INTEGRATED SMART SURVEY
ISIOLO COUNTY
KENYA
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ACRONYMS

ACF	Action Against Hunger
ANC	Antenatal Care/Clinic
BCC	Behavior Change Communication
BCG	Bacillus Calmette–Guérin
CI	Confidence Interval
CLTS	Community Led Total Sanitation
CNO	County Nutrition Officer
FFA	Food for Assets
GAM	Global Acute Malnutrition
GFD	General Food Distribution
HFA	Height-for-Age
HHs	Households
HINI	High Impact Nutrition Interventions
IMAM	Integrated Management of Acute Malnutrition
IMC	International Medical Corps
KFSSG	Kenya Food Security Steering Group
KNBS	Kenya Bureau of statistics
MNP	Micronutrient Powders
MOA	Ministry of Agriculture
MOH	Ministry of Health
MOW	Ministry of Water
MUAC	Mid Upper Arm Circumference
NDMA	National Drought Management Authority
NIWG	Nutrition Information Working group
OPV	Oral Polio Vaccine
PPS	Probability Proportional to Population Size
SAM	Severe Acute Malnutrition
SFP	Supplementary Feeding Program
UNICEF	United Nations Children's Fund
WFA	Weight for Age
WFH	Weight-for-Height
WFP	World Food Program

EXECUTIVE SUMMARY

The county is located in the pastoral North East cluster covering an estimated area of 25,000 square kilometers. Isiolo County has three major livelihood zones; pastoral all species (67%), Agro-pastoral (26%) and firewood/charcoal (7%) respectively.[1] The county integrated nutrition survey was implemented by Ministry of Health (MoH) and National Drought Management Authority (NDMA) with support from ACF and IMC. The nutrition survey was conducted between 19th January 2015 to 5th February, 2015. The Standardized Monitoring and Assessment in Relief and Transitions (SMART) methodology was employed during the anthropometric survey in planning, training, data entry and analysis. Other data sets including data on nutrition, health, Water, Sanitation and Hygiene (WaSH), food security, were also collected during the survey.

OBJECTIVES

The overall objective of the survey to estimate the prevalence of acute malnutrition amongst children aged 6-59 months. The specific objectives were:

- To determine the prevalence of under nutrition in children aged 6-59 months
- To determine the immunization coverage for measles, Oral Polio Vaccines (OPV type 1 and 3), and vitamin A supplementation in children aged 6-59 months
- To assess coverage and consumption of micronutrients powder in children aged 6-23 months
- To determine maternal nutritional status based on MUAC measurements
- To estimate coverage of iron / folic acid supplementation during pregnancy in women of reproductive age;
- To collect information on possible underlying causes of malnutrition such as household food security, water, sanitation, and hygiene practices
- To build the capacity of the Ministry of Health staff and National Drought Management Authority field monitors

METHODOLOGY

The survey was conducted in Isiolo County covering Garbatulla, Merti and Isiolo sub counties from 19th January to 2nd February 2015. The survey was a cross sectional study using Standardized Monitoring of Relief and Transition (SMART) methodology. Emergency Nutrition Assessment (ENA) for SMART software delta November 2014 version was used for sample size calculation yielding a sample size of 507 households and 489 children. Two stage cluster sampling was used with first stage involving selection of clusters (villages) using ENA for SMART software (November 2014 version) whereby 36 clusters were selected. The second stage involved randomly selection of 14 households per cluster. The target populations were children aged 6-59 months with anthropometric measurement morbidity, immunization and supplementation information collected from the mentioned group. Other information collected included the household demographics, nutritional status and iron folic acid supplementation for women 15-49 years, WaSH, food security and livelihood information. Data analysis was done using ENA for SMART (November 2014 version) for anthropometric measurements and Microsoft excel and SPSS[2] version 17 for morbidity, Immunization, Supplementation, WaSH and food security.

SUMMARY OF KEY FINDINGS

A total of 507 households were sampled with 576 children aged 6-59 months assessed for nutritional status through anthropometric measurements. All the 576 children were incorporated in the final analysis since there were no exclusions of children out of range

[1] NDMA livelihood classification for Isiolo County
[2] Statistical package for social sciences

data sets. The overall survey quality was 6.0% (excellent). Table 1 shows summary of integrated nutrition SMART survey findings for Isiolo County since 2013 to date. The current results indicate an increasing trend in wasting over time based on Global acute malnutrition (GAM) and Severe Acute Malnutrition rates (SAM) weight for height z-scores (WHZ). The GAM and SAM (WHZ) was at 13.2% and 1.7% respectively as of February, 2015. The current GAM and SAM rates compared to 2014 nutrition findings are remain within the same range with two test statistical test indicating no significance difference with p-value of 0.402 and 0.271 respectively. Clusters and sub counties reported with high number of wasted children based on findings include; Merti (Taqwa 2, Lafe and Manyatta Duba), Garbatulla (Haroresa and Duse), Oldonyiro (Lengerema) and Ngaremara (Attan Chini). The current situation could be attributed to prolonged failure of rainfall both long (March-May, 2014) and short rain seasons (October-December, 2014). The short rain assessment of February, 2015 indicated that the County was in integrated phase classification stressed phase however pockets of crisis phase were reported in Garbatulla Sub-county (Sericho, Eldera and Modogashe), Merti sub County (Lafe, Yamicha, Lakole, Awarsitu, Taqwa, Bisan Biliqo) and Isiolo sub county (Oldonyiro and Ngaremara)

Table 1: Summary of Results, Isiolo County; May 2013, February 2014 and January 2015[3]

		Integrated nutrition survey[4]		
INDEX	**INDICATOR**	**May 2013 (weighted SMART results)**	**February 2014 (SMART)**	**February 2015 (SMART)**
WHZ[5]-scores	Global Acute Malnutrition Weight for height <-2 z and/or oedema	8.2% (6.9 - 9.8)	11.5% (8.7-15.2)	13.2%(10.8-16.0)
	Severe Acute Malnutrition Weight for height <-3 z and/or oedema	0.9% (0.5 - 1.6)	1.0% (0.4-2.3)	1.7%(1.0- 3.0)
HAZ[6]-scores	Stunting (<-2 z-score)	20.8% (18.7 - 23.1)	23.2% (19.5-27.3)	18.1%(14.3-22.6)
	Severe stunting (<-3 z-score)	4.5% (3.5 - 5.8)	4.8% (3.1-7.6)	4.5%(2.8- 7.3)
WAZ[7]-scores	Underweight (<-2 z-score)	17.2%(15.3 - 19.3)	21.1% (17.1-25.7)	16.3%(13.1-20.1)
	Severe underweight (<-3 z-score)	3.1% (2.3 - 4.1)	3.4% (2.0-5.8)	1.7%(0.9- 3.2)
MUAC[8]	Global Acute Malnutrition MUAC <125 mm and/or oedema	2.7%	3.4 % (1.9-5.9)	3.5% (2.2- 5.4)

[3] Statistics for anthropometry are as per WHO 2006 Index
[4]Results presented in brackets are expressed with 95.0% confidence interval (CI)
[5] Weight for height Z scores
[6] Height for age Z scores
[7] Weight for age Z scores
[8]Mid upper arm circumference

	Severe Acute Malnutrition MUAC <115 mm and/or oedema	0.5%	0.6 % (0.2-1.9)	0.3% (0.1- 1.4)
Measles immunization coverage	9 Months by card	N/A	62.2%	63.5%
	18 Months by card	N/A	18.9%	32%
Vitamin A coverage	6-11 months ; At least once	N/A	95.5%	58.6%
	12-59 months; once	N/A	27.5%	30.6%
	12- 59 months; at least twice	N/A	70.4%	58.4%
Morbidity Patterns	6-59 Months	Fever with chills like malaria	48.6%	25%
		ARI/Cough	50.2%	58%
		Watery diarrhea	12.6%	16.3%
Maternal Nutritional status by MUAC	Pregnant and Lactating women <210MM		6.4%	7.5%
	All women (15-49)years <210MM		6%	7%
WaSH	Water sources	Piped water/borehole/protected spring /protected wells	69.5%	73.3%
	Distance to main source	≤ 500M	63.1%	67.3%
		>500M-≤2km	17.5%	18.8%
		>2km	19.5%	13.9%
	Hand Washing Behaviors	four critical times	60.4%	51.7%
	Latrine coverage	Latrine ownership	34%	35.8%
Food Security and Livelihood	Food Consumption Score	Poor	2%	4.4%
		Borderline	7.8%	4.8%
		Good	90.2%	89.8%
		Borrow food	4.8	5.1
		Restrict consumption of food by adults for young children to eat	7.2	7.59
		Total weighted coping strategy score	20.7	20.28

SUMMARY RECOMMENDATIONS

The following short-term and long-term recommendations were suggested by County and sub County stakeholders to be activated for action plan.

Table 2: Summary of possible recommendations from survey findings

Findings	Way Forward		By Who?
	Short Term Recommendations	Long Term Recommendations	
Nutrition and Health GAM rates of 13.2% SAM rates of 1.7%	➢ Strengthen linkages IMAM with other existing programs such as GFD, FFA ➢ Activate and update county response plan on the current situation ➢ Mapping of hard to reach areas for outreach support	➢ Strengthen case finding through community units for early detection and treatment of malnutrition	UNICEF, NDMA,MOH,ACF, &IMC MOH, ACF, IMC
Low coverage of vitamin A	➢ Strengthen supply chain mechanisms :from KEMSA to health facility level	➢ Continuous capacity building of health workers to facilitate forecasting and good estimate of supplies	UNICEF, NDMA, MOH, ACF, IMC
Low enrolment in the MNP program (43.2%)	➢ Continuous sensitization and social mobilization ➢ Increased health education on MNPs at health centres	➢ Strengthen awareness and sensitization among community members about MNPs	UNICEF, MOH, WFP, ACF &IMC
Measles at 18 months below national target (55.3%)		➢ Continued follow up of children through growth monitoring to improve coverage of Fully Immunized Children	MOH, ACF, IMC MOH, ACF, IMC
Poor maternal nutrition (7% of total women aged 15-49 and 7.5% PLWs having MUAC of <21cm)	➢ Nutritional education of mothers during ANC/PNC visits and Promotion of iron folate supplementation during pregnancy ➢ Linkages of malnourished PLW to supplementary feeding	➢ Involve women in key decision making process during planning and implementation of key health and nutrition programs, ➢ Empowering women on IGAs i.e. Kitchen gardening, poultry rearing	Community, County Government and Partners
WaSH Increased rates of open defecation from 23.7% to 35%	➢ Follow-up of status of previous recommendations and also on status of interventions directed to 45 ODF Villages in the county ➢ Promote CLTS to reduce open defecation	➢ Integrating BCC in promotion of key sanitation and hygiene practises ➢ Promote CLTS to reduce open defecation	MOH, ACF, IMC and other partners MOW,

