INTEGRATED HEALTH AND NUTRITION SMART SURVEY REPORT

GARISSA COUNTY

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ACKNOWLEDGEMENTS

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ACRONYMS AND ABBREVIATIONS

ACF	– Action Against Hunger
ARI	– Acute Respiratory Infection
CED	– Chronic Energy Deficiency
CHNE	– Community-based Health/Nutrition Education
CI	– Confidence Interval
CMAM	– Community-based management of Acute Malnutrition
CMR	– Crude Mortality Rate
CSB	– Corn Soya Blend
DDS	– Dietary Diversity Score
ENA	– Emergency Nutrition Assessment
FANTA	– Food and Nutrition Technical Assistance
FGD	– Focus Group Discussion
GCM	– Global Chronic Malnutrition
GFD	– General Food Distribution
GAM	– Global Acute Malnutrition
GS	– Growth Standards
HFA	– Height-for-Age
IMAM	– Integrated management of Acute Malnutrition
ITN	– Insecticide Treated Nets
IYCF	– Infant and Young Child Feeding
KEPI	– Kenya Expanded Programme on Immunization

KRC	–	Kenya Redcross society
MoMS	–	Ministry of Medical Services
MoPHS	–	Ministry of Public Health and Sanitation
MUAC	–	Mid-Upper Arm Circumference
NCHS	–	National Centre for Health Statistics
NGO	–	Non-Governmental Organization
OPV	–	Oral Polio Vaccine
PPS	–	Probability Proportional to Population Size
PRRO	–	Protracted Relief and Recovery Operation
SAM	–	Severe Acute Malnutrition
SCM	–	Severe Chronic Malnutrition
SD	–	Standard Deviation
SFP	–	Supplementary Feeding Programme
SMART	–	Standardized Monitoring and Assessment of Relief and Transitions
SPSS	–	Statistical Package for Social Scientists
TBA	–	Traditional Birth Attendant
TDH	–	Terre des Hommes
UFMR	–	Underfive Mortality Rate
UK	–	United Kingdom
UNICEF	–	United Nations Children's Fund
USAID	–	United States of America International Aid
WFA	–	Weight-for-Age
WFH	–	Weight-for-Height
WHO	–	World Health Organization

EXECUTIVE SUMMARY

Garissa County is located in North Eastern province and covers an area of 34,389.7km^2. It has an estimated population of 63,2060 persons[1] and an estimated under-5 target population of 18 %. The County receives a bimodal rainfall with a long term average of 250-300mm and is classified as semi-arid with annual mean temperatures ranging between 33^{0}C and 42^{0}C. The short rains, which are most reliable, fall between mid-October to December while the long rains are experienced between mid-March to June. Over 40 percent of the population are pastoralists.

Mercy-USA partners with MOPHS/MOMS, Kenya Red Cross, ACF, Terres Des Hommes in strengthening the health system for nutrition & health interventions through treatment of malnourished children through the national Integrated Management of Acute Malnutrition (IMAM) model and supporting implementation of the High Impact Nutrition Interventions (HINI). Other partners, World Food Program, Agency for Peace and CARE are also implementing health, nutrition and WASH programmes in Garissa County.

In order to gauge the performance of the HINI package and inform future programming in the County, Mercy-USA in collaboration with MOMS/MOPH, ACF, TDH and KRC carried out a nutritional survey in Garissa County between 15th April and 27th April 2013. The survey aimed to evaluate the extent and severity of malnutrition among children aged 6-59 months and analyze the possible factors contributing to malnutrition and recommend appropriate interventions. The survey area covered 7 administrative districts of Garissa County namely: Garissa, Balambala, Ijara, Fafi, Hulugho, Dadaab and Lagdera.

The survey used the Standardized Monitoring of Relief and Transitions (SMART) methodology in accordance with the National Guidelines for Nutrition and Mortality assessments in Kenya. Anthropometric, household and IYCN data were collected simultaneously during the survey. A two-stage cluster sampling with probability proportional to size (PPS) design was employed for the integrated nutrition survey. The sample size was determined on the basis of estimated prevalence rates of malnutrition (GAM). The desired precision and design effect was determined using the ENA for SMART software. The IYCF multi survey sampling calculator was used to calculate IYCF data. Qualitative data was collected through focus group discussions (FGDs) and general

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[1] KNBS, 2009 Population Projections

observations. Below is a summary of the findings:

Table 1 Summary of Findings

DEMOGRAPHY	Number	
Number of HH surveyed	632	
Number of children 6-59 months surveyed	763	
Number of children 0-23 months surveyed for IYCN	343	
Number of children 0-5 months surveyed for IYCN	146	
Average number of persons per HH	6.2	S.D = 2.3

Characteristic	N	% (95% CI)
Overall GAM (WFH <-2 Z score or presence of oedema) – WHO 2006	756	12 (9.3-15.5)
Overall SAM (WFH <-3 Z score or presence of oedema) – WHO 2006	756	1.3 (0.8-2.3)
Overall underweight (WFA <-2 Z score or presence of oedema) – WHO	536	14 (10.8-17.6)
Overall Severe underweight (WFA <-3 Z score or presence of oedema) –WHO	536	3.2 (1.8-5.6)
Overall stunting (HFA <-2 Z score) – WHO	509	17.1 (13.6-21.2)
Overall Severe stunting (Height for age <-3 Z score) –WHO	509	2.9 (1.8-4.8)
Maternal MUAC (<21cm)	482	8
Measles* immunization (card and recall)	750	82.3
OPV1 immunization (card and Recall)	821	92
OPV3 immunization (card and Recall)	821	84
Vitamin A supplementation coverage	761	76.6
Proportion of children dewormed	705	60
Proportions of women who attended ANC visits	482	68.4
Hospital Delivery	565	19
Exclusive Breastfeeding	146	23.3
Minimum dietary diversity 6-23 months consuming 3+ or 4+ food groups (breastfed and non-breastfed children respectively)	207	0
Minimum meal frequency: At least twice a day for 6-8 months (breastfed children)	31	93
Minimum meal frequency: 3+ times a day for 6-23 months old (breastfed children)	207	73
Minimum meal frequency: 4+ times a day of children 6-23 months (non-breastfed children)	207	32
Toilet coverage	632	49.8
% of caregivers wash hands with soap + water	632	43
Water usage	632	87 litres/hh/day
Water Treatment	632	15.5%

Recommendations

- Integrate nutrition, food security and livelihood and WASH programmes for better programme outcomes and higher impact and cost-effectiveness.
- Initiating income generating activities to create more livelihoods for the pastoral community.
- Infrastructural improvement to improve access to markets and facilitate general development in all areas of the County.
- Increase the number health centres in Garissa County.
- Issue of insecurity/conflict should be addressed by the government.
- Promote kitchen gardening of local traditional vegetables and pulses which are drought resistant and higher in nutrient composition to improve dietary and nutrition diversification.
- Breast feeding education should target expectant mothers as well as their mothers and mother-in-laws who have an important role to play in conveying infant and child care knowledge.
- Nutrition Health education targeting lactating and pregnant mothers to improve their nutritional status.
- Strengthen Community Led Total Sanitation and community awareness to increase toilet usage cover.
- Educate mothers on proper health seeking behaviour. This can attribute to why zinc uptake is low in management of diarrhoea cases, improve referral mechanism and strengthen community units.
- Treatment of drinking water should be encouraged and promoted either by boiling or use of chemicals (chlorination).
- Training of the community on appropriate hand washing with soap or alternatives available in the community e.g. ash or herbs.
- Create awareness of the importance of attending ANC and hospital delivery through mother to mother support groups and community health workers.
- Strengthen nutrition program Targeting ECD and Madrasas for school going children between the ages of 31/2 years to 5 years.
- Scale up the distribution of mosquito nets

1 INTRODUCTION

Background Information

Garissa County is located in North Eastern Province and covers an area of 34,389.7 km² and has an estimated population of 63,2060 persons (KNBS, 2009 Projections). Currently, the larger district is subdivided into 7 administrative districts, namely: Garissa, Balambala, Ijara, Fafi, Hulugho, Dadaab and Lagdera districts. It borders Wajir District to the North, Tana River District to the West, Ijara District to the South, Isiolo District to the North West and Somalia to the East. The district has a flat topography with altitude ranging from 70 – 400 metres above sea level.

Garissa is classified as semi-arid with annual mean temperatures ranging between $33^{0}C$ and $42^{0}C$. The vegetation ranges from scrublands to thorny thickets. The county receives a bimodal rainfall with a long term average of 250-300mm. The main sources of livelihoods are primarily pastoral activities (camel, goats, and shoats most common with cattle and sheep less frequent), agro-pastoral work, and formal employment or casual waged labour.

