INTEGRATED HEALTH AND NUTRITION SMART SURVEY
ISIOLO DISTRICT

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Final report

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TABLE OF CONTENTS

Acknowledgements 1
Table of contents 2
List of tables and figures 2
Abbreviations 3

Executive Summary 4
1. Introduction 7
1.1 Background 7
1.2 Survey Objectives 9
2. Methodology 10
2.1 General Approach 10
2.2 Type of Survey 10
2.3 Sampling methodology and sampling size 10
2.4 Data Collection Tools and Variables Measured 11
2.5 Training and supervision 11
2.6 Data Entry and Analysis 12
2.7 Nutritional Status Cut-off Points 13
3. Results 14
3.1 General Characteristics of Study Population and Households 14
3.2 Nutritional Status of Children 6-59 months 14
4.0 Mortality Results 17
4.1 Children's morbidity 17
4.2 Care Practices 18
4.3 Vaccination Results 19
4.4 Vitamin A Supplementation and De-worming coverage 19
4.5 Feeding Programme coverage 19
5.0 Primary Child caregiver Indicators 20
6.0 Food Utilization 21
7.0 ITN Utilization, Hygiene and Sanitation 24
8.0 Household Food Security Indicators 25
9.0 Discussion 29
9.1 Nutritional status 29
9.2 Mortality 29
9.3 Causes of malnutrition 29
9.4 Programme Coverage 30
10. Conclusion 30
11. Recommendations 30
Appendices 33

List of tables

Table 1: Relief Programmes currently in the Area 9
Table 2: Summary of Parameters considered for sample size calculation for the district 11
Table 3: Definition of boundaries for exclusion 12
Table 4: General Characteristics of Study Population and Households 14
Table 5: Distribution of age and sex of sample 14
Table 6: Overall prevalence of Acute Malnutrition by Weight for Height in z-scores (WHO 2006) 15
Table 7: Distribution of acute malnutrition and oedema based on weight-for-height z-scores 15
Table 8: Prevalence of acute malnutrition based on weight-for-height-z-scores and by age group 15
Table 9: Prevalence of acute malnutrition by age based on percentage of the median and/or oedema 16
Table 10: Distribution of MUAC by nutritional status 16
Table 11: Prevalence of underweight by Weight-for-Age z-scores (WHO 2006) 17
Table 12: Overall prevalence of stunting by Height-for Age z-scores (WHO 2006) 17
Table 13: Mean z-scores, design effects and excluded subjects 17
Table 14: Causes of death 17
Table 15: Prevalence of reported illness in children in the two weeks prior to interview 17
Table 16: Symptoms breakdown in the children in the 2 weeks prior to interview 17
Table 17: Vaccination coverage: BCG, OPV1, OPV3, Measles (9-59m) 19

Table 18: Vitamin A supplementation and Deworming Coverage 19
Table 19: Selective Feeding Programmes Coverage 19
Table 20: Impact of MtMSGs and Postnatal Care 21
Table 21: Summary of Breastfeeding Practices 21
Table 22: Summary of Complementary Feeding Practices 22
Table 23: Food Category and Diversity by Age Group 23
Table 24: Age Disaggregation Children 6-59m for Complementary Feeding Key Indicators 23
Table 25: Main Sources of Foods Consumed 26
Table 26: Quantities of Food Aid received by Households 27
Table 27: Estimated actual Ration per person, per month 28
Table 28: Summary of Nutritional Indicators of 6-59 month children in Isiolo Nutrition Survey 29

Figures:

Figure 1: Map of Isiolo district 7
Figure 2: Distribution of age and sex of sample 14
Figure 3: Distribution of W/H z-scores for sampled children 15
Figure 4: Acute Malnutrition expressed in MUAC in Age Groups 16
Figure 5: Prevalence of reported Illness 18
Figure 6: Caretakers Health Seeking Behaviour 18
Figure 7: Overall Adult Nutritional Status By MUAC indicating wasting 20
Figure 8: Main Household Water Source 24
Figure 9: Access to Toilet and Toilet Types 25
Figure 10: Diet Diversity Classification 25
Figure 11: Foods Consumed in 24-hr Recall 26
Figure 12: Coping Strategies 27
Figure 13: Income and Expenditure 28

ABBREVIATIONS

ALRMP II	Arid Lands Resource Management Project II
ANC	Antenatal Clinic
ANOVA	Analysis Of Variance
ARTI	Acute Respiratory Tract Infection
ASAL	Arid and Semi-Arid Lands
BFHI	Baby Friendly Hospital Initiative
CDC	Centre for Disease Control
CHW	Community Health Workers
CI	Confidence Interval
CMAM	Community Management of Acute Malnutriton
CMD	Crude Mortality Rate
COCOP	Consortium of Cooperating Partners
CSB	Corn-Soya Blend
CS	Community Strategy
DD	Dietary Diversity
DSG	District Steering Group
EBF	Exclusive Breast Feeding
EMOP	Emergency Operations Programme
ENA	Emergency Nutrition Assessment
EPI	Expanded Program on Immunizations
EWS	Early Warning System
FFA	Food For Asset
GFD	General Food Distribution
GoK	Government of Kenya
HEA	Household Economy Approach Assessment
HH	Household
HINI	High Impact Nutrition Interventions
HSSF	Health Sector Support Fund
IMAM	Integrated Management of Acute Malutrition
IYCF	Infant and Young Child Feeding
IYCN	Infant and Young Child Nutrition
ITN	Insecticide Treated Nets
KEPI	Kenya Extended Programme of Immunisation
KFSSG	Kenya Food Security Steering Group

MoH	Ministry of Health
MtMSG	Mother to Mother Support Groups
NCA	Nutrition Causal Analysis
NCHS	National Centre for Health Statistics
ORS	Oral Rehydration Solution
OTP	Outpatient Therapeutic Programme
PHC	Primary Health Centre
PLM	Pregnant and Lactating Mothers
PPS	Probability proportional to size
PRRO	Protracted Relief and Recovery Operations
RELPA	Regional Enhanced Livelihoods in Pastoral Areas
SFP	Supplementary Feeding Programme
SMART	Standardized Monitoring and Assessment of Relief and Transitions
TFP	Therapeutic Feeding Programme
U5	Under Five Years Old
UMR	Under-five Mortality Rate
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
URTI	Upper Respiratory Tract Infection
WFP	World Food Programme
WHO-GS	World Health Organisation Growth Standards
WFH	Weight for Height
WHM	Weight for Height Median

EXECUTIVE SUMMARY

Isiolo district is in Eastern Province of Kenya and covers an area of 25,000 square kilometers with an estimated population of 143,294 (73,694 Male and 69,600 Female) persons (KNBS 2009). The district borders Marsabit district to the north, Wajir and Garissa districts to the east, Tana River and Meru districts to the south, and Samburu and Laikipia districts to the west. In November 2007 the larger Isiolo district was divided into two districts namely; Isiolo and Garbatulla. In December 2010, Merti District was curved out of Isiolo to form another District. Currently, Isiolo district has three administrative divisions namely; Isiolo East, Central and Ol donyiro, Merti District has two administrative divisions namely; Merti and Cherab while Garbatulla district has three administrative divisions namely Kinna, Garbatulla and Sericho.

Isiolo is one of the districts classified as ASAL (Arid and Semi Arid Districts of Kenya). Livestock and agriculture-based activities contribute over 70% of the household income in the district and employ over 75% of the labour. The main livelihood zone in the district is pastoral – keeping cattle, shoats, camel and donkeys. There are also semi-urban or urban settlements, many of who have previously dropped out of the pastoralist lifestyle following recurrent shocks. Other significant livelihood zones include; agro-pastoral, waged labor, and firewood/charcoal. The cyclical droughts experienced in the district have severely hampered efforts to improve the food security situation in the district (failure of three consecutive rain seasons leading to poor regeneration of pasture and inadequate recharge of water resources).In Isiolo district which is mainly dominated by the pastoralist livelihoods, the availability of and the access to water is a main concern. High livestock influx from the neighbouring districts of Wajir, Garissa Moyale further exacerbates the worsening situation by depleting the remaining water and pasture sources. Declined harvests of 50% of the normal in the agro-pastoral areas of central Isiolo and Kinna have worsened the household food availability. The food security situation has declined in the district following the poor performance of the short rains of October-December 2010. By March 2011, all divisions except Central, continued to experience severe drought conditions

The International Medical Corps–Kenya (IMC-Kenya), under the supervision of International Medical Corps UK has been undertaking Community Management of Acute Malnutrition (CMAM) project in Isiolo since January 2011. Funded by UNICEF, this project is part of the three (3) High Impact Nutrition Intervention pilot districts[1] in the country. International Medical Corps partners with Ministry of Health (MoH) by supporting the scaling up of high impact nutrition interventions (HINI) and strengthening the health system, in a 12 month project (1st December -30th November 2011). This will complement the support that UNICEF and WFP are giving to the government to ensure the scale up of high impact interventions. In order to build the

[1] Other districts include Samburu, and Marsabit.

capacity to manage acute malnutrition at the health facility and community levels, International Medical Corps has facilitated trainings for health workers on management of acute malnutrition and Integrated Management of Childhood Illnesses (IMCI). Community Health Workers (CHWs) have also been trained on community mobilization and sensitization, case finding, follow-up and mentorship of pregnant and lactating women to promote better nutritional practices and effect positive behavioural change. The programme being implemented in Isiolo district targets 20,685 children under the age of five years and 6,212 pregnant and lactating women. . The proposed strategy is aligned with the MoH /UNICEF partnership framework of supporting the Ministry of Health in delivering 12 high impact nutrition interventions in Kenya to which MoH has fully committed to implement and International Medical Corps will endeavour to support MOH in the implementation process. International Medical Corps also aims to build on relationships with the Ministry of Health, community leaders and local organisations. Given the chronic gaps in health personnel, building the capacity of CHWs, volunteers and health facility committees and strengthening the referral mechanisms is essential. This will increase the capacity of the MoH and the community to manage risk.