Low Household water access in Isiolo County Reduced instances of hand washing	➢ Improve the water access in the short term through expediting water trucking, fuel subsidies to high volume boreholes and establishing RRI borehole repair teams ➢ Increased community sensitization on the importance of hand washing	➢ Construction of additional boreholes, sand dams in water scarce hotspots ➢ Implementation of PHAST and CHAST (In schools)	MOW, ACF & IMC MOH, IMC &ACF
Food security and Livelihood Poor dietary diversity Poor food consumption High CSI Poor dietary intake	➢ Strengthened partnership among partners dealing with food and nutrition ➢ Promote consumption of locally available food e.g. Fish ➢ BCC against negative food taboos such as chicken consumption in some communities ➢ Intensify GFD and FFA among populations with immediate need of food	➢ Promotion of the growth of drought resistant/resilient crops e.g. sorghum and millet. ➢ BCC against negative food taboos such as chicken consumption in some communities	MOH, ACF, IMC and other partners MOA, MOH, NDMA, WFP, and Partners

1.0 INTRODUCTION

1.1 Background Information

Isiolo County is classified as an arid and semi-arid lands of Kenya, located in the Pastoral North East cluster.[9]it covers a surface area of 25, 336 square Kilometers (km^2) with an estimated population of 143,294[10]. It consists of three Sub Counties namely Isiolo, Garbatulla and Merti. The county is characterized by recurrent droughts, hot and dry climate with low and erratic rainfall patterns. The County is mainly inhabited by the Borana, Somali, Turkana, Samburu and Meru communities spread across pastoral all species (67%), Agro-pastoral (26%) and firewood/charcoal (7%) respectively as shown in figure 1.

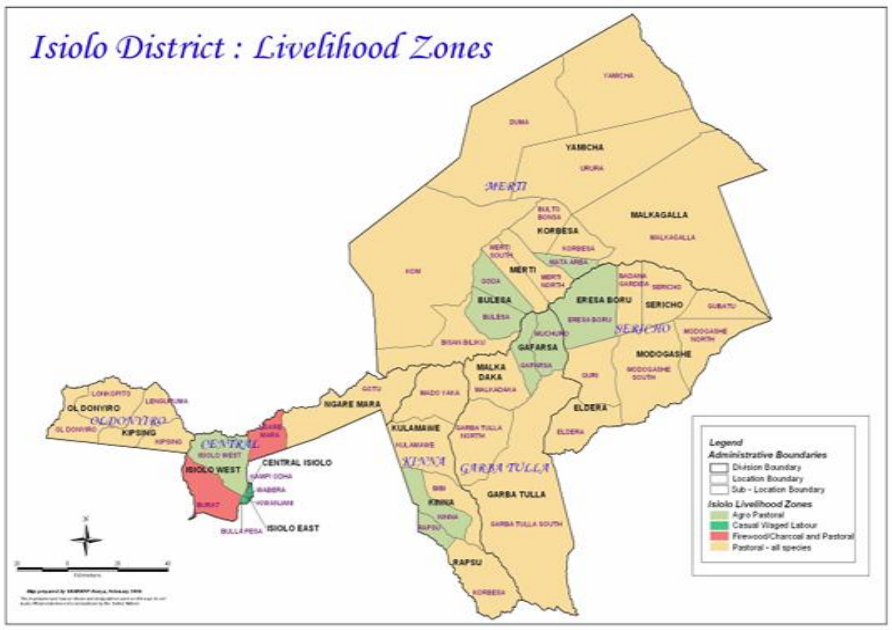

Figure 1: A map of Isiolo County livelihood zones

Isiolo has two rainfall season; long (Mid-March to May) and short rain (October-December) season. The communities depend on short rain season rather than the latter. The seasonal calendar also characterizes dry season into short (January-Mid March) and long dry (June to mid-October) season as seen in figure 2. The integrated nutrition SMART survey was conducted in line to seasonal assessment and survey findings were used to classify and inform on outcome indicators (nutrition status) during short rain assessment in February, 2015. The rainfall seasons have been below average predictions and seasonality norm hindering household food security access to food and income. The short rainfall (October – December, 2014) performance was poor in onset (delayed by three weeks), rainfall amount was below 10millimetres in some areas while the distribution was uneven with most areas recording below average expectations.

[9] KFSSG short rains 2015
[10] KNBS 2009 Population Census report

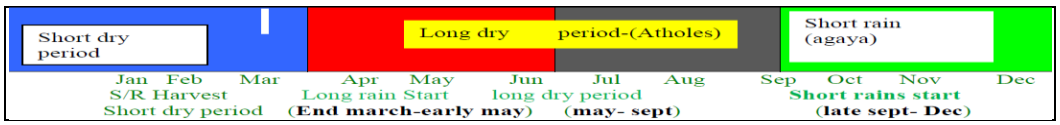

Figure 2: Isiolo County Seasonal calendar

Action Against Hunger (ACF) and International Medical Corps (IMC) in partnership with Ministry of Health (MoH) have been supporting the implementation and scale up of nutrition activities and strengthening health and nutrition systems in Isiolo County since January 2011. Currently, IMC has its operations in Isiolo sub-county, while ACF has its operations in Garbatulla and Merti Sub Counties. In February 2014, the first Integrated Nutrition survey in Isiolo County was carried out, indicating a serious nutritional situation with GAM of 11.5% (8.7-15.2, 95% C.I.) and a SAM of1.0% (0.4-2.3, 95% C.I.). Mortality data revealed Crude Death Rate (CDR) and Under-five Death Rate (U5DR) were 0.57/10,000/day (0.31-1.04 95% C.I.) and <0.001/10,000/day respectively. The National Drought Management Authority (NDMA) early warning indicators reflect looming household food insecurity within the County. The February 2015 Short Rain Assessment (SRA, conducted from 19th to 2nd February, 2015) indicated Integrated Phase Classification (IPC) on acute food security situation at stressed phase with most pastoral areas of Merti, Garbatulla, Oldonyiro in crisis phase. . The County nutrition technical working group guided by Ministry of Health (MoH) took the lead of the assessment activities (planning, training, data collection and dissemination) with ACF and IMC providing technical support.

1.2 Objectives of the Survey

The main objective of the survey was to estimate the prevalence of acute malnutrition amongst children aged (6-59) months in Isiolo County. The specific objectives were:

1. To determine the prevalence of under nutrition in children aged 6-59 months.
2. To determine the immunization coverage for measles, Oral Polio Vaccines (OPV type 1 and 3), and vitamin A supplementation in children aged 6-59 months.
3. To assess MNP coverage and consumption in children aged 6-23 months
4. To determine maternal nutritional status based on Mid Upper Arm Circumference (MUAC) measurements.
5. To estimate coverage of iron / folic acid supplementation during pregnancy in women of reproductive age.
6. To collect information on possible underlying causes of malnutrition such as household food security, water, sanitation, and hygiene practices.
7. To build the capacity of the MOH, NDMA staff and NDMA field monitors.

2.0 SURVEY METHODOLOGY

2.1 Type of Survey

The integrated health and nutrition survey was undertaken in Isiolo County in January and February, 2015 using the SMART methodology. Secondary information review of various existing surveillance data to include; NDMA monthly bulletins, Health Information System (DHIS) and previous assessments was undertaken prior to the survey. The SMART methodology was employed during the anthropometric survey in planning, training, data entry and analysis. Other data sets, to include data on nutrition, health, WaSH, food security and livelihood, were also collected during the survey which covered the three sub counties namely Isiolo, Merti and Garbatulla.

2.2 Sampling Procedures

A sample size of 36 clusters by 14 households was used based on various parameters as indicated in table 3. A two stage sampling methodology was employed. In the first stage 36 clusters were sampled using probability proportional to population size (PPS). Population data was obtained from Kenya Bureau of Statistics (Census 2009) then triangulated with population data from the administrative leaders.The second stage involved obtaining an updated and complete list of households from village elder at the cluster/village level and 14 households were selected using simple random sampling. All the households sampled were interviewed using the household questionnaire and anthropometric measurements taken on all children aged 6-59 months.

Table 3: Sampling Methodology for Anthropometric Survey

Data entered on ENA software	Anthropometric Survey	Rationale
Estimated prevalence of GAM	11.5	February2014 Integrated SMART survey
Desired precision	3.3	The lower the malnutrition prevalence, the higher the precision In order to meet the set objectives
Design effect	1.25	Design effect obtained from nutrition SMART survey 2014 results; to cater for heterogeneity within the County
Average household size	6	From KNBS (Kenya National Bureau of statistics) 2009 census data
Percent of under five children	18.4	Population estimate from DHIS and Census report 2009
Percent of non-respondent	3	To cater for any unforeseen circumstances; based
Households to be included	**507**	
Children to be included	**489**	

2.3 Training Framework

The training of the survey team took place in Isiolo town from 19th to 22nd January 2015. The training covered all the components for an integrated nutrition Survey; focusing on survey objectives, sampling, and data collection tools, anthropometric measurements, interviewing techniques, field procedures and questionnaire administration. The training sessions were facilitated by MoH (led by the County nutrition officer) with technical support from ACF and IMC. A total of 29 persons were trained. A standardization test was also done on 10 children with aim of testing the participants' precision and accuracy in taking anthropometric measurements. A pilot test of two households per team in nearby villages (not sampled) was also conducted on the final day of the training. The experiences and arising challenges were shared and addressed.

2.4 Survey Teams and Supervision

The survey team was composed of 6 team leaders, 18 enumerators and 3 data entry clerks eventually forming 6 teams. The team leaders were obtained from relevant county government ministries. 8 NDMA field monitors and 13 community members used in the previous surveys were considered for enumerator and data entry clerk positions. The coordination and supervision of the entire process was led by the County Nutrition Officer under technical support from ACF and IMC Staff. Data quality assurance process was maintained by observing the following steps:

- Validation of the survey planning and methodology at the Nutrition information working group
- Survey team training in adherence to SMART standards to including undertaking of both standardization and pilot test
- Daily support and supervision of teams at the cluster level
- Daily feedback session through plausibility and questionnaire checks
- Continuous daily data entry and primary analysis of all datasets

2.5 Case Definitions and Inclusion Criteria

Primary data was gathered from the sampled villages to make inferences with regard to the survey objectives for a period of 6 days.