The county has been under emergency food operation since the year 2000. The main activities being undertaken under the Food for Asset (FFA) program across the district are environmental projects, construction of water pans, construction of feeder roads, desilting of water pans and irrigation projects. The other activities include General Food Distribution (GFD) with the help of NGOs and the government.

Mercy-USA partners with MOPHS/MOMS, Kenya Red Cross, ACF, Terres Des Hommes in strengthening the health system for nutrition & health interventions through treatment of malnourished children through the national Integrated Management of Acute Malnutrition (IMAM) model and supporting implementation of the High Impact Nutrition Interventions (HINI). Other partners, World Food Program, Agency for Peace and CARE are also implementing health, nutrition and WASH programmes in Garissa County.

1.2 Rationale for conducting a survey

In order to gauge the performance of the HINI package and inform future programming in the district, Mercy-USA in collaboration with MOMS/MOPHS, ACF, TDH and KRC carried out a nutritional survey in Garissa County between 15th April and 27th April 2013. The aim was to evaluate the extent and severity of malnutrition among children aged 6-59 months and analyze the possible factors contributing to malnutrition and recommend appropriate interventions.

1.3 Objectives

The aim of the survey was to determine the current nutritional status in the county and to analyse the possible factors contributing to malnutrition. It is also important to recommend appropriate interventions that will inform future programming.

The specific objectives of this survey were:

- To estimate the level of acute malnutrition among children aged 6-59 months
- To estimate the level of malnutrition (MUAC measurements) among women of reproductive aged 15-49 years
- To estimate the prevalence of some common diseases (measles, diarrhea, malaria, and ARI)
- To estimate Measles, Polio vaccination and Vitamin A supplementation coverage amongst children 9-59 months and 6-59 months respectively
- To assess infant and young child care and feeding practices among caretakers with children aged 0-23 months
- To establish the situation of water and sanitation, appropriate hygiene practices including hand washing among caretakers

Table 2 Timing of the Survey (Including Seasonal Calendar)

Jilal	Guu	Hagaa	Deer
Dry period January to March. Temperatures are high. Activities carried out include: • Migration of livestock for pasture & water search	Long rainy season starts late March through May. Activities carried out include: • Selection/breeding of livestock • Weeding ceremonies	Dry and cold period from June, through mid-October. Activities carried out include: • High rate of livestock and household migration • High labour demand	Short rainy season from October to December. Activities carried out include: • Restocking of livestock. • Breed improvement • Planting for rain fed

			crops
• Herd separation	• Weaving	• Destocking/culling	• Crafts and weaving
• Livestock marketing	• Male circumcision	• Surveillance for pasture	• Calving and kidding
• Pressure on boreholes	• Restocking of livestock	/browse	period
	• Planting for rain fed crops	• Caravan water trekking	
	• Deworming of livestock		

1.4 Situation of Area Surveyed

The survey was conducted in all districts of Garissa County, including Garissa, Balambala, Dadaab, Hulugho, Ijara, Fafi, and Lagdera.

In Garissa County, the long rains for 2013 started in the month of March. Most parts of the county recorded highly enhanced rainfall that was characterized by heavy rainfall. However towards mid-April the rainfall was poorly distributed both in time and space. Nevertheless, the surface water sources recharged to over 80 percent of their capacities. Waiting time at water sources was generally less than an hour while distances to water sources was at 5-10 kilometers. However, due to unusually high temperatures, water sources that were poorly recharged had started to dry up, leading to the increase in distance to water sources. Water consumption at the time of the survey was normal across all the livelihood zones, and range between 10 to 20 liters per person per day.

During the survey period, the sustained availability of pasture, browse and water in all livelihood zones has enhanced livestock productivity. Available pasture and browse in the pastoral areas of Garissa County was expected to sustain livestock during the survey month of April. The normal to-below-normal March to May long rains is expected to help pasture regeneration and water recharge hence supporting grazing conditions through June. Food security during the survey period, however, likely to be affected by conflict for access to pasture, browse, and water that is likely to ensue due to migration from other areas[2].

At the time of the survey, livestock body conditions are good for all species across all livelihood zones. The area has seen two successive good conceptions in livestock. Group with good livestock births and low incidences of livestock disease, these outcomes have significantly improved households' livestock herd sizes in all livelihood zones. Milk production continues to improve due to the increase in livestock birth rates and

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[2] Kenya Food Security Outlook, January to June 2013

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availability of high nutritional forage livestock. The increase in quantity is reflected at the market, which has high volume of milk for sale and reduced prices thus favorable for the poor. The average market price ranges between Kshs. 20-25 per 750ml bottle in all the livelihood zones[3].

Improved food access is reflected in the general improvement to households Food Consumption Scores (FCS). According to World Food Program (WFP) Food Security Outcomes Monitoring Data, 60 to 90 percent of households had acceptable FCS in the County.

2 METHODOLOGY

Three different sampling methodologies were applied. IYCF multi survey sampling calculator was used to calculate IYCF sample while the Emergency Nutrition Assessment (ENA) for Standardised Monitoring of Relief and Transition (SMART) was used to calculate anthropometric and mortality data. This was guided both by the National Guidelines for Nutrition and Mortality Assessments in Kenya and the recommended UNICEF nutritional survey key indicators. Qualitative data was also collected through: focus group discussions (FGDs) and general observations.

The first sampling stage was to calculate the anthropometric sample size, the following boundaries were used: a GAM prevalence of 14%[4], desired precision of 4%, a design effect of 2, an estimated household size of 6[5] persons, 18%[6] < 5 years and non-response rate of 3%. These items gave a sample size of 629 children (6-59 months) and a household sample size of 668 households.

The second sampling stage comprised of village/clusters and and the third was household selection. In order to select survey clusters, the names of sub-locations, with their respective population sizes and the required number of clusters was entered into the SMART software, which generated the actual list of the sublocations surveyed (including reserve clusters). At the field level, the names of all the household heads were collected and 20 households were chosen randomly. Where this was not feasible to survey, the modified EPI method was employed.

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[3] Garissa District Drought Monthly Bulletin, January 2013

[4] Anticipated GAM 14% with 90% C.I

[5] Integrated Health and Nutrition SMART Survey Garissa District, April 2011

[6] Population Estimates, 2009 Census

IYCF multi survey sampling calculator was used to obtain sample size for infants and young children (0-23 months). Indicators used to calculate sample size were: timely initiation of breastfeeding (children 0-23 months), exclusive breastfeeding under 6 months, minimum dietary diversity, and minimum meal frequency. Using information obtained from Garissa Survey conducted in April 2011, the sample size for children between 6-23 months was 245 and 0-6 months was 145.

Table 3 Anthropometric Sample Size Calculation

Data entered on ENA software	Anthropometric sample	Rationale
Estimated prevalence	14	Anticipated GAM from 2012 SMART 90% CI
Desired precision	4	The higher the malnutrition prevalence, the lower the precision
Design effect	2	The different livelihoods, vastness of the area and pockets of malnutrition
Average household size	6	Finding from SMART Survey, April 2011
Percent of under five children	18%	2009 Kenya Population and Housing Census
Percent of non-respondent	3	To cater for unseen /anticipated circumstances
Households to be included	668	
Children to be included	629	

2.1 Description of Sampling Methods

Number of households surveyed was 668 was given by ENA software. The number of households to be surveyed divided by the number of household to be reached per day (20) gave a total of 35 clusters to be surveyed. A total of 6 survey teams, each comprising of 1 team leader and 2 enumerators, collected the data for 6 days. Survey teams first reported to the area chief, assistant chief or a village elder who acted as a local guide. However, a total of 632 households were sampled. This was because some clusters were not accessible due to the heavy rains and unforeseen insecurity issues. Data was not collected from R clusters because not more than 10% of the total clusters were inaccessible. Data was also not collected in a few households because the owners had moved.

2.2 Data to be Collected, and Data Collection Methods and Tools

To estimate malnutrition prevalence and IYCF the following information was collected:

- Anthropometry
  - o *Weight*: Taken by use of a digital bathroom scale to the nearest 0.1 Kgs. All scales were calibrated using standard measures.
  - o *Height*: Either height or length measurements were taken based on the age of the child. Recumbent length was taken for all children less than two years (<24 months) with height taken for all children two years and above using a calibrated height board.
  - o *Oedema*: Assessed by exerting pressure on both feet for three seconds by the thumb with emphasis on bilateral oedema.
  - o *MUAC*: Assessed by use of MUAC tape on the left hand of the child and caregiver.
  - o *Age*: Birth certificate and birth notification was used as the primary source of information for this. In the event that a caretaker lacked this then the calendar of events was used.
  - o *Sex*: recorded as either male or female.
- Vaccination information (Measles, BCG, and Vitamin A supplementation).
- Incidences of childhood illnesses in the last 2 weeks prior to the survey.
- Other child care, food security and hygiene data at household level.
- For children aged below 23 months, IYCF data was collected.

