INTEGRATED HEALTH AND NUTRITION SMART SURVEY

MOYALE, SOLOLO AND CHALBI DISTRICTS

12th – 23rd AUGUST, 2013

CONCERN WORLDWIDE KENYA

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Executive Summary

Background

Both the greater Moyale District (Currently Moyale and Sololo Districts) and Chalbi District are in Marsabit County. Moyale covers an area of 9,370.8 in square kilometers, with an estimated population of 115,4271 persons where 23,085 are aged below 5 years. The larger Moyale district has three livelihood zones namely pastoral, agro-pastoral and formal employment/business/petty trade. Agro-pastoral communities are concentrated in the northern part of the district along Kenya – Ethiopia border. In the last two years the district has had a favorable climatic condition as a result of three consecutive rainy seasons namely March – June 2012, October – December 2012 and March – June 2013.

Chalbi District has an estimated population of 32,011 where 6,402[2] is the estimated under five populations as at 2013 projected statistics. Pastoralism is the pre-dominant livelihood with the main livestock kept being cattle and goats although camels and sheep are also kept. The district receives bimodal rainfall pattern with long rains received in March to May and short rains between October and December. The rainfall ranges from 300-800 mm.

To try to improve the health and nutrition status in the county, Concern Worldwide has been working with the Ministry of Health and Sololo Mission Hospital in the implementation and up scaling the High Impact Nutrition Intervention (HiNi) in the County. In Moyale and Sololo Districts, Concern supports 30 health facilities in the implementation of HiNi which also has the IMAM component. In Chalbi, Concern supports seven facilities and ten outreach sites in the implementation of HiNi.

Rationale and Survey Objectives

The survey was proposed in order to assess the levels of malnutrition and the performance of the HiNi indicators in Moyale/Sololo and Chalbi Districts where Concern Worldwide is supporting the Ministry of Health in the implementation of HiNi. In a nutshell the general objective of the survey was to establish the current health and nutrition status in the three districts. More precisely, the specific objectives of the survey included:

- To estimate the current prevalence of acute malnutrition in children aged 6 – 59 months
- To compare the overall nutritional changes with the previous GAM and SAM
- To determine the morbidity rates amongst children aged 0-59 months over a two week recall period
- To estimate the coverage of Measles, BCG vaccination and deworming for children 9-59 months and 6-59 months respectively
- To determine the coverage for zinc supplementation and vitamin A supplementation among the children 6-59 months

[1] Based on the current population growth rate of 2.69% per annum, KNBS
[2] Projections based on the KNBS population growth rate

- To estimate the nutritional status of female caregivers aged 15-49 years using MUAC measurements
- To measure the IYCN indicators

Survey Methodology

The survey applied a two stage stratified cluster sampling using the SMART methodology with the clusters being selected using the probability proportional to population size (PPS). Stage one sampling involved the sampling of the clusters which were included in the survey while the second stage sampling involved the selection of the households from the sampled clusters. The target sample size for Moyale/Sololo was 885 households while the target sample for Chalbi district was 299 households. In Moyale/Sololo 49 clusters were selected while in Chalbi there 25 clusters that were selected for the survey. There were 7 teams which were involved in data collection in Moyale/Sololo and took 7 days while in Chalbi 5 teams were used to collect the data and spent 5 days in the data collection. Additionally, before the data collection started the teams were given a four day training which included review of the survey tools, methodology and using anthropometric measurements. In addition, a standardization test was done on the third day of the training while also a pilot survey was conducted on the fourth day of the survey. The survey started on 12th August 2013 in both areas where the training of the Moyale/Sololo survey team was done in Moyale and the Chalbi survey team was trained in Marsabit. Various partners also supported the Ministry and Concern Worldwide in implementing the survey and these included Food for the Hungry Kenya (FHK), World Vision, National Drought Management Authority (NDMA), APHIA Plus and UNICEF.

Summary of Results

Table 1: Summary of Moyale/Sololo Health and Nutrition Indicators

Indicator	11-Jun	12-Jul	*13-Aug*
Demographic			
Total No. of HHs Assessed for Anthropometry	529	814	843
Total number of Children assessed	881	1000	1131
Male	416	504	563
Female	455	496	568
Average Number of Persons per Household	5.9	6	6.6
Number of Children 0 – 23 Months Surveyed for IYCN	439	352	638
Number of Children 0 – 5 Months Surveyed for EBF	99	273	194
Nutrition Status of Children 6 – 59 Months			
Global Acute Malnutrition (WHO 2006)	13.5% (11.2-16.2)	7.4% (5.6 - 9.8)	5.9% (4.3 - 8.0)
Male	16.7 % (13.5 - 20.4)	7.3 % (5.2 - 10.3)	6.2% (4.3 - 9.0)
Female	10.7 % (8.1 - 14.1)	7.5 % (4.8 - 11.4)	5.6% (3.9 - 8.2)
Severe Acute Malnutrition (WHO 2006)	1.3% (0.7-2.4)	1.4% 0.8-2.4)	0.7% (0.3 - 1.5)
Male	1.4 % (0.7 - 3.0)	1.6 % (0.8 - 3.0)	0.9% (0.4 - 2.1)
Female	1.3 % (0.6 - 2.9)	1.2 % (0.5 - 3.0)	0.5% (0.2 - 1.6)
Oedema	0.00%	0.20%	0.20%

Malnutrition by MUAC (<12.5 cm or oedema)	6.6% (5.1-8.4)	5.3% (3.7-7.5)	1.5% (0.9 - 2.4)
Male	NA	4.4 % (2.4 - 7.7)	1.2% (0.6- 2.5)
Female	NA	6.3 (4.2 - 9.1)	1.8% (0.9- 3.3)
Malnutrition by MUAC (<11.5 cm or oedema)	0.8% (0.4-1.8)	1.4% (0.6-3.1)	1.2% (0.7- 2.0)
Male		1.2 % (0.3 - 4.8)	1.1% (0.5- 2.3)
Female		1.6 % (0.8 - 3.3)	0.2% (0.0- 1.3)
Proportion of children Stunted (HAZ<-2)	33.3% (29.2-37.7)	28.2% (25.3 –31.4)	26.7% (23.3 - 30.4)
Male	38.3 % (32.8 - 44.0)	30.8 % (25.3 - 36.8)	28.9% (24.7 - 33.4)
Female	28.4 %(23.4 - 34.0)	25.7 % (22.6 - 29.0)	24.9% (20.5 - 29.1)
Proportion of children Underweight (WAZ<-2)	31.0% (26.9-35.4)	15.3% (12.7-18.4)	15.6% (12.8 - 18.9)
Male	38.7 % (33.9 - 43.7)	15.7% (12.3-19.8)	16.1% (12.9 - 20.1)
Female	23.5 % (18.6 - 29.2)	15.0% (11.8-18.9)	15.1% (12.1 - 18.8)
Children Morbidity			
Proportion of Children Sick 2 Weeks Preceding the Survey	43.2%	18.9%	38.5%
Proportion of Children with ARI	24.0%	35.3%	28.5%
Proportion of Children with Fever		35.3%	26.6%
Proportion of Children with Diarrhea	24.0%	20.4%	35.3%
Health Seeking Behavior among the children sick 2 weeks prior		83.6%	76.8%
Vaccination Coverage			
OPV 1 Coverage	97.6%	99.4%	97.9%
BCG Coverage			98.3%
OPV 3 Coverage	94.9%	98.4%	96.6%
Measles Coverage among Children 9 – 59 Months	61.7%	94.2%	92.9%
Proportion of children aged 6-11 months receiving Vitamin A supplementation in the past 6 months	62.10%	86.00%	56.60%
Proportion of children aged 12- 59 months receiving Vitamin A supplementation in the past 6 months	64.40%	73.90%	57.40%
Proportion of children 12-59 months dewormed within the last six months	9%	43.6%	34.4%
Maternal Indicators			
Proportion of PLW who were Malnourished (MUAC < 21cm)	11.7%	5.4%	5.0%
Proportion of Lactating Supplemented with Vitamin A		33.9%	22.5%
Proportion of Caregivers Supplemented with Iron	26.1%	33.7%	49.2%
Proportion of Caregivers Delivering at Home with No Assistance of Skilled Worker			16.9%
Water and Sanitation			
Proportion of Households with Access to Safe Drinking Water	28.2%	23.6%	21.9%
Proportion of Households with Access to Toilet Facility	56.1%	73.6%	53.3%
Proportion of Respondents Practising Proper Hand Washing at Critical Times	57.7%	38.7%	33.7%
Infant and Young Children Feeding Practices			
Proportion of Children Exclusively Breastfed	20.20%	44.40%	70.70%
Early initiation to breast milk	22.40%	43.80%	84.30%
Proportion of Children 6-23 months meeting the Minimum meal frequency	NA	NA	16.10%

Proportion of children 6-23 months meeting the minimum dietary diversity	NA	44.90%	60.40%

Table 2: Summary of Chalbi Health and Nutrition Indicators

Indicator	June/June 2012	Aug-13
Demographic		
Total No. of HHs Assessed for Anthropometry	827	328
Total number of Children assessed	791	353
Male	414	167
Female	377	189
Average Number of Persons per Household	5.3	5.3
Number of Children 0 – 23 Months Surveyed for IYCN	441	163
Number of Children 0 – 5 Months Surveyed for EBF	254	54
Nutrition Status of Children 6 – 59 Months		
Global Acute Malnutrition (WHO 2006)	10.7% (8.2-13.8)	15.9% (12.1 - 20.5)
Male	12.9 % (10.2 - 16.1)	19.4% (13.1 - 27.7)
Female	8.3 % (5.4 - 12.5)	12.8% (8.2 - 19.4)
Severe Acute Malnutrition (WHO 2006)	1.5% (0.9-2.6)	3.4% (2.1 - 5.5)
Male	1.9 % (1.0 - 3.9)	2.4% (0.9 - 6.3)
Female	1.1 % (0.4 - 2.9)	4.3% (2.4 - 7.5)
Oedema	0.00%	0.00%
Malnutrition by MUAC (<12.5 cm or oedema)	3.5 % (2.4-5.2)	4.5% (2.5 - 8.1)
Male	2.9% (1.7-4.9)	5.4% (3.0-9.5)
Female	4.3% (2.6-6.8)	3.7% (1.4-9.4)
Malnutrition by MUAC (<11.5 cm or oedema)	2.7% (1.7-4.2)	0.0% (0.0-0.0)
Male	2.2%(1.2-3.8)	0.0% (0.0.-0.0)
Female	3.2% (1.6-6.1)	0.0% (0.0-0.0)
Proportion of children Stunted (HAZ<-2)	28.9 % (25.4 - 32.7	32.2%(26.7 - 38.2)
Male	32.4 % (27.6 - 37.6	33.9%(26.6 - 42.2)
Female	25.1 % (20.7 - 30.1	30.6% (24.5 - 37.4)
Proportion of children Underweight (WAZ<-2)	23.6 % (19.1 - 28.8	29.9%% (24.3 - 36.2)
Male	27.2 % (22.2 - 32.8	31.9% (23.8 - 41.3)
Female	19.7 % (14.3 - 26.4	28.2% (21.4 - 36.1)
Children Morbidity		
Proportion of Children Sick 2 Weeks Preceding the Survey	10.8%	19.5%
Proportion of Children with ARI	41.9%	14.3%
Proportion of Children with Fever	28.4%	45.7%
Proportion of Children with Diarrhea	1.4%	17.1%
Health Seeking Behavior among the children sick 2 weeks prior	44.1%	65.7%

Vaccination Coverage		
OPV 1 Coverage	91.2%	98.6
BCG Coverage		96.9%
OPV 3 Coverage	88.2%	90.5%
Measles Coverage among Children 9 – 59 Months	90.8%	88.9%
Proportion of children aged 6-11 months receiving Vitamin A supplementation in the past 6 months	86.70%	75.90%
Proportion of children aged 12- 59 months receiving Vitamin A supplementation in the past 6 months	75.00%	56.60%
Proportion of children 12-59 months dewormed within the last six months	72.7%	44.3%
Maternal Indicators		
Proportion of PLW who were Malnourished (MUAC < 21cm)	10.2%	7.8%
Proportion of Lactating Supplemented with Vitamin A	45.7%	54.3%
Proportion of Caregivers Supplemented with Iron	68%	75.0%
Proportion of Caregivers Delivering at Home with No Assistance of Skilled Worker		0.6%
Water and Sanitation		
Proportion of Households with Access to Safe Drinking Water	35.1%	65.5%
Proportion of Households with Access to Toilet Facility	40.6%	44.2
Proportion of Respondents Practising Proper Hand Washing at Critical Times	9.0%	10.4%
Infant and Young Children Feeding Practices		
Proportion of Children Exclusively Breastfed	48.20%	65.10%
Early initiation to breast milk	94.40%	84.50%
Proportion of Children 6-23 months meeting the Minimum meal frequency	50.30%	28.10%
Proportion of children 6-23 months meeting the minimum dietary diversity	35.50%	5.70%

Conclusion and Recommendation

In Moyale/Sololo, the survey found that the nutrition status had *slightly* improved since July 2012. The August, 2013 survey established a GAM rate of 5.9% which is classified as poor based on the WHO classification. This is also the lowest GAM rate recorded in Moyale/Sololo since 2011. The improved nutrition condition was mainly attributed to the favorable climatic condition which has resulted in improved livestock body condition, availability of water and harvest for the agro-pastoralists hence impacting positively on the food security situation in the area. Additionally, this may also have been attributed to the improved IYCN practices as established by the survey results. Nevertheless, the results also show that micronutrient supplementation was still low in the area. The survey recommends that there is need to strengthen the community strategy in order to improve service delivery at the community level particularly for the micronutrient supplements

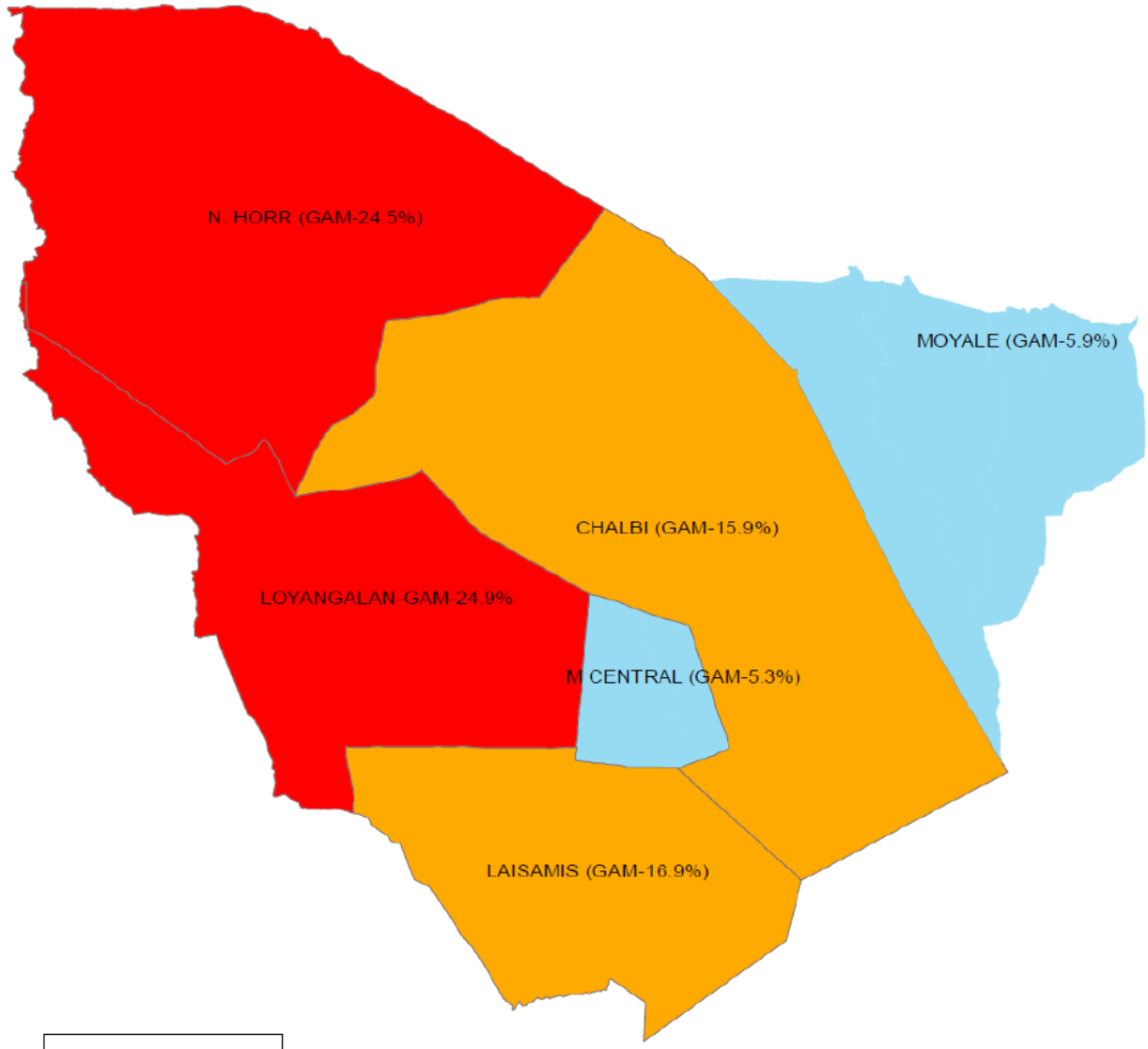
In Chalbi, the survey found that the nutrition status has slightly deteriorated when compared with the same period in 2012. The August, 2013 survey established a GAM rate of 15.9% which is classified as critical based on the WHO classification. The deteriorated nutrition status in Chalbi was mainly attributed to the increase in prices of basic food items indicative of worsening food security in the district. Additionally, during this period the livestock body condition was classified as worsening by the National Drought

Management Authority[3]. The worsening nutrition status in Chalbi could also be attributed to inadequate coverage of health facilities by health workers. In particular, 3 out of the 7 (43%) health facilities in the district were not properly covered 3 months prior to the survey. Hence the 3 facilities were not able to provide preventive health services to the community members.

The survey also showed that micronutrient supplementation was still low in the area. In this regard, it is recommended to intensify community level services and integrated programing to address the deteriorating food security and WASH situation given the poor forecast of the short rain. In addition, training of the newly recruited health staffs in the district on HINI and continuous monitoring of the health and nutrition situation by DHTM, county nutrition team and NDMA is important to address the deteriorating situation.