Anthropometric data was collected from all eligible children aged 6-59 months. The children were targeted with the following information

- **Age**: The child's immunization card, birth certificate or birth notification were the primary source for this information. In the absence of these documents, a local calendar of events developed from discussions with community members, enumerators and key informants. Age calculation chart was used for ease of identifying age in months (see Annex).
- **Child's Sex:** This was recorded as either '**m**' for male or '**f**' for female.
- **Weight:** A seca[11]digital weighing scale was used to measure the children's weight. The electronic scales were calibrated on daily basis using a standard weight to confirm measurements and any faulty scales were replaced. In order to enhance accuracy and hence quality, of emphasis was placement of weight scale to a hard flat surface, minimal or no movement of the child and accurate recording of measurements to the nearest 0.1kg

[11]Electronic SECA scale manufactured by Secagmbh& co.kg. Hammer Steindamm 9-25.22089 Hamburg. Germany.

- **Height:** Recumbent length was taken for children less than 2 years of age while those children above 2 years of age were measured standing up. A height board was used to measure length/height. Of emphasis was ideal placement of cursor as per instructions on height measurements (SMART/IMAM[12] guidelines) ensuring minimal or no movement of the child and maintaining height readings at eye level to the nearest 0.1cm.
- **MUAC:** Mid Upper Arm Circumference was measured on the left arm, at the middle point between the tip of the elbow and the tip shoulder bone while the arm is at right-angle, then followed MUAC measurements of the arm while it is relaxed and hanging by the body's side. MUAC was measured to the nearest mm. In the event of a disability on the left arm or a left-handed child, the right arm was used. Of emphasis during the exercise was correct identification of mid-point and correct tension upon placement of MUAC tape on arm.
  Maternal MUAC tapes were used to measure MUAC in women of reproductive age.
- **Bilateral Oedema:** This was assessed by the application of moderate thumb pressure for at least 3 seconds on both feet. If a depression formed on both feet upon pressure application, then presence of bilateral oedema was confirmed.
- **Measles vaccination:** The child's vaccination card was used as a source of verification. In circumstances where this was not available, the caregiver was probed to determine whether the child had been immunized against measles or not (done subcutaneously on the right upper arm). All children with confirmed immunization (by date) on the vaccination card, the status were recorded as "1" (Card) otherwise as "3" (Not immunized). Oral confirmation from the caregiver without proof of card was recorded as "2" (Recall). Children between 9 to 18 months or greater were used to determine coverage of this in the final analysis.
- **Oral Polio Vaccine (OPV) 1 (**1st dose at 6 weeks) **and OPV3** (3rd dose at 14 weeks) was calculated for all children aged 6-59 months.

Other relevant information about the eligible child was also gathered as follows:

- **De-worming:** Determined by whether the child had received drugs for intestinal worms in the past one year. This was recorded as "0" for No, "1" for Yes by card, ''2'' for Yes by recall and ''3'' for Do not know.
- **Vitamin A coverage**: This was determined by the number of times the eligible child had received vitamin A in the past year. The response received (number of times) was probed (to determine where health-facility/outreach sites or elsewhere and the number of times recorded in the card) and eventually recorded on the anthropometric questionnaire.
- **Morbidity:** This was gathered over a two week recall period by interviewing/probing the mothers/caretakers of the target child and eventually determined based on the respondent's recall. This information was however not verified by a clinician.
- **Other data sets**: the Household questionnaire was used to gather data on other variables related to HINI indicators, WaSH (Water Sanitation and Hygiene) and FSL (Food Security and Livelihood).
- **Micronutrient powders**: The eligible children for this information were 6-23 months. The respondent was asked whether the child was enrolled in the program; recorded in the questionnaire as "0" for No and "1" for Yes. Those who said no were probed for reasons as to why not enroll. Those enrolled were probed on adherence.

[12] Integrated Management of Acute Malnutrition

Other data sets: The household questionnaire was used to gather data on health related variables, HINI[13] Indicators, water availability and accessibility, sanitation and hygiene practices, food sources, dietary diversity and coping strategies.

2.6 Data Entry and Analysis

Daily data entry was undertaken for all data sets so as to ensure close supervision and quality of data. Anthropometric data was analyzed in ENA for SMART software January 2015 version. All other data sets were entered and analyzed using Microsoft Excel.

2.7 Indicators, Guidelines and Formulas Used In Acute Malnutrition

Weight for height (WFH) index

This was estimated from a combination of the weight for height (WFH) index values (and/or oedema) and by sex based on WHO standards 2006. This index was expressed in WFH indices in Z-scores, according to WHO 2006 reference standards.

Z-Score:

- Severe acute malnutrition is defined by WFH < -3 SD and/or existing bilateral oedema
- Moderate acute malnutrition is defined by WFH < -2 SD and >-3 SD and no oedema.
- Global acute malnutrition is defined by WFH < -2 SD and/or existing bilateral oedema.

Mid upper arm circumference (MUAC)

MUAC analysis was also undertaken to determine the nutrition status of sampled children and women of reproductive age (15-49 years). The following MUAC criteria were applied.

Table 4: MUAC guidelines

MUAC Guideline	Interpretation
Children 6-59 months	
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)*	Risk of malnutrition
MUAC > 135mm (no bilateral Oedema)	Adequate nutritional status
Women of Reproductive Age (15-49 years)	
MUAC <21-23cm	At Risk of malnutrition
MUAC <21cm	Moderate Acute Malnutrition

2.8 Referrals

During the survey, all severe and moderately malnourished children as per MUAC and Weight-for-Height cut offs were referred to the nearby health facilities. Pregnant and lactating women with MUAC <21cm were also referred.

3.0 SURVEY FINDINGS

3.1 General Characteristics of Study Population and Households

The total population from sampled clusters was 2,441 persons with an average 4.8 persons per household. The average number of children below 5 years of age in a household was 1.3. Upon assessment of the main occupation of household heads, livestock herding

[13]High Impact Nutrition Interventions

(37.1%) and waged casual labor (24.4%) were found to be the major forms of occupation. Other reported forms of occupation were petty trade (10.1%), salaried employment (11.1%), own farm labor (4.4%), firewood and charcoal selling (7.5%) and merchants/traders (2.4%) During the assessment, casual labor (25.6%), sale of livestock (22.0%) and firewood/charcoal at17.5% were reported to be the current main source of income. School enrollment among eligible children (3-18 years) was also assessed with the findings showing that majority (79.0%) were enrolled in school at different levels. The main reasons for not attending school were children thought to be under age (40.3%), family labor responsibilities (23.7%), distance to the nearby school (19.3%), households (16.1%) not seeing the value of schooling and some households too poor to buy school items (5.7%).

3.2 ANTROPOMENTRY

3.2.1 Distribution by Age and Sex

The anthropometric measurements involved 576 children aged 6-59 months, who were all involved in the analysis. The overall score for the survey was 6% (interpreted as excellent as per the plausibility check). The boys and girls involved in the anthropometric measurements were equally distributed. The boy: girl ratio was 1.08 which is within the estimated range of 0.8-1.2 with a p value of 0.359.The table below shows distribution by age and sex of the sampled children.

Table 5: Distribution by age and sex

	BOYS		GIRLS		TOTAL		RATIO
AGE(months)	no	%	No	%	no	%	Boy: Girl
6-17	83	51.9	77	48.1	160	27.8	1.1
18-29	65	46.4	75	53.6	140	24.3	0.9
30-41	78	56.5	60	43.5	138	24.0	1.3
42-53	49	52.7	44	47.3	93	16.1	1.1
54-59	24	53.3	21	46.7	45	7.8	1.1
TOTAL	299	51.9	277	48.1	576	100.0	1.1

3.2.2 Nutritional Status of Children 6-59 Months

3.2.2.1 Prevalence of global acute malnutrition based on Weight-for -Height Z score

The survey used World Health Organization 2006 growth standards as a reference to determine the nutritional status. A total of 576 children 6-59 months were included in the analysis. The findings established a GAM prevalence of 13.2% (10.8-16.0, 95%CI) classified as serious (WHO 2000[14] Classification) and SAM prevalence of 1.7% (1.0-3.0, 95%CI). This presents an observed increase as compared to previous year same period though not significant (with p value of 0.402 and 0.271 for GAM and SAM respectively). The increase was attributed to the worsening drought situation, in addition to increase in disease incidences (ARI 58% and watery diarrhoea 16.3% due to dry, dusty and windy conditions and compromised hygiene and sanitation practices, see section 3.4). It was also attributed to the compromised food security situation with household having more than one coping strategy mechanisms and poor dietary diversity due to limitation in food availability, access and poor performance of long and short rains in the county (see section 3.9).

[14]WHO (1995/2000), Classification of public health significance for children aged less than five years

The survey anthropometric data indicated high pockets of malnutrition (wasting) based on weight for height z-scores in Taqwa2, Lafe, Manyatta Duba (Merti), Haroresa, Duse (Garbatulla), Attan Chini (Ngaremara) and Lengerema (Oldonyiro). The survey results also illustrated no differences in GAM rates among boys and girls. Table 6 shows prevalence of global acute malnutrition (GAM) and Severe acute malnutrition (SAM) based on WHZ.

Table 6: Prevalence of global acute malnutrition based on Weight-for -Height Z score (and/or oedema) and by sex

	All n = 576	**Boys** n = 299	**Girls** n = 277
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(76) 13.2 % (10.8 - 16.0 95% C.I.)	(44) 14.7 % (10.7 - 19.9 95% C.I.)	(32) 11.6 % (8.5 - 15.5 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(66) 11.5 % (9.2 - 14.2 95% C.I.)	(38) 12.7 % (9.0 - 17.7 95% C.I.)	(28) 10.1 % (7.3 - 13.9 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(10) 1.7 % (1.0 - 3.0 95% C.I.)	(6) 2.0 % (0.9 - 4.2 95% C.I.)	(4) 1.4 % (0.5 - 3.8 95% C.I.)

The Gaussian curve (Figure 3) indicates that the sample curve has deviated to the left of the reference population with a mean and standard deviation based on WHZ[15](n=576) at-0.99 and ±0.9 respectively.