Mortality data was not collected; very limited indictors were collected on Food security data to help give more information on the outcome of the GAM. This information is available as secondary data through other information sources (The 2012-2013 Short Rain Assessments, Kenya Food Security Outlook January to June 2013, and Garissa District Drought Monthly Bulletin for January 2013) provided the information.

2.3 Data Collection Tools and Variables Measured

Three sets of questionnaires were used for data collection, these included:

- Questionnaire A (Household And Anthropometry) – Primary Caretakers
- Questionnaire B (IYCF) – 0-23 months
- Focus Group Discussion (FGD) Guide (Qualitative Data) – Women, Men, and Community Leaders

2.4 Equipment Used

Standard UNICEF height boards, electronic weighing scales, paediatric MUAC tapes and maternal MUAC tapes were used to measure anthropometry. These measurements were recorded to the nearest 0.1 cm/kg. Heavy clothing and shoes were taken off for measurements.

2.5 Training

The team was trained for 3 days from 15th April, 2013 to 17th April, 2013. This training covered: nutrition survey objectives, anthropometric measurements, interviewing techniques, and completion of questionnaires. To check understanding, a standardization test was held on 18th April, 2013 and finally a pre-test was done on the 19th April, 2013. All survey team members participated in the standardization test to ensure the standardization of measurement and recording practice before actual start of data collection. During the standardization test, participants were divided into their respective teams and took anthropometric measurements from 10 healthy children 6–59 months and their scores were compared to the standardization group's performance (the trainers). Data collection took 6 days as from 20th April to 25th April 2013.

2.6 Data Entry and Analysis

Anthropometric data was entered daily from the field to ensure quality of data using the SMART/ENA software. All the other quantitative data was entered and analyzed in the SPSS (Version 16.0) computer package.

2.7 Survey Limitations

There were inherent difficulties in determining the exact age of some children (even with use of the local calendar of events), as some health cards had erroneous information. This may have led to inaccuracies when analysing chronic malnutrition. Although verification of age was done by use of health cards, in some cases no exact date of birth was recorded on the card other than the date a child was first seen at the health facility or just the month of birth. Recall bias may link to wrong age which then leads to wrong weight for age and height for age indices.

Unforeseen insecurity in Elkamere village in Hulugho District led to inaccessibility of clusters. Poor road network hindered collecting data in Labile Village in Lagdera District due to the heavy rains.

Picture 1 Example of a Health Card Showing Poor Recording of Date of Birth

3. RESULTS

3.1 Household Demographics

Overall, the number of households surveyed was 632. On average, each household has 6.2 (SD 2.3) members with a range of 1–14 persons. Polygamy was practised in 29.1% of the households while the rest 67.6 % practised monogamy. 1.3% households were single parents. Majority (90.8%) of the households were male-headed, while the rest at 9.2 % were female-headed.

Table 4 Demographic Information of Target Population

DEMOGRAPHY	Number	
Number of HH surveyed	632	
Number of children 6–59 months surveyed	763	
Number of children 0–23 months surveyed for IYCN	353	
Number of children 0–5 months surveyed for IYCN	146	
Average number of persons per HH	6.2	S.D = 2.3

The main occupation of the household head was livestock herding (50%). Daily labour was the second most common occupation at 16.1%, followed by salaried persons at 9.3%. The least common occupation was through remittances (3.6%). Those grouped under others were unemployed.

Table 5 Occupation

Type of Occupation	Percentage
Livestock herding	50.0
Daily labour/wage labour	16.1
Employed (salaried)	9.3
Small business/petty trade	8.7
Farmer/own farm labour	7.4
Other	4.7
Remittance	3.6

3.2 Anthropometric Results (Based on WHO Standards 2006)

Definitions:

Global acute malnutrition is defined as <-2 z scores weight-for-height and/or oedema, while severe acute malnutrition is defined as <-3z scores weight-for-height and/or oedema. Exclusion of z-scores from observed mean SMART flags. WHZ -3 to 3; HAZ -3 to 3; and WAZ -3 to 3 was done.

Table 6 Distribution of Age and Sex of Sample

	Boys		Girls		Total		Ratio
AGE (mo)	no.	%	no.	%	no.	%	Boy:Girl
6-17	85	51.8	79	48.2	164	21.5	1.1
18-29	113	55.4	91	44.6	204	26.7	1.2
30-41	103	53.9	88	46.1	191	25.0	1.2
42-53	73	48.7	77	51.3	150	19.7	0.9
54-59	22	40.7	32	59.3	54	7.1	0.7
Total	396	51.9	367	48.1	763	100.0	1.1

The overall sex ratio was 1.1 which is within the range of 0.8-1.2[7]. The age group 18-29 was the most represented at 26.7%. This could be attributed to recall bias.

The sample curve shows some displacement to the left of the reference population with a mean of −0.85 (SD 1.01). This is an indication of poor nutrition status of the sampled population in comparison to the reference population.

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[7] Prudhorn, Caludine. Assessment and Treatment of Malnutrition in Emergency Situations. Action Against Hunger, 2002

Figure 1 Population and Sample Distribution Curve
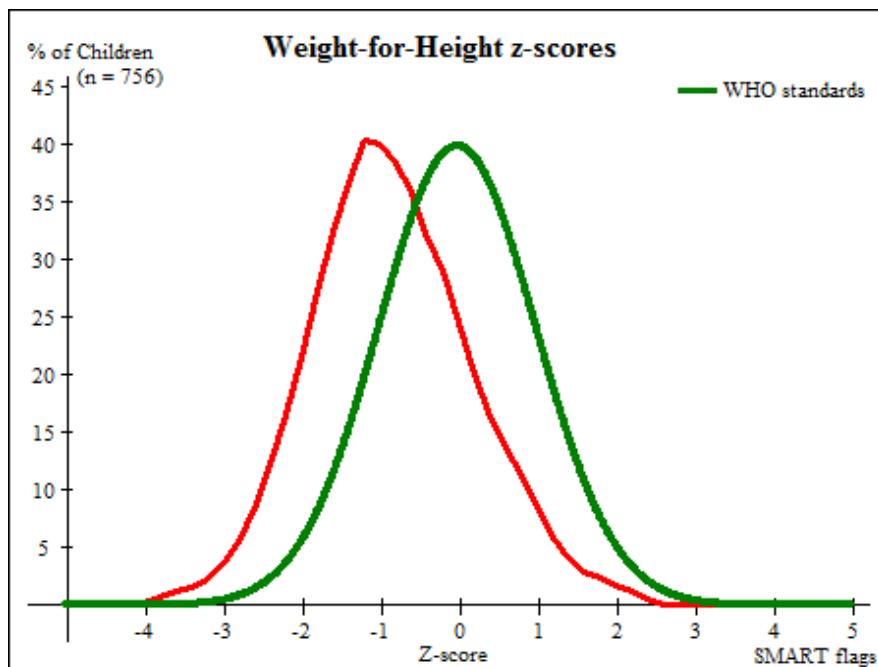
According to information from FGDs, some of the causes of malnutrition are intake of inadequate balanced diet, lack of mother's knowledge of IYCN and other infections and diseases.

Table 7 Prevalence of Acute Malnutrition based on weight-for-height z-scores (and/or oedema) and by sex

	April 2011 (95% C.I)	All (April 2013) n = 756	Boys(April 2013) n = 391	Girls(April 2013) n = 365
Prevalence of global malnutrition (<-2 z-score and/or oedema)	16.2% (13.9–18.8)	(91) 12.0 % (9.3 – 15.5 95% C.I.)	(50) 12.8 % (9.7 – 16.7 95% C.I.)	(41) 11.2 % (7.9 – 15.8 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >--3 z-score, no oedema)	13.0% (11.0–15.2)	(81) 10.7 % (8.1 – 14.0 95% C.I.)	(42) 10.7 % (7.9 – 14.5 95% C.I.)	(39) 10.7 % (7.4 – 15.2 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	3.2% (2.1–5.0)	(10) 1.3 % (0.8 – 2.3 95% C.I.)	(8) 2.0 % (1.1 – 3.9 95% C.I.)	(2) 0.5 % (0.1 – 2.3 95% C.I.)