[3] National Drought Management Authority, The Larger Marsabit District July Bulletin

Marsabit County Nutrition Status - 2013



Map Created by Samuel K. Kirichu - APM (Survey&Surveillance), Concern Worldwide, Kenya

CHAPTER ONE

INTRODUCTION

1.1Background

1.1.1 Overall Introduction

Marsabit County consists of seven districts namely Laisamis, Chalbi, Marsabit Central, North Horr, Sololo, Moyale and Loiyangalani. Marsabit County has a surface area of 70,961 (KM^2)[4] and is ranked as the largest county in the country. However, the county has a population 291,166[5] and is ranked number 42 out of 47 in the country in terms of population. Additionally, it is the least populated county in the country in terms people per km^2 with a density of 4 people per km^2. The county remains one among the counties with the highest poverty index in the in Kenya and ranked position 44 out of 47 counties with a poverty rate of 83.2%[6]. The county boarders Isiolo County to the South West, Samburu County to the South, Lake Turkana to the West, Ethiopia to the North and Wajir County to the North West. The county has three major livelihoods with the pastoralism being the dominant in Chalbi, Laisamis, North Horr and Loiyangalani. Pastoralism is also available in Moyale and Sololo Districts. Agro-Pastoralism is available on the Moyale and Sololo highlands bordering Ethiopia and Marsabit Central districts. The final livelihood zone is business which is much predominant in Marsabit Central and Moyale Towns.

The county experiences poor health and nutrition outcomes which are mainly attributed to poor access to critical health services. Additionally, other major factors contributing to high malnutrition rates in the county include chronic and acute food insecurity due to erratic or poor rainfall, poor dietary diversity and low purchasing power due to eroded capacity by seasons of successive droughts, and also worthy to note is suboptimal child care and feeding practices and poor practices related to hygiene and sanitation, cultural beliefs and low access to essential health services also plays a major role in nutritional status of children in this district. For instance, various nutrition surveys have been done in the Larger Marsabit District (Chalbi, Laisamis, Marsabit Central, Loiyangalani and North Horr) and the Larger Moyale District (Moyale and Sololo) which have registered as high malnutrition rates as 27%[7] in May 2011 and as low as 12.5%[8] in 2012, a high of 13.5% in June 2011 and a low of 7.5% in July 2012 in the Larger Marsabit District and the Larger Moyale District respectively.

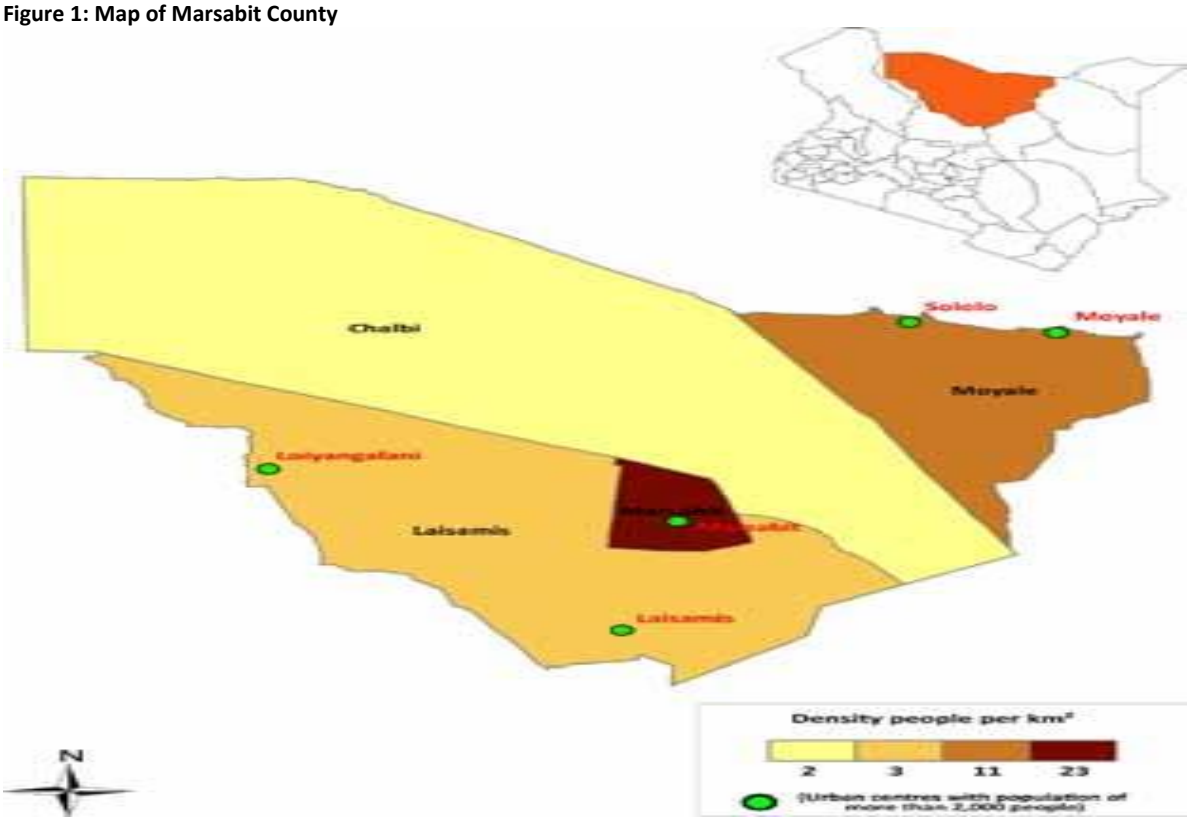
To try to improve the health and nutrition status in the county, various partners have been working with the Ministry of Health in the implementation and up scaling the High Impact Nutrition Intervention (HiNi) in the County. For instance Concern Worldwide has been supporting the Ministry of Health (MoH) in the

[4] Kenya County Fact Sheets, Commission for Revenue Allocation
[5] Kenya County Fact Sheets, Commission for Revenue Allocation
[6] Kenya Integrated Household Budget Survey
[7] MoH, UNICEF and FHK. Integrated Health and Nutrition Survey, May 2011
[8] MoH, UNICEF, Concern Worldwide and FHK. Integrated Health and Nutrition Survey, June 2012

implementation of the HiNi services in Moyale, Sololo and Chalbi Districts. On the other hand Food for the Hungry Kenya (FHK) has been supporting the MoH in the implementation and up scaling of HiNi in North Horr, Marsabit Central and Loiyangalani Districts while World Vision has been supporting the same activates in Laisamis District. Additionally, Concern Worldwide has been implementing a health program in Marsabit Central and Moyale Districts.

Although the nutrition situation has considerably improved during the last 3years in the county mainly due to accelerated coverage, prevailing rates of child malnutrition and under- nutrition of women, as well as micronutrient deficiencies are still very high compared to other parts of the country. It is a common knowledge that widespread malnutrition contributes largely to high infant and child mortality and an important cause of poverty which impacts negatively on the full development of the human resource bases and the achievements of the Millennium Development Goals and other national targets. It is on this note that the Ministry of Health, Concern Worldwide, Food for Hungry Kenya (FHK), World Vision, UNICEF, APHIA Plus and other partners undertook the integrated health and nutrition survey in county. This was a coordinated survey where Concern Worldwide and FHK took the technical and implementation leadership but being supported by World Vision, APHIA Plus and UNICEF.

Figure 1: Map of Marsabit County



1.1.2 Moyale and Sololo Nutrition Program

The greater Moyale District (Currently Moyale and Sololo Districts) covers an area of 9,370.8 in square kilometers, with an estimated population of 115,4279 persons where 23,085 are aged below 5 years. The district boarders Ethiopia to the North, Chalbi District to the North West, Isiolo County to the South and Wajir to the North East. It has four administrative divisions namely Uran, Obbu, Central and Golbo which are within three livelihood zones namely pastoral, agro-pastoral and formal employment/business/petty trade. Agro-pastoral communities are concentrated in the northern part of the district along Kenya – Ethiopia border. In the last two years the district has had a favorable climatic condition as a result of three consecutive rainy seasons namely March – June 2012, October – December 2012 and March – June 2013.

Concern Worldwide with financial support from UNICEF has been supporting MoH and Sololo Mission Hospital in the Scaling up of High Impact Nutrition Interventions for improved nutrition in children and pregnant and lactating women in Moyale and Sololo Districts. The goal is to contribute to reduction in mortality and chronic malnutrition in children aged 0 to 5 years. These interventions are in line with the priorities outlined in the nutrition sector partnership framework which supports scaling up of high impact interventions as well as supporting the MoH to deliver essential nutrition services which include proven cost effective and feasible interventions in prevention and treatment of malnutrition. Key activities include detection and referral of acute malnourished cases (i.e. children and pregnant/lactating mothers) at health facilities, promotion and protection of infant and young child feeding practices, promoting micronutrient supplementation for children and mothers, de-worming, nutrition education, coordination of nutrition initiatives, nutrition surveillance, reporting and monitoring. Currently, there are 30 facilities which are being by Concern Worldwide in the implementation of the High Impact Nutrition Intervention.

1.1.3 Chalbi Nutrition Program

Chalbi District is one of the 5 districts in the Larger Marsabit District, Eastern Province in Northern Kenya, with an estimated population of 32,011 where 6,402[10] is the estimated under five populations as at 2013 projected statistics. The district boarders Ethiopia to the North, Lake Turkana to the West, Laisamis District to the South, Sololo District to the East and Isiolo County to the South East. Pastoralism is the pre-dominant livelihood with the main livestock kept being cattle and goats although camels and sheep are also kept. The district receives bimodal rainfall pattern with long rains received in March to May and short rains between October and December. The rainfall ranges from 300-800 mm.

Following the 2011 drought experienced throughout the horn of Africa and which was considered one of the worst emergencies in recent years, Concern Worldwide with financial support from children investment fund foundation (CIFF) has been supporting Ministry of Health from October 2011 in Scaling up of High Impact Nutrition Interventions for improved nutrition in children and women in Chalbi District. Currently there are seven facilities and 10 outreached that are being supported by Concern Worldwide in the implementation of HiNi.

[9] Based on the current population growth rate of 2.69% per annum, KNBS
[10] Projections based on the KNBS population growth rate

1.2 Rationale of the Survey

The survey was proposed in order to assess the levels of malnutrition and the performance of the HiNi indicators in Marsabit County. The survey was conducted through the partnership of Food for the Hungry (FH), Concern Worldwide, Ministry of Health, World Vision, UNICEF, APHIA and other implementing partners. This survey was conducted between 12th August and 23rd August, 2013 and helped in evaluating the extent of malnutrition among the children aged 6-59 months and the possible factors contributing to malnutrition and recommends appropriate interventions

1.3 Objectives

1.3.1 Overall Objective

The general objective of the survey was to establish the current health & nutrition status in the Marsabit County

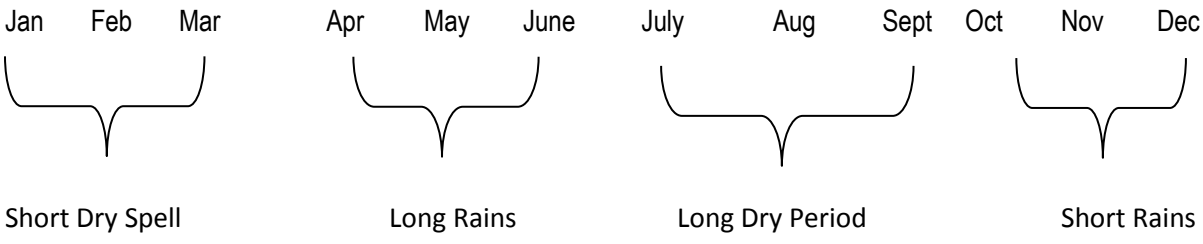
1.3.2 Specific Objectives:

- To estimate the current prevalence of acute malnutrition in children aged 6 – 59 months
- To compare the overall nutritional changes with the previous GAM and SAM
- To determine the morbidity rates amongst children aged 0-59 months over a two week recall period
- To estimate the coverage of Measles, BCG vaccination and deworming for children 9-59 months and 6-59 months respectively
- To determine the coverage for zinc supplementation and vitamin A supplementation among the children 6-59 months
- To estimate the nutritional status of female caregivers aged 15-49 years using MUAC measurements
- To measure the IYCN indicators

1.4 Timing of the Survey

The survey was undertaken from 12th August, 2013. Training and piloting of the survey materials and standardization test will be conducted from 12th to 15th August, 2013 and thereafter data collection from 16th August, 2013. Data entry will be done in the evening following data collection. This survey was conducted in the middle of the long dry period as shown in the section below:

1.5 Seasonal Calendar



1.6 Survey Area

The survey was conducted in the Marsabit County. This includes Laisamis, Loyangalani, Chalbi, Moyale and Sololo, North Horr and Marsabit Central Districts. However, the survey area was stratified into five: Chalbi District formed stratum 1, North Horr and Loyangalani Districts formed stratum 2, Laisamis District formed stratum 3 and Marsabit Central District formed stratum 4 while Moyale and Sololo formed Stratum 5. The stratification was based on the geographical distribution of the Marsabit County. This report is particular to Moyale/Sololo and Chalbi where Concern Worldwide takes lead in the implementation of the nutrition program.

CHAPTER TWO

METHODOLOGY

2.1 Study Design

The survey applied a two stage stratified cluster sampling using the SMART methodology with the clusters being selected using the probability proportional to population size (PPS). Stage one sampling involved the sampling of the clusters which were included in the survey while the second stage sampling involved the selection of the households from the sampled clusters.

2.2 Study Population

The target population for this survey was children aged 6 – 59 months for the anthropometric component, 0 – 5 months for EBF rates and the caregivers of the targeted children in the Marsabit County

2.3 Anthropometric Sample Size

The anthropometric survey sample size was calculated using the SMART survey calculator. The parameters of interest were captured in the ENA Nov 2011 software and the respective number of children and households required for the survey computed as indicated in Table 1. The sampling frame for this survey was the updated list of villages (with current projected population) from the survey area.

2.3.1 Sample Size Calculation for the Anthropometric

Table 3: Anthropometric Sample Size for the Marsabit District

	Chalbi	Loyangalani & North Horr	Laisamis	Marsabit Central	Moyale	Total
Estimate (GAM)	10.7%	13.9%	13.9%	13.9%	7.4%	
Precision	4.0%	4.0%	4.0%	4.0%	4.0%	
Design Effect	1.5	1.5	1.5	1.5	1.5	
Estimated Number of Children	**344**	**431**	**431**	**431**	**269**	**1906**
Average HH Size	4.7	4.7	5.0	4.7	5.7	
Proportion of Children Under 5	12.9%	15.9%	21.3%	15.6%	18.0%	
Estimated Number of Households	**650**	**661**	**464**	**673**	**300**	**2748**
HH Proportion	10.9%	26.1%	13.6%	17.2%	32.2%	
Weighted Number of HH to be Sampled	**299**	**717**	**374**	**472**	**885**	**2748**
HH per Day	**12**	**15**	**15**	**17**	**18**	
Number of Cluster	**25**	**48**	**25**	**28**	**49**	
Number of Teams	5	6	5	4	7	27
Number of Days	5	8	5	7	7	

Rationale for Parameters Used for the Anthropometric Survey

- ✓ *GAM – 2012 SMART Survey for Moyale, Chalbi and the Marsabit County*
- ✓ *Precision – 4.0%*
- ✓ *Design Effect – 1.5 across all the areas. Due to the stratification of the county a design effect of 1.5 was considered since heterogeneity of the area has been reduced*
- ✓ *Non-Response Rate – 3% as recommended in the Kenya Survey Guidelines*
- ✓ *Average HH Size – Kenya District Health Information System projections*
- ✓ *Proportion of children under 5 - Kenya District Health Information System projections*
- ✓ *HH Proportion by district - Kenya District Health Information System projections*
- ✓ *HH to be sampled per day – based on the arrival time in the field from the base and the number of hours every team is expected to work in a day. This was also determined by the vastness of the areas being covered*

2.3.2 Sample Size Calculation for the IYCN

Table 4: IYCN Sample Size for the Marsabit County

Indicator	Prevalence	Precision	Design effect	No. of Child	Average household size	% children under 5	% non-response households	Households to be included
Exclusive breastfeeding	50	6	1.5	436				
Timely initiation of breastfeeding	50	6	1.5	436	4.7	12.9	3	1850
Minimum dietary diversity	50	6	1.5	436	4.7	12.9	3	1850
Minimum meal frequency	50	6	1.5	436	4.7	12.9	3	1850

Rationale for Parameters Used for the IYCN Survey

- ✓ *Prevalence – 50% for all indicators. This will help achieve the highest sample size in Marsabit County*
- ✓ *Precision – 6% as recommended in the survey guidelines*
- ✓ *Design Effect – 1.5: assumption that the IYCN indicators will not vary much across the county since the social-cultural factors are almost the same with some few variation hence the design effect of 1.5 to cater for the heterogeneity that may arise*
- ✓ *Non-Response Rate – 3% as recommended in the Kenya Survey Guidelines*
- ✓ *Average HH Size – Kenya District Health Information System projections*

- ✓ *Proportion of children under 5 - Kenya District Health Information System projections*
- ✓ *HH Proportion by district - Kenya District Health Information System projections*
- ✓ *HH to be sampled per day – based on the arrival time in the field from the base and the number of hours every team is expected to work in a day. This was also determined by the vastness of the areas being covered*

The above table presents the IYCN sample size calculations for Marsabit County with the consideration that the IYCN estimates will be obtained for the entire county. This is based on the fact that the IYCN indicators may not vary much across the county since the social-cultural background among the residents of Marsabit County are almost similar and hence there was no need to estimate the district level indicators. Comparing the two samples size i.e. the anthropometric and the IYCN, the anthropometric is the higher of the two and hence was considered the sample size for the entire survey. Nevertheless, to obtain the minimum IYCN sample then the minimum number of children (6-23) and 0-5 months were as indicated in the table below:

Table 5: Sample Allocation by Cluster

	Chalbi	Loyangalani & North Horr	Laisamis	Marsabit Central	Moyale	Total
HH proportion	10.9%	26.1%	13.6%	17.2%	32.2%	100.0%
IYCN Sample Size Allocation	48	114	59	75	140	436
Children per Cluster (6 – 23 months)	2	2	2	3	3	
Children per Cluster (0-5)	2	2	2	3	3	

The number of children 0-5 months and 6-23 months that was required per cluster in each of the stratum is indicated in the table above. For instance in Chalbi, 2 children aged 6-23 months were required per cluster while another 2 children were required for the EBF estimate. The children 6-23 months were obtained from the same households that the anthropometric survey was done implying that every child aged 6 – 23 in every household sampled for the anthropometric had the IYCN questionnaire applied. This was the case since the children 6-23 are a subset of the children targeted for the anthropometric. In addition, the children required for the EBF rate were also obtained from the same households sampled for the anthropometric survey and in case the number required were not achieved then purpose sampling was done to obtain the remaining number of children.

2.4 Cluster Selection

All accessible villages were included in the initial sample selection with each village considered a cluster and clusters were sampled with probability proportional to size. All villages along with their respective populations were entered into the ENA software and clusters selected accordingly. At stage two each team used the modified EPI method to select the households to be sampled. This was based on the absence of the household listing for the entire county. This list existed in some districts but for making the methodology similar across the entire county, then modified EPI method was applied. Within the selected households all children 6-59 months fitting the inclusion criteria were measured.