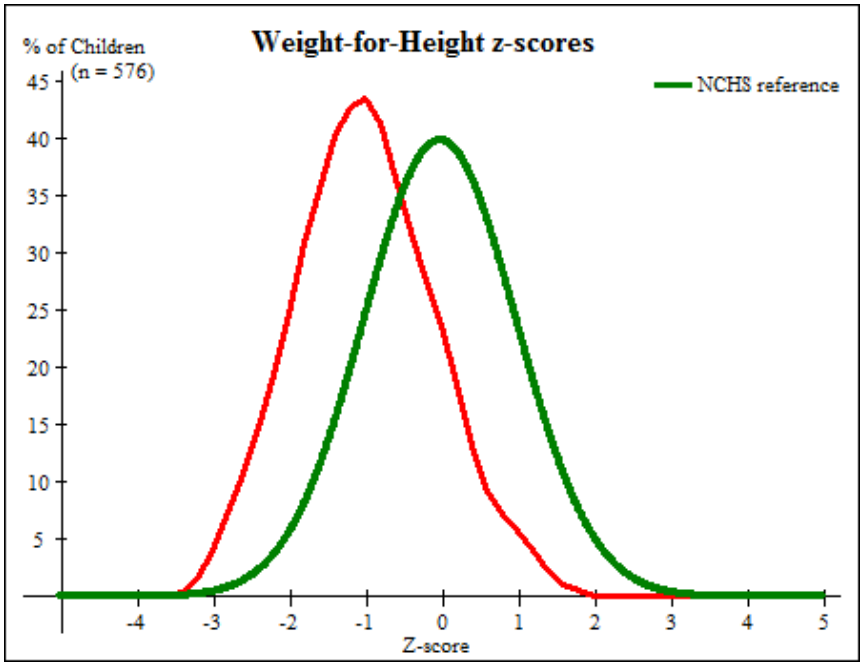

Figure 3: Frequency of distribution of WFH

The overall wasting levels based on weight for height z-scores by severity and specific age groups is highlighted in table 7. The SAM by WHZ levels was highest among age group 6-17

[15] Weight-for –height Z score

months at 2.5% while MAM rates by WHZ was highest among children aged 18-29 and 30-41 months as illustrated in table 3.

Table 7: 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	160	4	2.5	8	5.0	148	92.5	0	0.0
18-29	140	2	1.4	23	16.4	115	82.1	0	0.0
30-41	138	1	0.7	20	14.5	117	84.8	0	0.0
42-53	93	3	3.2	9	9.7	81	87.1	0	0.0
54-59	45	0	0.0	6	13.3	39	86.7	0	0.0
Total	576	10	1.7	66	11.5	500	86.8	0	0.0

3.2.2.2 Distribution of acute malnutrition and Oedema based on weight-for-height z-scores

In Isiolo survey there were no oedema cases. Ten children were categorized as marasmic (1.7%). The results are as shown in table 8.

Table 8 : 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. 10 (1.7 %)	Not severely malnourished No. 566 (98.3 %)

3.2.2.3 Prevalence of Acute Malnutrition by MUAC

MUAC (Mid upper arm circumference) indicator measurements are used for early detection and referral of children with malnutrition.Based on MUAC measurements, GAM prevalence in Isiolo County was 3.5% (2.2-5.4, 95% C.I., Table 9 below), which is a slight increase from 3.4% (1.9-5.9, 95% C.I) though not significantly different.

Table 9: Prevalence of acute malnutrition based on MUAC cut offs (and/or Oedema) and by sex expressed with 95% CI

	All n = 576	Boys n = 299	Girls n = 277
Prevalence of global malnutrition (< 125 mm and/or oedema)	(20) 3.5 % (2.2 - 5.4 95% C.I.)	(7) 2.3 % (1.1 - 5.1 95% C.I.)	(13) 4.7 % (2.6 - 8.4 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(18) 3.1 % (2.0 - 4.9 95% C.I.)	(7) 2.3 % (1.1 - 5.1 95% C.I.)	(11) 4.0 % (2.2 - 7.0 95% C.I.)

Prevalence of severe malnutrition (< 115 mm and/or oedema)	(2) 0.3 % (0.1 - 1.4 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(2) 0.7 % (0.2 - 2.9 95% C.I.)

3.2.2.4 Prevalence of underweight by Weight-for-age (WFA) Z-scores

Moderate malnutrition (underweight) is defined as low weight for age with a Z-score between <-2 and -3 and for severe malnutrition with a Z-score < -3.The survey unveiled underweight rates of 16.3% (13.1-20.1, 95 %CI) which is a decrease from 21.1% (17.1 - 25.7 95% C.I., Table 10), not significantly difference with p-value of 0.0876.

Table 10: Prevalence of underweight based on weight-for-age z-scores by sex results expressed with 95% CI

	All n = 576	**Boys** n = 299	**Girls** n = 277
Prevalence of underweight (<-2 z-score)	(94) 16.3 % (13.1 - 20.1 95% C.I.)	(49) 16.4 % (12.4 - 21.3 95% C.I.)	(45) 16.2 % (11.5 - 22.5 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(84) 14.6 % (11.6 - 18.2 95% C.I.)	(44) 14.7 % (11.1 - 19.3 95% C.I.)	(40) 14.4 % (9.9 - 20.5 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(10) 1.7 % (0.9 - 3.2 95% C.I.)	(5) 1.7 % (0.6 - 4.6 95% C.I.)	(5) 1.8 % (0.8 - 4.2 95% C.I.)

3.2.2.5 Prevalence of stunting based on height-for-age z-scores

Stunting is a reduced growth rate in human development. It is a primary manifestation of malnutrition and recurrent infections in early childhood and even before birth, due to malnutrition during fetal development brought on by a malnourished mother. The definition of stunting according to the World Health Organization (WHO) is when the "height for age" value is less than two standard deviations of the WHO Child Growth Standards median.[16]Stunted growth in children has public health impact apart from the obvious impact of shorter stature of the person affected. Stunting also leads to greater risk for illness and premature death, may result in delayed mental development and therefore poorer school performance and later on reduced productivity in the work force, and reduced cognitive capacity[16]. Stunting rate was 18.1% (14.3-22.5, 95% C.I.) which is a slight decrease from 23.2 % (19.5 - 27.3, 95% C.I.), unveiled in 2014 though not significantly different with p-value of 0.0841. The prevalence of stunting remained stable i.e. below WHO critical levels. Stunting compromises child growth status, as child age increases “short stature” will be evident.

[16] WHO November 2014

Table 11: Prevalence of stunting based on height-for-age z-scores and by sex results expressed with 95% CI

	All n = 576	Boys n = 299	Girls n = 277
Prevalence of stunting (<-2 z-score)	(104) 18.1 % (14.3 - 22.6 95% C.I.)	(62) 20.7 % (15.3 - 27.5 95% C.I.)	(42) 15.2 % (10.8 - 20.9 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(78) 13.5 % (10.6 - 17.2 95% C.I.)	(48) 16.1 % (11.8 - 21.5 95% C.I.)	(30) 10.8 % (7.4 - 15.6 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(26) 4.5 % (2.8 - 7.3 95% C.I.)	(14) 4.7 % (2.6 - 8.1 95% C.I.)	(12) 4.3 % (2.2 - 8.3 95% C.I.)

3.3 Child Immunization, Vitamin A Supplementation and Deworming

Immunization builds child immune system to fight and respond to diseases. The Kenya ministry of health under the expanded programme on immunization aims to increase access to immunization services nationwide in order to reduce morbidity and mortality which is in line to United Nations Millennium Development Goal 3 which aims to reduce infant and child morbidity and mortality (MDG)[17]. In Isiolo county Oral Polio Vaccine (OPV 1 at 6 weeks) immunization by card and recall was at 71.2% and 28% respectively. There was a reported slight increase since 2014 at 69.7% and 28.9% by card and recall respectively. OPV3 at 14 weeks was at 70% by card and 28.2% by recall which is also an increase from 2014 which was at 68.7% by card and 28.9% by card this show that there is increased adherence to OPV3 among the community members. (OPV 1) and (OPV3) are above the national target of 80%. BCG immunization verified by presence of a scar on the left arm was at 92.4% which is an increase from 89.2% in 2014. Measles vaccination at 9 months was at 63.5% by card and 28.9% by recall which is an increase from 2014 which was at 62.2% by card and 27.2% by recall. The increase in immunization coverage is attributed to improved reporting and consistent national and County campaigns. Measles at 18 months was at 32% by card and 23.3% by recall which was an increase from 2014 which was at 18.9% by card and 10.2% by recall. However for both years the overall rate was below the national target of 80%, this is attributed to minimal awareness by caregivers since the vaccine was rolled out in 2014.

Vitamin A supplementation is important among young children (6-59 months) because it reduces all-cause mortality[18].In Kenya, up to 85 % of children are vitamin A deficient, putting them at risk of illness and death[19]. Supplementation of children aged 6-11 Months (received one time) and 12-59 months (those who received twice) declined significantly compared to 2014 as shown in Table 12 below this was attributed to a major stock out reported in the month of May to October 2014. Vitamin A supplementation (once) for children (12-59 months) remained stable.

Table 12: Vitamin A supplementation

		2014	2015
6-11 Months	At least once	95.5%	58.6%
12-59 Months	One time	27.5%	30.6%
	At least twice	70.4%	58.4%

[17] Kenya comprehensive multiyear plan for 2011-2015
[18]World Health Organization (WHO) 2009
[19]the Micronutrient Initiative

Deworming is defined as the giving of an anthelmintic drug as a preventive as well as a treatment method for helminthes e.g. soil helminthes in children which can be treated by administering mebendazole or albendazole. To reduce the worm burden, World Health Organization (WHO) recommends periodic drug treatment (deworming) of all children living in endemic areas, health and hygiene education and provision of adequate sanitation[20]. Deworming in Isiolo County was assessed in children 12-59 months in the past one year. The deworming rates for those who dewormed once was 41.7% which was a slight increase from 37% in 2014. However for those who dewormed twice as per the Ministry of Health recommendations were 28.1% which was a decline from 32.2% in 2014,this was attributed to stock out persistence between months of March to May 2014.

3.4 Child morbidity

3.4.1 Incidence of disease among children 6-59 months

A two week recall period prior to the survey was used determine morbidity among children 6-59 months. 34.7% of the children were reported to be sick. Those who reported to suffer from fever with chills like malaria declined from 48.6% in 2014 to 25 %.Incidences of acute respiratory infections (ARI) /cough increased from 50.2% in 2014 to 58%, attributed to the dry and windy condition There was an increase in watery diarrhea incidences from 12.6% in 2014 to 16.3%; this is attributed to water scarcity as result of the worsening drought condition leading to compromised access to safe water, suboptimal hygiene and sanitation practices. Incidences of bloody diarrhea and other illnesses (skin, eye and ear infections) were at 0.5% and 2% respectively.