For purposes of informing stakeholders/partners in the district as well as the planning of appropriate response to the current nutritional situation in Isiolo district, this nutrition survey was imperative. Consequently, a nutrition/health survey was conducted by the Ministry of Health (MOH) and International Medical Corps between 10th -17th April 2011 with the purpose of establishing the current health and nutritional situation and recommend appropriate interventions. The main objective of the survey was to evaluate the extent and severity of malnutrition among children aged 6-59 months and to elucidate possible factors contributing to malnutrition and recommend appropriate interventions as well as provide data for use in monitoring the progression of the situation. The survey utilized the Standardized Monitoring of Relief and Transitions (SMART) methodology and also in accordance with both the National Guidelines for Nutrition and Mortality assessments in Kenya and the UNICEF-recommended nutritional survey key indicators. Anthropometric, IYCF and mortality data were collected simultaneously during the survey. A two-stage cluster sampling with probability proportional to size (PPS) design was employed for the integrated nutrition survey. Sample size was determined on the basis of estimated prevalence rates of malnutrition (GAM), desired precision and design effect) using the ENA for SMART software.

Overall, the surveyed households had, on average, 5.6 (SD 2.6) members and 859 U5s whose nutritional status was assessed. The findings showed a global acute malnutrition (GAM) rate of **15.7% (**12.0 - 20.2 95% C.I.) (z-scores <-2 standard deviations and/or oedema) and a severe acute malnutrition (SAM) rate of **2.6%** (1.8-3.7C.I.) by WHO-GS. The overall prevalence of GAM denotes a 'critical' situation, and above the emergency threshold according to WHO benchmarks[2]. According to the WFH z-scores index, the weight-for-height percentage median (WFHM) index (NCHS references) gave the expected lower rates for both GAM **4.7 %** (3.6 - 6.3 95% C.I.) and SAM 0.0% rates. MUAC findings showed 17.3% (14.7-20.2) of the U5s at risk of malnutrition (12.5cm-<13.5CM). The prevalence of underweight among the U5s was **22.1 %** (17.9 - 27.0 95% C.I.) with **4.4 %** (3.0 - 6.5 95% C.I.)of the children being severely underweight. The prevalence of global chronic malnutrition (GCM) stood at **19.7 %** (16.5 - 23.4 95% C.I.) while severe chronic malnutrition (SCM) rate was **5.2 %** (3.5 - 7.7 95% C.I.). The results also showed that though not significantly, more boys than girls suffered from both GCM and SCM.

After birth 75.5% of the infants were put on the breast within the first hour of birth, 69.1% given colostrum during the first 3 days of birth, but 44.7% were given pre-lacteals during the first 3 days, a practice that hospital delivery would help curb. A set of 10 Key IYCF indicators were assessed using WHO guidelines. Commendably, timely initiation of breastfeeding stood at 75.5% among children 0-5 months assessed. Exclusive breastfeeding rate (analysed in infants <6months who had not received pre-lacteals and were not on other foods) stood at 58.5%, based on the current status. Overall maintenance of breast feeding stood at a median of 21 months. Also, introduction to solid/semi-solid foods was also commendable at over 70%. However, the children's timely introduction to complementary feeding was very low at 3.3%. Complementary diets were poor, with only 57.6% of the children achieving the minimum dietary diversity(DD)-more than 4 food groups, coupled with relatively low (not on-demand) feeding frequency, that saw only 20.0% of children receiving the minimum meal frequency. Thus, the minimum acceptable diet indicator (composite of optimal DD and meal frequency), was even poorer at 13.0%. The meals taken were largely lacking in micronutrient-rich ingredients (fruits and vegetables, pulses and meats), but consumption of iron-rich foods was marginally better at 18.0%. These are major setbacks to optimal IYCF.

Child immunization for polio (96.4%; 94.3%) and measles (91.4%) was commendably high and above the Kenya Expanded Programme on Immunization (KEPI) recommendation of 80%. However, micronutrient supplementation-Vitamin A. (56.2%) was below the benchmark while only 46.0% of the children had received de-wormers which are crucial in reducing helminthic infections in growing children. The estimated period coverage[3] for both SFP (64.6%) is adequate but OTP (25.0%) was low and below the project targets of 80%[4] in ASAL districts. Given the level of malnutrition found, 2581 children (19,698/13.1%) should be enrolled in the SFP programme and 512 children (19698/2.6%) in OTP, using WHZ as admission criteria. So far, the MoH/IMC CMAM program has admitted 1997 Under-fives (U5), 749 pregnant and lactating mothers (PLM) in SFP and 128 U5

[2] Interpretation of level; Global Acute Malnutrition (GAM): prevalence of GAM <5% termed as acceptable, 5-9% poor, 10-14% serious and >15% critical.
[3] Mark Myatt (2003). New method of estimating programme coverage. Community Based Approaches to Managing Severe Malnutrition.
[4] HINI Targets for programme coverage in ASAL districts.

in OTP[5]. A high rate of morbidity of 61.0%(57.4-64.4 C.I) was reported- that is, U5s having been sick during prior 2-week period, with most of them (45.5%) suffering from acute respiratory infections(ARIs), 31.2% from malaria-like symptoms and 12.4% from diarrhoea. Care-seeking behaviour was also gauged by 87.3% of HH seeking medical care when the child was ill, with 82.6% of them seeking assistance from a medical facility. Other indicators investigated were sanitation practices among the caregivers, ITN, water and toilet utilization, maternal care and nutritional status and household food security indicators.

The overall Global Acute Malnutrition (GAM) prevalence in Z- scores is just past emergency threshold of >15%, and higher than the rate estimated in the SCUK small sample baseline Nutrition Survey for Isiolo district in February 2011 (i.e. 11.3%). However, this rate is plausible given that rates of 25.0% (using CHANIS) were reported the previous month in Isiolo[6]. The daily Crude Mortality rate (CMR) and Under 5 mortality rates (U5MR) are below the 'alert' level of 1/10,000/day and 2/10,000/day respectively, according to WHO benchmarks[7]. Nonwithstanding, the nutrition situation remains critical.
Although both CMR(0.12/10,1000) and U5MR(0.27/10,000) are below the threshold for an 'alert' status, this survey identified a number of other aggravating factors negatively bearing on optimal U5 child nutritional status and therefore an impediment to the on-going intervention activities in the district. Among these were:

- Child morbidity prevalence reported to have affected 61.0%, which was found, through chi-square analysis to significantly affect child nutritional status-especially in the light of relatively high SAM rate and the likelihood of increase in infections disease during rainy season;
- Poor IYCF practices including early weaning, prelacteals and poor complementary feeding practices;
- Low programme coverage-OTP is <30 % which bears directly on the SAM rate which is relatively high.There is urgent need to strengthen this component, to prevent SAM reaching emergency levels of >4%.
- Low micronutrient and deworming coverage
- Poor hygiene and sanitation status in the community with sub-optimal hand-washing practices and minimal treatment of unsafe drinking water at the household level
- Poor household food security
- A prevailing food deficit situation that is set to deteriorate further before the onset of long rains

In conclusion, the relatively high prevalence of GAM in addition to the aggravating factors listed above depict a situation set to deteriorate further unless the requisite food and non-food interventions are urgently put in place, the following recommendations are made:

1. Application of the WHO-GS WFH z-score index and/or MUAC screening for an active case-finding exercise to help capture cases for SFP and OTP interventions; Following the onset of rains, in the mixed farming and agro pastoral areas, planting activities have just begun. This means that harvests are not expected until August – October and till then, there is need to support Ministry of Health in identifying and treating children with malnutrition as a live saving measure.
2. Prompted by critical levels of GAM, therapeutic targeted interventions SFP and OTP are recommended to buffer the nutrition situation deteriorating even further. As an interim measure, all HH with recently-discharged SFP children should be targeted for GFD, to buffer household food security and minimise relapse
3. Up scaling of the general food aid distribution throughout the district due to poor rains and inclusion of all households with recently discharged SFP children;
4. Provision of essential resources and personnel (additional CHWs and other community volunteers) to mobile and outreach clinics in the far-to-reach areas of the district to complement existing facilities. Capacity-building of community personnel on IMAM implementation should continue.
5. Provision of adequate resources, motivation of community volunteers and availability of job aids to enable full implementation of the government's Community Strategy (C.S) to address nutrition and health issues in the district in a more comprehensive way-this includes targeted BCC with emphasis on high impact intervention messages
6. Strengthen programmes and strategies currently addressing infant and young child nutrition (IYCN) with a view to improving the protection, promotion, and support of optimal IYCF.
7. Systems strengthening to ensure facility and community level care for pregnant women and lactating mothers This would ensure key support for exclusive breast feeding and other practices. Efforts such as the MtMSG, Baby Friendly Hospital Initiative and Community Strategy, Malezi Bora, HSSF as well as outreach efforts should optimize the care for maternal, infant and young child nutrition.
8. As the HINI program is rolled out there is need for continual monitoring of both facility and community based interventions to track progress while also documenting the process to assess the trends in the outcomes as well as impact indicators. Particular attention should go to improved maternal nutrition, iron/folate supplementation during the prenatal period and ensuring ORS/zinc support for diarrhoea.