2.5 Data Collected and Data Collection Methods and Tools

Both qualitative and quantitative data collection method were used to collect the survey data; the following data was collected:

1. Anthropometry (weight, height, oedema, MUAC, age, sex) for children and MUAC for mothers
2. Vaccination information (measles, BCG, and Vitamin A supplementation)
3. Incidences of childhood illnesses in the last 2 weeks prior to the survey
4. Maternal health information
5. IYCN data

The survey adopted the data collection tools recommended in the nutrition survey guidelines with a few modifications to cater for all the objectives of the survey.

2.6 Organization of the Survey

- **Coordination/Collaboration:** before the survey was conducted meetings were held with the respective district authorities and key stakeholders briefed them about the purpose, objectives and methods for the survey. The survey details were discussed with the District Steering Group, the Arid Lands Resource Management, key partners on the ground (NGO and UN) and conducted in collaboration with the District Health Office. The authorities were requested to officially inform the communities (villages) that were involved in the assessment.
- **Recruiting the Survey Team:** recruitment was done in collaboration with the Ministry of Health office at the district level in order to give ownership and participation in the assessment. Twenty seven teams of four were selected to include two measurers, one enumerator and a team leader.
- **Training of the Survey Team:** the teams were given 4-days training prior to field work, including a standardization test to ensure standardization of measurement and recording practice. All data collectors were trained on taking anthropometric measurements, completion of questionnaires and sampling methodology. The data collection forms and questionnaires were pilot tested in clusters not selected to be part of the larger survey, to ensure that the interviewers and respondents understand the questions and that interviewers follow correct protocols.
- **For the quality of training,** the teams were split into three namely: Moyale/Sololo teams were trained in Moyale Town, Chalbi and Marsabit Central Teams were trained together and Loyangalani and Laisamis were trained together.
- **Team work in the field:** Twenty seven teams each with four members who have experience in data collection were organized/ selected from the survey area with each team consisting of 1 team leader, interviewer and 2 measurers. In addition, supervisors from FH, World Vision, Aphia Plus, Concern Worldwide, NDMA, District Statistics Office, MoH, and other partners closely supervised the team throughout the survey. In moving from one randomly selected household to another, the teams were guided by a village leader, or a community volunteer, depending on the village and who was available.

2.7 Data Entry, Analysis and Report Writing

- **Data Analysis:** the data entry and analysis was done using ENA for SMART, CSPro and SPSS Statistical software. In addition, to improve on the data entry quality, there was double data entry. The Concern Worldwide Survey and Surveillance Assistant Manager and the Consultant were

responsible for the data entry, analysis and report writing, but this process was conducted in collaboration with Concern and FH staffs at Nairobi and Field Offices. Results are presented using the new WHO reference levels.

- **Preliminary Results and Final Report:** the preliminary findings were submitted by the Survey Consultant and the Survey and Surveillance Assistant Manager to the DHMTs, stakeholders, FH, Concern and the Nutrition Information Working Group (NIWG) within four weeks of completion of the survey fieldwork at District and National level and included the prevalence of global acute malnutrition as well as the prevalence of moderate and severe acute malnutrition, vaccination and other relevant information.

CHAPTER 3

RESULTS AND DISCUSSION

3.1 Household Demographic Characteristics

In Moyale, the total number of households surveyed was 843 while in total; there were 1,147 children whose anthropometric measurements were taken who were aged between 6 and 59 months. Additionally, among the children taken their anthropometric measurements, 444 were aged between 6 and 23 months. The total number of children aged 0 to 5 months surveyed was 194. The average number of persons per household in Moyale was 6.6 (SD=2.6) which is not significantly different with what was established in 2012[11]. The 2012 SMART survey established that the average number of household in Moyale was 6.0 (SD=2.0). A comparison between the finding of this survey and the Kenya National Census[12] data shows that there is no significant difference between the average number household sizes in Moyale District. The census data shows that the average household size in Moyale is 6.2. Further, the average number of children aged 0-5 months in Moyale was found to be 0.2 (SD=0.4) while the average number of children aged 6 to 59 months in the same area was found to be 1.6 (SD=0.6).

In Chalbi, the total number of households surveyed was 328 where 356 children aged 6 to 59 months were taken their anthropometric measurements taken. There were 109 children aged between 6 and 23 months who were included in the survey from the sampled households while the number of children aged between 0 and 5 months included in the survey was 54. The average household size in Chalbi was 5.3 (SD=1.9) which doesn't differ with the findings of 2012[13] which established that the average household size was 5.3 (SD=0.07). The average number of household size also does not differ significantly with what the Kenya 2009 Census found which established that the average household size in Chalbi District was 4.5[14]. The average number of children aged 0 to 5 months per household was found to be 0.14 (SD=0.36) while the average number of children aged 6 to 59 months was 1.25 (SD=0.59).

[11] Integrated Health and Nutrition SMART Survey, The Larger Moyale District 2012
[12] Kenya National Bureau of Statistics, 2009 Household Census
[13] Integrated Health and Nutrition SMART Survey, Chalbi District 2012
[14] Kenya National Bureau of Statistics, 2009 Household Census

Table 6: Demographic Characteristics

Characteristic	Moyale	Chalbi
	Number	Number
Number of HH Surveys	843	328
Number of Children 6-59 Months Surveyed	1147	356
Number of Children 6-23 Months Surveyed	444	109
Number of Children 0-5 Months Surveys	194	54
Average Number of Persons per Household	6.6 (2.6)	5.3 (1.9)
Average number of children (0-5 months) per HH	0.2 (0.4)	0.14 (0.36)
Average number of children (6-59 months) per HH	1.6 (0.6)	1.25 (0.59)

3.2 Anthropometric Results (Based on WHO Standards 2006)

In Moyale, a total of 1,140 children aged between 6 and 59 months were included taken their anthropometric measurements. The percentage of values flagged with SMART flags was as follows: WHZ: 0.7 %, HAZ: 2.6 %, WAZ: 0.3 %

In Chalbi, a total of 356 children aged 6 and 59 months were taken anthropometric measurements. The percentage of values flagged with SMART flags was as follows: WHZ: 0.8 %, HAZ: 2.2 %, WAZ: 0.6 %

In this survey, the global acute malnutrition (GAM) is defined as the proportion of children with a z-score of less than -2 z-scores weight-for-height and/or presence of oedema. Additionally, severe acute malnutrition (SAM) is defined as the proportion of children with less than -3 z-scores weight-for-height and/or presence of oedema. Further, based on MUAC, global acute malnutrition was defined as the proportion of children with a MUAC of less 125 mm and/or presence of oedema. Severe acute malnutrition based on MUAC was define as the proportion of children with a MUAC of less than 115 mm and/or presence of oedema. On exclusion of z-scores from Observed mean SMART flags the following criteria was used: WHZ -3 to 3; HAZ -3 to 3; WAZ -3 to 3

3.2.1 Distribution of Sample by Sex and Age

This section presents the distribution of the sample based on both sex and age.

Table 7: Distribution of Sample by Sex and Age – Moyale/Sololo

	Boys		Girls		Total		Ratio
AGE (mo)	no.	%	no.	%	no.	%	Boy:Girl
6-17	144	51.1	138	48.9	282	24.7	1.0
18-29	120	46.5	138	53.5	258	22.6	0.9
30-41	142	51.3	135	48.7	277	24.3	1.1
42-53	105	46.1	123	53.9	228	20.0	0.9
54-59	59	62.1	36	37.9	95	8.3	1.6
Total	570	50.0	570	50.0	1140	100.0	1.0

In Moyale, the results show that the number of boys and girls were both equal. That is, there were 570 boys in the survey while the total number of girls included in the survey was also 570. This implies that

the overall sex ratio was 1.0 which falls within the acceptable sex ratio threshold of between 0.8 and 1.2[15]. A sex ratio of 1 further implies that the distribution of the gender in the sample was unbiased. However, the results show that there was an over-representation of boys in the age group of 54 to 59 months than girls.

Table 8: Distribution of Sample by Sex and Age – Chalbi

	Boys		Girls		Total		Ratio
AGE (mo)	no.	%	no.	%	no.	%	Boy:Girl
6-17	53	47.3	59	52.7	112	31.5	0.9
18-29	54	51.4	51	48.6	105	29.5	1.1
30-41	30	46.9	34	53.1	64	18.0	0.9
42-53	23	40.4	34	59.6	57	16.0	0.7
54-60	7	38.9	11	61.1	18	5.1	0.6
Total	167	46.9	189	53.1	356	100.0	0.9

In Chalbi, the overall sex ratio was found to be 0.9 which is an indicative of more girls in the sample than the boys. However, the overall sex ratio shows an unbiased gender distribution as falls within the acceptable range of the sex ratio which is 0.8 and 1.2. The above results also show that the age groups 42 to 53 and 54 to 60 had an over-representation of girls than boys. Nevertheless, the other age groups were well represented and within the acceptable thresholds.

3.2.2 Prevalence of Wasting - Moyale

This section presents the results of prevalence of wasting based on the weight-for-height and/or presence of oedema and by Mid Upper Arm Circumference.

3.2.2.1 Wasting Based on WFH Z-Score and/or Oedema

Table 9: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex – Moyale

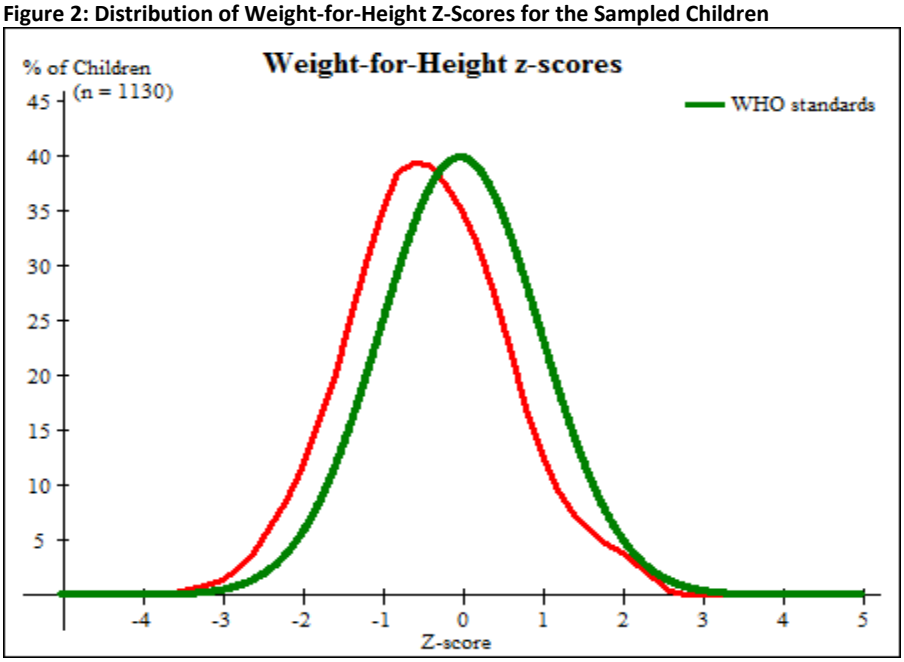
	All n = 1131	Boys n = 563	Girls n = 568
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(67) 5.9 % (4.3 - 8.0 95% C.I.)	(35) 6.2 % (4.3 - 9.0 95% C.I.)	(32) 5.6 % (3.9 - 8.2 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(59) 5.2 % (3.8 - 7.2 95% C.I.)	(30) 5.3 % (3.6 - 7.9 95% C.I.)	(29) 5.1 % (3.5 - 7.4 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(8) 0.7 % (0.3 - 1.5 95% C.I.)	(5) 0.9 % (0.4 - 2.1 95% C.I.)	(3) 0.5 % (0.2 - 1.6 95% C.I.)

The prevalence of oedema is 0.2 %

[15] Assessment and Treatment of Malnutrition in Emergency Situations, Claudine Prudhon, Action Contre La Faim (Action Against Hunger), 2002.

The results of the survey showed that the prevalence of global acute malnutrition in Moyale was 5.9% (4.3-8.0 95% C.I). The results are indicative of a poor[16] nutrition status in the area based on the WHO classification of global acute malnutrition. The prevalence of severe acute malnutrition (SAM) among the children aged 6 to 59 months in Moyale was found to be 0.7% based on the WFH and/or oedema. The SAM rate is considered normal based on the WHO[17] classification of severe acute malnutrition. The results also showed that sex was not a risk factor of malnutrition in Moyale as evidenced by the overlapping confidence intervals among the GAM rates and SAM rate for the two sexes. The prevalence of oedema was found to be 0.2%.

Figure 2: Distribution of Weight-for-Height Z-Scores for the Sampled Children



The above figure compares the nutrition distribution of the sampled population with the WHO curve. The mean of the WHZ was found to be -0.43 with a standard deviation of 1.00. The mean of WHZ for this survey indicates a slight shift to the left of the sample population compared with the standard population curve implying a poorer nutrition status of the sampled population.

3.2.2.2 Wasting Based on Percentage of the Median and/or Oedema

Table 10: Prevalence of acute malnutrition based on the percentage of the median and/or oedema – Moyale

	n = 1139
Prevalence of global acute malnutrition (<80% and/or oedema)	(18) 1.6 % (0.9 - 2.7 95% C.I.)
Prevalence of moderate acute malnutrition (<80% and >= 70%, no oedema)	(16) 1.4 % (0.8 - 2.5 95% C.I.)
Prevalence of severe acute malnutrition (<70% and/or oedema)	(2) 0.2 % (0.0 - 0.7 95% C.I.)

[16] WHO cut off points for wasting using z-score (-2 Z scores in populations: <5% - Acceptable; 5-9% - Poor; 10-14% - Serious; >15% - Critical)
[17] Emergency Level: SAM > 4%

Using the percentage of the median and/or oedema, the prevalence of global acute malnutrition was found to be 1.6% (0.9 – 2.7 95% C.I.) while the prevalence of severe acute malnutrition was found to be 0.2% (0.0 – 0.7 95% C.I.)

3.2.2.3 Wasting Based on MUAC and/or Oedema

Table 11: Prevalence of acute malnutrition based on the Mid-Upper Arm Circumference and/or oedema – Moyale

	All n = 1141	**Boys** n = 570	**Girls** n = 571
Prevalence of global malnutrition (<125 mm and/or oedema)	(17) 1.5% (0.9- 2.4 C.I.)	(7) 1.2% (0.6- 2.5 C.I.)	(10) 1.8% (0.9- 3.3 C.I.)
Prevalence of moderate malnutrition (<125 mm and >=115 mm, no oedema)	(14) 1.2% (0.7- 2.0 C.I.)	(6) 1.1% (0.5- 2.3 C.I.)	(8) 1.4% (0.7- 2.9 C.I.)
Prevalence of severe malnutrition (<115 mm and/or oedema)	(3) 0.3% (0.1- 0.8 C.I.)	(1) 0.2% (0.0- 1.3 C.I.)	(2) 0.4% (0.1- 1.4 C.I.)

The prevalence of global acute malnutrition based on the mid-upper arm circumference and/or oedema was found to 1.5% (0.9 – 2.4 C.I) while the prevalence of severe acute malnutrition was found to be 0.3% (0.1 – 0.8 C.I). Additionally, the results showed that sex was not a risk factor of malnutrition in Moyale. This is based on the fact the confidence intervals for the malnutrition rates for both boys and girls overlaps.

3.2.3 Prevalence of Wasting - Chalbi

This section presents the results of prevalence of wasting based on the weight-for-height and/or presence of oedema and by Mid Upper Arm Circumference.

3.2.3.1 Wasting Based on WFH Z-Score and/or Oedema

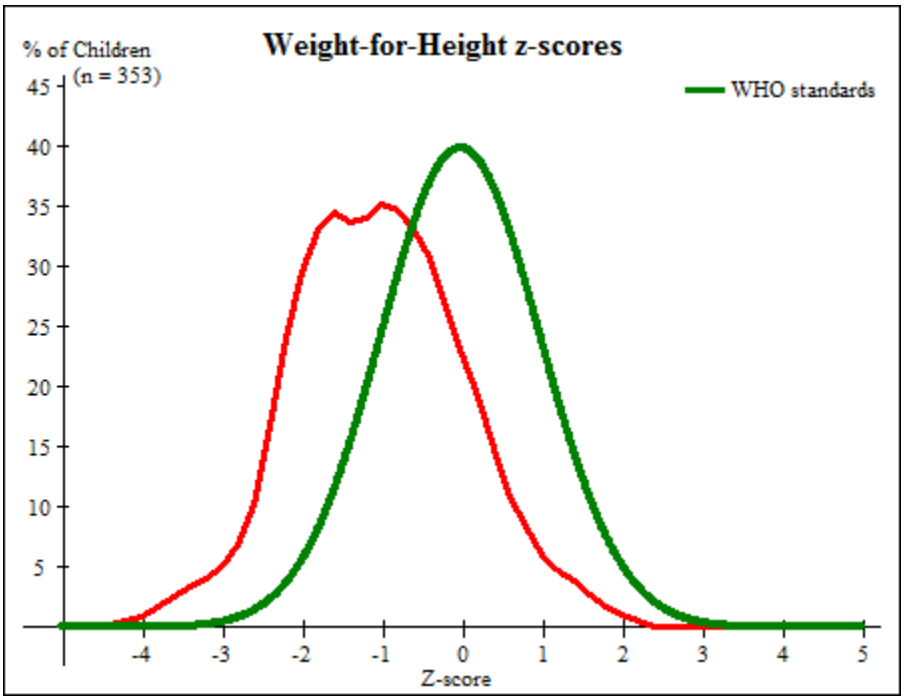
Table 12: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex – Chalbi

	All n = 353	**Boys** n = 165	**Girls** n = 188
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(56) 15.9 % (12.1 - 20.5 95% C.I.)	(32) 19.4 % (13.1 - 27.7 95% C.I.)	(24) 12.8 % (8.2 - 19.4 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(44) 12.5 % (8.9 - 17.2 95% C.I.)	(28) 17.0 % (11.1 - 25.0 95% C.I.)	(16) 8.5 % (4.9 - 14.5 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(12) 3.4 % (2.1 - 5.5 95% C.I.)	(4) 2.4 % (0.9 - 6.3 95% C.I.)	(8) 4.3 % (2.4 - 7.5 95% C.I.)

The prevalence of oedema is 0.0 %

The prevalence of global acute malnutrition in Chalbi District was found to be 15.9% (12.1 – 20.5 95% CI) which is classified as an emergency based on the WHO classification of malnutrition based on weight-for-height z-score. On the other hand, the prevalence of severe acute malnutrition was found to be 3.4% (2.1 – 5.5 95% C.I) which is classified as normal based on the WHO classified. However, though the SAM rate is considered normal, the prevalence of moderately acute malnutrition in the area was high. Analysis of acute malnutrition based on sex showed that gender was not a risk factor of acute malnutrition as the confidence interval of the two sexes overlapped significantly.

Figure 3: Distribution of Weight-for-Height Z-Scores for the Sampled Children



The above figure compares the nutrition distribution of the sampled population with the WHO curve. The mean of the WHZ was found to be -1.03 with a standard deviation of 1.04. The mean of WHZ for this survey indicates a shift to the left of the sampled population compared with the standard population curve implying a poorer nutrition status of the sampled population.