3.4.2 Health Seeking Behavior

Assessment of health seeking behavior among caregivers for children reported sick, revealed 80.5% of the caregivers sought assistance; an increase compared to 2014 which was at 64.2% while 19.5% did not seek assistance. The survey unveiled that majority of the caregivers 57.8% sought assistance from the public clinic however this was a decline from 64.2% in 2014 and an increase in those who sought assistance from traditional healer/local herbs from 4% in 2014 to 21.1%,, this can be attributed to pastoral households moving away from areas where health facilities are accessible in search of water and pastures. Other sources of treatment sought by caregivers included private clinic 14.9%, shop/kiosk 1.2%, community health worker 1.2% and mobile clinic 3.7%.

3.4.3 Therapeutic Zinc supplementation in treatment of watery Diarrhea

Zinc benefits children with diarrhea because it is a vital micronutrient essential for protein synthesis, cell growth and differentiation, immune function, and intestinal transport of water and electrolytes. Zinc supplementation has been found to reduce the duration and severity of diarrheal episodes and likelihood of subsequent infections for 2–3 months[21].In Isiolo county 56.7% of the children who suffered from watery diarrhea used zinc supplementation, this is a decrease from 71% in 2014.In both years the proportion of those who supplemented zinc was below the national target.

[20] e-Library of Evidence for Nutrition Actions (eLENA)

[21]Bhutta ZA et al. Therapeutic effects of oral zinc in acute and persistent diarrhea in children in developing countries: pooled analysis of randomized controlled trials. American Journal of Clinical Nutrition, 2000, 72(6):1516–22.

3.5 Micronutrient powder supplementation

3.5.1 Coverage of the Micronutrient powder program

Home fortification with micronutrient powder (MNP) has been shown to be a low-cost, feasible, and effective approach to address micronutrient deficiencies[22]. A large-scale program distributing micronutrient powder was rolled out in Isiolo County by the World Food Program in September 2014 with the Ministry of Health, ACF and IMC supporting through implementation. The program targets children aged 6-23 months. In the survey only 241 children were eligible. 43.2% were enrolled in the while 56.8% were not. The low enrolment is attributed to the fact that the program has been operational for five months in the county, therefore the results should be used with a disclaimer that current coverage does not have baselines for comparability and NITWG[23] are currently reviewing the tool/indicator. The survey further assessed reasons why 56.8% of the eligible children were not enrolled and 51.8% reported that they were not aware of the program this can be attributed to the short period the program has been operational in the county leading to minimal awareness. Table 13 gives the reasons why eligible children were not in the program.

Table 13: Reasons for not being in the MNP program

Reason for not being enrolled	Percentage of the households
Didn't know about the program	51.80%
Discouraged from what I heard about MNPs from caregivers	30.70%
Child had not fallen ill, didn't go to the h/facility	5.10%
Facility/outreach was too far	25.50%
Child receiving therapeutic/supplementary foods	7.80%

3.5.2 Consumption and adherence of MNP

The survey further assessed the consumption and adherence. Out of (42.3%n= 104) of the children who were enrolled only (50.9% n= 53) consumed in the last 7 days and (49.1% n=51) did not consume. Among those who did not consume 45.1% cited that the child did not like. Among those who consumed only, (71.7% n=38) adhered to the recommended alternate days.

3.6 Maternal Health and Nutrition

3.6.1 Iron folate supplementation during pregnancy

Maternal health refers to the health of women during pregnancy, childbirth and the postpartum period[24].The survey assessed iron/folate supplementation based on the current

[22] US National Library of Medicine
[23] Nutrition Information Technical Working Group
[24] WHO maternal health

pregnancy, and maternal nutritional status based on MUAC[25] for Pregnant Lactating Women (PLW). 72% of the pregnant mothers reported to have consumed the pills. However there was low utilization with 3.1% meeting the recommended 90 days, this can be attributed to minimal nutritional education of mothers during ANC[26]/PNC[27]visits. The table below shows iron-folate supplementation during recent pregnancies.

Table 14: Iron-Folate supplementation in pregnancy

Consumption in days	Percentage of women
30 days	86.20%
60 days	10.60%
90 days	3.10%

The major reasons contributing to low consumption of iron-folate supplements above 90 days as recommended could be attributed to low literacy levels among pregnant mothers, ignorance, side effects experienced from consumption of the supplement (bad taste and nausea) pregnant mothers visit health facilities for antenatal care towards the end of the third trimester.

3.6.2 Maternal nutrition status based on Mid Upper Arm Circumference (MUAC)

The nutritional status by MUAC of all the pregnant and lactating women was at 7.5% which is an increase from 6.4% in 2014; this is attributed to poor dietary diversity and high maternal workload. Table 10 shows MUAC distribution in PLW[28] and all women of reproductive age.

Table 15: Distribution of MUAC in PLW and all women of reproductive age

MUAC<210MM	2014	2015
PLW	6%	7%
15-49 YEARS	6.4%	7.5%

3.8 Water Sanitation and Hygiene (WaSH)

3.8.1 Water

As per the 2015 Isiolo County Short Rains Assessment findings, the county experienced delayed onset and early cessation of the October to December short rains thereby exacerbating the current water shortage. Garbatulla, Sericho and Oldonyiro experienced remarkably high incidences of acute water shortage. Safe water sources (piped water syste, boreholes, protected spring and protected shallow wells) were the main sources for drinking water utilized by 73.3% of the households in Isiolo County as illustrated in table 16.

Table 16: Main source of drinking water

Source of water	2014	2015
Piped Water System	69.50%	73.30%
Unprotected Shallow Wells	15.50%	9.90%

[25]Mid Upper Arm Circumference
[26]Antenatal clinic
[27] Post natal clinic
[28]Pregnant and lactating women

River/Springs	13.90%	9.10%
Earth pans/Dams	1.20%	3.80%

Majority of the households (67.3%) had water points within a distance of 500 meters from their homestead as shown in table 17. The migration has led to household moving near the water sources hence reducing the trekking distance.

Table 17: Distance to main water source

Distance to water source	SMART 2014	SMART 2015
≤ 500m	63.10%	67.30%
> 500m -≤ 2km	17.50%	18.80%
> 2km	19.50%	13.90%

The low performance, late onset and early cessation of the October to December short rain resulted to acute water shortage[29]. Most open water sources dried up with some leaving surface water unsafe for human consumption. 31% of the household were not able to meet the minimum sphere threshold water consumption of at least 15 litres per day as shown in figure 5.

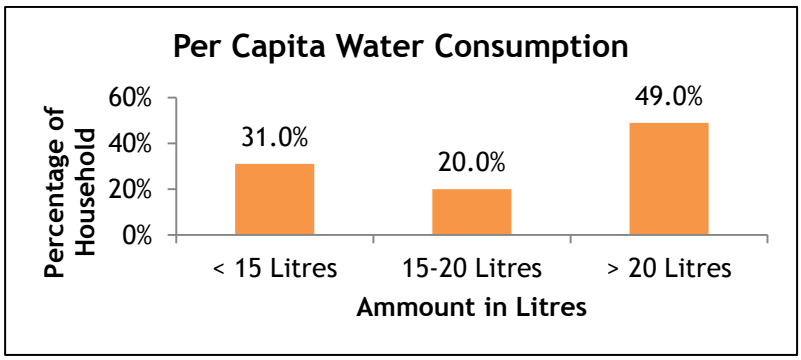

Figure 4: Per capita water consumption**3.8.2 Hygiene Practices**

There was a decrease in proportion of caregivers who washes their hands in all of the four critical hand washing times compared to 2014 as shown in figure 6. This could be attributed to shortage of water among the pastoral livelihood and low awareness of optimal hygiene practices. Increase in hygiene related diseases such as upper respiratory tract infections and diarrhea could be attributed to reduced hand washing.

[29] Isiolo County Short Rains Assessment Report, February 2015

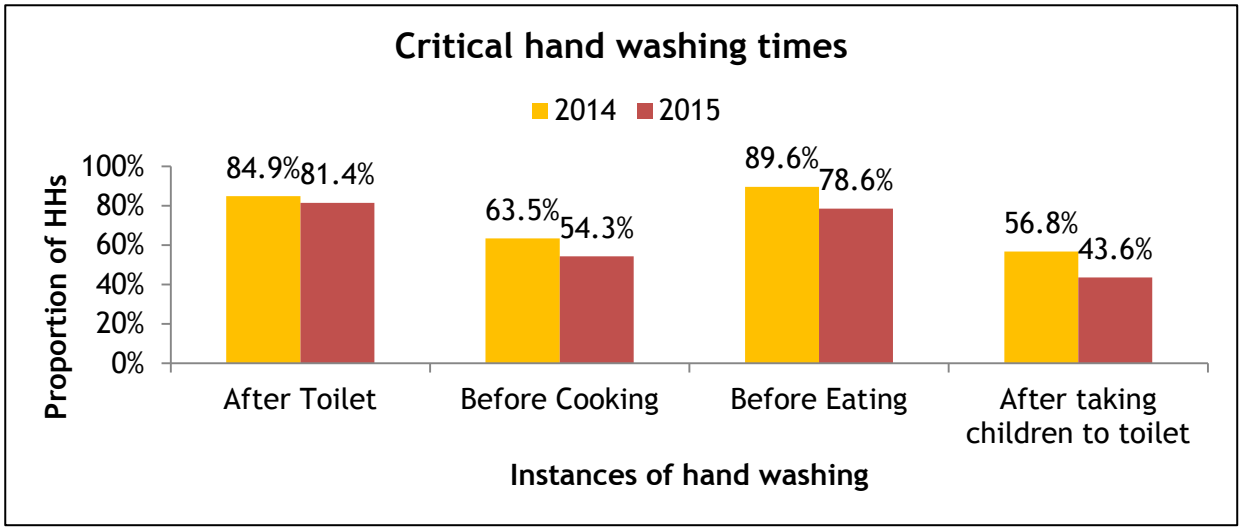

Figure 5: Critical hand washing times

Caregivers who observed the four critical hand washing times were 51.7% (n=58). Only 58.5% (n=167) used recommended soap and water in washing their hands. This was a decrease compared to 2014 results with those using only water increasing from 28.7% to 38.6% as shown in table 18.

Table 18: Hand washing practices

Hand washing practices	SMART 2014	SMART 2015
Only water	28.70%	38.60%
Soap and Water	70.70%	58.50%
Soap when I can Afford	0.60%	2.80%

3.8.3 Sanitation Practices

Safe and appropriate disposal of human waste is crucial to avoid food and water borne diseases. Proportion of household owning toilet slightly increased from 34% to 35.8%. Open defecation significantly increased compared to 2014, from 24% to 35% while concurrently, the proportion of population that shared latrines also significantly dropped from 42% to 29% as shown in table 19.

