	59: Beginning of Ramadhan and elders came	47 Ramadhan	35 Ramadhan	23 Iddul fitr clan clashes btwn Murule and Marehan	11. Bus Attack at Wargadud, Iddul Fitr attack at Sheikh	

		from NBI to Rahmu for peace negotiations				Barow Lafey)	
August	Hot, dry, windy and dusty schools close,	58 Eidul Fitrl, Killing of Sheikh at Rhamu , Mass Distribution of relief food by ADRA(MW) coming of China at Wargadud Unknown camel disease(MW)	46 IDDUL Fitr	34 IDUL Fitr tribal classhes at Rhamu town	22 Garre General meeting at Elwak	10: GCOE meeting in Banisa MCOE meeting at Aresa	
September	Hot and dry Schools Open	57 Teachers strike	45 Bira(Summer) Distribution of Meat Voucher by SCI (MW) Drought	33 School Opening	21 Bus attack at Dabacity iddul haji	9: Tawakal Bus Accident	
October	- Beginning of short rains	56 Somalia Elections, Inter clan clashes (MW)	44 IDUL Haji	32 IDUL HAJI	20	8: Explosion Bisharo Hotel	
November	rains continue	55 start of Voter registrati	43 Distribution of relief	31 Mandera Bus	19 Death of Alungu Ass Chief	7: Inugration of	

	schools close	on, start of HSNP Registration	food by county Government ,KCPE& KCSE	Attack Garre Elections in Ethiopia,	Kiliwhiri-BNS road construction	Sultan Mohamud Khalif schools closed due to exams End of short rains	
December	End of short rains, Long holiday	54: End of voter registration	42 Mass Recruitment of County staff , Haggai	30 Release of KCPE results, Quarry attack, Car Accident at Takaba HSNP staff dead	18 Alangu Police attack Death of Haji Abdikadir Shakit celebration of best two pupils at Lafey	6: KCPE & KCSE exams release Doctors strike Degodia Meeting at Rhamu Dimtu Destruction of Safaricom Mast in Mandera South	

Appendix 4: SMART survey questionnaire

Mandera Nutrition SMART Survey Questionnaire © July 2017

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 Division	1.7 Location	1.8Sub-Location	1.9 Village	1.10 Cluster No	1.11 HH No	1.12 Team No.

2. Household Demographics

2.1	2.2	2.3		2.4	2.5	2.6	2.7	2.8	2.9
		Age (months for children <5yrs and years for over 5's)							
		YRS	M TH						

2.10	**How many mosquito nets does this household have? _____ (Indicate no.)**	
2.11	**Main Occupation of the Household Head – HH.** **(enter code from list)** 1=Livestock herding 2=Own farm labour 3=Employed (salaried) 4=Waged labour (Casual) 5=Petty trade 6=Merchant/trader 7=Firewood/charcoal 8=Fishing **9=Others (Specify)|____|**	**2.12.** What is your **main** current source of income 1. =No income 2. = Sale of livestock 3. = Sale of livestock products 4. = Sale of crops 5. = Petty trading e.g. sale of firewood 6. = waged labor 7. =Permanent job 8. = Sale of personal assets 9. = Remittance 10. Other-Specify|____|
2.13	Marital status of the respondent 1. = Married 2. = Single 3. = Widowed 4. = separated 5. = Divorced. |____|	**2.14What is the residency status of the household?** 1. IDP 2. Refugee |____| 3. Resident

Fever with Malaria: High temperature	**Cough/ARI:** Any episode with severe, persistent cough or difficulty	**Watery diarrhoea:** Any episode of three or more watery stools	**Bloody diarrhoea:** Any episode of three or more stools with blood per day

3. CHILD HEALTH AND NUTRITION (ONLY FOR CHILDREN 6-59 MONTHS OF AGE; IF N/A SKIP TO SECTION 3.6)

Instructions: *The caregiver of the child should be the main respondent for this section*

3.1 CHILD ANTHROPOMETRY

*(**Please** fill in **ALL REQUIRED** details below. Kindly maintain the same child number as part 2)*

A **Child No.**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**3.2**	**3.3**
	what is the relationship of the respondent with the child/children 1=Mother2=Father 3=Sibling 4= grandparent 5=Other (specify)	SEX F/m	Exact Birth Date	Age in months	Weight (KG) XX.X	Height (CM) XX.X	Oedema Y= Yes N= No	MUAC (cm) XX.X	Has your child (NAME) been ill in the past two weeks? If No, please skip part K and proceed to 3.4)	If YES, what type of illness (multiple responses possible) 1 = Fever with chills like malaria	If the child **had watery diarrhoea** in the last TWO (2) WEEKS, did the child get THERAPEUTIC zinc supplementation?	**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 first seek assistance?** 1. Traditional healer 2.Community health worker 3. Private clinic/ pharmacy

									1.Yes 2. No	2 = ARI /Cough 3 = Watery diarrhoea 4 = Bloody diarrhoea 5 = Other (specify) *See case definitions below*	*Show sample and probe further for this component check the remaining drugs(confirm from mother child booklet)* 1 = Yes 2 = No 3 = Do not know		4. Shop/kiosk 5.Public clinic 6. Mobile clinic 7. Relative or friend 8. Local herbs 9.NGO/FBO 10. other specify
01													
02													
03													
04													