[5] March 2011 SFP/OTP Admission Data
[6] ARLMP II EWS Isiolo Drought Bulletin-March 2011
[7] In stable developing countries, a CMR of <1 death/10,000/day and an U5MR of <2 deaths/10,000/day are below the 'Alert' thresholds of 1 death/10,000/day and 2 deaths/10,000/day, respectively.

9. Continue water trucking to all areas affected by water stress and Strengthening of hygiene practices to reduce the incidence of diarrhoeal disease associated with contaminated water in the household including health education to educate the community on domestic treatment of drinking water and effective hand washing (soap/ash) after helping a child in the latrine, during food preparation and before child feeding. This should be backed-up with provision of free water treatment chemicals where feasible.
10. Livelihoods programmes like FFA and P.R, should continue to strengthen sustainable coping strategies during the lean times.

Summary of findings

Characteristic	N	n	% (95% CI)
Overall GAM (WFH <-2 Z score or presence of oedema) - WHO 2006	**741**	**116**	**15.7% [12.0 - 20.2]**
Overall SAM (WFH <-3 Z score or presence of oedema) - WHO 2006	**741**	**19**	**2.6% [1.8 - 3.7]**
Overall GAM (WFH <-2 Z score or presence of oedema) - NCHS 1977	**749**	**122**	**16.3% [12.6 - 20.7]**
Overall SAM (WFH <-3 Z score or presence of oedema) - NCHS 1977	**749**	**9**	**1.2% [0.6 - 2.2]**
Overall GAM (WFH < 80% median) – NCHS 1977	**741**	**35**	**4.7% [3.6 - 6.3]**
Overall SAM (WFH < 70% median) - NCHS 1977	**741**	**0**	**0.0% [0.0-0.0]**
Overall underweight (WFA <-2 Z score or presence of oedema) - WHO	**742**	**164**	**22.1% [17.9 - 27.0]**
Overall Severe underweight (WFA <-3 Z score or presence of oedema)-WHO	**742**	**33**	**4.4% [3.0 - 6.5]**
Overall stunting (HFA <-2 Z score)- WHO	**725**	**143**	**19.7% [16.5 - 23.4]**
Overall Severe stunting (Height for age <-3 Z score) -WHO	**725**	**38**	**5.2% [3.5 - 7.7]**
Prevalence of GAM by MUAC (<12.5cm)	**759**	**40**	**5.2% [3.8-6.7]**
SFP Programme Coverage (Period Prevalence Estimate)			64.6%
OTP Programme Coverage (Period Prevalence Estimate)			25.0%
Proportion of children sick two weeks prior to survey	774	472	61.0% [57.4-64.4]
Proportion of caretakers seeking medical care when child is ill	771	664	83.7% [79.2-97.6]
Measles* immunization (card and confirmation)	745	685	91.4% [84.3-99.6]
OPV1 immunization (card and confirmation)	785	746	96.4% [89.3-99.8]
OPV3 immunization (card and confirmation)	785	730	94.3% [87.3-99.6]
Vitamin A supplementation coverage	785	428	56.3% [46.4-62.6]
Proportion of children dewormed	755	347	41.0% [40.2-52.2]
Proportion of malnourished pregnant/lactating women (MUAC<23.0cm)	280	85	30.4%
Proportion of malnourished non-pregnant women (MUAC <21.0cm)	180	20	11.1%
Overall mothers aware of Mother to Mother Support Groups (MtMSGs)	551	68	12.3% [9.8-15.4]
Overall mothers members of MtMSGs	551	37	6.7% [15.1-23.3]
Hospital Delivery	551	213	39.7% [35.5-44.0]
Child taken to clinic within 2 weeks after home delivery	341	244	71.6 [66.4-76.3]
Vitamin A Supplementation at last delivery	295	56	56.3% [51.9-60.6]
Under-five mortality rate (deaths/10000/day)	**0.27**		**[0.07-1.08]**
Crude mortality rate (deaths/10000/day)	**0.12**		**[0.05-0.29]**

Only for children ≥ 9 months

1. INTRODUCTION

1.1 BACKGROUND INFORMATION

Context

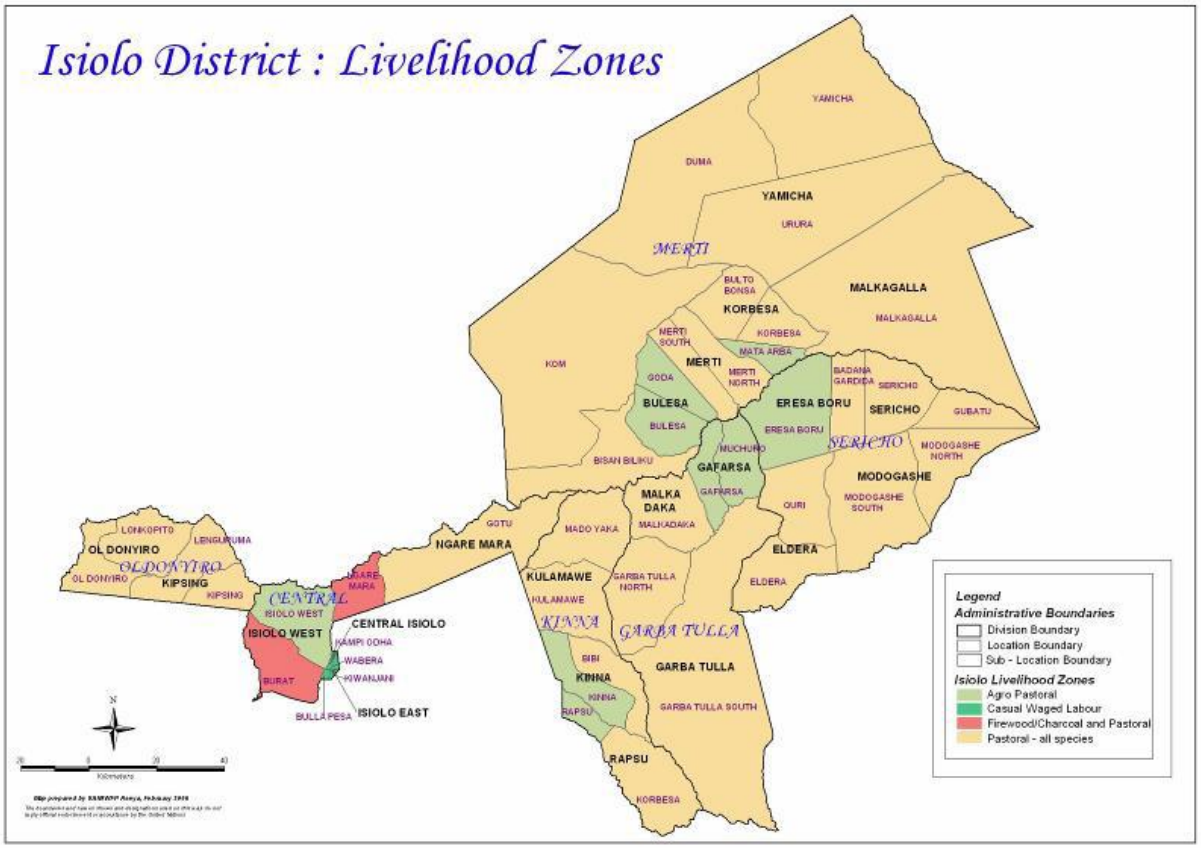
Isiolo district is in Eastern Province of Kenya and covers an area of 25,000 square kilometers with an estimated population of 143,294 (73,694 Male and 69,600 Female) persons (KNBS 2009). The district borders Marsabit district to the north, Wajir and Garissa districts to the east, Tana River and Meru districts to the south, and Samburu and Laikipia districts to the west. In November 2007 the larger Isiolo district was divided into two districts namely; Isiolo and Garbatulla. In December 2010, Merti District was curved out of Isiolo to form another District. Currently, Isiolo district has three administrative divisions namely; Isiolo East, Central and Ol donyiro, Merti District has two administrative divisions namely; Merti and Cherab while Garbatulla district has three administrative divisions namely Kinna, Garbatulla and Sericho.

Isiolo is inhabited by among other groups the Borana, the Somali, Turkana, the Samburu and the Meru. The main livelihood zone in the district is pastoral – largely cattle, sheep and goats, with small pockets of agro-pastoralist communities. There are also semi-urban or urban settlements, many of who have previously dropped out of the pastoralist lifestyle following recurrent shocks. Other significant livelihood zones include; agro-pastoral, waged labor, and firewood/charcoal.