Table 19: Point of human waste disposal

Point of human waste disposal	SMART survey2014	SMART survey 2015
Open defecation	23.70%	35%
Share latrine	42.40%	29%
Own latrine	33.90%	35.80%

3.9 Food Security and Livelihoods

3.9.1 Food security Information

The food security situation in Isiolo County has remained worse since October 2014 owing to poor performance of October-December short rainfall season. In December 2014, livestock body condition was fair and crops planted in the agro pastoral zones withering as

rains ceased earlier than normal[30,31]. The short rain assessment of February, 2015 indicated that the County was in IPC stressed phase however pockets of crisis phase were reported in Garbatulla Sub-county (Sericho, Eldera and Modogashe); Merti sub County (Lafe, Yamicha, Lakole, Awarsitu, Taqwa, Bisan Biliqo) and Isiolo sub county (Oldonyiro and Ngaremara). The food security situation is expected to deteriorate owing to increased food prices as a result of food commodities shortage, reduced terms of trade among the pastoral livelihood

3.9.2 Household dietary diversity

Dietary diversity was based on 24 hour recall to assess the different food groups consumed by the household. A total of 16 food groups were assessed and later aggregated to 12. Figure 7 below shows the proportions of household sample who consumed the various food groups.

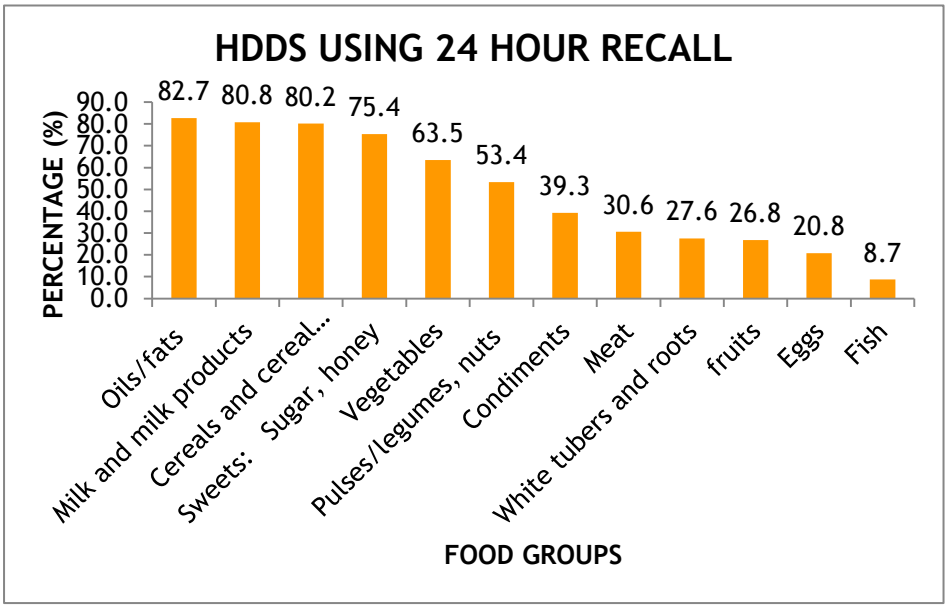

Figure 6: Dietary diversity (based on 24 hour recall)

Consumption of high nutrient dense food (meat, pulses, eggs) was low compared to less nutrient dense food (cereals, sweets, fats/oils). Milk was the most consumed nutrient dense food at 80.8%. Compared to the results of 2014 survey, consumption of fish increased from 0.6% to 8.7%.

[30] NDMA Early Warning Bulletin, December 2014.
[31] Isiolo Short Rain Assessment Report, February 201

Table 20: Food groups consumed by >50% of households by dietary diversity tercile (24 hour recall)

Lowest dietary diversity (=< 3 food groups-18.8%)	Medium dietary diversity (4 and 5 food groups-27.0%)	High dietary diversity (=> 6 food groups-54.2%)
Sweets/Sugars	Cereals	Cereals
Cereals	Milk and milk products	Milk and milk products
Fats/oil	Oils/Fats	Condiments
	Sweets/sugars	Oils/Fats
		Meats
		Sweets/sugars
		Vegetables

Households classified under the lowest dietary diversity consuming less than three meals mainly sugars and sweets, cereal and oils were at 18.8% a slight improvement compared to 2014 at 27%. Households classified under high dietary diversity consuming more than six food groups were at 54.2%. However, dietary diversity terciles are proxy measure of food consumption of above 50% of the household. Generally, the poor dietary diversity was attributed to crop failure among agro pastoral livelihood zones, increased food prices and reduced income. Milk production was poor attributed to reduced water and pasture and outbreak of livestock diseases (Foot and mouth disease, east coast fever and lumpy skin disease)[32]. Majority of household sought their food through purchases from local markets. There were no market disruptions in major markets to include Isiolo central and Oldonyiro. Food prices in centres like Kipsing, Dadachabasa, Merti, Sericho and Iresaboru are too high because of inaccessibility to major markets in Isiolo and Meru.

3.9.3 Micronutrient dietary diversity

Micronutrient deficiencies pose a global public health problem increasing the general risk of infectious illness and of dying from diarrhoea, measles, malaria and pneumonia. Further analysis of all foods based on specific foods available was done as indicated in table 21. Further analysis was done to assess the consumption of micronutrient rich foods. Food rich in micronutrients were classified under six food groups using World Food Program (WFP) food security indicators tool as shown in the table 21.

Table 21: Micronutrients food groups

Food Groups	Local examples
Staples	• Cereals such as maize meal (ugali), rice, pasta, bread , Corn soy blend (from ration) • White tubers such potatoes, sweet potatoes (from markets)
Protein rich foods	• Pulses such as bean, peas, • Eggs • Milk and dairies • Fish(mud fish, Omena from markets)
Fruits and vegetables	• All fruits such as mango, papaya, orange, banana, lemon • All vegetables such as carrot, pumpkin, spinach, kales

[32] Short Rain Assessment results, February 2015

Iron rich foods	• Green leafy vegetables (iron rich): spinach, kales • Flesh meats • Organs meat such as liver, kidney and heart • Fish
Vitamin A rich food	• Orange Vegetables (vitamin A rich): carrot, pumpkin, • Orange fruits (vitamin A rich):mango, papaya, Orange
Oils and fats	• Cooking fat and oil, margarine

Consumption of iron rich food frequently for the last seven days was at 44.8%. Consumption of vitamin A rich food was low with 44.6% not consuming vitamin A rich food seven days prior to the survey.

3.9.4 Food Consumption Score

Food consumption score was based on 7 days recall to capture elements in food consumption and food access. Food consumption score is a proxy indicator of the current food security situation[33] and combines measurements of dietary diversity, the frequency with which different foods are consumed and the relative nutritional importance of various food groups[34]. Majority of the household were within good food consumption score attributed to consumption of Cereal, protein and milk (>5/week), or fruit or vegetable, oil and sugar. There was a slight decrease in percentage of households with good food consumption score and increase in those with poor food consumption score as shown in the table 22.

Table 22: Food Consumption Score

Main Threshold	Nomenclature	2014 Findings	2015 Findings N=504
0-21	Poor food consumption score	**2.0%**	(n=21) **4.4%**
21.5-35	Borderline food consumption score	**7.8%**	(n=29) **5.8%**
>35.5	Good food consumption score	**90.2%**	(n=453) **89.8%**

3.9.5 Coping Strategy Index

The Coping Strategies Index (CSI) is a simple and easy-to-use indicator of household stress due to a lack of food or money to buy food. A total of 452 households (89.7%) were embraced one or more of the coping strategies with a total weighted score of 20.23. This was a slight decrease in total weighted score and increase in the weighted score of most severe strategies (restricting consumption of adult to allow young children to eat and borrowing food) compared to 2014 SMART survey as shown in table 23.

[33]Food Consumption Scores and IPC by World Food Programme, 2009
[34]Ruel, M.T., Is Dietary Diversity an Indicator of Food Security or Dietary Quality? A Review of Measurement Issues and Research Needs. Discussion paper 140. Washington D.C, 2003

Table 23: Coping Strategy Index

Coping strategy	2014 Weighted Score	Percentage of HH (N=503)	Frequency score (0-7)	Severity score (1-3)	2015 *weighted score*
Rely on less preferred & less expensive food	**2.8**	77.7% (n=392)	2.63	1	**2.63**
Borrow food	**4.8**	65.4% (n=363)	2.55	2	**5.1**
Limit portion sizes	**2.8**	69.2% (n=349)	2.44	1	**2.44**
Restrict consumption of food by adults for young children to eat	**7.2**	69.4% (n=330)	2.53	3	**7.59**
Reduced number of meals	**3.1**	68.9% (n=348)	2.47	1	**2.47**
Total weighted coping strategy score	**20.7**				**20.23**

4.0 CONCLUSION

Acute malnutrition rates based on Weight for Height z-scores (WHZ) in Isiolo County are currently at serious WHO classification levels. The Global Acute Malnutrition (GAM) and Severe Acute Malnutrition (SAM) rates at 13.2% and 1.7% slightly increased when compared to 2014 GAM and SAM rates of 11.5% and 1.0% respectively. Certain pockets in pastoral and agro-pastoral areas have high malnutrition rates as compared to County estimates. The current stunting and underweight rates are at 18.1% and 16.3%, a slight increase compared to 2014 rates of 23.2% and 21.0% respectively. Maternal malnutrition rates based on Mid Upper Arm Circumference (MUAC) less than 21 centimeters (cm) among pregnant and lactating mothers increased from 6.4% in 2014 to 7.5% in 2015. The deterioration in acute malnutrition might be attributed to compromised household food insecurity and increased child illnesses. The IPC acute food insecurity based on short rain assessment conducted in February 2015 indicated the County at stressed phase (level 2) with pockets of Merti and Garbatulla in crisis phase (level 3) with estimated total population in need of food assistance at 45.1%. Water access and safety remains a big burden to most households with WaSH indicators below SPHERE thresholds. The current latrine coverage is at 35.8% below SPHERE recommendation of 50%. Increased incidences child illnesses namely upper respiratory and watery diarrhea was observed.

5.0 RECOMMENDATIONS

Prior to developing the recommendations, previous SMART survey (February, 2014) recommendations and its implementation status were reviewed by County stakeholders as indicated in table 24.