3.4 Kindly maintain the same child number as part 2and 3.1 above

	A	B	C	D	E	F	G	H	I

Child No.	How many times has child received Vitamin A in the past year? (show sample)	How many times did you receive vitamin A capsules from the facility or out reach 1= health facility 2= outreach site 3= ECDE centres 4= campaigns	If Vitamin A received how many times verified by **Card?**	How many times has child received drugs for worms in the past year?**(12-59 Months)** *(show Sample)*	Has the child received BCG vaccination? **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 *(On the upper right shoulder)?* **1=Yes, Card 2=Yes, Recall 3 = No 4 = Do not know**	Has child received the second measles vaccination (18 to 59 months) *(On the upper right shoulder)?* **1=Yes, Card 2=Yes, Recall 3 = No 4 = Do not know**
01									
02									
03									

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 NUmber. **(all ladies in the HH aged 15-49 years from the demographics page)**	What is the Woman's physiological status 1. **Pregnant** 2. **Lactating** 3. **Pregnant and lactating** 4. **None of the above**	Woman's MUAC reading: **____.__cm**	During the pregnancy of the (name of child below 24 months) did you take IFASS (iron pills, sprinkles with iron, iron syrup or iron-folate tablets? (name that appears in HH register) 1. **Yes** 2. **No** 3. **Don't know** 4. **N/A**	If Yes, for how many days? (approximate the number of days)

4.0 WATER, SANITATION AND HYGIENE (WASH)/- *Please ask the respondent and indicate the appropriate number in the space provided*

4.1	**What is the MAIN source of drinking water for the household <u>NOW</u>?** 1. Piped water system/ borehole/ protected spring/protected shallow wells 2. Unprotected shallow well 3. River/spring 4. Earth pan/dam 5. Earth pan/dam with infiltration well|____| 6. Water trucking /Water vendor 7. Other *(Please specify)*	**4.2 What is the trekking distance to the current main water source?** 1=less than 500m (Less than 15 minutes) 2=more than 500m to less than 2km (15 to 1 hour) 3=more than 2 km (1 – 2 hrs) 4=Other(specify) |____|
4.2. 2a	**Do you queue for water?** 1. Yes 2. No **(If No skip to question 4.3)**|____|	**4.2.2b. If yes how long?** 1. Less than 30 minutes |____| 2. 30-60 minutes 3. More than 1 hour
4.3a	**Is anything done to your water before drinking*(Use 1 if YES and 2 if NO)*. if No skip to 4.4** |____|	**4.3b If yes what do you do? (*MULTIPLE RESPONSES POSSIBLE) (Use 1 if YES and 2 if NO).*** 1. Boiling…… …….|____| 2. Chemicals (*Chlorine,Pur,Waterguard*)…… |____| 3. Traditional herb……...| ____|

		4. Pot filters……..|____| **5.** Other (specify_____)…….|____|		
4.4	**Where do you store water for drinking?** 1. Open container / Jerrican 2. Closed container / Jerrican|____|	**4.5 How much water did your household use YESTERDAY (excluding for animals)?** *(Ask the question in the number of 20 liter Jerrican and convert to liters & write down the total quantity used in liters)*		**|____|**
4.6	**Do you pay for water?** 1. Yes 2. No **(If No skip to Question 4.7.1**)|____|	**4.6.1 If yes, how much per 20 liters jerrican** _____ **KSh/20ltrs**	**4.6.2 If paid per month how much** |____|	
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…… …… 2. Before cooking…… ……... 3. Before eating…… ……. 4. After taking children to the toilet…….. 5. Others…… …….			|____| |____| |____| |____| |____|

4.7.2	**If the caregiver washes her hands, then probe further; what do you use to wash your hands?** 1. Only water 2. Soap and water 3. Soap when I can afford it 4. traditional herb 5. water and ash 6. Any other specify |____|	**4.8 Where do members of your household Mainly relieve themselves?** 1. In the bushes, open defecation 2. Neighbor or shared traditional pit/improved latrine 3. Own traditional pit/improved latrine 4. Others Specify |____|

5.0: Food frequency and Household Dietary Diversity

	Did members of your household consume any food from these food groups in the last *7 days?(food must have been cooked/served at the household)* ***1=Yes*** ***0=No***	**If** *yes*, **mark dayst he food was consumed in the last 7 days?** **yes=1; no=2**								What was **main** source the dominant fo item consumed the HHD? **1.Own production** **2.Purchase** **3.Gifts fr friends/familie** **4.Food aid** **5.Traded Bartered** **6.Borrowed** **7.Gathering/w fruits** **8.Other (specify)**
Type of food*		**D1**	***D2***	**D3**	**D4**	**D5**	**D6**	**D7**	**TOTAL**	

5.1. Cereals and cereal products *(e.g. sorghum, maize, spaghetti, pasta, anjera, bread*)?										
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).
	In the past 7 DAYS, have there been times when you did not have enough food or money to buy food? If No; END THE INTERVIEW AND THANK THE RESPONDENT **If YES, how often has your household had to:** *(INDICATE THE SCORE IN THE SPACE PROVIDED*)	
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?	
	TOTAL HOUSEHOLD SCORE: **END THE INTERVIEW AND THANK THE RESPONDENT**	