The survey area covered the 5 administrative divisions of Isiolo District namely: **Isiolo East, Central and Ol donyiro, Merti and Cherab**. Within these are 19 locations and 31sub-locations. The total area of the district is 14471 km^2 with an estimated total

population of 104, 223 inhabitants[8], with an annual growth rate of 3.6% p.a. The estimated Under-5 target population of the survey was 6768[9].

Figure 1: Map of Isiolo District



Geography

The greater Isiolo district covers an area of 25,605 Square Km, and is located between longitude 36°50' East and latitude 0°05' North and 2°North. Isiolo is classified as 100% ASAL[10]. The district is predominantly flat with low lying plains that rise gradually from an altitude of 200m above sea le vel at Lorian Swamp in the north to about 300m above sea level at Merti Plateau. To the west, are volcanic hills, and foothill slopes of the Mount Kenya and Nyambene Hills. There are four perennial rivers in the district namely Ewaso Nyiro which originate from Mt. Kenya and Aberdare ranges, and Kinna and Bisanadi which originate from Nyambene hills. The district is hot and dry for most of the year. The average rainfall is 580mm and is erratic and unreliable and cannot support perennial agricultural crops. The district receives a bimodal rainfall pattern. The short rains, which are most reliable, are experienced in mid-October to December while the long rains are received in mid-March to June. The annual mean rainfall ranges between 450 mm to 650 mm. High temperatures are recorded in the district throughout the year, with a mean annual temperature of 27°C.

Livelihoods

The major economic activities for the people in the district are livestock-based, subsistence farming, and petty trade. Pastoralists are very vulnerable to drought, which can be traced back to the shifta wars and to the subsequent insecurity that led to further loss of livestock. Livestock and agriculture-based activities contribute over 70% of the household income in the district and employ over 75% of the labour. The main livelihood zone in the district is pastoral – keeping cattle, shoats, camel and donkeys. There are also semi-urban or urban settlements, many of who have previously dropped out of the pastoralist lifestyle following recurrent shocks. Other significant livelihood zones include; agro-pastoral, waged labor, and firewood/charcoal.

Current climatic conditions and Food Security

The food security situation has declined in the district following the poor performance of the short rains of October-December 2010. By March 2011, all divisions continued to experience severe drought conditions (except Central that received sub-normal rainfall)[11]. This resulted into milk levels declining from 0.25 litters per household compared to 2.25 litters in the normal times. Further still the price of milk has increased from the normal of Kshs 20 to Kshs 60/litre, an increase of 200%, making it inaccessible to many households. High livestock influx from the neighbouring districts of Wajir, Garissa Moyale further exacerbates the worsening situation by depleting the remaining water and pasture sources. In addition, disease outbreaks are also

[8] Current Population estimates from DSO Office- Isiolo
[9] Under 5 population estimated at 15.4 % of the total population
[10] Draft National ASAL Policy, 2004
[11] ALRMP II Drought Monthly Bulletin for March 2011

likely to lead to market closures with consequent effect on household food access. Declined harvests of 50% of the normal in the Agro-pastoral areas of central Isiolo and Kinna have worsened the household food availability. Food crop production is relatively low, resulting in low incomes and reduced purchasing power. The poor state of infrastructure in the districts has also resulted in soaring and unstable food prices due to low access and ineffective redistribution mechanisms within market systems. As the prices of food commodities in the markets are on the upward trend due to limited stocks, worsened situation is likely to occur as the expected long rains is normally unreliable in the district[12]. The food security situation will likely deteriorate as a result of livestock migration, reduced body weight, conflicts and cereals shortages.

The cyclical droughts experienced in the district have severely hampered efforts to improve the food security situation in the district (failure of three consecutive rain seasons leading to poor regeneration of pasture and inadequate recharge of water resources). Household crop production is currently of little significance to household food security as over 98% of cereals are imported from high potential neighbouring districts of Meru, Nyambene and Laikipia. The nomadic people in the district primarily rely on their livestock assets for meat, and milk and cash income. The industry contributes between 44%-80% of cash earnings accruing to households under the agro-pastoral, firewood/charcoal/pastoral and pastoral livelihood zones. Isiolo district is disaster prone and vulnerable to hazards such as drought, insecurity (cattle rustling) and occasional floods that adversely affect this key sector. Because of inadequate drought management policies and resources, these hazards often result in disasters, causing widespread food crises. At the same time, food prices sky-rocket due to high cost of transportation. Consequently, there is continued reliance on relief food distribution and the Food for Work Programmes run by the World Food Program and the Arid Lands Resource Management Project (ARLMP II) and Supplementary and Therapeutic feeding among others targeting children under 5 years and pregnant and lactating women as well as the general population.. Female-headed households that form about 14.9% of the total households are susceptible to food insecurity because of inadequate access to productive resources and spending a considerable proportion of their time searching for water, leaving little time for economic activities. Food insecurity is further perpetuated by cultural beliefs and attitudes that attach low value to certain foods such as fish and vegetables.

Food Distribution

Isiolo district has been under Emergency Operations, now Protracted Relief and Recovery Operation (PRRO) since 2004. The food aid beneficiary caseload during the various phases of the emergency operation varied from phase to phase owing to the changing food security situation in the district. The district is currently implementing Phase XI of the PRRO targeting instead of Phase XII owing to the late implementation of phase XII recommendations which had proposed a reduction in food aid beneficiaries. . The current caseload consists of 1555 households (15,038 beneficiaries) under Food for Assets (FFA), 40,562 beneficiaries under General Food Distribution (GFD) while 9,500 beneficiaries are targeted under the protection rations programme. The lead agency for GFD/FFA is Action Aid.

Health

The district has 26 health facilities and the majority of the population is living less than 5km from the nearest facility. Several strategies are on-going to ensure that the Under five years old (U5) needy children and pregnant and lactating mothers are reached with essential health and nutrition services. These include decentralization of essential nutrition services to ensure the beneficiaries have access and utilization is improved. The 1st level of the health care system is Community Health Workers (CHWs) to form linkages between health facilities and communities. Training of staff in IMAM is currently on-going at existing health facilities to offer the required package of HINI interventions. Mother to mother support groups (MtMSG) are a link between the health worker and the under-fives, to help achieve HINI indicators. There are currently 85 groups formed in the district with a membership of 8-15 mothers[13].

Vaccination coverage is satisfactory with only (2) facilities lacking immunization services.

Despite service upgrading through IMC capacity-building , the major challenges facing the health sector in this district are lack of sufficient water supply in some facilities (due to borehole breakdown) which poses a major challenge in day to day service delivery and lack of reporting tools[14]. Coverage has improved since 2010 due to supply of vaccines, good maintenance of cold chain and supportive supervision[15]. In addition, CHW support, monthly meetings and a reward system for best-performing health facility are additional motivators for improving coverage[16].

The most prevalent diseases in the greater Isiolo region have been malaria, other disease of respiratory system (DRS), diarrhoeal diseases, skin diseases and pneumonia, in order of prevalence. The HIV prevalence rate in the district stands at 4.8% (and rising) compared to 6% national rate. No disease outbreaks were reported in 2010 although there was a slightly high caseload of dysentery, suspected typhoid and measles. The diseases that are endemic during the coming rainy season are malaria, kalazaar and diarrhoreal disease(primarily due to contaminated surface runoff and non-treatment of drinking water)[17].

Water access and availability

[12] KFSSG Short Rains Assessment (Jan 2011)
[13] District Review Meeting
[14] Health Facility Assessment
[15] SRA Isiolo District- Jan 2011
[16] DPHN-Isiolo District Hospital
[17] Discussions with DMoH

Water is pivotal to the viable sustainability of the ASAL region. The main sources of water in Isiolo are; Boreholes, Rivers (Ewaso Nyiro River and Isiolo River) water pans and sand dams. All the water pans in Isiolo have dried up, Ewaso Nyiro River is dry downstream (in Bulesa) while Isiolo River is dry downstream (Erimet). The water level in shallow wells and boreholes is going down while shallow wells downstream of Merti where most animals are concentrated. Pasture access in the dry season zones worsened to 26km (March 2011). Access distance in Central division improved to 8km. Water access and availability worsened in all divisions except Central. The worst affected centers remained Kipsing, Malkagalla, Bassa, Lakole and Belgesh. Distances to access water for households increased to an average of 16km. Shallow wells deepened further to an average of 40-60 feet, while yields reduced compared to February 2011. The current trekking distance in Merti, Central and Ol donyiro is between 0.5 to 10 kilometers while the average consumption is between 4 to 8 liters per person per day. This has not changed compared to the long term average but is way below the emergency threshold of 15 liters per person per day. The price of water remains at Ksh 2 per 20 liter jerry can while the waiting time at water source is half an hour.

Nutrition

The International Medical Corps–Kenya (IMC-Kenya), under the supervision of IMC UK has been undertaking Community Management of Acute Malnutrition (CMAM) project in Isiolo since January 2011. Funded by UNICEF, this project is part of the three (3) High Impact Nutrition Intervention pilot districts[18] in the country. IMC partners with MoH by supporting the scaling up of high impact nutrition interventions (HINI) and strengthening the health system, in a 12 month project (1st December -30th November 2011). This will complement the support that UNICEF and WFP are giving to the government to ensure the scale up of high impact interventions. In order to build the capacity to manage acute malnutrition at the health facility and community levels, IMC has facilitated trainings for health workers on management of acute malnutrition and Integrated Management of Childhood Illnesses (IMCI). Community Health Workers (CHWs) have also been trained on community mobilization and sensitization, case finding, follow-up and mentorship of pregnant and lactating women to promote better nutritional practices and effect positive behavioural change. The programme will be implemented in Isiolo district and will target 20,685 children under the age of five years and 6,212 pregnant and lactating women.