Table 24: Previous SMART survey (February, 2014) recommendations and implementation status

Findings	Discussions/way forward	Implementation Status
Nutrition and Health	-Need to scale up disease surveillance and include severe acute malnutrition as part of the weekly surveillance	SAM being reported as a priority disease, as part of the weekly disease surveillance
	-Upscale Food for Assets beneficiaries and engage mothers in the cash transfer program as they are more responsible in ensuring household food availability. - Improving protection Rations so as to supplement IMAM programs and avoid sharing. -Need to have a Contingency plan to respond to the situation before it worsens	The number of both FFA and GFD beneficiaries increased from 49,300 (2014) to 64,500 (2015) NDMA in collaboration with MOH supported upscale of outreach activities in the county for 5 months
	-Need to carry out health education to mothers on the importance of the supplement at the facility level. -Need to change the approaches used on health education by using model mothers and or group counseling rather than individual counseling.	Ongoing during ANC visits Health educations sessions done during ANC visits
Food Security and Livelihood situation	-Women education, through MTMSGs or other groups, to take advantage of national women enterprise funds for micro-enterprises and savings	Women not yet linked to national enterprise funds
	-Community education on the importance of livestock off takes during drought; based on situation scenario.	Done during drought by County livestock ministry and community based organizations
	-Nutrition education and food demonstrations to improve on diversity and maximize the use of locally available foods.	Not yet done
	-Identification of key nutritious foods that can be produced within the County hence they are available at an affordable price to act as a game changer.	Ongoing: Expansion of irrigated crop production under irrigated agriculture, Promotion of drought tolerant crops (THVC) and Water harvesting for crop production (water pans)
	-Link with home economic and nutrition staff to increase awareness on nutrition education among agricultural extension workers.	Not yet done; Plans are underway
Water and Sanitation Hygiene	-Health education on importance of using latrines Make the community members open defecation free (ODF) to ensure behavior change through triggering Community Led Total Sanitation (CLTS)	Ongoing ODFs villages have not improved (45) since 2013
	-Water trucking to these areas required as an immediate temporary action to save the situation. -Permanent water sources installed as part of longer solution to water problems.	Water trucking done; Situation improved during the short rains. However, this was temporary as most river water sources are diminishing

	-Provision of water treatment chemicals through the health facilities	Done during outreaches
	-Need to strengthen community health promotion through the public health department and also to understand the community knowledge gaps.	Ongoing through community dialogues in areas with community units PHP on hand washing done through outreaches and MTMSGs

Based on the finding of this survey and in consultation with the county nutrition technical forum, recommendations were made as shown in table 25.

Table 25: 2015 SMART survey (February, 2015) recommendations as suggested by stakeholders at County levels

Findings	Way Forward		By Who?
	Short Term Recommendations	Long Term Recommendations	
Nutrition and Health GAM rates of 13.2% SAM rates of 1.7%	➢ Strengthen linkages IMAM with other existing programs such as GFD, FFA ➢Activate and update a county response plan on the current situation ➢Follow up of status of previous recommendations ➢Mapping of hard to reach areas for outreach support	➢Strengthen case finding through community units for early detection and treatment of malnutrition	UNICEF, NDMA,MOH,ACF, &IMC MOH, ACF, IMC
Low coverage of vitamin A	➢Strengthen supply chain mechanisms :from KEMSA to health facility level	➢ Continuous capacity building of health workers to facilitate forecasting and good estimate of supplies	UNICEF, NDMA, MOH, ACF, IMC

Low enrolment in the MNP program (43.2%) Measles at 18 months below national target (55.3%) Poor maternal nutrition (7% of total women aged 15-49 and 7.5% PLWs having MUAC of <21cm)	➢ Continuous sensitization and social mobilization ➢ Increased health education on MNPs at health centres ➢ Strengthen awareness among the caregivers on the second dose of measles at 18 months. ➢ Nutritional education of mothers during ANC/PNC visits and Promotion of iron folate supplementation during pregnancy ➢ Linkages of malnourished PLW to supplementary feeding	Barrier analysis on factors that hinders the uptake of micronutrient powders Barrier analysis on the factors hindering uptake of health services (Immunization) ➢ Involve women in key decision making process during planning and implementation of key health and nutrition programs, ➢ Empowering women on IGAs i.e. Kitchen gardening, poultry rearing	UNICEF, MOH, WFP, ACF &IMC MOH, ACF, IMC MOH, ACF, IMC Community, County Government and Partners
WaSH Increased rates of open defecation from 23.7% to 35% Low Household water access in Isiolo County Reduced instances of hand washing	➢ Follow-up of status of previous recommendations and also on status of interventions directed to 45 ODF Villages in the county ➢ Promote CLTS to reduce open defecation ➢ Improve the water access in the short term through expediting water trucking, fuel subsidies to high volume boreholes and establishing RRI borehole repair teams ➢ Increased community sensitization on the importance of hand washing	➢ Integrating BCC in promotion of key sanitation and hygiene practises ➢ Promote CLTS to reduce open defecation ➢ Construction of additional boreholes, sand dams in water scarce hotspots ➢ Implementation of PHAST and CHAST (In schools)	MOH, ACF, IMC and other partners MOW, MOW, ACF & IMC MOH, IMC &ACF

Food security and Livelihood Poor dietary diversity Poor food consumption High CSI Poor dietary intake	➢ Strengthened partnership among partners dealing with food and nutrition ➢ Promote consumption of locally available food e.g. Fish ➢ BCC against negative food taboos such as chicken consumption in some communities ➢ Intensify GFD and FFA among populations with immediate need of food	➢ Promotion of the growth of drought resistant/resilient crops e.g. sorghum and millet. ➢ BCC against negative food taboos such as chicken consumption in some communities	MOH, ACF, IMC and other partners MOA, MOH, NDMA, WFP, and Partners

6.0 APPENDICES

6.1 Sampled Clusters

Table 26: List of Sampled clusters

GEOGRAPHICAL UNIT	POPULATION SIZE	CLUSTER NUMBER
Bulla Waso	832	1
Bulla Waso	1013	RC
Kulamawe	7041	3,RC
Bulla kati	862	2
Kampi Ya Juu	4166	4
Olla Jarole	1195	5
Taqwa	530	6
Game	1112	7
Maili-Tano	1184	8
Oldonyiro Sarge	330	9
Shambani	1087	10
Bulla Nasie	759	11
Tuluroba	5006	12,13
Kariakor/Soweto	855	14
Attan Chini	249	15
Attan juu	427	16
Etop/ Ngapawoi	383	17
Namelok	587	18
Kawalash	876	19
Lemorijo	400	20
M.Golicha	430	21
Kombola North	311	22
Demo B	208	23
Duse	423	24
Jamia Mosque	642	25
Kinna Town	518	26
Bulla S	385	27
Quri Haroresa	165	28
Central	468	RC
Qalqalcha	598	29
Orotin	282	30
Goda 'B'	414	31
Biliqi	1020	32
Lafe	294	33
Town' A'	850	34
Taqwa 2	900	35
Manyatta Duba	650	36

6.2 Age calculation chart

Table 27 Age Calculation Chart

AGE CALCULATION CHART FOR UNDER 5 (*record Age in Months*)
Adequately Verify the age of the child. Accurate as at JANUARY 2015:Please cross- check against date of birth of child and date of survey to establish actual age)

DATE OF BIRTH	AGE IN MONTHS	DATE OF BIRTH	AGE IN MONTHS
2010-Feb	59	2013 - May	20
2010-Mar	58	2013 - Jun	19
2010-Apr	57	2013 - Jul	18
2010-May	56	2013 - Aug	17
2010-Jun	55	2013 - Sep	16
2010-Jul	54	2013- Oct	15
2010-Aug	53	2013-Nov	14
2010-Sept	52	2013-Dec	13
2010-Oct	51	2014 - Jan	12
2010-Nov	50	2014-Feb	11
2010-Dec	49	2014-Mar	10
2011-Jan	48	2014-Apr	9
2011-Feb	47	2014-May	8
2011-Mar	46	2014-Jun	7
2011-Apr	45	2014-Jul	6

6.3 Standardization Test Results

Table 28: Standardization test results

Weight		subjects	mean	SD		
		#	kg	kg	TEM	
	Supervisor	10	14.5	1.4	acceptable	Bias poor
	Enumerator 1	10	14.6	1.4	TEM good	Bias poor
	Enumerator 2	10	14.6	1.4	TEM acceptable	Bias poor
	Enumerator 3	10	14.6	1.4	TEM acceptable	Bias poor
	Enumerator 4	10	14.6	1.4	TEM good	Bias poor
	Enumerator 5	10	14.6	1.4	TEM good	Bias poor

Height		subjects	mean	SD		
		#	cm	cm		
	Supervisor	10	100.6	5.8	TEM acceptable	Bias good
	Enumerator 1	10	101.8	5.2	TEM reject	Bias poor
	Enumerator 2	10	100.6	5.7	TEM poor	Bias good
	Enumerator 3	10	101	5.5	TEM good	Bias acceptable
	Enumerator 4	10	100.5	5.3	TEM good	Bias good
	Enumerator 5	10	100.9	5.4	TEM good	Bias good

MUAC		subjects	mean	SD		
		#	mm	mm		
	Supervisor	10	152	7.6	TEM poor	Bias good
	Enumerator 1	10	151.6	8.7	TEM reject	Bias good
	Enumerator 2	10	152.	8.7	TEM reject	Bias good

			6			
	Enumerator 3	10	155.3	9.4	TEM good	Bias poor
	Enumerator 4	10	155.4	9.9	TEM reject	Bias poor
	Enumerator 5	10	151	8.9	TEM poor	Bias good

6.4 Smart Survey Questionnaire

1.IDENTIFICATION 1.1 Data Collector_____ 1.2 Team Leader_____ 1.3 Survey date (dd/mm/yy)----------								
1.4 County	1.5 Sub-county 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 Group	**Please give me the names of the persons who usually live in your household.**	**Age (months for children <5yrs and years for over 5's)** YRS	MTH	**Childs age verified by** 1=Health card 2=Birth certificate/ notification 3=Baptism card 4=Recall	**Sex** 1= Male 2= Female	**If 3 yrs and under 18 Is child enrolled in school?** 1 = Yes 2 = No (If yes go to 2.8; If no go t o 2.7)	**Main Reason for not attending School (Enter one code from list)** 1=chronic Sickness 2=Weather (rain, floods, storms) 3=Family laborresponsibilities 4=Working outside home 5=Teacher absenteeism 6=Too poor to buy school items e.t.c 7=Household doesn't see value of schooling 8 =No food in the schools 9 = Migrated/ moved from school area 10=Insecurity 11-No school Near by 12=Married 13=others (specify)……..	**What is the highest level of education attained?(level completed) From 5yrs and above** 1 = pre primary 2= Primary 3=Secondary 4=Tertiary 5= None 6=others(specify)	**If the household owns mosquito net/s, who slept under the mosquito net last night? (***Probe-enter all responses mentioned(Use 1 if "Yes" 2 if "No and 3 if not applicable)*
< 5 YRS	1								
	2								
	3								
	4								
>5 TO 18 YRS	5								
	6								
	7								
	8								
	9								
	10								
	11								
	12								
ADULT	13**(HH)**								
	14)								