The prevalence of oedema is 0.0%. For GAM boys were more malnourished than girls but

the difference was not statistically significant. A GAM of 12.0% denotes a serious situation with aggravating factors in the community according to WHO benchmarks. The prevalence of oedema was 0% but 1.8% of the children were marasmic. Compared to the last survey done in April 2011 the GAM has dropped significantly from 16.2% to 12.0% with a p. value of 0.031.[8]

Table 8 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	1	0.6	12	7.5	147	91.9	0	0.0
18–29	201	4	2.0	17	8.5	180	89.6	0	0.0
30–41	189	1	0.5	16	8.5	172	91.0	0	0.0
42–53	150	3	2.0	29	19.3	118	78.7	0	0.0
54–59	54	1	1.9	7	13.0	46	85.2	0	0.0
Total	754	10	1.3	81	10.7	663	87.9	0	0.0

Moderate cases of malnutrition were recorded highest among children between 42–53 months at 19.3% respectively. The probable reasons for these gathered from FGD were that most of the children at these age group join madrasa where they are taught from morning to evening and others are in early childhood development centres. These children end up missing important vitamins given during campaigns and the food is of poor quality and quantity.

Table 9 Prevalence of Acute Malnutrition 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	164	2	1.2	16	9.8	146	89.0	0	0.0
18–29	204	1	0.5	4	2.0	199	97.5	0	0.0
30–41	191	0	0.0	4	2.1	187	97.9	0	0.0

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[8] 2011 SMART survey did not include Dadaab as a district

42–53	150	1	0.7	5	3.3	144	96.0	0	0.0
54–59	54	0	0.0	1	1.9	53	98.1	0	0.0
Total	763	4	0.5	30	3.9	729	95.5	0	0.0

Using the MUAC criteria to assess nutritional status, 4 (0.5%) children were severely malnourished with a MUAC <11.5cm while 30 (3.9%) had moderate malnutrition with total GAM cases of 4.4%.

Table 10 Prevalence of Underweight based on weight-for-age z-scores by sex

	All n = 536	Boys n = 283	Girls n = 253
Prevalence of underweight (<-2 z-score)	(75) 14.0 % (10.8 – 17.9 95% C.I.)	(44) 15.5 % (11.5 – 20.7 95% C.I.)	(31) 12.3 % (8.0 – 18.4 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(58) 10.8 % (8.1 – 14.3 95% C.I.)	(36) 12.7 % (9.3 – 17.2 95% C.I.)	(22) 8.7 % (5.5 – 13.4 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(17) 3.2 % (1.8 – 5.6 95% C.I.)	(8) 2.8 % (1.3 – 6.0 95% C.I.)	(9) 3.6 % (1.6 – 7.9 95% C.I.)

Overall, boys were more underweight than girls but this was not statistically significant.

Table 11 Prevalence of Stunting based on height-for-age z-scores and by sex

|	All n = 509	Boys n = 270	Girls n = 239
Prevalence of stunting (<-2 z-score)	(87) 17.1 % (13.6 – 21.2 95% C.I.)	(56) 20.7 % (16.1 – 26.3 95% C.I.)	(31) 13.0 % (8.6 – 19.2 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(72) 14.1 % (11.0 – 18.0 95% C.I.)	(45) 16.7 % (12.7 – 21.6 95% C.I.)	(27) 11.3 % (7.1 – 17.5 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(15) 2.9 % (1.8 – 4.8 95% C.I.)	(11) 4.1 % (2.3 – 7.2 95% C.I.)	(4) 1.7 % (0.6 – 4.4 95% C.I.)

Boys were more stunted than girls the difference was statistically significant with a p. value of 0.035.

Table 12 Mean z-scores, design effects and excluded subject

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	756	-0.85±1.01	1.62	0	9
Weight-for-Age	536	-1.01±1.00	1.36	220	9
Height-for-Age	509	-0.62±1.31	1.25	220	36

3.3 Children's Morbidity

The common causes of morbidity in Garissa County included upper respiratory tract infections (URTI), malaria, diarrhea, skin diseases, and pneumonia. According to the short rain assessment of 2012-2013, the mortality rates are stable and below the emergency thresholds across Garissa County. The prevalence of reported illness in children in the two weeks prior to survey was at 58.5% of which only 39.3% sought assistance. Most caregivers, 53.4%, reported to have taken their child to public clinic when sick, 16% to a private clinic, 8.1% waited for a mobile clinic, 5.3% sought a traditional healer, 5.1% sought a religious healer, 4.8% saw a community health worker, 4.2% went to shops, 1.4% treated with herbs, 0.8% saw relatives/friends and finally 0.8% went to a NGO/FBO. Symptom breakdown is as shown in Figure 2. The other illnesses recorded were skin diseases and pneumonia.

Figure 2 Symptoms Breakdown
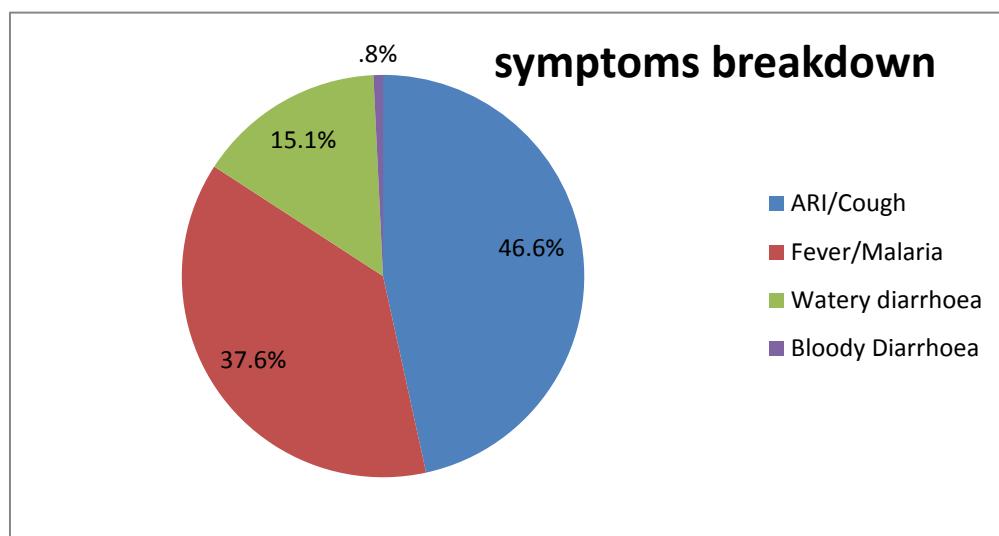
Of those who suffered from bloody and watery diarrhea only 43% received zinc

supplements for the management of diarrhea.

Table 13 Supplementation during last diarrhea episode (0-59Mos) N=83

Zinc supplementation	Frequency (%)
Received ZINC supplement card	13
Received ZINC supplement recall	30
Did not receive Zinc supplement	55
Do Not Know (DNK)	2
Total	100

3.4 Vaccination Results

The overall vitamin A supplementation is at 76.6%. The sources of vitamin A were: 32% from health facility, 44% from outreach and 24% from mass campaigns. The mean number of times a child was given Vitamin A supplementation was 2 (SD 1).

Table 14 Vitamin A Supplementation coverage for 6-59months

	VITAMIN A 6- 59 (ever received) Months N=763	VITAMIN A 6-59(Overall coverage)	VITAMIN A 6- 11 (received once)Months N=79	VITAMIN A 12-59 MOS (Received twice in last 1 year) n=684
2013	97%	76.6%	81%	76%
2011	48.5%		65.9%	21.3%

Overall, immunization seems to have improved compared to previous survey done. This could be attributed to the increase in mass campaigns and outreaches that have been taking place.

Table 15 Measles for 9-59 months, OPV 1 and 3 for 0-59 months

	Measles (n=750)		OPV 1(n=821)		OPV 3 (n=821)	
YES	WITH CARD	RECALL FROM MOTHER	WITH CARD	RECALL FROM MOTHER	WITH CARD	RECALL FROM MOTHER
% Coverage	21.7	61.6	32	60	26	58
OVERALL % (2013)	82.3		92		84	

Dewormimg coverage was analysed amongst children aged 1-5 years and has greatly improved from 46.7% in 2011 to 61.2% in 2013. This can also be linked to increased mass campaigns and integrated outreaches in Garissa County. The formation and sustainability of mother to mother support groups that teach women different IYCN components has also played a big role in improving immunization in children.