Table 1: Relief programmes currently in the area

Organization	Activities
Action Aid:	Lead Implementing Partner for GFD/FFA- Isiolo District
APHIA Plus:	Health
FHI:	IYCF-Complementary Feeding Component of HiNi Project
FHK:	Livelihood Support
SCUK:	M&E Component of HiNi Project
ICRI:	WATSAN Component of HiNi Project
Child Fund:	Community Health
Kenya Red Cross:	Emergency relief, WATSAN;
CAFOD:	Food Relief
CCS:	Food Relief
WFP:	Coordination/ M&E/ Assessments

1.2 SURVEY OBJECTIVES

This report summarizes the outcomes of a nutrition survey whose aim was to assess the nutritional status of children less than 5 years of age and determine the prevalence of global and severe malnutrition within five divisions of Isiolo District. The assessment was commissioned by IMC-K –Isiolo Nutrition Programme. The survey was undertaken from 10th- 17th April and was carried out in collaboration with MoH. This survey aims to determine the current nutritional status and underlying causes of malnutrition in the district to analyse the possible factors contributing to malnutrition and recommend appropriate interventions that will inform future programming. It also aims to produce a nutrition surveillance system in the greater Isiolo District.

The specific objectives of this survey are to estimate:

1. To estimate the level of acute malnutrition and nutritional oedema among children aged 6-59 months
2. To estimate the level of malnutrition among adult women aged 15-49 years
3. To identify factors likely to have influenced malnutrition in young children
4. To estimate the prevalence of some common diseases (measles, diarrhoea, malaria, and ARI)
5. To estimate measles, polio vaccination and Vitamin A supplementation coverage amongst children
6. To estimate crude and under-five mortality rates
7. To assess child and infant care and feeding practices
8. To estimate the coverage of general food distribution and feeding programs
9. To describe the current household food security situation

[18] Other districts include Samburu, and Marsabit.

10. To describe the situation of water and sanitation
11. Any other objectives as may be required by the DHMT

2.0 METHODOLOGY

2.1 General Approach

The **2-stage cluster** survey methodology was employed in accordance with SMART and the National Guidelines for Nutrition and Mortality Assessments in Kenya. The SMART software sample size calculation gave 432 children as the minimum number required for the anthropometric survey (cluster). The target population for the anthropometric survey was children aged 6-59 months. The survey tool used was the recommended Nutrition, Food Security and Mortality Household Questionnaire modified to collect additional information required. Data was collected on anthropometry, morbidity, vaccination and deworming status, Vitamin A supplementation, IYCF and care practices, livelihoods, food consumption and dietary diversity as well as hygiene and sanitation practices. To collect the qualitative data, Focus Group Discussion (FGD), clusters were randomly selected in each of the divisions based on the livelihood zones. These included pastoral, waged labour and agro pastoral livelihood zones. A total of 3 FGDs were conducted, and each group was composed of 8-10 participants. Key informants from MoH, government departments and implementing agencies were also interviewed to obtain additional information.

2.2 Type of Survey

This Anthropometric and Retrospective Mortality survey utilized the Standardized Monitoring of Relief and Transitions (SMART) methodology and was also in accordance with both the National Guidelines for Nutrition and Mortality assessments in Kenya and additional nutritional survey indicators. Both anthropometric and mortality data were collected simultaneously in all households visited during the survey. Qualitative data from FDGs, key informant interviews and general observations were also collected to complement the quantitative findings.

2.3 Sampling Methodology and Sample Size

A two-stage cluster sampling method with probability proportional to size (PPS) design was employed for this nutritional survey. The Emergency Nutrition Assessment (ENA) for Standardized Monitoring of Relief and Transitions (SMART) software was used to determine the sample size using sub-location (village)-level population data for each of the two new administrative districts.

In the first sampling stage, survey sample size was determined by entering relevant information (estimated GAM rate, desired precision and design effect) into the ENA for SMART software. Using an estimated GAM prevalence of 16.9[19]%, desired precision of 5%, a design effect of 2 and an estimated household size of 4.5[20] persons and non-response rate of 3% gave a sample size of 432 children (6-59 months) and household sample of 713 households (HH).

The mortality Sample size has been calculated based on the following parameters: Total population – 104,223[21]; Estimated CMR – 2[22]; design effect (D.E) – 2; Precision - 0.75%; Recall period of 90 days and Average household size -4.5. This yielded a mortality sample size of 3041 and 695 HH.

Table 2: Summary of parameters considered for sample size calculation for the district

District	**Sample of Anthropometry**	**Sample s**ize HH	**# of HH for mortality**	**Sample size considered**	# of HH/ **cluster**	**# of clusters**
Isiolo	**432**	**713**	**695**	**713**	**18**	**45**

In addition to the 45 clusters selected, the ENA programme automatically included 5 reserve clusters (RC), which would act as contingency, so that in the event that a cluster was inaccessible, an alternative cluster could be chosen from the extra five clusters.

The second sampling stage comprised of village and household selection. In order to select survey clusters, the names of villages/sub-locations, their respective population sizes and the required number of clusters were entered into the SMART software, which generated the actual list of the villages to survey (including reserve clusters). At the field level, the EPI method was employed to select the first household to be enumerated. The survey teams first reported to the area chief, assistant chief or a village elder who assigned them a cluster guide. With the assistance of the cluster guide, the teams then went to the approximate centre of the village and spun a pen to select a random direction to walk to the boundary of the village. Choosing this initial random direction ensured randomization of the households to be visited in order to avoid systemic bias which may arise if survey teams systematically sample households in a biased subjective manner e.g. in proximity to shopping centres. While at the boundary of the village, the teams spun the pen again to select a second direction and walked along counting the houses along this direction. The first household to be visited was randomly selected by drawing a random number from the random number tables between zero and the total number of houses counted when walking to the periphery. The subsequent households were selected by proximity always selecting households to the right. In villages with more than one cluster, the village was subdivided and the centre of each subdivision determined and households selected as described above. In a cluster that was sparsely populated, all the households in the cluster were visited. All children aged 6-59 in every household visited were included in the anthropometric survey and 0-6 month category included in IYCF survey.

[19] The highest C.I of the past malnutrition rates (2010 nutrition survey)
[20] Based on the 2009 census. Information obtained from the DDO
[21] Information obtained from the DCs Office
[22] Based on 2010 survey results

A household was defined as a group of people who lived together and shared a common cooking pot. In polygamous families with several structures within the same compound but with different wives having their own cooking pots, the structures were considered as separate households and assessed separately. In cases where there was no eligible child, a household was still considered part of the sample and its mortality data were collected. If a respondent was absent during the time of household visit, the teams left a message and re-visited later to collect data for the missing person, with no substitution of households allowed. The teams visited the nearest adjacent village (not among those sampled) to make up for the required number of households if the selected village yielded a number below 18 households, following the SMART methodology[8].

2.4 Data collection Tools and Variables Measured

A total of 6 survey teams, each comprising of 1 team leader and 2 enumerators collected the data. 4 sets of questionnaires (Appendix 2) were used for data collection. These included 4 sets of structured questionnaires Questionnaire A (household)- all HH members; Questionnaire B(anthropometry and maternal)- 6-59 months, caregivers; Questionnaire C(IYCF)- 0-6months and Questionnaire D(mortality)-all HH members as well as a focus group discussion (FGD) guide to collect qualitative data.

2.4.1 The household questionnaire

This was used to elicit general household information (demographic data, household water sources and consumption, household food consumption, maternal health care information, maternal dietary diversity, sanitation, food aid, food insecurity mitigation strategies, possession and utilization of insecticide-treated mosquito nets(ITNs), livestock condition and household socio-economic status indicators.

2.4.2 Child (6-59 months old) questionnaire (Anthropometry)

Using this questionnaire, the following data were collected:

Child age: the age of the child was recorded based on a combination child health cards, the mothers'/caretakers' knowledge of the birth date and use of a calendar of events for the district developed in collaboration with the survey team (Appendix 5).

Child sex: it was recoded whether a child was male or female.

Bilateral oedema: normal thumb pressure was applied on the top part of both feet for 3 seconds. If pitting occurred on both feet upon release of the fingers, nutritional oedema was indicated.

Child weight: the weights of children were taken with minimal light clothing on, using UNICEF Salter Scales with a threshold of 25kgs or UNISCALE (mother and child scale) and recorded to the nearest 0.1kg. The teams were trained to use both the Uniscale and Salter scale so they were competent in use of both instruments.

Child length/height: children were measured bareheaded and barefooted using wooden UNICEF height boards with a precision of 0.1cm. Children under the age of two years were measured while lying down (length) and those over two years while standing upright (height). If child age could not be accurately determined, proxy heights were used to determine cases where height would be taken in a supine position (between 65cm-<85cm) or in an upright position (heights greater ≥85cm). Height rods with a marking at 85cm were used to assist in determining measuring position.