3.2.3.2 Wasting Based on Percentage of the Median and/or Oedema

Table 13: Prevalence of acute malnutrition based on the percentage of the median and/or oedema – Chalbi

	n = 356
Prevalence of global acute malnutrition (<80% and/or oedema)	(14) 3.9 % (2.4 - 6.6 95% C.I.)
Prevalence of moderate acute malnutrition (<80% and >= 70%, no oedema)	(14) 3.9 % (2.4 - 6.6 95% C.I.)
Prevalence of severe acute malnutrition (<70% and/or oedema)	(0) 0.0 % (0.0 - 0.0 95% C.I.)

The prevalence of global acute malnutrition based on the median and/or oedema in Chalbi district was 3.9% (2.4 – 6.6 95% C.I) while the prevalence of severe acute malnutrition based on the median and/or oedema was 0%.

3.2.3.3 Wasting Based on MUAC and/or Oedema

Table 14: Prevalence of acute malnutrition based on the Mid-Upper Arm Circumference and/or oedema – Chalbi

	ALL=356	BOYS=167	GIRLS=189
Prevalence of global malnutrition (<125 mm and/or oedema)	(16) 4.5% (2.5-8.1 C.I.)	(9) 5.4% (3.0-9.5 C.I.)	(7) 3.7% (1.4-9.4 C.I.)
Prevalence of moderate malnutrition (<125 mm and >=115 mm, no oedema)	(16) 4.5% (2.5-8.1 C.I.)	(9) 5.4% (3.0-9.5 C.I.)	(7) 3.7% (1.4-9.4 C.I.)
Prevalence of severe malnutrition (<115 mm and/or oedema)	(0) 0.0% (0.0-0.0 C.I.)	(0) 0.0% (0.0-0.0 C.I.)	(0) 0.0% (0.0-0.0 C.I.)

Using the mid-upper arm circumference, the prevalence of global acute malnutrition in Chalbi was 4.5% (2.5 – 8.1 C.I) while the prevalence of severe acute malnutrition was found to be 0.0%. Additionally, the results showed that sex was not a risk factor of malnutrition in Chalbi district.

3.2.4 Underweight

The measure of underweight gives a mixed reflection of both the current and past nutrition experience by a population and is very useful in growth monitoring. Children whose WFA Z score fell below -2 standard deviations of the WHO reference population or had bilateral oedema were classified as underweight. Children whose WFA Z score fell below -3 standard deviation of the WHO reference population or had bilateral oedema were classified as severe underweight. This section presents the prevalence of underweight in Moyale and Chalbi districts.

3.2.4.1 Prevalence of Underweight in Moyale

Table 15: Prevalence of underweight based on weight-for-age z-scores by sex – Moyale

	All n = 1135	Boys n = 566	Girls n = 569
Prevalence of underweight (<-2 z-score)	(177) 15.6 % (12.8 - 18.9 95% C.I.)	(91) 16.1 % (12.7 - 20.1 95% C.I.)	(86) 15.1 % (12.1 - 18.8 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(152) 13.4 % (10.8 - 16.5 95% C.I.)	(80) 14.1 % (11.1 - 17.8 95% C.I.)	(72) 12.7 % (9.8 - 16.2 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(25) 2.2 % (1.5 - 3.3 95% C.I.)	(11) 1.9 % (1.1 - 3.5 95% C.I.)	(14) 2.5 % (1.4 - 4.4 95% C.I.)

The results in the above table show that the prevalence of underweight using the weight-for-age z-score in Moyale was found to be 15.6% (12.8 – 18.9 95% CI). This prevalence of underweight was classified as

medium using the WHO classification of underweight[18]. On the other hand the prevalence of severe underweight was found to be 2.2% (1.5 – 3.3 95% C.I) which is considered normal. Additionally, the results showed that sex was not a risk factor for underweight in Moyale. This is demonstrated by the confidence interval of underweight for the two sexes which overlaps significantly.

3.2.4.2 Prevalence of Underweight in Chalbi

Table 16: Prevalence of underweight based on weight-for-age z-scores by sex – Chalbi

	All n = 354	**Boys** n = 166	**Girls** n = 188
Prevalence of underweight (<-2 z-score)	(106) 29.9 % (24.3 - 36.2 95% C.I.)	(53) 31.9 % (23.8 - 41.3 95% C.I.)	(53) 28.2 % (21.4 - 36.1 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(79) 22.3 % (16.9 - 28.9 95% C.I.)	(37) 22.3 % (15.4 - 31.2 95% C.I.)	(42) 22.3 % (16.3 - 29.8 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(27) 7.6 % (5.2 - 11.0 95% C.I.)	(16) 9.6 % (5.7 - 15.9 95% C.I.)	(11) 5.9 % (2.5 - 12.9 95% C.I.)

In Chalbi, the results of the survey showed that the prevalence of underweight based on the weight-for-height z-score was 29.9% (24.3 – 36.2 95% CI) which is considered high based on the WHO classification. The prevalence of severe underweight was found to be 7.6% (5.2 – 11.0 95% C.I) which is high. The results further showed that there was no significant difference between the prevalence of either underweight or severe underweight by gender.

3.2.5 Stunting (Weight-for-Age)

Stunting (height-for-age) is an indicator of chronic (long-term) malnutrition arising from persistently poor food security situation, micronutrient deficiencies, recurrent illnesses and other factors which interrupt normal growth. Unlike wasting, stunting is not affected by seasonality but rather related to the long-term effect of socio-economic development and long-standing food insecurity situation. This section presents the results of stunting in both Moyale and Chalbi.

[18] WHO Classification of Underweight: Low - <10%, Medium – 10 – 19.9%, High – 20 – 29.9%, Alarming/Critical - >30%

3.2.5.1 Prevalence of Stunting in Moyale

Table 17: Prevalence of stunting based on height-for-age z-scores by sex – Moyale

	All n = 1112	Boys n = 558	Girls n = 554
Prevalence of stunting (<-2 z-score)	(297) 26.7 % (23.3 - 30.4 95% C.I.)	(161) 28.9 % (24.7 - 33.4 95% C.I.)	(136) 24.5 % (20.5 - 29.1 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(220) 19.8 % (17.2 - 22.7 95% C.I.)	(115) 20.6 % (17.2 - 24.5 95% C.I.)	(105) 19.0 % (15.5 - 23.0 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(77) 6.9 % (5.5 - 8.7 95% C.I.)	(46) 8.2 % (6.0 - 11.2 95% C.I.)	(31) 5.6 % (4.0 - 7.7 95% C.I.)

The results of the survey show that the prevalence of stunting in Moyale was 26.7% (23.3 – 30.4 95% CI) which is categorized as medium based on the WHO classification[19]. Further, the prevalence of severe stunting was found to be 6.9% (5.5 – 8.7 95% CI) which is considered medium. Further, the results showed that sex was not a risk factor for stunting in Moyale.

3.2.5.2 Prevalence of Stunting in Chalbi

Table 18: Prevalence of stunting based on height-for-age z-scores by sex – Chalbi

	All n = 348	Boys n = 165	Girls n = 183
Prevalence of stunting (<-2 z-score)	(112) 32.2 % (26.7 - 38.2 95% C.I.)	(56) 33.9 % (26.6 - 42.2 95% C.I.)	(56) 30.6 % (24.5 - 37.4 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(85) 24.4 % (19.1 - 30.7 95% C.I.)	(41) 24.8 % (18.6 - 32.3 95% C.I.)	(44) 24.0 % (17.5 - 32.0 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(27) 7.8 % (5.6 - 10.7 95% C.I.)	(15) 9.1 % (5.5 - 14.7 95% C.I.)	(12) 6.6 % (3.7 - 11.5 95% C.I.)

In Chalbi, the prevalence of stunting was found to be 32.2% (26.7 – 38.2 95% CI) which is classified as high based on the WHO classification of stunting. On the other hand, the prevalence of severe stunting was established as 7.8% (5.6 – 10.7 95% C.I) which is high. Again, the results showed that sex was not significantly associated with stunting in Chalbi.

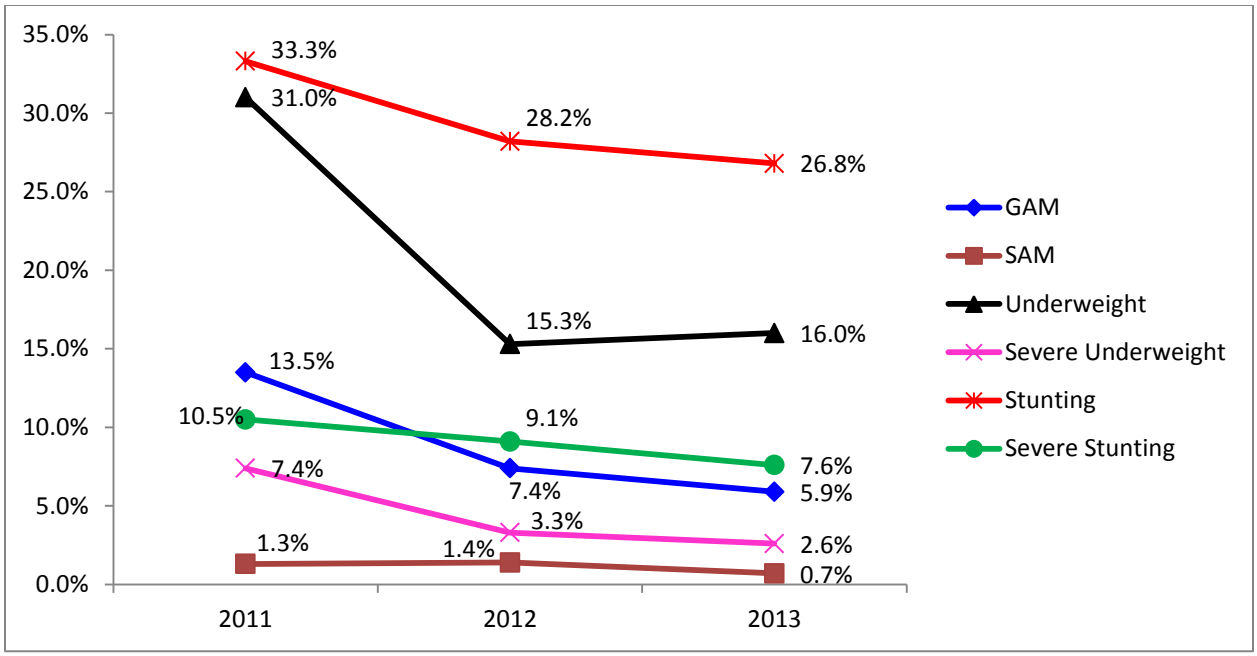
3.2.6 Trends of Malnutrition

This section presents the trends of malnutrition in both Moyale and Chalbi. Of much focus will be the trends of wasting, underweight and stunting all based on the z-score.

3.2.6.1 Trends of Malnutrition in Moyale

Figure 4: Malnutrition Trends in Moyale from 2011 to 2013

[19] WHO Classification: Low - <20%, Medium - 20 – 29.9% , High – 30 – 39.9%, Alarming/Critical - >40.0%



	2012	n	N	2013	n	N	p-value
GAM	7.4%	74	999	5.9%	67	1131	0.2622
SAM	1.4%	14	999	0.7%	8	1131	0.2044
Underweight	15.3%	153	997	16.0%	177	1135	0.7178
Severe Underweight	3.3%	33	997	2.6%	25	1135	0.4403
Stunting	28.2%	282	999	26.8%	297	1112	0.5587
Severe Stunting	9.1%	91	999	7.6%	77	1112	0.3136

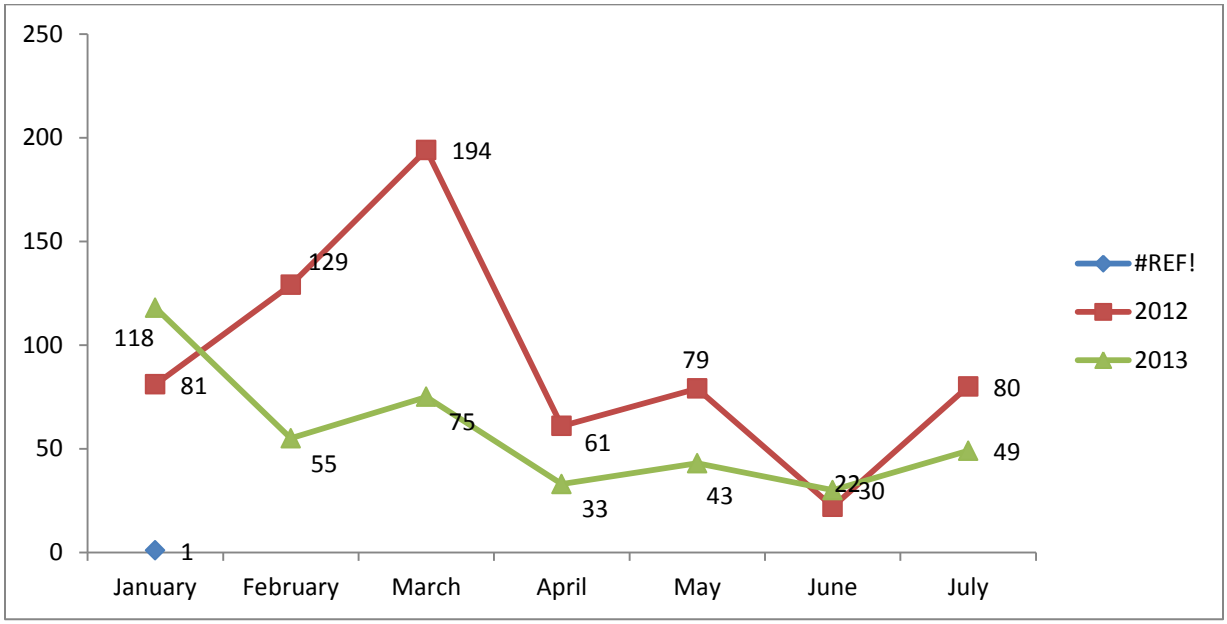
According to the survey results, the prevalence of GAM has been on a downward trend since 2011. In 2011 the GAM rate was recorded as 13.5% while in 2012 the same was at 7.4% and in 2013 the GAM rate was found to be 5.9%. However, the drop in GAM between 2012 and 2013 was found to be insignificant (p=0.2622). The drop in the GAM rate since 2011 is a pointer to an improving nutrition situation in Moyale. The improved nutrition situation in Moyale can also be confirmed by the reduced admission into the IMAM program as shown in Figure 5 below.

The survey results showed that the prevalence of underweight reduced significantly from 2011 to 2012 though in 2013, there was a slight increase in the prevalence of underweight. The slight increase in underweight observed in 2013 was however insignificant (p=0.7178). On the other hand, the prevalence of severe underweight has been on a downward trend since 2011. In 2011, the prevalence of severe stunting was recorded as 7.4% while in 2012 the same was at 3.3% and in 2013 the prevalence of severe underweight was recorded as 2.6%. However, the drop in the prevalence of severe underweight was found to be insignificant (p=0.4403).

The results of the survey show that there has been a downward trend in the levels of stunting in Moyale from 2011. In 2011, the stunting level was at 33.3%, in 2012 the stunting level was at 28.2% while in

2013 the stunting level was at 26.8%. However, when comparing the results of 2012 and 2013, the results show that the drop in the stunting level was not significant (p=0.5587). A downward was also observed in the levels of severe stunting for the same period. When comparing the drop observed between 2012 and 2013, the results show that the drop was insignificant.

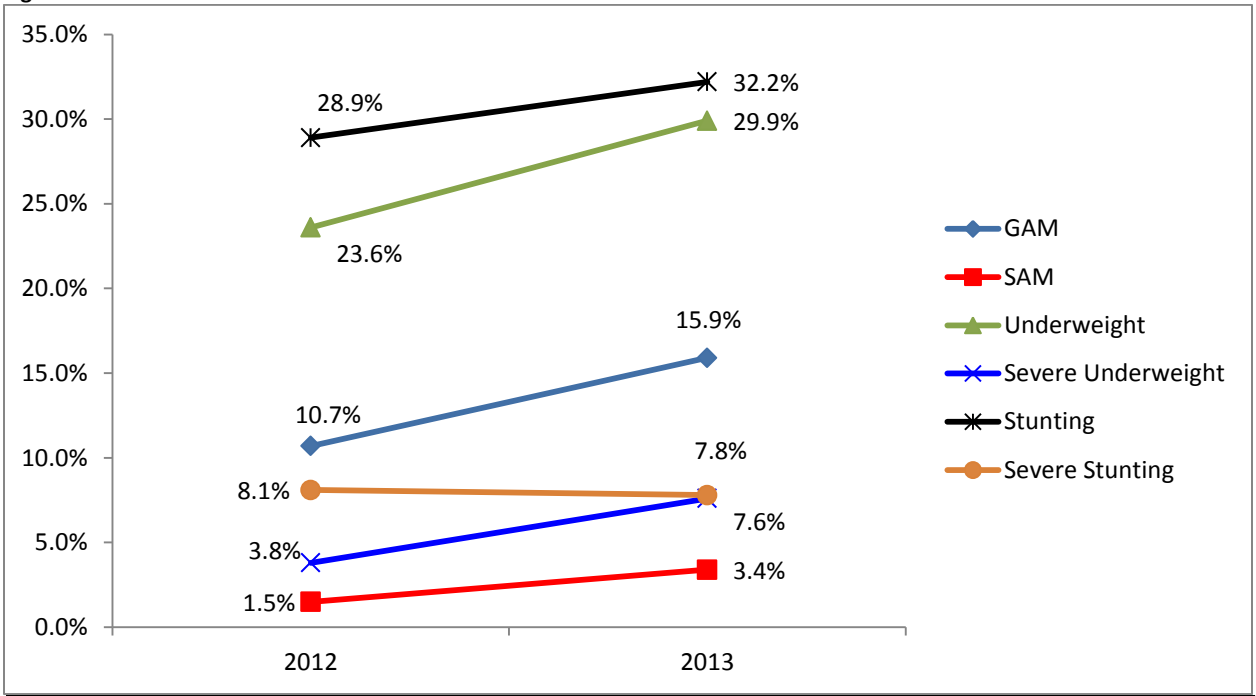
Figure 5: Trends in Admission in the IMAM Program in Moyale from 2011 to 2013



A further look at the admissions into the IMAM program both OTP and SFP, the results shows a decrease in the admissions from 2011 to 2013. There were more admissions made in 2011 than in 2012 and 2013 while there was more admission into the IMAM program in 2012 compared with 2013. This further confirms the improving nutrition status in the Moyale since 2011.