Table 16 Deworming coverage for children 1-5 years old

DEWORMING	2011 survey (%)	Frequency (%) 2013
Dewormed by card	27.2	5.8
Dewormed by recall	19.5	55.3
Not Dewormed	49.2	36.5
Do Not Know	4.1	2.4
Total	100	100

3.5 Infant and Young Feeding Practices (IYCF) Results

The findings indicate that practically all children (99.7%) were reported to have ever breastfed. The proportion of infants reportedly put on the breast within the first hour of birth was 62.1%, 22.6% was within 24hrs and finally 15.3 % reported to have been breastfed after 24 hours. Of the children who reported to have ever breastfed, 91.0% received colostrum during the first 3 days of birth. The findings indicated that 81.3% of children maintained breast feeding up to 2 years. 70.3% of the infants were reportedly given pre-lacteals before the age of 6 months. Among infants given pre-lacteals, the most frequently given item was animal milk and its products which in this case it was mainly goat milk (50.5%), plain water (32 %), sugar/glucose water or honey 10.7%, cereal based diet 5% and finally fruit juices (1.2%). According to FGDs, mothers gave their children water because it was believed that children are born thirsty.

Practically all (98%) of the children less than 6 months were reported to have been breastfeeding during the survey. The findings revealed that 23.3% were exclusively breastfed. The findings of the FGDs revealed that exclusive breastfeeding is not widely practiced and infants are introduced to other fluids as early as 1 week old. Reasons given for early weaning was that breast milk alone was not enough for the baby and the mother did not have enough milk.

After 6 months children should receive other foods in addition to breast milk since the

nutrients from breast milk alone cannot meet all the needs for accelerated growth and development. On average the mean food frequency was 3.2 (SD 2.5) given to children > 6 months. The findings showed that overall, all children sampled consumed low dietary diversity of less than four groups, a threat to optimal child growth and development.

Table 17 Summary of Key IYCF Findings

Infant and Young Feeding Practices	Overall % 2011	Overall % 2013
Breastfeeding Practices		
Put to breast within one hour of birth (n=343)	40.6	62.1
Exclusive breastfeeding for children <6months (n=146)	75.7	23.3
Dietary Diversity (% 6–23 year old children)		
Consuming 3+ food groups (breastfed children) n=207	No comparable data	0.0
Consuming 4+ food groups (non –breastfed children) n=207	No comparable data	0.0
Consuming 3+ or 4+ food groups (breastfed and non-breastfed children respectively) n=207	No comparable data	0.0
Minimum Meal Times (% 6–23 year old)		
Atleast twice a day for 6–8months breast feed (n=31)	No comparable data	93
3+ times a day for 6–23months old (breastfed children)n=144	No comparable data	73
4+ times a day of children 6–23 months (non-breastfed children) n=63	No comparable data	32

3.6 Maternal Health

The majority (40%) of the caregivers who responded were neither pregnant nor lactating, 38% were lactating, 21% were pregnant and 1% were both pregnant and lactating. Overall, 68.4% of mothers reported having attended MCH clinics during their last pregnancy with a mean frequency of 2 (SD 1.6) clinic visits. Some of the major reasons as to why they did not attend ANC clinics were that the health facility was too far (50%), they were not aware of the importance of ANC (37%), TBA services were adequate (6%) unfriendly health worker (2%), and cultural barriers (1%). FGD discussions revealed that it takes an average of 57 minutes to reach the nearest health facility.

Despite the average ANC uptake, only 19 % of the women delivered in the hospital. 77%

delivered at home with assistance from traditional birth attendants (TBAs), 2% delivered at home without assistance, and 1% delivered at home with assistance from nurse. Of the mothers who delivered at home, only (36.5%) of the respondents reported to have taken their children for medical attention within the recommended 2-week period. 32% went for care after 1 month, 21% between 2 weeks and 1 month and 10% did not intend to take child to clinic.

55% of mothers reported having received iron supplements for a period of 90 days. Overall 8% of women had MUAC less than 21.0cm with malnutrition being observed was highest among lactation women.

Figure 3 Physiological Status with MUAC <21cm
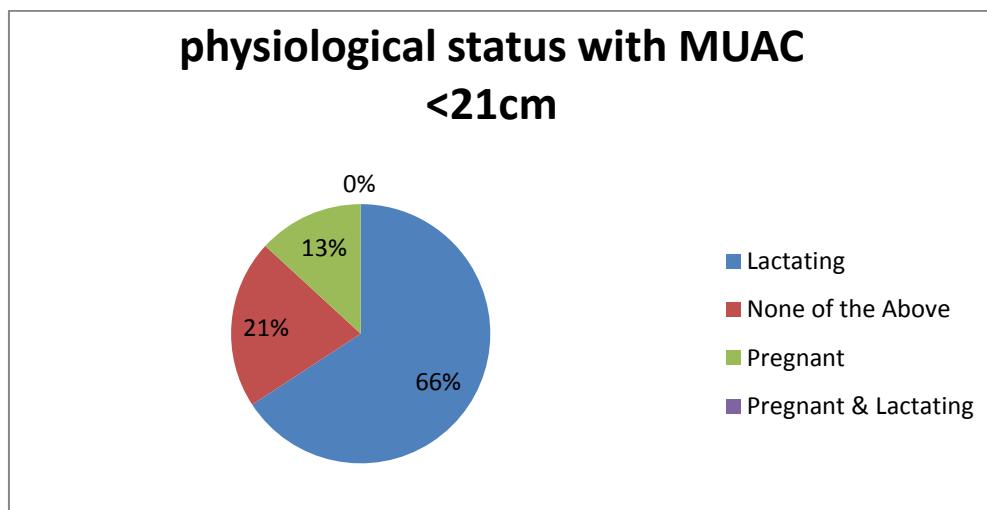
3.7 Water Hygiene and Sanitation Results

There were several sources of water for household use reported by the survey respondents. Most of the respondents 46% got water from piped water system. The other sources were unprotected shallow well, earth pan/dam, earth pan/dam with infiltration well, water trucking /water vendor, rain harvested water and river water.

50.8% of the respondents reported that the sources of water are reliable of which most used piped water systems. 37.5% reported to queue for water of which majority (44 %) queued for less than 30 minutes, 33 % more than 1 hour and 23 % 30 minutes to 1 hour.

Figure 4 Main Source of Water

Main Source of drinking Water
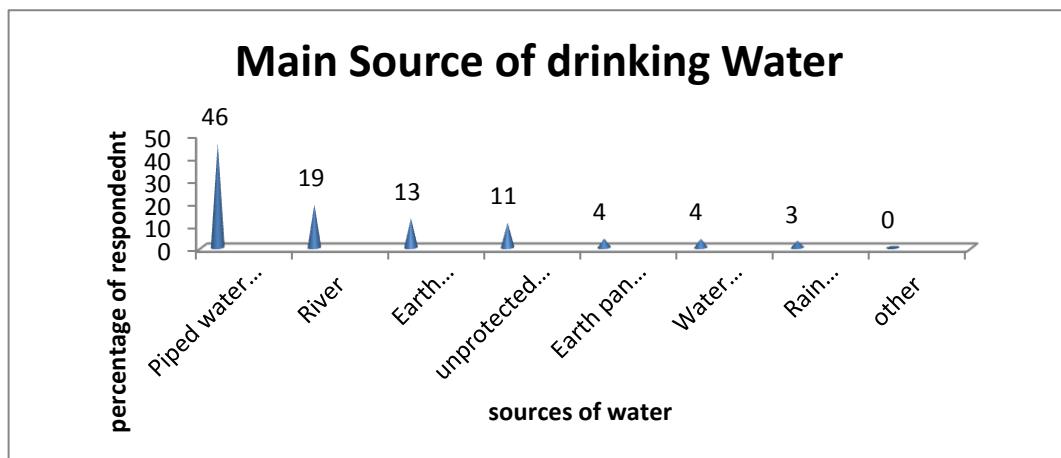
The findings show very minimal treatment of drinking water at the household level. 84.5% of the households did not treat water before drinking, 7.2% used chemicals to treat their water , 3% boiled drinking water, while1.9% used traditional herbs. Further analysis showed that 7.8% of caregivers stored water on open containers while the rest 92.2% stored water in closed containers. On average, each household used 87 (SD 42) litres of water per day (which translates to about four 20-litre jerricans). For households that buy water, they pay an average of Ksh 11 (SD 14.8) per 20-litre jerrican.