WHZ: Weight-for-height z-scores (WHZ) was calculated on site using the international reference population tables (WHO/CDC). The results were used to decide if referral to the SFP/OTP program was needed or not. If the WHZ was below -2z-score or presence of oedema, the caretaker received a referral slip (Appendix 8). In the analysis, the WHZ was recalculated for all children analyzed by ENA software.

Child MUAC: the MUAC of children were taken using child tapes, respectively, and recorded to the nearest 0.1cm.

Morbidity: a 2-week morbidity recall was conducted for all index children (6-59 months) to assess the prevalence of common diseases (e.g. malaria, acute respiratory infections (ARI), diarrhoea, measles, stomach-ache, eye and skin infections).

Child immunization and Vitamin A supplementation: data on vitamin A supplementation, deworming, and immunization for polio and measles were collected to estimate their coverage. The coverage for measles immunization was only done for eligible children (≥ 9 months).

Child feeding: information on breastfeeding, weaning and child feeding were collected. Dietary diversity information based on a 24-hour food intake recall was collected for the children to assess the number of food groups taken the previous day.

Feeding programme enrolment: it was established if children 6-59 months old were enrolled in SFP or OTP and the duration in the feeding programme.

2.4.3 Under 6 months old child questionnaire

This was used to collect infant and young child feeding (IYCF) practices data in the households visited**.**

2.4.4 Mortality questionnaire

This elicited 3-month (90-day) retrospective recall information on whether there had been any deaths in households and the probable causes of death through verbal autopsy.

2.4.5 Focus group discussion (FGD) guide

A FGD guide was used to collect qualitative data to complement quantitative data**.**

[8] SMART (2006): Measuring Mortality, Nutritional Status and Food Security in Crises Situations: SMART METHODOLOGY

2.5 Training and Supervision

The survey was coordinated and supervised by an external consultant assisted by the Nutrition Manager for IMC Nutrition Programme and Isiolo District Nutrition Officer (DNO) as the Survey Supervisor.

For data collection, a total of 6 teams were recruited and trained for the survey. Each team comprised of a team leader and two enumerators. The consultant carried out training assisted by IMC Nutrition Manager the survey supervisor.

The local events calendar was developed jointly with the survey team and the questionnaires translated

The anthropometric standardization exercise[23], as recommended by the SMART methodology, was used as an assessment of the team members' anthropometry techniques. Each team member was given a score of competence based on performing measurements with accuracy and precision. The results of the training exercise were analyzed by entering the data in the ENA computer package and training report generated.

After the class room training, the team were equipped with a 'Surveyor's Manual' for reference during fieldwork. Practical field experience was conducted on the last day of training, in one of the unselected clusters to take anthropometric measurements of children and caretakers, conduct interviews and fill questionnaires. The pre-testing exercise was performed on 5 households.

Each team was supervised at least once a day throughout the data collection by either the survey consultant or supervisor. At the end of each day at base, there was a de-briefing session and review of questionnaires. The survey, including the training, lasted for a period of 12 days.

The following topics were covered during training:

- survey objectives, types and causes of malnutrition
- SMART survey and sampling methodologies
- verbal interpretation of the questions into the local languages during training for uniform contextual understanding by all the teams
- household, child and mortality questionnaire interviewing techniques
- anthropometric measurement procedures
- practical on conducting interviews and anthropometric measurements
- interview techniques
- duties and responsibilities
- research ethics
- community entry behaviour
- survey logistics

2.6 Data Entry and Analysis

Anthropometric and mortality data entry and processing was done using the SMART/ENA software where the World Health Organization Growth Standards (WHO-GS) data cleaning and flagging procedures were used to identify outliers which enabled data cleaning as well as exclusion of discordant measurements from anthropometric analysis. The SMART/ENA software generated weight-for-height, height-for-age and weight-for-age Z scores to classify them into various nutritional status categories using WHO[9] standards and cut-off points and exported back to SPSS for further analysis. IYCF and all the other quantitative data were entered and analysed in the PSAW Statistics 18 (SPSS Version 18.0) and Excel[24].

2.7 Nutritional Status Cut-off Points

The following nutritional indices and cut-off points were used in this survey:

2.7.1 Weight-for-height (WFH) and MUAC – Wasting among Children

The prevalence of wasting (a reflection of the current health/nutritional status of an individual) are presented as global acute malnutrition (GAM) and severe acute malnutrition (SAM) using weight-for-height (WFH) z-scores, WFH percentage of median and MUAC indices. The results on wasting are presented as global acute malnutrition (GAM) and severe acute malnutrition (SAM):

- Children whose WFH z-scores fell below -2 standard deviations from the median of the WHO standards (WHO-GS) or had bilateral oedema were classified as wasted (to reflect GAM)
- Children whose WFH z-scores fell below -3 standard deviations from the median of the WHO-GS or had bilateral oedema were classified as severely wasted (to reflect SAM)
- A cut-off point of <12.5cm MUAC was used to denote GAM among the under-fives.

2.7.2 Weight-for-age (WFA) – Underweight

The measure of underweight gives a mixed reflection of both the current and past nutritional experience by a population and is a very useful tool in growth monitoring.

[23] SMART Regional Training Kit for Capacity-Building and Methodology (ACF Canada) 2010

[9] WHO 2006

[24] Infant and Young Child Feeding: Collecting and analyzing data, CARE USA 2010

- Children whose WFA z-scores fell below -2 standard deviations from the median of the WHO-GS or had bilateral oedema were classified as underweight
- Children whose WFA z-scores fell below -3 standard deviations from the median of the WHO-GS or had bilateral oedema were classified as severely underweight.
- Children whose WFH indices were <80% of the National Centre for Health Statistics (NCHS) median or had bilateral oedema were classified as wasted (GAM)
- Children whose WFH indices were <70% of the NCHS median or had bilateral oedema were classified as severely wasted (SAM)

2.7.3 Height-for-age (HFA) – Stunting

Height-for-age is a measure of linear growth and therefore an unequivocal reflection of the cumulative effects of past nutritional inadequacy and/or illness episodes.

- Children whose HFA z-scores fell below -2 standard deviations from the median of the WHO-GS were classified as stunted (to reflect Global Stunting)
- Children whose HFA z-scores fell below -3 standard deviations from the median of the WHO-GS were classified as severely stunted.

To determine the nutritional status the following variables were considered for analysis: sex, age, weight, height or length and oedema. The cluster number was also included for segregation purposes and to allow for smooth merging up of data with the other household variables in EPI and the SPSS software. During the z-score calculations the following facts were taken into consideration:

Table 3: Definition of boundaries for exclusion

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

Additional analyses for frequencies, descriptives, correlations, cross–tabulations and regressions were conducted using SPSS, Epi-Info, ENA Epi Info and Excel. Indices were expressed both in terms of z scores that represent the difference between observed weight and median weight of the reference population expressed in standard deviation. The result of this survey was compared to WHO standard cut-off points. The IYCF data was analysed to yield data for key indicatorsd in SPSS and excel spreadsheets using the step by step guidelines developed by CARE[25].

Survey data validation process

Data quality was ensured through:

- thorough training of team members for four days
- the majority of the enumerators and team leaders had prior experience in carrying out nutrition surveys
- standardization of interviewing procedures through verbal translation of questions by survey team members into the local languages spoken in the district during training
- standardization of anthropometric measurement procedures
- practical sessions on interviewing and anthropometric measurements taking
- daily supervision of the teams by the consultant, SCUK Nutrition Officer and Nutrition Coordinator
- review of questionnaires on a daily basis for completeness and consistency
- plausibility checks from SMART/ENA software specific to each team during daily data entry
- on-the-spot correction/feedback of any mistakes noted during data collection to avoid mistake carry-overs
- review of questionnaires by teams before leaving the household to ensure questionnaire completeness and consistency
- frequencies for all variables were first run and the data cleaned by cross-checking any aberrant values observed on the respective questionnaire before analysis
- triangulation of quantitative data using qualitative information-KIIs, secondary data and observation
- Age of children verified by EPI health cards- in the absence of cards, the local calendar of events formulated was used to give estimates of the birth month and year.

Survey Limitations

- There were inherent difficulties in determining the exact age of some children (even with use of the local calendar of events), as some health cards had erroneous information. This may have led to inaccuracies when analysing chronic malnutrition. Although verification of age was done by use of health cards, in some cases no exact date of birth was recorded on the card

[25] Infant and young child feeding practices, collecting and using data: a step by step guide. January 2010

other than the date a child first seen at the health facility or just the month of birth. Recall bias may link to wrong age which then leads to wrong weight for age and height for age indices.

- There was poor recording of vitamin A and de-worming in the health cards. Some of the mothers indicated that their children had received Vitamin A and de-worming while it was not recorded in the health cards.

- Some caretakers refused to allow recumbent height of their children to be taken. This was due to a taboo that associated lying down prostate with death. As a result, the anthropometric data of these children could not be used for analysis of malnutrition.