3.2.6.2 Trends of Malnutrition in Chalbi

Figure 6: Trends of Malnutrition in Chalbi



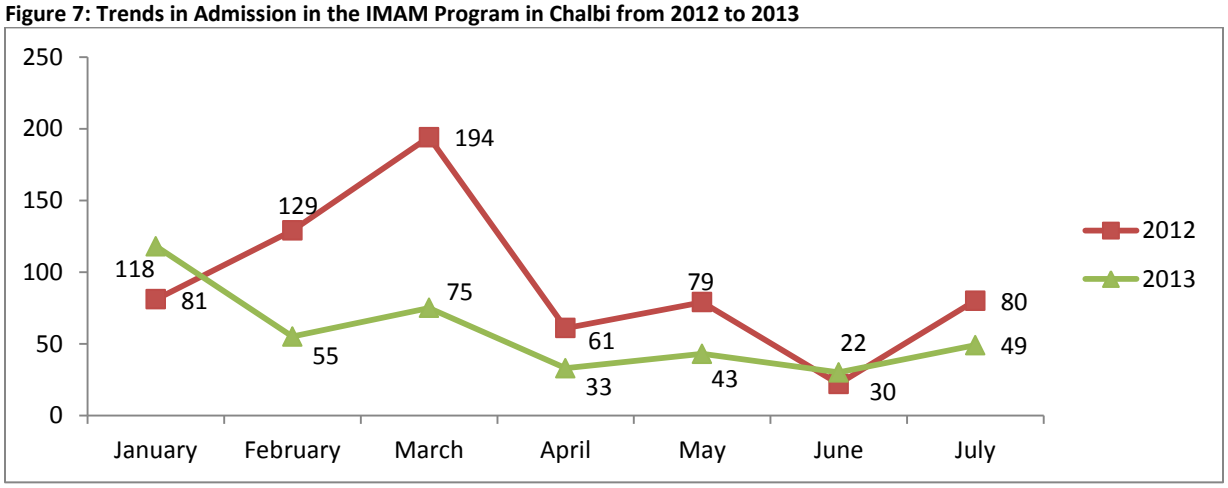
	n/N - 2012	n/N - 2013	p-value
GAM	84/786	56/353	**0.0626**
SAM	12/786	12/353	**0.1005**
Underweight	186/788	106/354	**0.0777**
Severe Underweight	30/788	27/354	**0.052**
Stunting	228/788	112/348	**0.3696**
Severe Stunting	64/788	27/348	**0.8882**
2012: DEFF=1.5, Clusters=36			
2013: DEFF=1.5, Clusters=25			

After comparing the prevalence of global acute malnutrition for 2012 and 2013, the results of the survey showed a deteriorated nutrition situation. In 2012 the GAM rate was at 10.7% while in 2013 the GAM rate was found to be 15.9%. However, the increase in the GAM rate from 2012 to 2013 was found to be insignificant at 5% level (p=0.0626). Additionally, the results showed an increase in the prevalence of severe acute malnutrition in Chalbi. According to the results, the SAM rate increased from 1.5% in 2012 to 3.4% in 2013 though the increase is not significant at 5% level (p=0.1005). As shown in the above results, there has been an increase in the GAM and SAM rate when compared with the results of 2012, however, of interest to note is that the admission into the IMAM program both OTP and SFP, there has been a significant drop in the number of admission as shown in Figure 7 below. This in itself is an indication of a worsening situation at the community level with the existing program not able to tap any emerging cases from the community. This may be a pointer of a weak active case finding system in the area.

On the underweight, the results of the survey showed that there was an increment when comparing between the results of 2012 and 2013. The prevalence of underweight increased from 23.6% in 2012 to 29.9% in 2013 though the increment was not significant (p=0.0777). On the other hand, the results showed that there was also an increment in the severe underweight from 3.8% in 2012 to 7.6% in 2013 though the increment was insignificant (p=0.052).

The survey results also showed that there was an increment in the levels of stunting. According to the results, the stunting levels increased from 28.9% in 2012 to 32.2% in 2013. However, the increment was not significant at 5% level (p=0.3696). On the contrary, the results showed that there was a slight drop in the levels of severe stunting. This dropped from 8.1% in 2012 to 7.8% in 2013 though the drop was not significant (p=0.8882).

Figure 7: Trends in Admission in the IMAM Program in Chalbi from 2012 to 2013



3.3 Morbidity among the Children below 5 Years

A two-week child morbidity recall (inclusive of the day of the survey) was assessed to establish the prevalence of common illnesses among the children less than 5 years.

3.3.1 Morbidity among the Children below 5 Years in Moyale

Table 19: Prevalence of reported illness in children in the two weeks prior to interview (N=1147)

	2012		2013		P-Value
	%	n	%	n	
Proportion of Sick Children	18.9%	186	38.5%	442	0.000

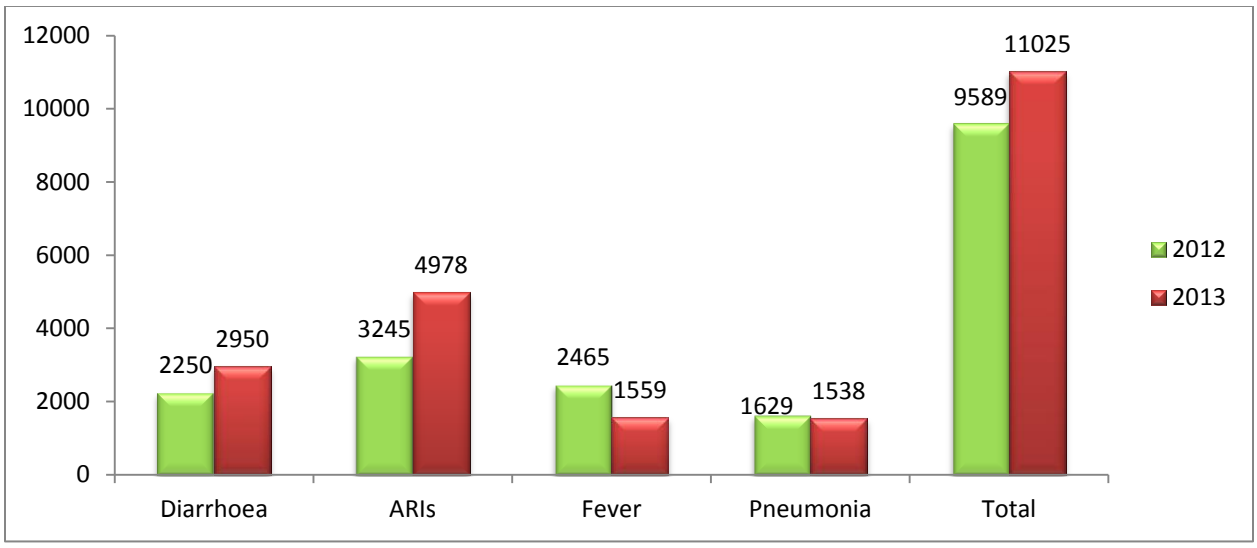
The prevalence of children sick 2 week prior to the survey in Moyale was 38.5% (n=442). A comparison between 2012 and 2013, the results showed that there was a significant increase in the morbidity among the children under 5 years in Moyale (p=0.000). The breakdown of the symptoms among the children reported having been sick two weeks prior to the surveys are as follow.

Table 20: Symptom breakdown in the children in the two weeks prior to interview

	2012		2013		P-Value
	%	n	%	n	
Diarrhoea	20.4%	45	35.3%	315	0.0002
ARIs	35.3%	78	28.5%	254	0.1219
Fever	35.3%	78	26.6%	237	0.0480
Suspected Cases of Measles	0.9%	2	0.1%	1	0.3134
Others	8.1%	18	9.5%	85	0.5843

Diarrhoea was the most prevalent disease in Moyale and accounted for 35.3% of all the diseases which were mentioned. The same trend was observed on the reported cases of diarrhoea at the facility level as recorded in the DHIS and shown in Figure 8 below. Additionally, when compared with the same period in 2012, there was a significant increment in the prevalence of diarrhoea in Moyale (p=0.0002). Additionally, the results showed a prevalence of ARIs of 28.5% which has dropped from 35.3% when compared with the same period in 2012. The prevalence of diarrhoea was found to be 26.6% which had dropped significantly from 35.3% in 2012 (p=0.0480). During the 2013, there was only 1 case of suspected measles. The case was found in Godoma and was referred to Godoma Dispensary for medical checkup. The prevalence of other diseases was 9.5% and these diseases included: coughing (21.2%), eye/ear infection (9.4%) and vomiting (14.1%).

Figure 8: Top Four Leading Morbidity in Moyale (April – July)



The data on the DHIS for the period between April and July 2012 and 2013 also showed similar trends. The data shows that the reported cases of diarrhoea in 2013 were much higher than the reported cases of diarrhoea in 2012, the same trend is also observed for the ARIs.

3.3.2 Morbidity among the Children below 5 Years in Chalbi

Table 21: Prevalence of reported illness in children in the two weeks prior to interview (N=359)

	2012		2013		P-Value
	%	N	%	N	
Proportion of Sick Children	10.8%	685	19.5%	359	0.005

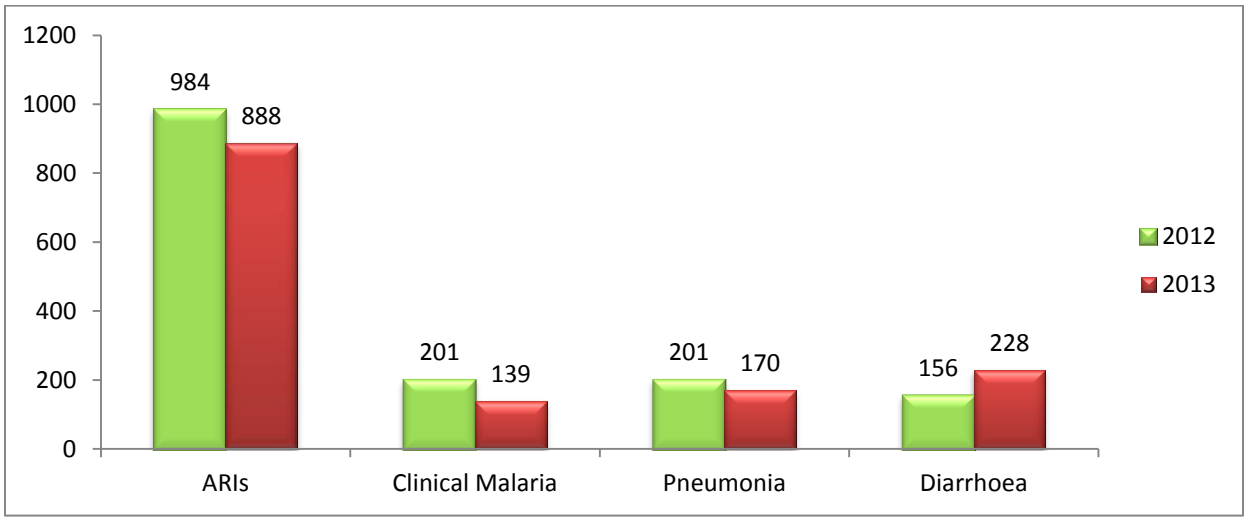
The results of the survey showed that the proportion of children sick 2 weeks prior to the survey in Chalbi was 19.5% which had increased significantly from 10.8% when compared with the results of the 2012 at the same period (p=0.005). The breakdown of the symptoms among the children reported having been sick two weeks prior to the surveys are as follow

Table 22: Symptom breakdown in the children in the two weeks prior to interview

	2012		2013		P-Value
	%	n	%	n	
Diarrhoea	6.8%	5	13.8%	12	0.2354
ARIs	41.9%	31	33.3%	32	0.3696
Fever	28.4%	21	36.8%	29	0.3622
Others	17.6%	13	16.1%	14	0.8395

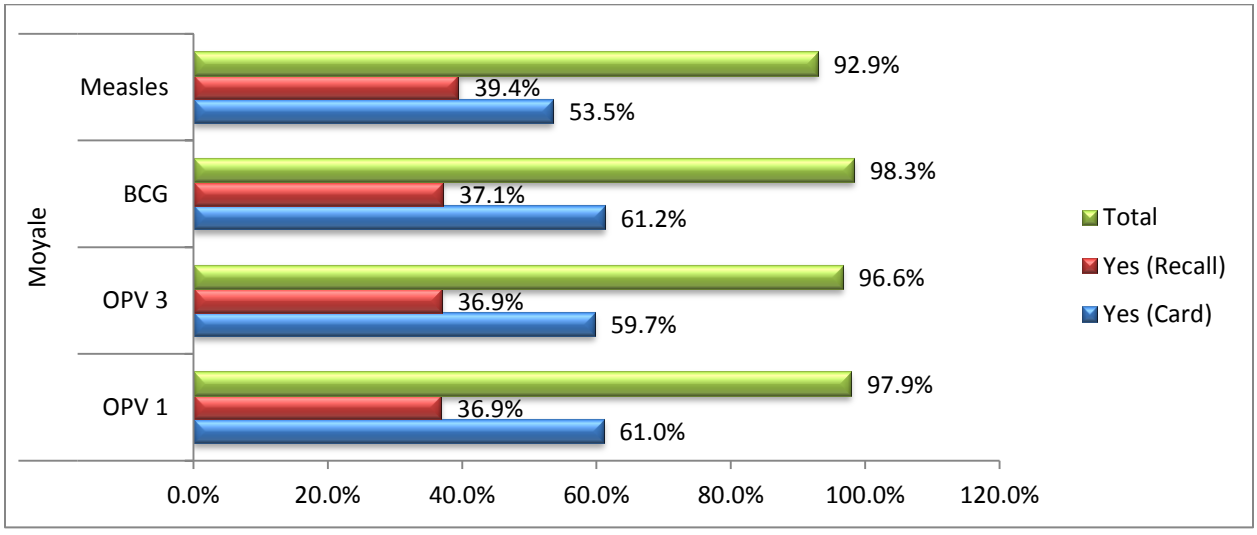
The most prevalent disease among the children under 5 years in the Chalbi at the time of the survey was fever (36.8%), this was followed by ARIs at 33.3%, then diarrhoea at 13.8%. The other diseases mentioned included eye infection (2), skin infection (3), vomiting (4), and swollen nose (1). Further, according to the results, when compared with the results for 2012, there was slight increment in the reported cases of diarrhoea though the increment was insignificant. Additionally, there was drop in the reported cases of ARIs though the drop was not significant while there was an insignificant increment in the reported cases of fever. When triangulated with the DHIS, in the four months preceding the survey, the leading cause of morbidity among the under 5 in 2013 was ARIs which had 888 reported cases in the period. A comparison with the same period in 2012, there was a slight drop from 984 reported cases. The same trend was observed for clinical malaria and pneumonia. However, the reported cases of diarrhoea in this period in 2012 were 156 which increased to 228 in 2013.

Figure 9: Top Four Leading Morbidity in Chalbi (April – July)



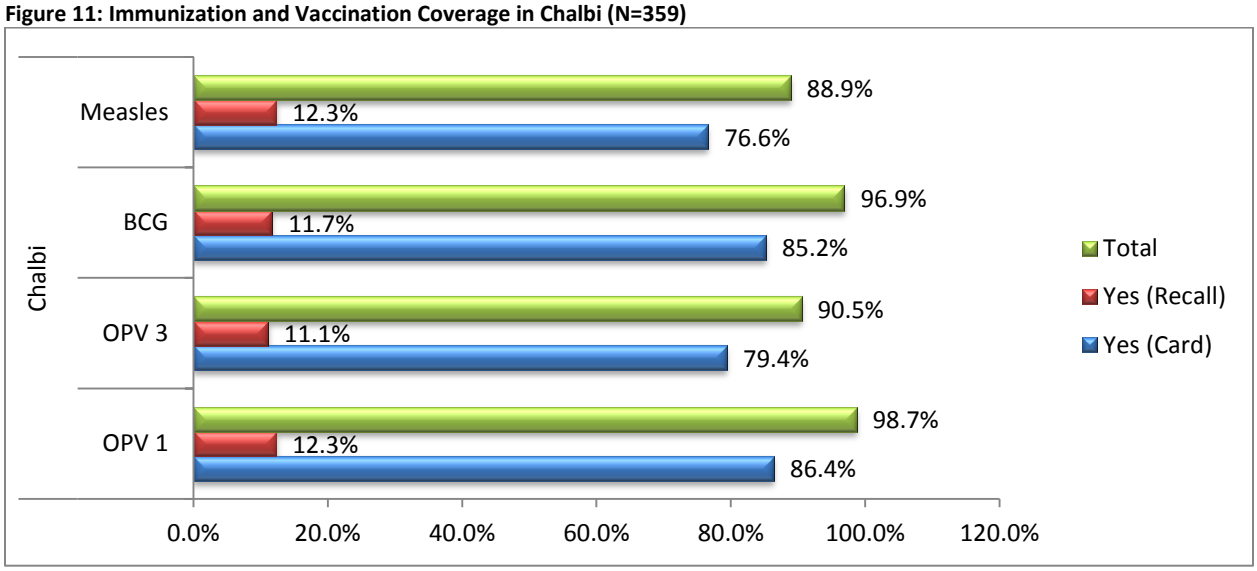
3.4 Vaccination Results

Figure 10: Immunization and Vaccination Coverage in Moyale (N=1147)



The overall measures coverage in Moyale among the children 9-59 months (N=1085) was established as 92.9% where 53.5% of this was verified using the health cards and 39.4% was identified through recall. Additionally, the BCG coverage among the children aged 6-59 months (N=1147) was found to be 98.3% where 61.2% were verified by the health card and 37.1% was verified using the recall method. The overall OPV coverage was 96.6% where 59.7% was verified using the health cards and 36.9% using the recall method. Finally, the OPV 1 coverage was established as 97.9% of which 61% was identified through the birth cards and the other 36.9% was through the recall method. These results show that the immunization and vaccination coverage was high in Moyale and even above the national targets of 80%.

Figure 11: Immunization and Vaccination Coverage in Chalbi (N=359)



In Chalbi, the coverage of measles vaccination among the children aged between 9 and 59 months (N=333) was found to be 88.9% of which 76.6% was verified using the health cards and 12.3% using the recall method. Moreover, 96.9% of the children aged between 6 and 59 months sampled had received BCG where 85.2% was verified using the birth cards and 11.7% through the recall method. Additionally, the coverage of OPV3 was found to be 90.5% where 79.4% was verified through the birth cards and 11.1% through the recall period. Finally, the OPV1 coverage was established as 98.7% where 86.4% was verified through the use of the birth cards and 12.3% was done through the recall method.