Figure 5 Water Treatment Methods

water treatment methods
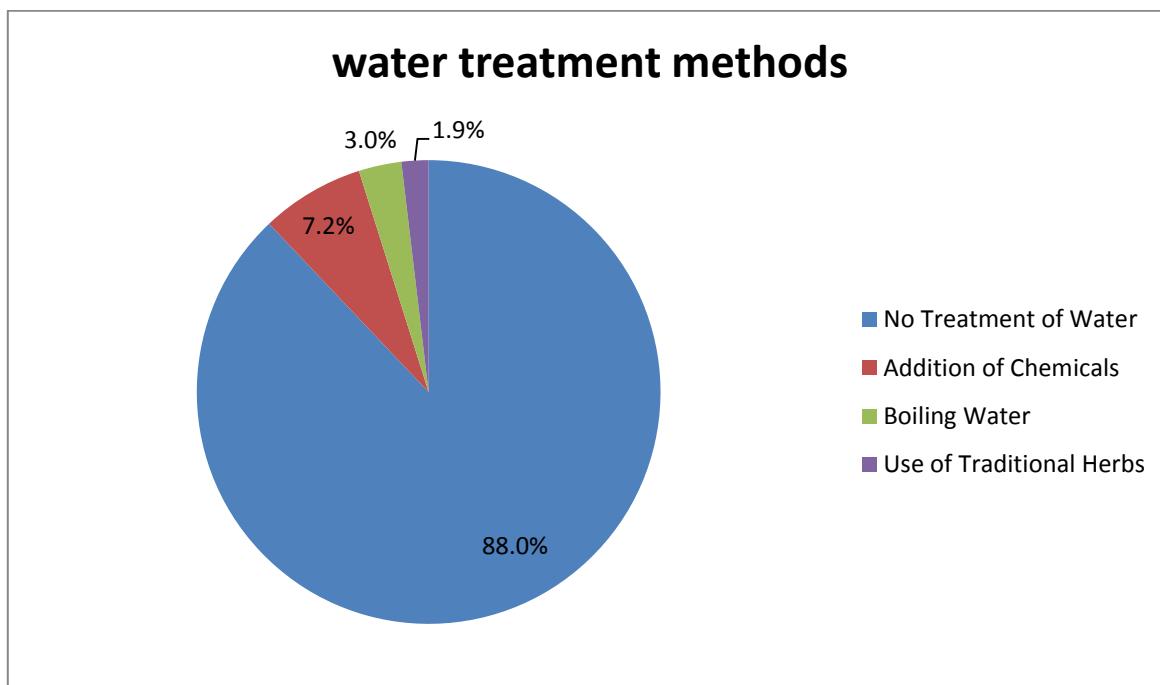
49.8% of the HH had access to a toilet facility while the rest 50.2% used open place/bushes to relieve themselves. The majority 81% of the latrines observed were clean and 69% of the latrines had a cement slab. From observation and report from the caregivers, 53% of households throw away their waste on the street/path, 24% dispose of waste in garbage pit, 14% burnt their waste which was included in others, 6% used a pit latrine, 2% used a manure pit and 1% gave animals their waste to eat.

Figure 6 Types of Toilet
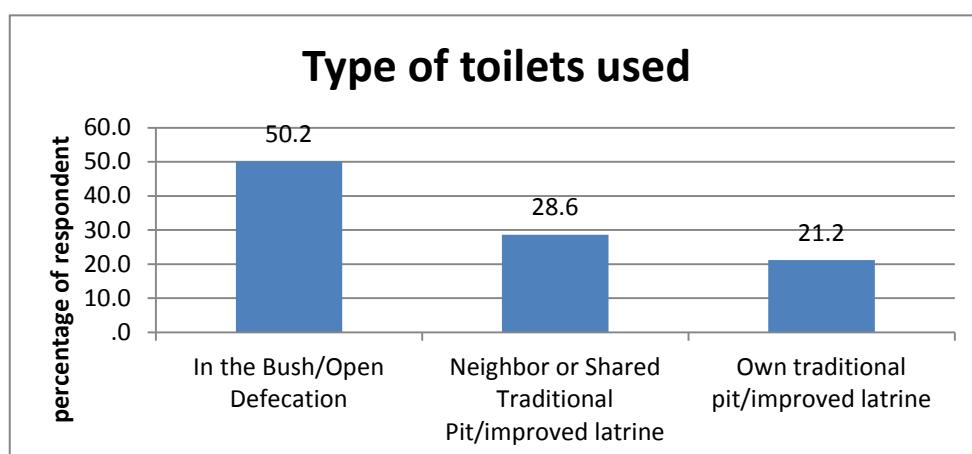
44% of the mothers reported washing their hands with water only, 43% said they wash hands with soap and water while the rest, at 13%, washed hands with soap when they can afford it. Of those who wash hands; majority 25.1% washed hands before prayers, 23% before eating, 21.3% before cooking, 20% after visiting the toilet, and 7.7% after taking children to the toilet. Some 2.9% reported they didn't have a special time to wash hands. The Proportion of respondents practicing proper hand washing at least 4 critical times is **10.6%** with soap and water.

Figure 7 Handwashing Practices

Handwashing times

(Bar chart — Percentage of respondent)

- Before Prayer: 25.1%
- Before Eating: 23.0%
- Before Cooking: 21.3%
- After Toilet: 20.0%
- After Taking Children to toilet: 7.7%
- No Special Time: 2.9%
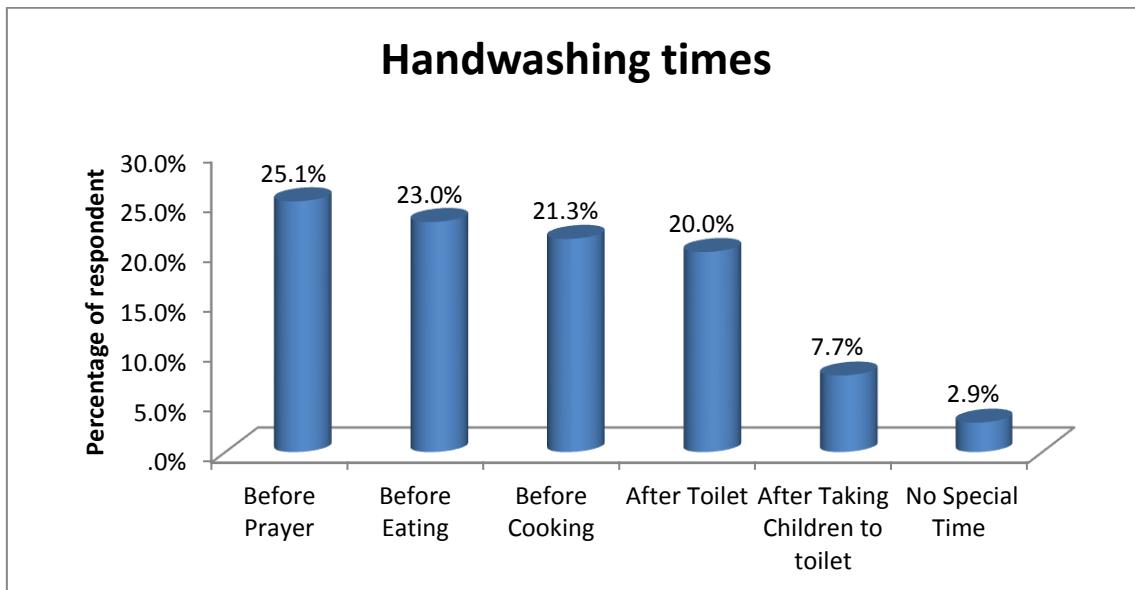
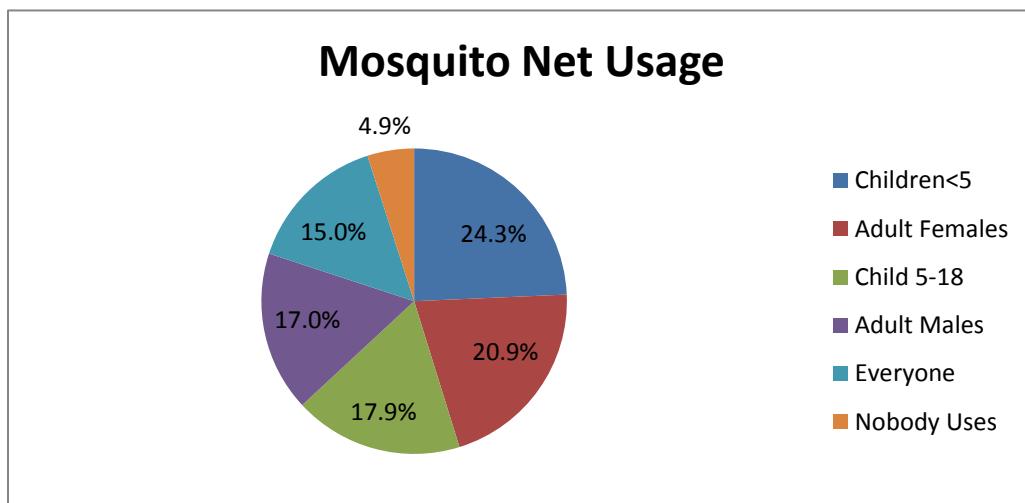## 3.8 Mosquito Net Usage

69.8% of the households possess a mosquito net of which 4.9% of households do not use the nets. It was reported that in 24.3% households children under 5 years sleep under the net.