Good Practice

- It was noted that use of the Uniscale (rather than Salter Hanging Scale) was beneficial in a community that is conservative and does not allow the undressing of children. A further advantage of the Uniscale is that children were more compliant in having their weight taken and for this particular environment (no trees in the vicinity of households and absence of roof beams), it was more appropriate than the Salter scale.
- Community mobilization which incorporated a significant part of administrative authorities interaction and prior identification of cluster guides by DNO, would assist in enhancing ownership of the outcome results of the survey.
- Working closely with a cluster guide that was respected by community members, yielded better quality data especially on sensitive topics e.g. infant mortality data.
- Crosschecking the DoB with both health card and calendar of local events enhanced the age verification process

3.0 RESULTS AND DISCUSSIONS

3.1 General Characteristics of Study Population and Households

Table 4: General Characteristics of Study Population and Households

Number of children 6-59 months surveyed	774
Number of children 6-59 months analysed	741
Number of children recorded as absentees	14
Number of anthropometry data excluded using Plausibility Check	17

Household Census:

Number of total population surveyed for mortality	4543
Number of children under five surveyed for mortality	859
Number of HH covered in the mortality survey	813
Number of persons who joined the household during the recall period	46
Number of persons who left the household during the recall period	196
Number of under five children who joined the household during the recall period	14
Number of under five children who left the household during the recall period	11
Number of births during the recall period	51

DEMOGRAPHY		
Number of persons per HH	**4543/813 = 5.59**	S.D = 2.6
Number of children per HH	**859/813 = 1.06**	S.D = 0.9

% of children under five in the population	18.9%	

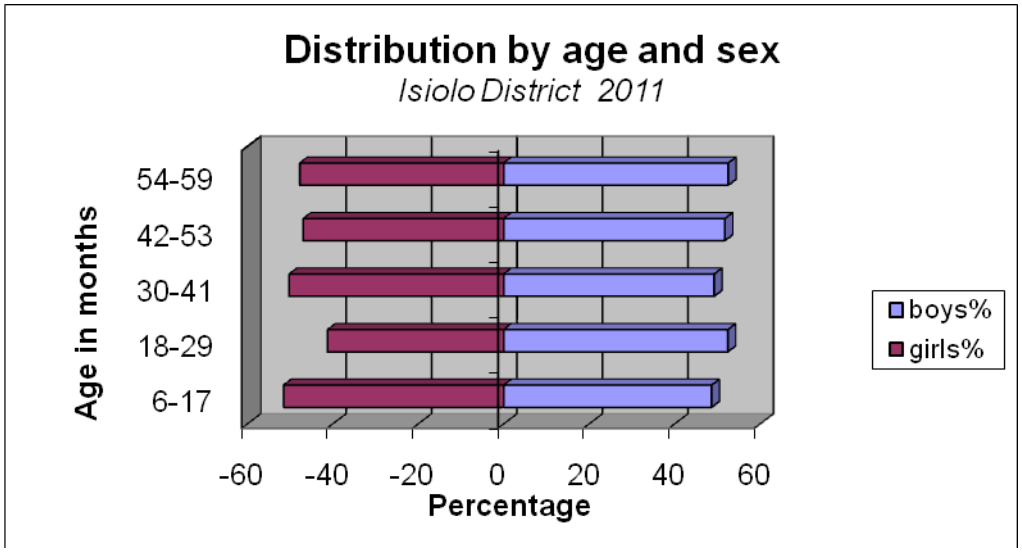
3.1.2 Distribution by age and sex

Table 5: Distribution of age and sex of sample

	Boys		Girls		Total		Ratio
	no.	%	no.	%	no.	%	Boy : girl
6-17	71	48.6	75	51.4	146	18.9	0.9
18-29	100	52.4	91	47.6	191	24.7	1.1
30-41	90	49.2	93	50.8	183	23.6	1.0
42-53	90	51.7	84	48.3	174	22.5	1.1
54-59	42	52.5	38	47.5	80	10.3	1.1
Total	393	50.8	381	49.2	774	100.0	1.0

Of the children measured, 50.8% were boys and 49.2% were girls (Table 5). Despite the fact that there were more girls than boys in the sample, the overall sex ratio was 1.0 which is within the recommended range of 0.8 – 1.2[26] demonstrating an unbiased sample as a whole. The age and sex distribution of the study group is shown below:

Figure 2: Distribution of age and sex of sample



3.2 Nutritional Status of Children 6-59 Months

The use of the National Centre for Health Statistics (NCHS) references has been phased out and replaced with the WHO growth standards (WHO-GS). TheWHO-GS are structured as a standard rather than a reference, and are therefore better in the assessment of the nutritional status of U5s regardless of child feeding differentials that characterize children in the community. However, the finding on weight-for-height percentage of the median (WFHM) are based on the NCHS references since percentage median estimates weight deficits in children more accurately and is a better predictor of mortality than z-scores.

3.2.1 Overall Prevalence of Global Acute Malnutrition by WFH Z-scores (WHO Standards)

The WFH index is the most appropriate index to quantify wasting in a population and reflects the current nutrition/health status of the community. Other than having a true statistical meaning, the use of z-scores (standard deviation scores) conveys malnutrition rates very precisely and allows for inter-study comparisons. The information presented here is based on the analyzable sample of eligible children whose plausible anthropometric data were collected. 17 (2.3%) of the children for the WFH analysis were excluded according to WHO-GS due to flagged values.

Table 6: OVERALL Prevalence of acute malnutrition by weight-for-height z-scores (WHO 2006 standards)

	All n = **741**	**Boys** n = 379	**Girls** n = 362
Prevalence of global malnutrition (<-2 z-score and/or oedema)	**(116) 15.7 %** (12.0 - 20.2 95% C.I.)	**(70) 18.5 %** (13.9 - 24.2 95% C.I.)	**(46) 12.7 %** (8.8 - 18.1 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(97) 13.1 % (9.6 - 17.5 95% C.I.)	(58) 15.3 % (11.0 - 20.8 95% C.I.)	(39) 10.8 % (7.1 - 16.1 95% C.I.)

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

Prevalence of severe malnutrition (<-3 z-score and/or oedema)	**(19) 2.6 %** (1.8 - 3.7 95% C.I.)	**(12) 3.2 %** (1.9 - 5.2 95% C.I.)	**(7) 1.9 %** (0.9 - 3.9 95% C.I.)

Table 5 shows that the prevalence of Global Acute Malnutrition (GAM) among all children was **15.7 %** (12.0-20.2 C.I.) indicative of a critical nutritional situation based on the WHO standards[27]. The prevalence of Severe Acute Malnutrition (SAM) of **2.6 %** (1.8-3.7 C.I.) suggests a high/serious SAM, but falls short of emergency levels[28]. Analysis of the data by sex shows that a higher proportion of boys 18.5% (13.9-24.2 C.I.) is malnourished than girls 12.7% (8.8-18.1 C.I.). However the overlapping confidence limits and chi-square analysis indicated that the difference in malnutrition between the boys and girls was NOT statistically significant (p>0.05) - both genders are at equal risk of malnutrition.

Figure 3: Distribution of W/H Z-scores for Sampled Children

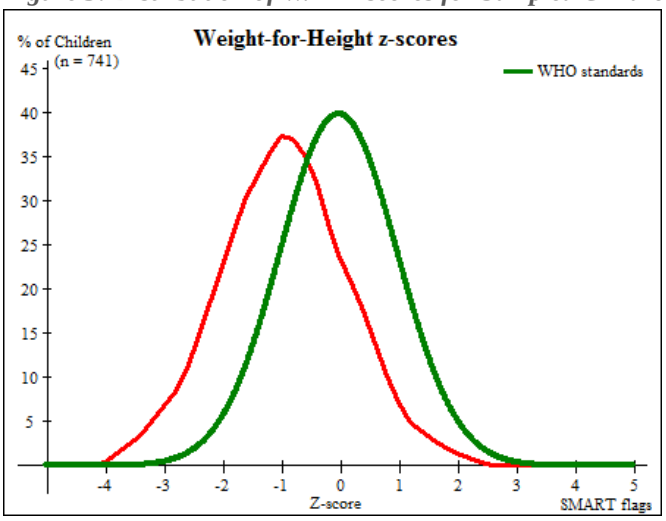


Figure 3 depicts the WFH z-score distribution curve of the survey sample relative to the WHO-GS curve. The findings indicate a shift to the left of the sample curve, with a mean score of -0.94 and a standard deviation of 1.07, which indicates that overall, the population exhibits a poorer nutritional status compared with the WHO reference population.

Table 7: Distribution of acute malnutrition and oedema based on weight-for-height z-scores

	<-3 z-score	**>=-3 z-score**
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic **No. 19 (2.6 %)**	Not severely malnourished No. 722 (97.4 %)

This table shows that 19 children (2.6%) are severely wasted (marasmus). No oedema cases were observed.

Prevalence of acute malnutrition (weight-for-height z-scores) by comparison of age groups

Table 8: Prevalence of acute malnutrition based on weight-for-height z-scores and by age group

		Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	141	5	3.5	10	7.1	126	89.4	0	0.0
18-29	186	2	1.1	25	13.4	159	85.5	0	0.0
30-41	173	6	3.5	25	14.5	142	82.1	0	0.0
42-53	163	5	3.1	24	14.7	134	82.2	0	0.0
54-59	78	1	1.3	13	16.7	64	82.1	0	0.0
Total	741	19	2.6	97	13.1	625	84.3	0	0.0

To analyse the effect of age on nutritional status, the whole sample was disaggregated into age-groups. Analysis was done on the sub-sample that would coincide approximately with the weaning period in a child's life cycle (6-29months) and thus highlight the effect of infant-feeding practices.