3.5 High Impact Nutrition Intervention (HiNi) Indicators and Maternal Indicators

3.5.1 HiNi Indicators

Table 23: Performance of HiNi Indicators in Moyale

HiNi Indicator	2012			2013			P-Value	DHIS
	n	N	%	n	N	%		
Vitamin A Supplementation (6-11 Months)	No Data			69	122	56.6%		71.5%
Vitamin A Supplementation (12-59 Months) - Twice	No Data			312	1025	53.0%		20.1%
Overall Vitamin A Supplementation Coverage	739	1000	73.9%	658	1147	57.4%	0.000	
ORS **	No Data			65	127	51.2%		
Zinc Supplementation Coverage	No Data			31	127	24.4%		
Deworming Coverage	392	900	43.6%	353	1025	34.4%	0.001	2.0%
Iron Folate Supplementation **	422	603	70.1%	415	843	49.2%	0.000	
Iron Folate Supplementation for 90 Days	No Data			60	415	14.5%		
Vitamin A Coverage (Lactating Women) **	154	457	33.7%	101	448	22.5%	0.003	7.4%

NB: ** Not a HiNi Indicator

The proportion of children aged 12 to 59 months who had been supplemented with Vitamin A twice in the year preceding the survey was estimated as 53.6% (n=711). This had however dropped significantly when compared with the same period in 2012 (p=0.000). Further, a comparison between the findings of the survey and the report available at the DHIS show that the proportion of children supplemented with Vitamin A aged between 12 and 59 months was only 30.1%. This show a great difference between the survey finding and what has been reported on the DHIS which is a pointer of low reporting rates of Vitamin A in the DHIS. The same trend was observed on the proportion of lactating women who were supplemented with Vitamin A after delivery. According to the results of the surveys, this proportion dropped significantly from 33.7% in 2012 to 22.5% in 2013 (p=0.003). Further, according to the DHIS the proportion of women supplemented with Vitamin A at the facilities was 7.4% which is low compared with the findings of the surveys which is also a pointer of underreporting at the DHIS. The vitamin A coverage in Moyale was found to be below the national targets of 80%. On the deworming coverage, the survey established that the deworming coverage was at 34.4% (n=353) which had also dropped significantly when compared with the same period in 2012 (p=0.001). A comparison with the DHIS, the results also noted that the DHIS reporting of deworming coverage was very low at 2% which also points to underreporting in the DHIS. The deworming coverage was found to be below the national targets.

The proportion of children supplemented with zinc in a diarrhoea episode two weeks prior to the survey was 24.4% (n=31) while those that were given ORS during the same was 51.2% (n=65). The results, also established that the iron folate supplementation among the pregnant women was 49.2% (n=415) which had dropped significantly when compared with the same period in 2012 (p=0.001). Moreover, the zinc coverage was found to be below the national target of 50%. Additionally, among the women who had been supplemented, only 14.5% of them took the iron folate supplement for a period of 90 days as required. The iron folate supplementation coverage is below the national targets of 50%.

Table 24: Performance of HiNi Indicators in Chalbi

HiNi Indicator	2012			2013			P-Value	DHIS
	n	N	%	n	N	%		
Vitamin A Supplementation (6-11 Months)	No Data			41	54	75.9%		109.2%
Vitamin A Supplementation (12-59 Months) - Twice	No Data			133	235	56.6%		30.1%
Overall Vitamin A Supplementation Coverage	513	682	75.2%	174	359	76.9%	0.005	
ORS **	No Data			5	12	41.7%		
Zinc Supplementation Coverage	0	4	0%	4	12	33.3%		
Deworming Coverage	436	600	72.7%	135	305	44.3%	0.000	7.0%
Iron Folate Supplementation **	325	554	58.7%	240	328	73.2%	0.005	
Iron Folate Supplementation for 90 Days	No Data			75	240	31.3%		
Vitamin A Coverage (Lactating Women) **	150	328	45.7%	138	254	54.3%	0.097	30.0%

NB: ** Not a HiNi Indicator

The prevalence of vitamin A supplementation among the children aged 6 to 11 months in Chalbi was 75.9%. This when compared with the DHIS is low, though it was noted that the DHIS had underestimated the targeted. Additionally, though this coverage can be considered high, it is still below the national target of 80%.The proportion of children aged 12 to 59 months who were supplemented with vitamin A in the past year before the survey was estimated at 56.6% which is also below the national targets. A comparison between the survey findings and the DHIS, the results show low vitamin A coverage by the DHIS. This can be attributed to underreporting in the DHIS and particularly reporting of cases supplemented at the community level. The overall Vitamin A supplementation coverage in Chalbi was found to be 60.2% which had dropped significantly compared with the results for 2012 (p=0.005).

The zinc supplementation coverage was found to be 33.3% which is below the national targets of 50%. However, this has increased compared with the results for 2012. The deworming coverage in Chalbi was established as 44.3% which is below the national targets. Additionally, the deworming coverage has dropped significantly when compared with the results of 2012 (p=0.000). Further, a comparison with the DHIS results, it is evident that there is under reporting of this indicator.

On iron folate coverage, the results found out that 73.2% of the caregivers had been supplemented with iron folate in their last pregnancy. This is considered high and above the national targets. Further, this also increased significantly when compared with the results of 2012 (p=0.005). However, among those supplemented with iron in their last pregnancy, only 31.3% of them took the supplements for the recommended 90 days. Finally, the survey results showed that the vitamin A coverage among the lactating women was 54.3% which had increased from 45.7% in 2012 though not significant. Again, as also found out in the other indicators, there seems to be under reporting of this indicator in the DHIS.

3.5.1 Maternal Health Indicators

Table 25: Maternal Health Indicators

Indicator		Moyale/Sololo		Chalbi	
		Percentage	N	Percentage	N
Maternal Nutrition	< 21 CM	5.0%	843	7.8%	328
	21-23 CM	18.2%		22.5%	
	>23 CM	77.0%		69.7%	
Place of Last Delivery	At Home Alone	16.9%		0.6%	
	At Home TBA	44.8%		95.3%	
	Facility	35.7%		2.8%	
Antenatal Clinic Visits	None	22.9%		21.0%	
	Once	6.2%		6.7%	
	Twice	9.3%		14.6%	
	Thrice	22.7%		28.9%	
	4 and Above Visits	38.9%		28.8%	

The prevalence of moderate acute malnutrition among the pregnant and lactating women in Moyale/Sololo was 5.0% while the prevalence of PLWs at risk of malnutrition was 18.2%. On the other hand, in Chalbi, the prevalence of moderate acute malnutrition among the PLW was established as 7.8% while those at risk was 22.5%.

On the place of last delivery, in Moyale/Sololo 16.9% of the caregivers interviewed reported having delivered at home alone, 44.8% reported having delivered at home with the help of the TBA. Further, only 35.7% of the mothers had delivered their last child in a health facility. The result indicates that there is still low facility delivery in Moyale. Though facility delivery is medium at 35.7% which may be attributed to presence of maternity wards in various facilities in the area, majority of the mothers still rely on TBA for delivery.

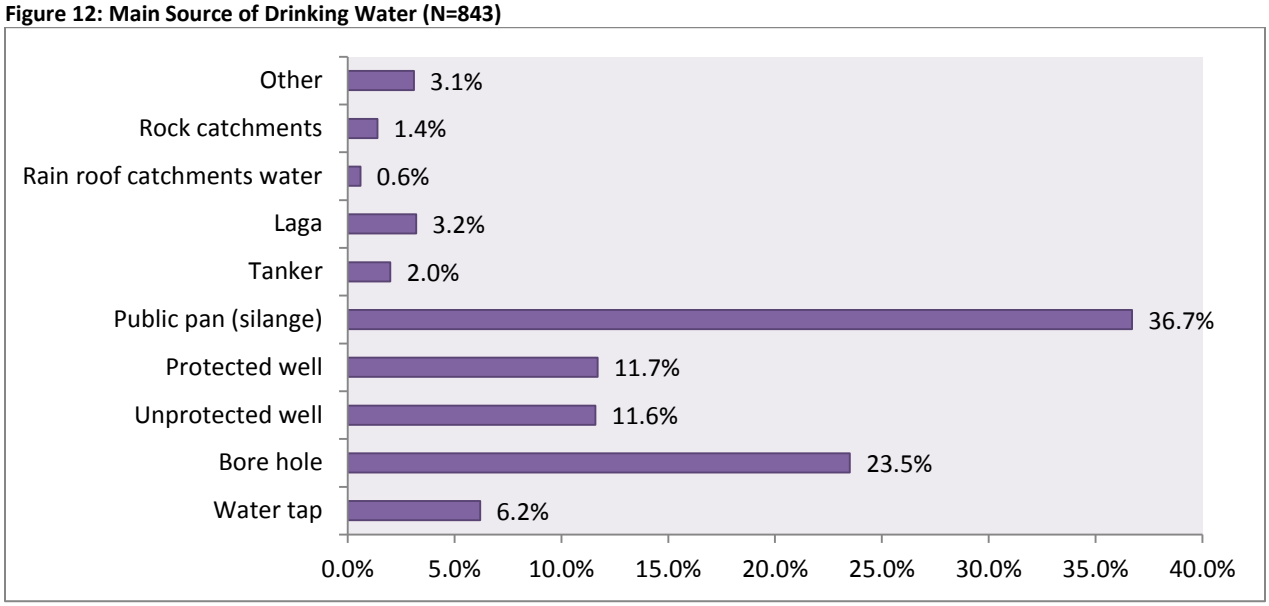
In Chalbi, the proportion of mothers who have delivered in health facilities was only 2.8% which is considered very low. This may be attributed to the fact that the district has only seven facilities and serves more than 30,000 in habitants. Furthermore, even in the existing facilities none of them has a maternity ward and hence hindering facility delivery. Further, the results show that almost all of the mothers in Chalbi rely on the TBA's for delivery.

Expected mothers are supposed to attend the ante-natal clinics for four times or more. The survey results showed that only 38.9% of the mothers in Moyale/Sololo who adhere to the four ANC visits this is quite low. Further, 22.9% of the mothers said that they did not attend any ANC visit during the last pregnancy and this is considered high. In Chalbi, only 28.8% of the caregivers who attended the ANC for the recommended four visits with 21% reporting never having attended an ANC visit.

3.6 Water and Sanitation

3.6.1 Water and Sanitation Situation in Moyale

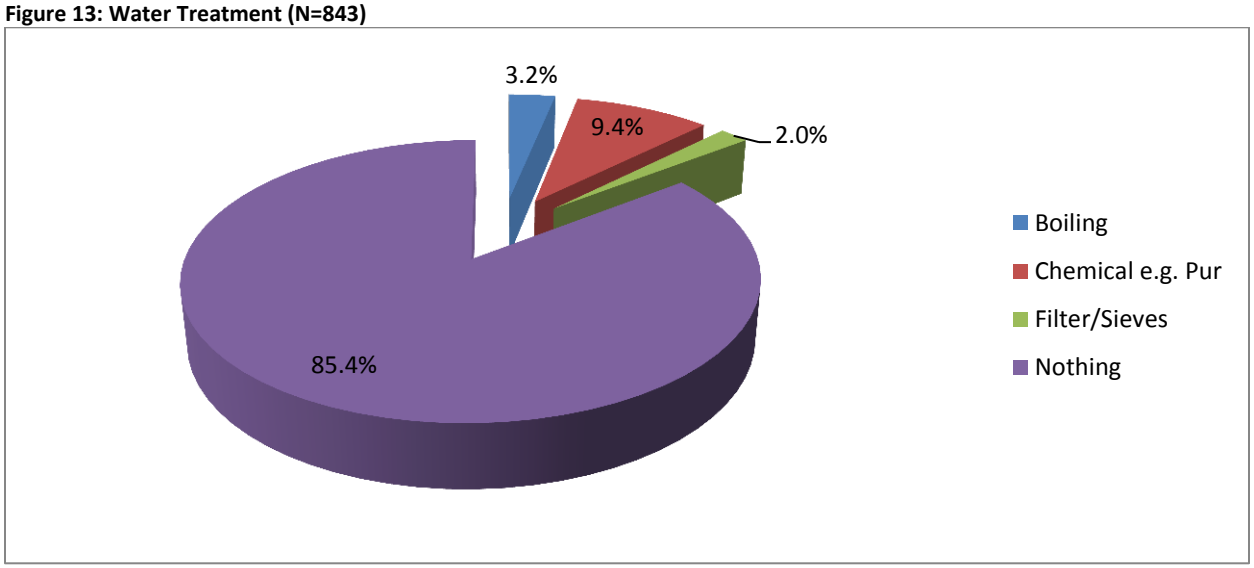
Figure 12: Main Source of Drinking Water (N=843)



The main source of drinking water in Moyale was public pan (silanga) reported by 36.7% of the survey respondents. This was followed by the boreholes reported by 23.5% of the respondents and then protected and unprotected wells mentioned by 11.7% and 11.6% respectively. Additionally, among the respondents interviewed only 21.9% of them had access to safe water sources while the rest (78.1%) had unsafe water sources.

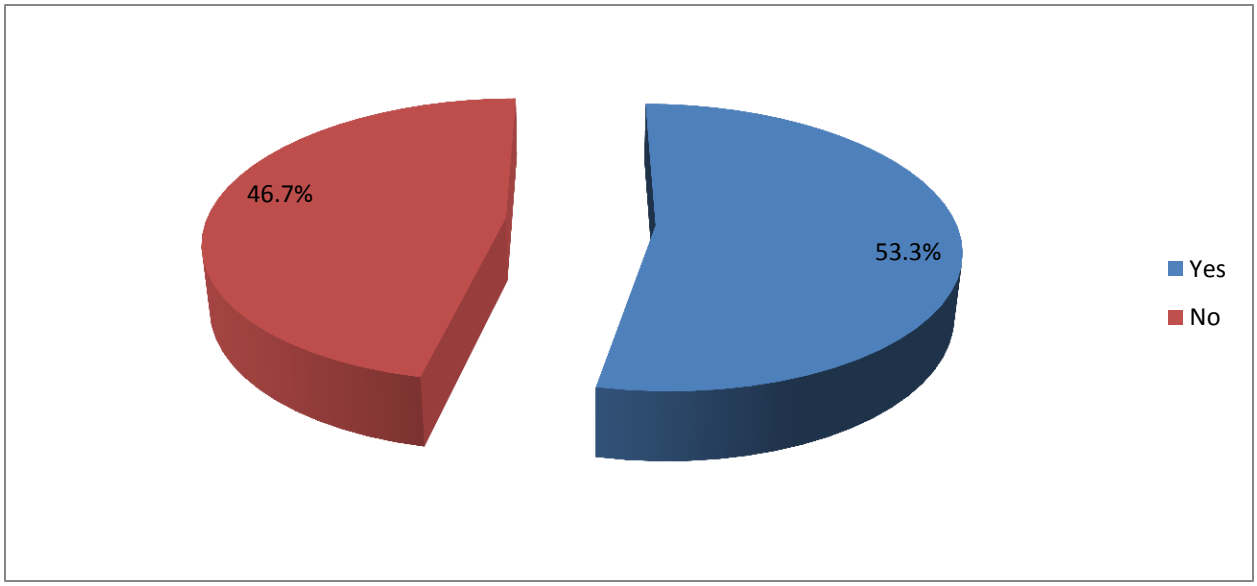
On the time take to fetch water, 45.6% (n=384) of the surveyed respondents reported that they spend between 30 minutes and 1 hour. Another, 26.0% (n=219) reported that they spend between 1 hour and 3 hours while 23.0% (n=194) reported that they spend less than 30 minutes to fetch water. Additionally, on average every household was found to spend 68.9 liters with a standard deviation of 31.

Figure 13: Water Treatment (N=843)



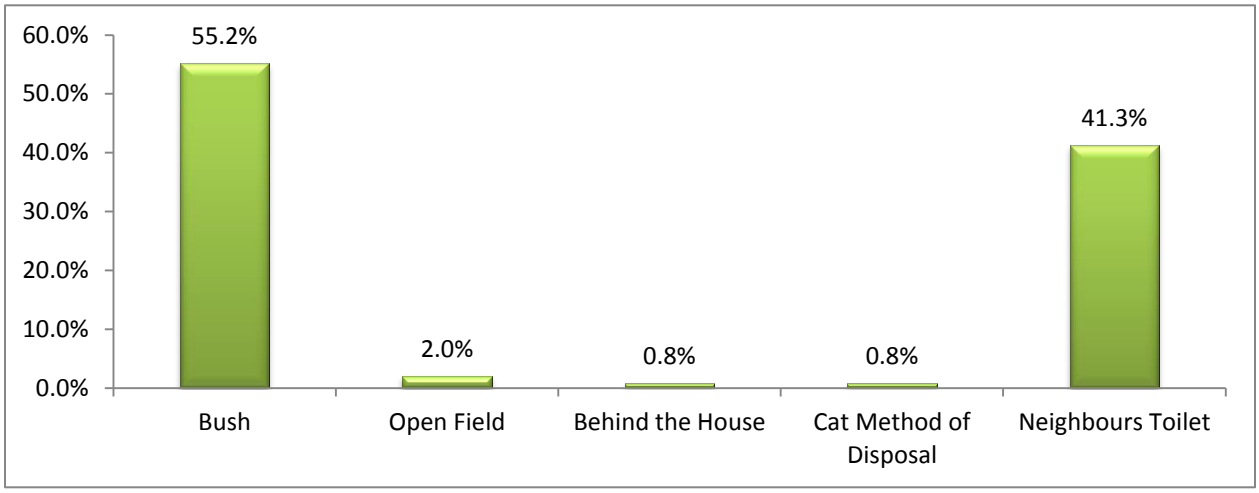
Among the households sampled in the survey, majority (85.4%) of them reported that they do not treat water before its drunk. Of those that treat, use of chemical such as pur was the most prevalent with 9.4% of the respondents reporting that they use chemical. Another 3.2% of the respondents reported that they use the boiling method and 2.0% reported using filters/sieves.

Figure 14: Access to Toilet/Latrine Facility (N=843)



Only 53.3% (n=449) of the households sampled in Moyale had access to either a toilet or a latrine facility. Of those households which are accessible to a toilet/latrine facility, 84.6% (n=379) are accessible to traditional pit latrine, 15.2% (n=68) are accessible to ventilated improved pit latrine while only 0.2% (2) are accessible to flush toilets. On whether the toilet was in use, 95.3% (n=407) of those who reported that they are accessible to toilet said that their toilets were in use.

Figure 15: Other Places for used by Residents to Relive Themselves (N=395)

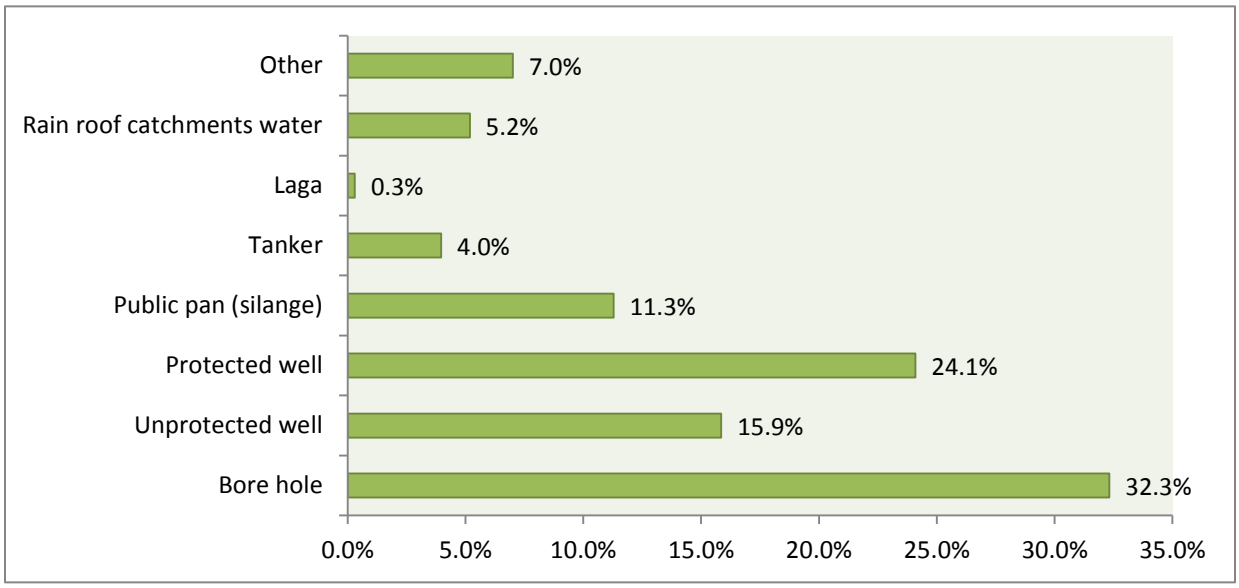


Among the respondents who reported that they did not have toilet facilities in their compounds, 55.2% (n=218) of them reported that they relieved themselves in the bushes. Another 41.3% (163) reported that they use neighbor's toilets while a small proportion of 2% (n=8) reported that they use open field.