Figure 8 Mosquito Net Usage

Mosquito Net Usage

(Pie chart)

- Children<5: 24.3%
- Adult Females: 20.9%
- Child 5-18: 17.9%
- Adult Males: 17.0%
- Everyone: 15.0%
- Nobody Uses: 4.9%

3.9 Food Security

Food security situation in Garissa County is Stressed (Phase 2)[9]. According to FGD, several factors including high food prices (especially vegetables and fruits), conflict and insecurity, inadequate and poor distribution of rainfall, poor road infrastructure, and the flooding of the Tana River (led to displacement of humans and damaged crops) influenced the food security in Garissa County at the time of the survey.

According to information from FGD, despite poor performance of the short rains, some regeneration of pasture and browse occurred. Thus livestock body conditions were sustained at the time of the survey. Milk production and consumption also increased as a result of peaking of cattle and camel calving. During the survey period, a majority of pastoral households were accessing 1–2.5 litres of milk. Livestock prices were above average resulting to increased household income. This is partly due to traded volumes of livestock in the markets are below average, because pastoralists are holding onto their livestock for fattening while a considerable number are lactating. The price of goats and cattle were above the long-term average. There were no animal diseases reported at the time of the survey.

Declining maize prices at the time were also making it easier for the pastoral households to access food from the market. About 80 to 90 percent of households were able to manage to access daily minimum food requirements.[10]

3.9.1 Livestock ownership

75.6% of households in the area own livestock. Those households that had cows had an average of 10 cows (SD 16). Households with goats had an average of 32 goats (SD 45), camels 14 (SD 18), donkeys 2 (SD 5), sheep 20 (SD 38) and chickens 8 (SD 14). Analysis by district revealed that Fafi District was the highest at 25% with the number of people owning livestock, followed by Lagdera 19%, Balambala 18%, Garissa 14%, Dadaab 13% and finally Ijara with 12%. At the time of collecting data most (53%) households reported an increase in their livestock, 34% reported livestock remained same while the rest 12%

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[9] Government of Kenya, The 2012–2013 Short Rains Assessment Report
[10] Government of Kenya, The 2012–2013 Short Rains Assessment Report

reported a decrease in their livestock. Main reason for increase of livestock was that animals had given birth while the reason for decrease was due to death of the animal.

3.9.2 Household Dietary Diversity Score (HDDS)

Overall, majority (54.7%) of the caregivers consumed more than 6 food groups in the previous 7 days, 32% consumed medium diversity group (4-5 food groups) and 13.3 % consumed low diversity groups as shown in Table 18.

Table 18 Household Diversity Score

Diet Diversity Groups	(%)Sept.2013	(%) April 2011
Low Diversity Groups (<=3 food groups)	13.3	40.2
Medium Diversity Groups (4-5 food groups)	32.0	
High Diversity Groups (> 6 food groups)	54.7	-

The most consumed food group was cereals and sweets at 95%and 91% respectively % while the least consumed food groups were fruits and fish at 13% and 3% respectively. The uncharacteristically low consumption of meat, vegetables and fruits was explained in FGDs by the fact that they were inaccessible because of increased prices from the market.

Figure 9 Most Consumed Food Groups
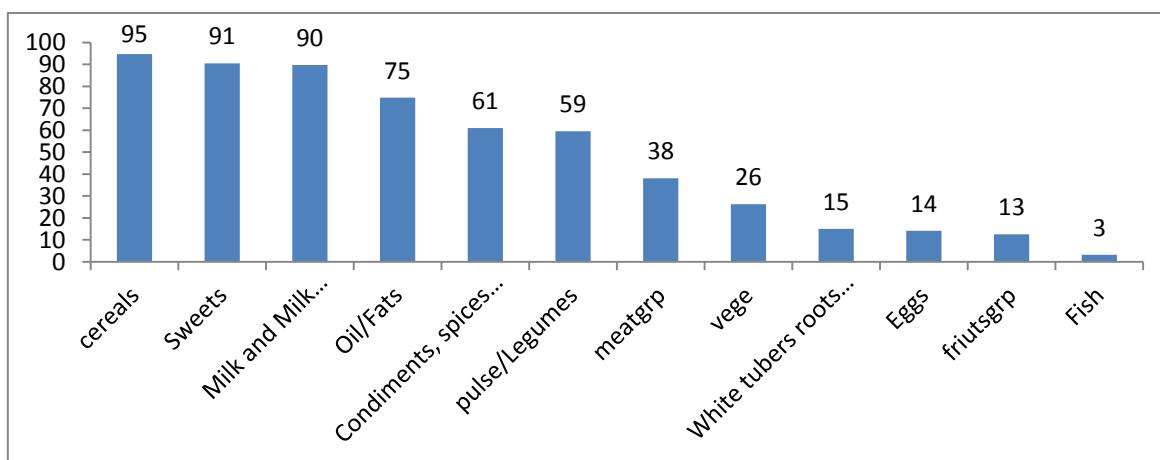
Most households 80.8% purchased food while the rest 17.2% produced their own food. There was minimal trade of food and borrowing reported.

Figure 10 Main Source of Food
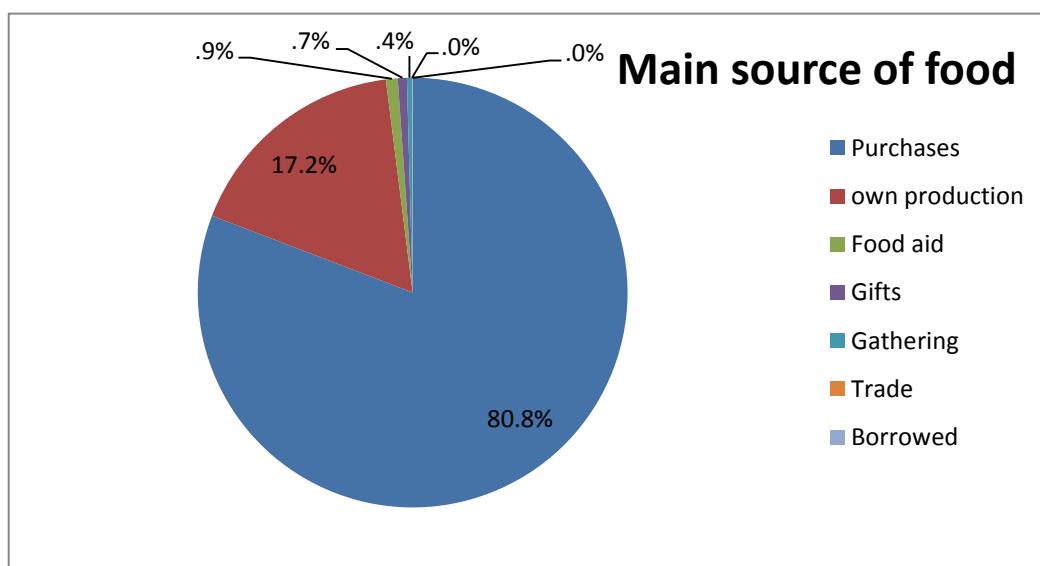
3.9.3 Household Coping Strategy

42.7% of the households reported that at times food was not enough. The most commonly employed household coping mechanisms were credit purchases of food, borrowing of food, relying on less preferred and less expensive food, reduction in the number of meals, and the reduction in size of meals for consumption by adults in order for small children to eat. Information collected during FGD revealed that in the last two months food shortage has not been severe. However, shortage is being felt recently due to the floods that were affecting human settlements and the washing away food in the farms.

Table 19 Household Coping Mechanism

Coping Mechanism	%
Purchase food on credit	36.1
Borrowed food	17.8
Less expensive food	14.9
Reduce number of meals	12.5
Reduced meal size	10.6
Restrict consumption by adults	8.2

4 CONCLUSIONS

Overall GAM though it has improved is still in a serious situation with aggravating factors:

- There is apparent inadequate food intake observed with children 6-23 months.
- The diet consumed is both low in quantity and quality
- Breastfeeding is predominant but not exclusive.
- There is evidence of poor public health, water and sanitation hygiene.
- Food security situation is at Stressed (Phase 2) due to high food prices, conflict and insecurity, poor distribution and amount of rainfall, poor road infrastructure, and the flooding of the Tana River.