	15								
	16								

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 labor 3=Employed (salaried) 4=Waged labor (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. =Casual 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. |_____|	**2.14. What is the residency status of the household?** 1. IDP 2.Refugee 3.Resident|_____|

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

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=Grandmother 5=Other (specify)	SEX F/m	Exact Birth Date	Age in months	Weight (KG) XX.X	Height (CM) XX.X	Edema Y= Yes N= No	MUAC (cm) XX.X	Has your child (NAME) been ill in the past two weeks? <u>If No, please skip part K and proceed to 3.4)</u> 1.Yes 2. No	If YES, what type of illness (multiple responses possible) 1 = Fever with chills like malaria 2 = ARI /Cough 3 = Watery diarrhoea 4 = Bloody diarrhoea 5 = Other (specify) *See case definitions below*	If the child **<u>had watery diarrhoea</u>** in the last TWO (2) WEEKS, did the child get THERAPEUTIC zinc supplementation? *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	**When the child was sick did you seek assistance ?** 1.Yes 2. No	**If the response is yes to question # 3.2 where did you seek assistance? (More than one response possible-** 1. Traditional healer 2.Community health worker 3. Private clinic/ pharmacy 4. Shop/kiosk 5. Public clinic 6. Mobile clinic 7. Relative or friend 8. Local herbs 9.NGO/FBO
01													

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	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									
04									

3.5MNP Programme Coverage ***Kindly maintain the same child number as part 2and 3.1 above***

3.5.1	Is the child enrolled in the MNP program?(show the example of the MNP sachet)***(circle the given answers)***	Yes =1 No=0 **If the answer is no go to 3.5.2, If the answer is yes go to section 3.6**
Child 1		
Child 2		
Child 3		
Child 4		
3.5.2	If the child, 6-23months, is not enrolled for MNP, kindly give reason. (Multiple answers possible. circle the given answers. DO NOT READ the answers)	Do not know about MNPs……1 Discouraged from what I heard from others……..2 The child has not fallen ill, so have not gone to the health facility……..3 Health facility or outreach is far……4 Child receiving therapeutic or supplementary foods--5 Other reason, specify……6

3. 6Consumption of MNP

3.6.1	Has the child consumed MNPs in the last 7 days?(shows the MNP sachet)***(Circle the given answer)***	YES = 1N0= 0 ***If no continue to 3.6.3,*** ***If yes go to 3.6.2***
3.6.2	If yes, how frequent do you give MNP	Every day……1 Every other day……..2

	to your child? ***(Circle the given answer)***	Every third day……..……..……..3 2 days per week at any day…….……...4 At any day when I remember……..…….5
3.6.3	If no, since when did you stop feeding MNPs to your child? ***(Circle the given answer)***	1 week to 2 weeks ago .....1 2 week to 1 month ago.....2 More than 1 month.....3
3.6.4	What are the reasons to stop feeding your child with MNPs? (***Multiple answers possible. circle the given answers. DO NOT READ the answers)***	Finished all of the sachets.....1 Child did not like it.....2 Husband did not agree to give to the child.....3 Sachet got damaged .....4 Child had diarrhea after being given vitamin and mineral powder……..5 Child fell sick.....6 Forgot……..…..7 Child enrolled into the IMAM program……8 Other (Specify)_____ ……..…..9

MATERNAL NUTRITION FOR MOTHERS OF REPRODUCTIVE AGE (15-49 YEARS)*(Please insert appropriate number in the box)*				
3.7	**3.8**	**3.9**	**3.10**	**3.11**
Woman ID. **(all ladies in the HH aged 15-49 years from the demographics page)**	What is the mother's / caretaker's physiological status **1. Pregnant** **2. Lactating** **3. None of the above**	Mother/ caretaker's MUAC reading: **_____.__cm**	During the pregnancy of the (name of child below 24 months) did you take 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 / Jerri can 2. Closed container / Jerri can|____|	**4.5 How much water did your household use YESTERDAY (excluding for animals)?** *(Ask the question in the number of 20 liter Jerri can 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 did you use to wash your hands?** 1. Only water 2. Soap and water 3. Soap when I can afford it 4. traditional herb 5. 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 days the food was consumed in the last 7 days?** **yes= 1; no=2**								What was the **main** source of the dominant food item consumed in the HHD? **1.Own production** **2.Purchase** **3.Gifts from friends/families** **4.Food aid** **5.Traded or Bartered** **6.Borrowed** **7.Gathering/wild fruits** **8.Other (specify)**
Type of food*		**D1**	***D2***	**D 3**	**D 4**	**D 5**	**D 6**	**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)?*										
5.10Eggs?										
5.11Fish: Fresh or dries fish or shellfish										
5.12Pulses/legumes, nuts *(e.g. beans, lentils, green grams, cowpeas)*?										
*5.13*Milk and milk products *(e.g. goat/camel/ fermented milk, milk powder)?*										
5.14Oils/fats *(e.g. cooking fat or oil, butter, ghee, margarine)?*										
5.15Sweets: Sugar, honey, sweetened soda or sugary foods such as chocolates, sweets or candies										
5.16Condiments, 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**	

6.5 Survey Quality

Table 29: Overall survey quality

CRITERIA	Missing / flagged data	Overall sex ratio	Overall age distribution	Digit pref. score Weight	Digit pref. score Height	Digit pref. score MUAC	Standard deviation WHZ	Skewness WHZ	Kurtosis WHZ	Poisson distribution WHZ	Overall score WHZ
SCORE	0 (0.0%)	0 (p=0.359)	4 (p=0.001)	0 (4)	0 (8)	**0** (7)	0 (1.04)	0 (-0.01)	0 (0.18)	0 (p=0.785)	**6%**
Interpretation	Excellent	Excellent	Acceptable	Excellent	Good	Excellent	Excellent	Excellent	Excellent	Good	**Excellent**

6.6 Isiolo Smart Survey Team

Table 30: The survey team, their roles and place of residence

#	NAME	OCCUPATION	SURVEY RESPONSIBILITY	LOCATION	CONTACT
1	IMAN YUSSUF BORU	INTERN NUTRITIONIST	ENUMERATOR	ISIOLO CENTRAL	0728 293 834
2	DOKATU DIDA	INTERN NUTRITIONIST	ENUMERATOR	MERTI	0727 620 328
3	ZEITUNA ALI	INTERN NUTRITIONIST	ENUMERATOR	ISIOLO CENTRAL	0729 895 442
4	GUYO ABDI	NDMA FIELD MONITOR	ENUMERATOR	GARBATULLA	0701 626 205
5	ABDILATIF HUSSEIN	NDMA FIELD MONITOR	ENUMERATOR	GARBATULLA	0728 487 824
6	LEAH NYAMBURA	INTERN NUTRITIONIST	ENUMERATOR	ISIOLO CENTRAL	0723 116 212
7	KALLA DIBA KALLA	GRADUATE	DATA ENTRY	MERTI	0710 341 511
8	HUSSEIN M. HALAKE	GRADUATE	DATA ENTRY	GARBATULLA	0719 679 458
9	LENANYOKE JOHN	NDMA FIELD MONITOR	ENUMERATOR	OLDONYIRO	0717 730 100
10	JOHN LOPULO EKAI	GRADUATE	ENUMERATOR	NGAREMARA	0707 937 452
11	SARAH WAKO KOSI	VOLUNTEER-SCH	ENUMERATOR	ISIOLO CENTRAL	0729 895 442
12	HASSAN ALI NOOR	GRADUATE	ENUMERATOR	MODOGASHE	0728 673 662
13	DIBA YUSUF	STUDENT-UON	DATA ENTRY	KINNA	0727 393 223
14	MOHAMED ADAN DIDA	VOLUNTEER-SCH	ENUMERATOR	SERICHO	0729 741 872
15	DOKATU GALGALO	GRADUATE	ENUMERATOR	BULESA	0725 014 156
16	MOHAMED ADAN DIDA	NDMA FIELD MONITOR	ENUMERATOR	MALKA DAKA	0727 021 105

17	ABDULLAHI JILLO	NDMA FIELD MONITOR	ENUMERATOR	ISIOLO CENTRAL	0729 860 551
18	KADUBATA ABDULLAHI	NDMA FIELD MONITOR	ENUMERATOR	BOJI	0724 167 810
19	ABDI ALI	NDMA FIELD MONITOR	ENUMERATOR	GAFARSA	0728 621606
20	JARSO WARIO	NDMA FIELD MONITOR	ENUMERATOR	ISIOLO CENTRAL	0714 104 243
21	MOLU ALI GALGALO	CHV-SCH	ENUMERATOR	MERIT NORTH	0710 372 621
22	FLORENCE MUTWIRI	SCNO	TEAM LEADER	MERTI	0724 024 689
23	JUNIUS MUTEGI	SCNO	TEAM LEADER	GARBATULLA	0723 857 835
24	WILSON AKETCH	SCHRIO	TEAM LEADER	ISIOLO CENTRAL	0722 380 353
25	SAIDA ABDIRAHMAN	COUNTY NUTRTION OFFICER	TEAM LEADER	ISIOLO CENTRAL	0711 868 283
26	DAN LELERUK	NDMA OFFICER	TEAM LEADER	ISIOLO CENTRAL	0720 791 525
27	ALICE MWIRIGI	COUNTY NURSING OFFICER	TEAM LEADER	ISIOLO CENTRAL	0720 488 415
28	SIAD GUYO	NDMA OFFICER	TEAM LEADER	GARBATULLA	0722 900 733
29	SALAD DIDA	NDMA OFFICER	TEAM LEADER	ISIOLO CENTRAL	0721 440 589
30	LEAH NG'AARI	NUT. OFFICER-IMC	SUPERVISOR	ISIOLO CENTRAL	0724 739 244
31	RITA NTHIGA	FSNS INTERN-ACF	TEAM LEADER	NAIROBI	0722 483 632
32	STANLEY MACHARIA	FSNS OFFICER-ACF	COORDINATOR	NAIROBI	0713 847 388
33	LILIAN MWIKALI	NUT OFFICER-ACF	COORDINATOR	GARBATULLA	0728 822 970
34	ISAAC WACHIRA	NUT PM-ACF	SUPERVISOR	ISIOLO	0712 650 278
35	NICHOLAS MUSEMBI	NUT PM-IMC	COORDINATOR	ISIOLO	0703 700 787
36	BEN KIMATHI	M&E OFFICER-IMC	SUPERVISOR	ISIOLO	0724 663 756