Finally, the results showed that among the caregivers interviewed, 33.7% (n=284) of them practiced proper hand washing at critical times[20].

3.6.2 Water and Sanitation Situation in Chalbi

Figure 16: Main Source of Drinking Water (N=328)

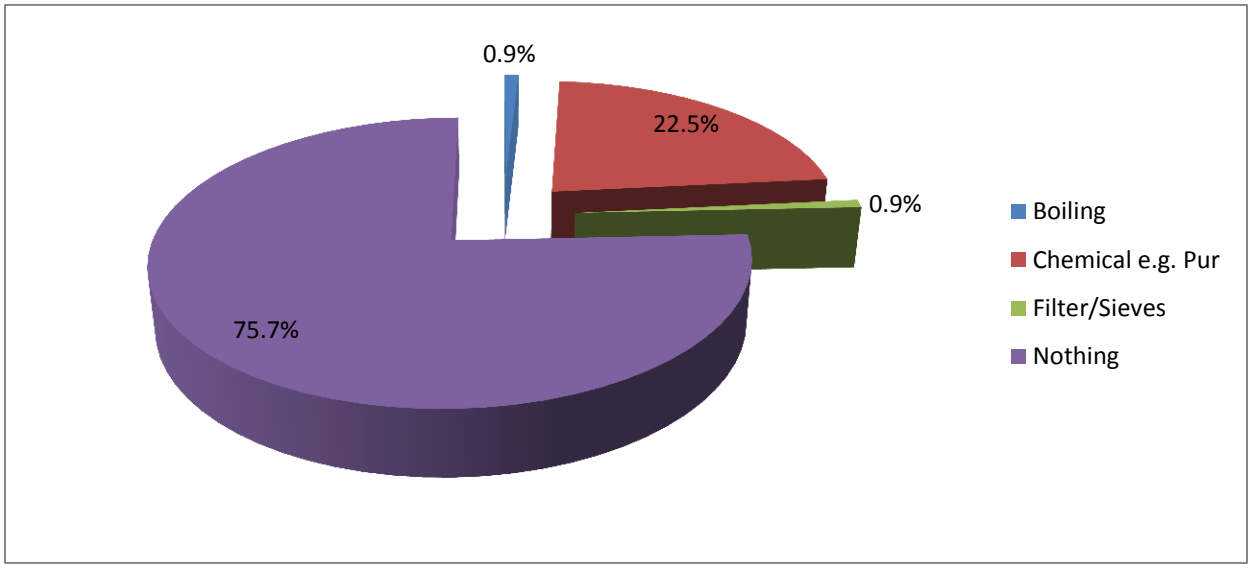


[20] Hand Washing at Critical Times: Any 3 of the Following times: After Defecation/Visiting Toilet, Before Handling Food, After Cleaning Child's Bottom, Before Feeding the Child, Before Eating. Application of Soap for Hand-Washing was also put into Consideration

In Chalbi the main source of drinking water was boreholes where 32.3% (n=106) of the respondents interviewed reported sourcing their drinking water. This was followed by the use of protected well where 24.1% (n=79) of the interviewed respondents reported sourcing their drinking water. The proportion of respondents who sourced their drinking water from unprotected well was 15.9% (n=52). Further, the results showed that 41.5% of the respondents had access to safe drinking water while the rest (58.5%) had no access to safe drinking water.

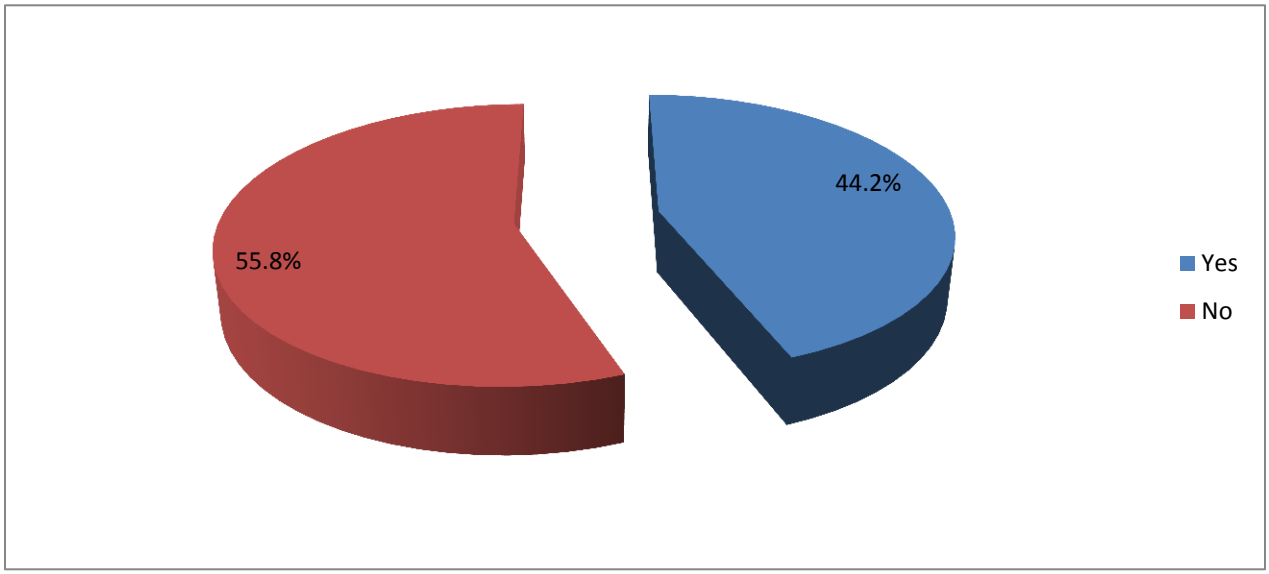
On the time take to fetch water, the results indicates that 38.4% (n=126) of the interviewed respondents took less than 30 minutes to fetch water. Another, 34.1% (n=112) reported that they took between 30 and 1 hour to fetch water while 20.1% (n=66) of the respondents reported that they spent over 3 hours while fetching water. Additionally, on average the households in Chalbi spend 42.3 liters of water per day with a standard deviation of 24.7.

Figure 17: Water Treatment (N=328)



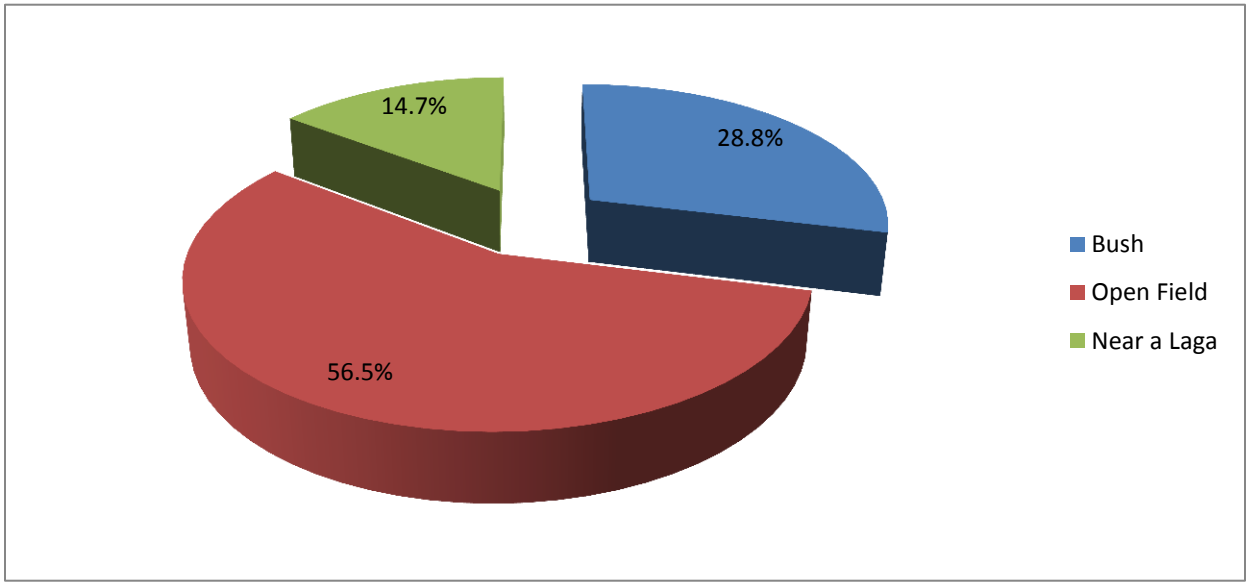
The results show that 75.7% (n=249) of the respondents interviewed reported that they never treated their water before use. However, among the 24.3% (n=80) of those that treated water bore drinking, 22.5% (n=74) used chemical as the water purifier agent while only 0.9% (n=3) who reported using the boiling method as a water purifying agent. This clearly shows that water treatment at the community is still low and this may be an area of concern. Of interest is the low application of boiling as a water treatment method despite the method being cheap.

Figure 18: Access to Toilet/Latrine Facility (N=328)



Of the households sampled in the survey, the results showed that majority (55.8%, n=183) of them had no access to either toilets of latrines. This implies that the proportion of households which have access to either a toilet and/or a latrine was 44.2% (n=145). Further, according to the respondents, 96.3% (n=131) of the accessible latrines were in usable conditions. It is also worth noting that among the households that had access to toilets, 87.6% (n=127) had access to ventilated improved pit latrine while 12.4% (n=18) had access to traditional pit latrines.

Figure 19: Other Places for used by Residents to Relive Themselves (N=184)



The results of the survey showed that among the respondents who had no access to a toilet facility in Chalbi, 56.5% (n=104) relieved themselves in the bushes, 28.8% (n=53) relied on the bush while 14.7% (n=27). This indicates that open defecation in Chalbi is quite high and maybe a health hazard in the area.

On hand washing at critical times, the results showed that 22.6% (n=24) of the respondents practiced proper hand washing at critical times.

3.7 Food Security

Table 26: Food Security

Indicator	Moyale/Sololo			Chalbi	
	Category	Proportion	N	Proportion	N
Main Source of Livelihood	Pastoralism	14.1%	843	84.5%	328
	Farming	4.7%		0.0%	
	Agro-Pastoralism	2.8%		3.7%	
	Petty Trade	18.0%		5.2%	
	Salaried	14.6%		2.4%	
	Casual Labour	35.7%		0.0%	
	Others	10.1%		4.3%	
Source of Income	Crop Sale	5.9%		3.0%	
	Salaried	14.4%		3.0%	
	Business	13.2%		5.2%	
	Livestock Sale	14.4%		82.3%	
	Casual Labour	42.5%		5.8%	
	Others	9.5%		0.6%	
Dominant Food Source	Own Production	8.2%		5.5%	
	Purchases	75.0%		85.4%	
	Gifts	0.9%		1.2%	
	Food Aid	15.2%		7.9%	
	Others	0.7%		0.0%	
Household DDS	Low DDS	13.4%		32.9%	
	Medium DDS	54.7%		57.0%	
	High DDS	31.9%		10.1%	

The dominant source of livelihood in Moyale/Sololo was casual laborer at 35.7%. This was followed by petty trade at 18% and then pastoralism at 14.1%. Farming contributed to only 4.7% while agro-pastoralism contributed to 2.8%. The high proportion of petty trade and casual laborer in Moyale/Sololo would mainly be attributed to the fact that majority of the population lives in Moyale and Sololo towns which are mainly urban set up. In Chalbi, the main source of livelihood was pastoralism at 84.5% and this was followed by petty trade at 5.2%. This high proportion of pastoralism would be mainly attributed to the fact that Chalbi is mainly a semi-arid area with no major urban areas. Additionally, the district has only a small portion where farming is done around Hurri Hills and this is combined with pastoralism.

On the main source of income, 42.5% of the interviewed respondents in Moyale/Sololo reported that their main source of income was casual labour. This was followed by livestock sale and salaried which each contributed to 14.4% while crop sale contributed to only 5.9%. In Chalbi, 82.3% of the respondents reported that their main source of income was sale of livestock. In Moyale/Sololo, the dominant source of food was purchases which were reported by 75% of the interviewed respondents and this was followed by food aid at 15.3%. In Chalbi, the dominant source of food was purchase which was reported by 85.4% of the respondents.

Finally, the household dietary diversity score (DDS) in Moyale/Sololo was mainly medium. This implies that majority of the respondents feed on between 4 and 6 food groups. It is important to note the household DDS in Moyale/Sololo was high and this would be attributed to the good food security at the time of the survey. This was as a result of the favorable weather condition in the area as a result of successful long rains in March-June 2013 and also successful short rains in November – December 2013 which increased the food security through adequate harvesting for the agro-pastoralism and also good forage and water for the pastoralism. On the other side, the household dietary diversity in Chalbi was mainly medium which implies that majority of the respondents took food from between 4 and 6 food groups. Of worth noting is the high low dietary diversity intake in Chalbi which was at 32.9%. The high low dietary intake in Chalbi would be attributed to the worsening food security in the area as a result of prolonged dry season and hence deteriorating animal condition in the area.

3.8 Infant and Young Children Nutrition

Infant and young child feeding are a cornerstone of care for childhood development. Worldwide about 30%[21] of children are stunted while in Kenya the proportion of stunted children is about 35%[22]. The high stunting levels have been associated with poor feeding and repeated infections and particularly during the first two year of a child. Studies have shown that improved feeding practices leads to improved intakes of energy and nutrition's, leading to better nutrition status. Among the infant and young children feeding practices indicators which were assessed in this survey include: timely initiation to breast milk, exclusive breastfeeding, continued breastfeeding at 1 year, continued breastfeeding at 2 years, introduction of solid, semi-solid, or soft foods, dietary diversity, meal frequency and acceptable diet.

[21] World Health Organization
[22] Kenya Demographic Health Survey, 2008/9

Table 27: IYCN Indicators

Indicator	Age Group	Moyale/Sololo/M. Central			Chalbi/Laisamis/N. Horr/Loyangalani		
		Numerator	Denominator	Proportion	Numerator	Denominator	Proportion
Timely Initiation to Breast milk	**0 – 23**	**702**	**833**	**84.3%**	**479**	**567**	**84.5%**
Exclusive Breastfeeding	**0 – 5**	**186**	**263**	**70.7%**	**140**	**215**	**65.1%**
Continued Breastfeeding at 1 Yr	**12 – 15**	**117**	**138**	**84.8%**	**89**	**94**	**94.7%**
Continued Breastfeeding at 2 Yrs	**20 – 23**	**48**	**124**	**38.7%**	**44**	**58**	**75.9%**
Introduction of Solid, Semi-Solid, or Soft Foods	**6 – 8**	**70**	**114**	**61.4%**	**29**	**70**	**41.4%**
Minimum Dietary Diversity – ALL	**6 – 23**	**92**	**570**	**16.1%**	**20**	**352**	**5.7%**
Minimum Dietary Diversity – Breastfed	6 – 23	64	437	14.6%	19	324	5.9%
Minimum Dietary Diversity – Non-Breastfed	6 – 23	28	133	21.1%	1	28	3.6%
Minimum Meal Frequency (2+ Meals)	6 – 8	79	114	69.3%	22	70	31.4%
Minimum Meal Frequency (3+) Breastfed	9 – 23	218	324	67.3%	73	256	28.5%
Minimum Meal Frequency (4+) Non-Breastfed	9 – 23	47	132	35.6%	4	26	15.4%
Minimum Meal Frequency ALL	**6 – 23**	**344**	**570**	**60.4%**	**99**	**352**	**28.1%**
Minimum Acceptable Diet	**6 – 23**	**64**	**570**	**11.2%**	**10**	**352**	**2.8%**

In the Moyale/Sololo stratum, timely initiation to breast milk was found to be 84.3% (n=702) which is considered above the 80% target hence classified as satisfactory. The exclusive breastfeeding rate was found to be 70.7% (n=186) which is above the national target of 50% and hence considered satisfactory. The continued breastfeeding rate at 1 year was found to be 84.8% (n=117) which is above the 80% target and hence classified as satisfactory. However, the continued breastfeeding at 2 years was found to be low at 38.7% (n=48) and hence considered unsatisfactory.

Further, in Moyale/Sololo, the introduction of solid, semi-solid and soft foods was found to be 61.4% (n=70) which is below the 80% target and hence considered unsatisfactory. Additionally, the results of the survey showed that only 16.1% (n=92) of the children aged 6 to 23 months took the minimum dietary intake the day before the survey. This is considered low and unsatisfactory since it is below the national targets. The proportion of children aged 6 to 23 months who took the minimum number of meals a day before the survey in Moyale/Sololo was 60.4% (n=344) which is still below the national targets. Finally, the minimum acceptable diet was only reached by 11.2% (n=64) of all the sampled children and this is classified as poor.

In the Chalbi stratum, the proportion of children initiated to breast milk in a timely way was 84.5% (n=479) which is considered high and above the national target and hence it's classified as satisfactory. Additionally, the proportion of children who were exclusively breastfed was found to be 65.1% (n=140) which is above the 50% national targets hence considered satisfactory. Continued breastfeeding at 1

year was found to be high at 94.7% (n=89) which is considered higher than the national target. Though continued breastfeeding was high at 75.9% (n=44), this was still below the national targets. The proportion of children 6 to 8 months introduced to solid, semi-solid, or soft foods in Chalbi was 41.4% (n=29) and this is way below the national target and hence considered unsatisfactory. The minimum dietary diversity was found to be 5.7% (n=29) which is considered low and unsatisfactory. Further, minimum meal frequency was established to be 28.1% (n=99) which is also considered low and unsatisfactory. Finally, the proportion of children 6 to 23 months who had the minimum acceptable diet a day before the survey was only 2.8% (n=10) which is considered very poor and unsatisfactory.

In general, the breastfeeding indicators in Chalbi were considered good while the other IYCN indicators were considered unsatisfactory.