5 RECOMMENDATIONS

Issue	Possible Causes	Recommendation	By Who
High GAM of 12%	Low food diversity among the children aged 0-23 months, intake of inadequate balanced diet, lack of mothers' knowledge of IYCN and other infections and diseases. Health facility inaccessible due to distance the nearest health facility being 57 minutes away. High food prices especially vegetables and fruits, conflict and insecurity, poor distribution and amount of rainfall, poor road infrastructure, and flooding of the Tana River.	Integrate nutrition, food security and livelihood and WASH programmes for better programme outcomes and higher impact and cost-effectiveness. Initiating income generating activities to create more livelihoods for the pastoral community. Infrastructural improvement to improve access to markets and facilitate general development in all areas of the County. Increase the number health centres in Garissa County. Issue of insecurity/conflict should be addressed by the government. Promote kitchen gardening of local traditional vegetables and pulses which are drought resistant and higher in nutrient composition to improve dietary and nutrition diversification. Strengthen nutrition program Targeting ECD and Madrasas for school going children between the ages of 31/2 years to 5 years.	MOH MOA MOD MOPW KRC Mercy-USA
Low mosquito net usage	Most of the household members did not use a mosquito net, at 30.2%. Note: 75.7% of under five children did not sleep under mosquito nets. This could be the reason for the (37.6%) of malaria reported.	Scale up the distribution of mosquito nets.	MOH
Exclusive Breastfeeding at 23.3%	Cultural beliefs	Breast feeding education should target expectant mothers as well as their mothers and mother-in-laws who have an important role to play in conveying infant and child care knowledge.	MOH Mercy-USA
Low maternal health especially for	Lack of knowledge	Nutrition Health education targeting lactating and pregnant mothers to improve their nutritional status.	MOH Mercy-USA

lactating women			
Low toilet coverage. At 49% with toilet access	Poor community sensitization on importance of having toilets in the community.	Strengthen Community Led Total Sanitation and community awareness to increase toilet usage cover.	MOPH Mercy-USA ADP
Poor health seeking behaviour with only 39.3% of caregivers seeking treatment for sick children	Health facility being too far.\n\nPoor referral mechanism due to lack of motivation of CHW.	Educate mothers on proper health seeking behaviour. This can attribute to why zinc uptake is low in management of diarrhoea cases, improve referral mechanism and strengthen community units.	MOH Mercy-USA
Poor water treatment practice at 84.5% of households consuming water without treatment	Lack of knowledge.	Treatment of drinking water should be encouraged and promoted either by boiling or use of chemicals (chlorination).	MOPH Mercy-USA
Poor hygiene practices at 43% washing hands with soap and water	Lack of knowledge.	Training of the community on appropriate hand washing with soap or alternatives available in the community e.g. ash or herbs.	MOPH Mercy-USA
Low hospital deliveries at 19%	37% of mothers did not have knowledge on importance of ANC.	Create awareness of the importance of attending ANC and hospital delivery through mother to mother support groups and community health workers.	MOH Mercy-USA

6 APPENDICES

Appendix 1 IYCN Calculator

Garissa Sample size
calculator for IYCF in

Appendix 2 Household Questionnaire

GARISSA COUNTY
SMART 2013 Househo

Appendix 3 IYCN Questionnaire

INFANT AND YOUNG
CHILD FEEDING QUES

Appendix 4 Focus Group Discussion Guide

Final FGD
Questionnaire.doc

Appendix 5 Calendar of Events Dadaab

calendar of
events-Dadaab.xlsx

Appendix 6 Calendar of Events Garissa

calendar of events
garisssa.xlsx

Appendix 7 Plausibility Checks

Indicator	Survey value	Acceptable value/range	Interpretations/ Comments
Digit preference score – weight	0	<10	Excellent
Digit preference – height	0	<10	Excellent
WHZ (Standard Deviation)	0 (1.02)	0.8–1.2	Excellent
WHZ (Skewness)	0	–1 to +1	Excellent
WHZ (Kurtosis)	0	–1 to +1	Excellent
Percent of flags WFH	0	<3%	Excellent
Poisson	1		Accept
Overall Age distribution (%)	10		Accept
Overall Sex Ratio	0	0.8–1.2	Excellent
Overall Survey Score	11		Accept

Appendix 8 Map

GARISSA DISTRICT: LIVELIHOOD ZONES
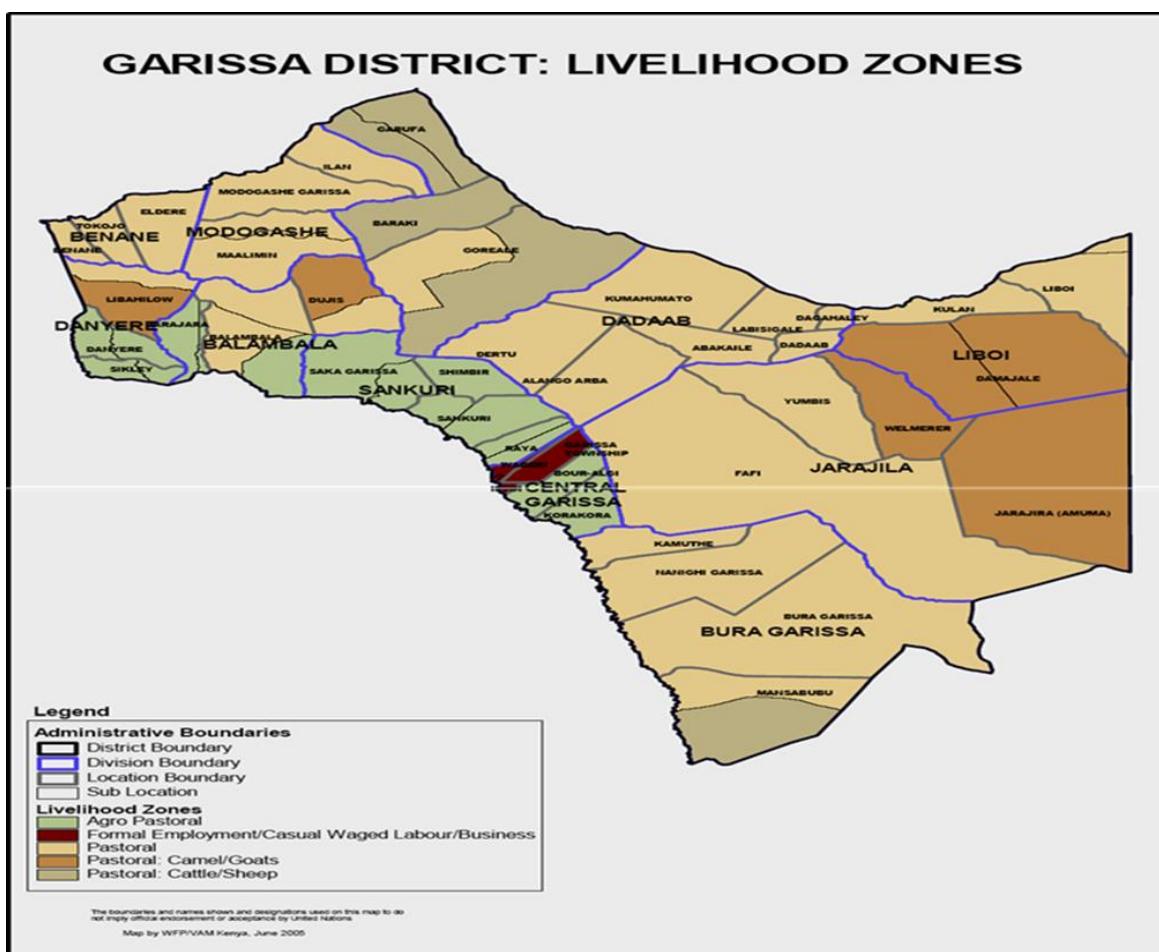
Appendix 9 Description of Main Activities and Timeframe

ACTIVITIES	March 2013			April 2013				
	Week 2	WEEK 3	WEEK 4	WEEK 1	WEEK 2	WEEK3	WEEK 4	WEEK 5
Planning and methodology validation	██							
Meeting DHMTS		██	██					
Training of enumerators						██		
Data collection						██	██	
Dissemination of results								██