CHAPTER FOUR
CONCLUSION AND RECOMMENDATIONS

<table>
<tr><th colspan="4">CHALBI</th></tr>
<tr><th>Conclusion</th><th>Probable Explanation</th><th>Recommendations</th><th>By Who</th></tr>
<tr><td rowspan="5">High GAM of 15.9% which is classified as Critical based on the WHO Classification</td><td rowspan="5">Food Insecurity
✓ Food availability and accessibility was currently poor and the situation seemed worsening (Classified as worsening by July NDMA Bulletin)
✓ The animal body condition was also worsening due to forage scarcity (Also observed in the July NDMA Bulletin)
✓ There was indication of water shortage in the district at the time of the survey which was deemed to be worsening (Also observed in the July NDMA Bulletin). It was also noted that some schools in Hurri hills had not reopened due to lack of water (2 weeks after the schools opened).
✓ (The long rains came earlier than expected .It rained for a short time with high intensity. The rains were poorly distributed in Chalbi. .This was good in Bubisa, Turbi and Folore. They performed poorly in Kalacha, Maikona and Elgade where a rough analysis showed high cases of malnutrition – 70%)
✓ Number of household benefitting from GFD was reduced increasing household food insecurity
Health and Health Systems
✓ There was a diarrhoea outbreak in the month of July in Kalacha, Maikona and El Gade
✓ Three out of the only seven facilities in the district were closed for up-to three months prior to the survey i.e. May, June and July. Maikona was closed down for one month, Folore for two months and Hurri Hills for three months when the staff went on leave
✓ Community Level mobilization and activities were noted to be weak. CHEWs were mostly not on the ground. The link between CHEWS-CHWs and facility was poor in a number of facilities. This also worked against the active case finding</td><td>✓ Retargeting for GFD to be done</td><td>✓ GoK, FH and WFP</td></tr>
<tr><td>✓ Growth monitoring should be intensified through avenues such as well baby clinics, and filtering during unwell episodes. Weight for Height should be a routine activity</td><td rowspan="3">✓ MoH with Support from Concern Worldwide</td></tr>
<tr><td>✓ Mass Screening and Active Case Finding of Children Under 5 years and Refer any Child <135 mm</td></tr>
<tr><td>✓ IMAM Training for Newly Recruited Health Staff who were employed in September. The training should be done in October</td></tr>
<tr><td>✓ Ensure that the facilities are well staffed with at least two health workers per facility</td><td>✓ MoH</td></tr>
<tr><td>Low Vitamin A, Zinc and Deworming Coverage</td><td>✓ Poor community level activities</td><td>✓ Strengthening the Community Strategy at the district
✓ Have work plans for the CHWs and CHEWs
✓ Remapping of the CHWs and ensure that every part of the</td><td>✓ MoH with Support from Concern Worldwide</td></tr>
</table>

		district is well covered ✓ Continuous monitoring of the HiNi activities both at the community and facility level ✓ Targeting the Early Childhood Education Centres for both Vitamin A and Deworming Activities	
Poor Wash Indicators i.e. Hand Washing at Critical Times, Water Treatment, Toilet/Latrines Usage	✓ Cultural Factors	✓ A BCC programme to bring about change in WASH indicators needed to be initiated	✓ MoH
Poor Dietary Intake and Low Meal Frequency	✓ Cultural Factors	✓ Up-Scaling and Strengthening of the MIYCN program	✓ MoH with Support from Concern Worldwide
Low ANC uptake and Facility Delivery	✓ In adequate maternity facilities in Chalbi District. In fact, the no health facility in the district which has a maternity ward. ✓ Distance to the health facilities greatly affects ANC visits ✓ Further, too much confidence with the traditional birth attendants was also established as	✓ Initiation of maternal waiting homes in the major settlement area where the health facilities are found ✓ There should be a health program initiated in the area to address the maternal and child health	✓ MoH
Improper Case Definition of Different Diseases i.e. Pneumonia	✓ High number of reported cases of pneumonia in the DHIS which could not triangulated with the survey data	✓ OJT needed on pneumonia case definition and Zinc supplementation	✓ MoH with Support from Concern Worldwide
MOYALE/SOLOLO			
Conclusion	**Probable Explanation**	**Recommendations**	**By Who**
Low GAM of 5.9% and is Classified as Medium by WHO. However, the survey showed that there	**Food Security** ✓ Generally, there has been three consecutive rainy seasons in Moyale/Sololo namely March – June 2012, October – December 2012 and March – June 2013. As a result, there has been consistent availability of pasture and water in the area hence the animal body	✓ The selective feeding program and out-patient therapeutic program should continue being implemented in the area.	✓ GoK and Concern Worldwide

were pockets of malnutrition in the area particularly, Dabel and Godoma.	condition has remained stable. Additionally, for the agro-pastoralists, due to the consistent favourable weather, there has been good harvest for the period. This in turn has helped in improving the food security in the area. ✓ In Dabel and Godoma the high malnutrition rates were mainly attributed to the transportation breakdown around the month of March to June due to the heavy rains and hence the community faced food shortage since transport to the market was cut down. Additionally, in the same period there was a reported outbreak of animal disease which made the pastoralist move away from the area and hence in adequate intake of animal products. **Health and Health Systems** ✓ There hasn't been any outbreak of a disease in the area and the under-five morbidity as recorded in the DHIS has gone down compared with other similar periods. Additionally, the survey results also showed decreased morbidity in the area.	✓ The area being good for farming, there is need for the residents to be oriented on farming skills in order to uptake agriculture as a source of livelihood.	✓ Ministry of Agriculture
Low Vitamin A, Zinc and Deworming Coverage	✓ Low community level activities	✓ Strengthening the Community Strategy at the district ✓ Have work plans for the CHWs and CHEWs ✓ Continuous monitoring of the HiNi activities both at the community and facility level	✓ MoH with Support from Concern Worldwide
Poor IYCN Practices namely dietary diversity, meal frequency.	✓ Cultural Factors	✓ Up-Scaling and Strengthening of the MIYCN program	✓ MoH with Support from Concern Worldwide
Poor Wash Indicators i.e. Hand Washing at Critical Times, Water Treatment, Toilet/Latrines Usage	✓ Cultural Factors	✓ A BCC programme to bring about change in WASH indicators needed to be initiated	✓ MoH
Low ANC uptake and Facility Delivery	✓ Distance to the health facilities greatly affects ANC visits ✓ Further, too much confidence with the traditional birth attendants was also established as major barrier to facility delivery	✓ The health program should design an intervention which would aim at addressing the issues of over-reliance with the TBAs ✓ Maternal waiting homes should be initiated in high density areas where there are no maternity services	✓ MoH with support from other partners who include Concern Worldwide
Improper Case Definition	✓ High number of reported cases of pneumonia in the DHIS which	✓ OJT needed on pneumonia and	✓ MoH with

of Different Diseases i.e. Pneumonia and measles	could not triangulated with the survey data	measles case definition and prescription of Zinc supplementation	Support from Concern Worldwide

APPENDICES

Plausibility Results – Moyale/Sololo

Criteria	Flags*	Unit	Good	Accept	Poor	Unacceptable	**Score**
Missing/Flagged data	Incl	%	0-2.5	>2.5-5.0	>5.0-10	>10	
(% of in-range subjects)			0	5	10	20	**0** (0.7 %)
Overall Sex ratio	Incl	p	>0.1	>0.05	>0.001	<0.000	
(Significant chi square)			0	2	4	10	**0** (p=0.976)
Overall Age distrib	Incl	p	>0.1	>0.05	>0.001	<0.000	
(Significant chi square)			0	2	4	10	**4** (p=0.023)
Dig pref score - weight	Incl	#	0-5	5-10	10-20	> 20	
			0	2	4	10	**0** (2)
Dig pref score - height	Incl	#	0-5	5-10	10-20	> 20	
			0	2	4	10	**0** (5)
Standard Dev WHZ	Excl	SD	<1.1	<1.15	<1.20	>1.20	
			0	2	6	20	**0** (1.00)
Skewness WHZ	Excl	#	<±1.0	<±2.0	<±3.0	>±3.0	
			0	1	3	5	**0** (0.11)
Kurtosis WHZ	Excl	#	<±1.0	<±2.0	<±3.0	>±3.0	
			0	1	3	5	**0** (-0.02)
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<0.000	
			0	1	3	5	**1** (p=0.021)
Timing	Excl	Not determined yet					
			0	1	3	5	
OVERALL SCORE WHZ =			0-5	5-10	10-15	>15	**5 %**

At the moment the overall score of this survey is 5 %, this is good

Plausibility Results – Chalbi

Criteria	Flags*	Unit	Good	Accept	Poor	Unacceptable	**Score**
Missing/Flagged data	Incl	%	0-2.5	>2.5-5.0	>5.0-10	>10	
(% of in-range subjects)			0	5	10	20	**0** (0.8 %)
Overall Sex ratio	Incl	p	>0.1	>0.05	>0.001	<0.000	
(Significant chi square)			0	2	4	10	**0** (p=0.244)
Overall Age distrib	Incl	p	>0.1	>0.05	>0.001	<0.000	
(Significant chi square)			0	2	4	10	**10** (p=0.000)
Dig pref score - weight	Incl	#	0-5	5-10	10-20	> 20	
			0	2	4	10	**0** (5)
Dig pref score - height	Incl	#	0-5	5-10	10-20	> 20	
			0	2	4	10	**0** (5)
Standard Dev WHZ	Excl	SD	<1.1	<1.15	<1.20	>1.20	
			0	2	6	20	**0** (1.04)
Skewness WHZ	Excl	#	<±1.0	<±2.0	<±3.0	>±3.0	
			0	1	3	5	**0** (0.10)
Kurtosis WHZ	Excl	#	<±1.0	<±2.0	<±3.0	>±3.0	
			0	1	3	5	**0** (0.01)
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<0.000	
			0	1	3	5	**0** (p=0.263)
Timing	Excl	Not determined yet					
			0	1	3	5	
OVERALL SCORE WHZ =			0-5	5-10	10-15	>15	**10** %

At the moment the overall score of this survey is 10 %, this is acceptable.

List of Clusters – Moyale/Sololo

District	Sublocation	Village	Selected Clusters
Moyale	Godoma didiqo	Danicha	1
Moyale	Godoma	Ogomdi	2
Moyale	Godoma	Chabicha	3
Moyale	Watiti	Hallo bima	4
Moyale	Nana	Ejersa	5
Moyale	Nana	Dubo	6
Moyale	Dabel	Baqata	7
Moyale	Dabel	Shauri yako	8,9
Moyale	Dabel	Doqe	10
Moyale	Kate	Sora Waqo	11
Moyale	Dadacha Lakole	Dadacha Lakole	12
Moyale	Bori	Dida Galgallo	13
Moyale	Bori	Ghari Guyo	14
Moyale	Odda	Adan zone	15
Moyale	Odda	Qalaluwe zone	16
Moyale	Odda	Guracha zone	17
Moyale	Odda	Iladu zone	18
Moyale	Heilu	Mohamed Ali	19
Moyale	Heilu	Qampe Koto	20
Moyale	Heilu	Abdi Huka	RC
Moyale	Heilu	Tacho Sora	21
Moyale	Gurumesa	Gurumesa 1	22
Moyale	Gurumesa	Gurumesa 3	23
Moyale	Goromudha	Issack Mohamed	24
Moyale	Goromudha	Mohamed Gatello	25
Moyale	Goromudha	Hussein Mamo Ali	26
Moyale	Butiye	Aliow Wachile	27
Moyale	Butiye	Dirbo Harro	28
Moyale	Butiye	Shuke Golicha	29
Moyale	Butiye	Guyo Happi	30
Moyale	Sessi	Anna Jillo	31
Moyale	Mansille	Qanchora Guyo	32
Moyale	Township	Mohamed Shombiti	33
Moyale	Township	Abdullahi Mohammed	RC
Moyale	Township	Halid tache	34
Moyale	Township	Adan Malla	35
Moyale	Township	Diba Karayu	36
Moyale	Lami	Abduba Jillo	RC
Moyale	Lami	Asebo Aila	37
Sololo	Rawana	Rawana	38
Sololo	Walda	Walda	39
Sololo	Dambala fachana	Dambala Fachana	40
Sololo	Anona	Anona	41
Sololo	Uran	Kiltipe	42
Sololo	Uran	Uran Godha	43
Sololo	Golole	Golole	44,45
Sololo	Sololo makutano	Sololo Makutano	RC
Sololo	Mado adhi	Mado Adhi	46
Sololo	Ramata	Waqo Guyo	47
Sololo	Ramata	qoye jattanai	48
Sololo	Ramata	Boru Guyo	RC
Sololo	Ramata	Dub Jaldesa	49

List of Clusters – Chalbi

Sub location	Villages names	Cluster
Arano	Toricha	1
Mandete Kuro	Mandete Kuro	2
Maikona	Diba Okotu	3
	Boji	4
	Mathare	5
	Guyo Roba	6
Kalacha	Duke	7
	Lalasalama	8
	Chile	9
	Kutur	10
Elgade	Town	11
	Elboji/Elguracha	RC
Hurri hills	Konchora	12
	Guba	RC
	Bori wara	13,14
Folore	Folore town	15,16
Folore	Gandile	17
Torbi	Mathare	18
Bulgalbo	Roba Bagajo	19
	Diid galgalo	20
Shurr	Shura	21
Bubisa	Ilman Antonto	22
	Nairobi	23
	Wochan	RC
	Dakha baricha	24
	Dekuku	25

Local Calendar of Events: Moyale and Sololo

MONTH	Seasons	2008	2009	2010	2011	2012	2013
JANUARY Ji Toko / Abrassa	Drought, School open, New year (Bon Agaya)		55	43	Dismisal of Ali and Kosgey Case in the Hague 31	Borana/Gabra Clashes 19	Campaign 7
FEBRUARY JI Lama/Amachi	Influx of livestock/ Drought season (Bon Agaya)		54	42	30	Borana/Gabra Clashes 18	Campaign 6
MARCH Ji Sadi/ Gurandara	Drought season (Bon Agaya)		53	The worst drought (Olla) 41	29	17	General Election 5
APRIL JI Afuri/ Bitotesa	Beginning of long rains, Easter (Gann)		52	40	28	16	Kenyatta sworn in as 4th president 4
MAY Ji Shani / Chamsa	Planting season(Aburr) /Labour Day		51	39	27	15	3
JUNE Ji Jaa / Bufa	Cold (Adoles)/ Madaraka Day		50	38	Borana-Burji Clashes 26	Plane Crash killing Saitoti & Ojonde 14	Teachers strike 2
JULY: Ji Torb/ Wachabaji	Cold (Adoles)		Sololo New District/ Major Drought(Olla) 49	World Cup in S. Africa 37	25	Gold rash in Dabel 13	Ramadhan 1
AUGUST: Ji Sadet/ Obora Diqa	Harvesting/ Dry season (Chamsa)		National Census (Nam Isaban)/ Odda road accident 11 People died 48	Constitutional Referendum 36	24	Ramadhan / Death of Meles Zinawi 12	0
SEPTEMBER Ji Sagal/ Obora Guda	Dry season (chamsa) , Land preparation	59	47	Promulgation of the constitution 35	Ramadhan 23	Idil Fitri 11	
OCTOBER Ji Kudan/ Bira	Short rains begins (Agaya)	58	46	Ramadhan 34	Idil Fitri 22	Measels Campaign (Finno) 10	
NOVEMBER Ji Kudani toko / Chiqaa	Short rains (Agaya)	57	Ramadhan 45	Idil Fitri 33	21	Suguta Masacra / Torbi - Moyale highway Commissioned by Pr. Kibaki 9	
DECEMBER Ji Kudan Lama/ Sadasa	Christmas festives/ Beginning of dry spells	56	44	32	Burji-Gabra Clashes 20	Campaign 8	

First check for date of birth on health cards, immunization cards, etc. If possible then calculate the exact age in months if possible. If no reliable card, then use the local calendar together with the respondent's recall.

Moyale Nutrition Smart Survey Participants

S/NO.	POSITION	NAMES	DESIGNATION	CONTACT	AREA/FACILITY	DISTRICT
1.	Overall Survey Coordinator	Samuel Kirichu	APM – Survey & Surveillance	0723471295	CONCERN	Moyale
2.	Senior Supervisor	Joseph Wangai	Coordinator	0724569020	CONCERN	Moyale
3.	Senior Supervisor	Bob Kaugi	Project Manager	0704280084	CONCERN	Moyale
4.	Senior Supervisor	Caroline Mugo	APM – Nutrition	0705823676	CONCERN	Moyale
5.	Senior Supervisor	Francis Malwe	P.O - Nutrition	0720863694	CONCERN	Sololo
6	Senior Supervisor	Adalaide challies	Nutrition Trainee	0712467977	CONCERN	Nairobi
7	Supervisor/Team Leader	Adan Hirbo	DNO- Moyale	0720963154	MOH	Moyale
8	Supervisor/Team Leader	Michael Miruru	DNO – Sololo	0724552448	MOH	Sololo
9	Supervisor/Team Leader	Dansoye Dulla	DPHN- Sololo	0721237620	MOH	Sololo
10	Supervisor/Team Leader	John Ougo	Data Analyst –NDMA	0712888749	NDMA	Moyale
11	Supervisor/Team Leader	Joseph Lokidongoi	NO I/C MCH	0729377850	MOH	Moyale
12	Supervisor/Team Leader	Roba Golicha	PHO – Moyale	0700162563	MOH	Moyale
13	Supervisor/Team Leader	E. bule Mio	NDMA	0723279275	NDMA	Moyale
14	Enumerator	Ahmed A Jaldesa	Student	0722968728	sessi	Moyale
15	Enumerator	Hassan Hussein Hassan	CHW	0718657284	Moyale D.H	Moyale
16	Enumerator	Timirow Lakicha	Student	0702886930	Gurumesa	moyale
17	Enumerator	Halima Hussein	Volunteer	0721488462	Yaballo	Moyale
18	Enumerator	Adan Ibrahim	Graduate	0725252461	Nana	Moyale
19	Enumerator	David Buke	Student	0727468578	Walda	Walda
20	Enumerator	Ibrahim issack	Student	0718015863	goromuda	Moyale
21	Enumerator	Galgallo Roba	Nurse	0728805534	Golole	Sololo
22	Enumerator	Hassan dulla	Student	0722104864	Manyatta	Moyale
23	Enumerator	Gamachu kullo	Student	0710277295	Sessi	Moyale
24	Enumerator	Jarso Qalicha	Volunteer	0716563631	Sololo makutano	Sololo
25	Enumerator	Diqa Duba	CHW	0725672917	Ramata	Sololo
26	Enumerator	Maria francis	CHW	0706517346	Catholic	Moyale
27	Enumerator	Rahma Osman	Student	0715745740	Heilu	Moyale
28	Enumerator	Abdulla kanano	Student	0726309018	Butiye	Moyale
29	Enumerator	Ifra dawe	Student	0723320099	Manyatta	Moyale
30	Enumerator	Hawo Tadele	Student	0728258481	Manyatta	Moyale
31	Enumerator	Stephen galma	Student	0728507542	Butiye	Moyale
32	Enumerator	Godana Galgallo	Graduate	0717593418	Ramata	Sololo
33	Enumerator	Mariam godana	Student	0712425945	Butiye	Moyale
34	Enumerator	Duba gufu jaldesa	Student	0720421679	Ramata	Sololo