The GAM of the older children was higher than the overall GAM and the burden of severe wasting (SAM) also higher. However, there is NO statistical significance in difference between acute malnutrition rates observed among children aged 6-29 months and the whole sample (p>0.05). Thus in this sample, age is NOT a risk factor for malnutrition.

Prevalence of acute malnutrition based on the percentage of the median and/or oedema

Table 9: Prevalence of acute malnutrition based on the percentage of the median and/or oedema

[27] WHO cut off points for wasting using Z scores (<-2 Z scores in populations: <5% acceptable; 5-9% poor; 10-14% serious; >15% critical).
[28] Emergency Level SAM >4%

	NCHS Reference n = 741
Prevalence of global acute malnutrition **(<80% and/or oedema)**	**(35) 4.7 %** (3.6 - 6.3 95% C.I.)
Prevalence of moderate acute malnutrition **(<80% and >= 70%, no oedema)**	(35) 4.7 % (3.6 - 6.3 95% C.I.)
Prevalence of severe acute malnutrition **(<70% and/or oedema)**	**(0) 0.0 %** (0.0 - 0.0 95% C.I.)

Compared to WHO-GS, the WFH z-scores index, the weight-for-height percentage median (WFHM) index (NCHS references) gave the expected lower rates for both GAM 4.7% (3.6-6.3 CI) and no children detected for SAM (0.0%) .

3.2.2 Prevalence of Acute Malnutrition by MUAC

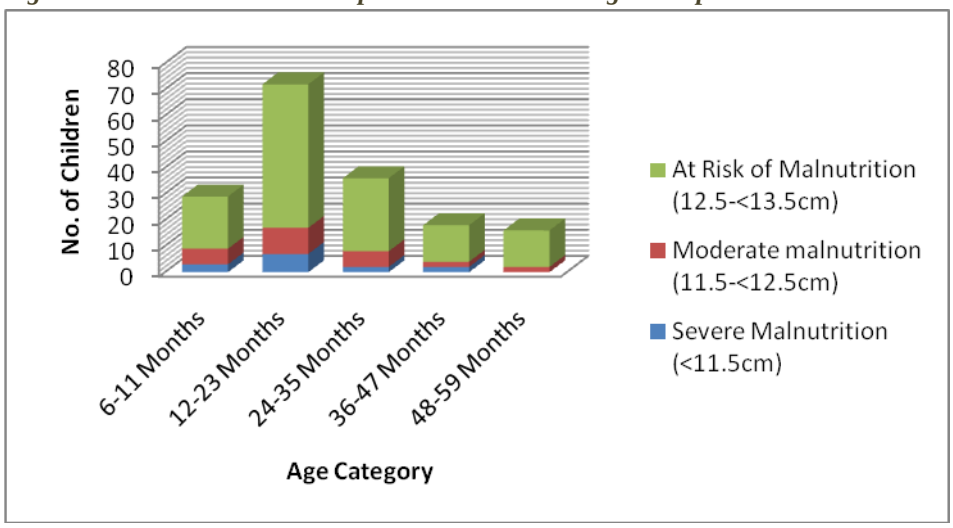
Compared to WFH z-scores, the mid-upper arm circumference (MUAC) is not a very sensitive indicator of acute malnutrition and tends to overestimate acute malnutrition for children below one year of age. It is, however, used as a rapid screening tool for admission into nutrition intervention programmes. Overall, MUAC usually tends to indicate lower GAM levels compared to WFH z-scores. The use of MUAC in screening for admission into feeding programmes is currently in a phase-out process for eventual replacement with WFH z-scores in accordance with the WHO Technical Guidelines Recommendations, which have since been adopted by the MoH. However, MUAC is still in use in many nutrition intervention programmes in Kenya (including in the SFP and OTP programmes in Isiolo district) since it is still a criteria for admission in the national IMAM guidelines.

Table 10: Distribution of MUAC by Nutritional Status

Nutritional Status	MUAC Criteria	Number	Percentage
		n	**%**
Severe malnutrition	<11.5cm	14	1.8%(1.1-3.2) (95% CI)
Moderate malnutrition	>=11.5 and <12.5cm	26	3.4 %(2.3-5.0) (95% CI)
At risk of malnutrition	>=12.5 and <13.5cm	131	17.3% (14.7-20.2) (95% CI)
Satisfactory nutritional status	>=13.5cm	588	77.5 %(74.3-80.4) (95% CI)
	TOTAL	**759**	**100**

According to the MUAC index, prevalence of malnutrition i.e. GAM (MUAC<12.5cm) in 759 children was 5.2% and severe malnutrition (SAM)(MUAC<11.5) at 1.8%, with 17.3% being at risk of malnutrition (MUAC 12.5cm-<13.5cm).

Figure 4: Acute Malnutrition expressed in MUAC in Age Groups



From Figure 4, it is evident that the younger children have a higher rate of GAM than those 24-59 months.

Overall, the younger age group(6-23m) seem more affected than the older age groups. Chi-square analysis indicates that there is indeed a significant difference ($p<0.01$) between the younger (6-23 m) and whole (24-59) sample. This suggests that infant feeding practices are related to malnutrition levels.

3.2.3 Prevalence of Underweight by Weight-for-age Z-scores (WHO-GS)

The weight-for-age (WFA) index provides a composite measure of wasting and stunting and is commonly used to monitor the growth of individual children in EPI health cards since it enables mothers to easily visualise the trend of their children's increase in weight against age. A low WFA is referred to as underweight. The prevalence of underweight among the children was 22.1% (17.9-27.0 CI) while 4.4% (3.0-6.5 CI) were severely underweight as shown in Table 11. As was the case for acute malnutrition, more boys than girls suffered from global underweight as well as severe underweight.

Table 11: Prevalence of underweight by weight-for-age z-scores (WHO standards)

	All n = 742	Boys n = 378	Girls n = 364
Prevalence of underweight (<-2 z-score)	**(164) 22.1 %** (17.9 - 27.0 95% C.I.)	**(87) 23.0 %** (17.9 - 29.1 95% C.I.)	**(77) 21.2 %** (16.3 - 27.0 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(131) 17.7 % (14.2 - 21.7 95% C.I.)	(67) 17.7 % (13.8 - 22.5 95% C.I.)	(64) 17.6 % (13.2 - 23.0 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	**(33) 4.4 %** (3.0 - 6.5 95% C.I.)	**(20) 5.3 %** (3.4 - 8.2 95% C.I.)	**(13) 3.6 %** (2.1 - 6.1 95% C.I.)

3.2.4 Prevalence of Chronic Malnutrition (Stunting) by Height-for-age (HFA) Z-scores (WHO-GS)

Height for age (stunting) is an indicator of chronic (long-term) malnutrition arising from deprivation related to persistently poor food security situation, micronutrient deficiencies, recurrent illnesses and other factors which interrupt normal growth. Unlike wasting, it is not affected by seasonality but is rather related to the long-term effects of socio-economic development and long-standing food insecurity situation. A low height-for-age reflects deficits in linear growth and is referred to as stunting.

The findings (Table 12) indicated an overall global chronic malnutrition (GCM) rate of 19.7% (16.5-27.0 C.I.) and a severe chronic malnutrition (SCM) rate of 5.2 % (3.5-7.7 C.I.). There was no significant difference in the level of stunting between the boys and girls, as judged by the overlap in the Confidence Intervals.

Table 12: OVERALL Prevalence of stunting by height-for-age z-scores (WHO standards)

	All n = 725	Boys n = 368	Girls n = 357
Prevalence of Global CM (<-2 z-score)	**(143) 19.7 %** (16.5 - 23.4 95% C.I.)	**(79) 21.5 %** (16.8 - 27.0 95% C.I.)	**(64) 17.9 %** (13.9 - 22.7 95% C.I.)
Prevalence of Moderate CM (<-2 z-score and >=-3 z-score)	(105) 14.5 % (12.0 - 17.4 95% C.I.)	(58) 15.8 % (12.0 - 20.4 95% C.I.)	(47) 13.2 % (9.6 - 17.7 95% C.I.)
Prevalence of severe CM (<-3 z-score)	**(38) 5.2 %** (3.5 - 7.7 95% C.I.)	**(21) 5.7 %** (3.4 - 9.5 95% C.I.)	**(17) 4.8 %** (2.8 - 8.1 95% C.I.)

Table 13: Mean z-scores, Design Effects and excluded subjects

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	741	-0.94±1.07	2.33	16	17
Weight-for-Age	742	-1.21±1.05	2.17	15	17
Height-for-Age	725	-1.08±1.14	1.35	16	33

* contains for WHZ and WAZ the children with oedema.

The table above indicated the flagged values due to aberrant values

4.0 Mortality Results *(retrospective over 91days prior to interview)*

Mortality was assessed using the current household census method. There were 4543 individuals alive at the time of the survey, 859 of who were children U5.

For all the deaths recorded, 3(60%) occurred in persons older than 5 years and 2 (40%) in children less than five years of age.

CMR (total deaths/10,000 people / day)**: 0.12** (0.05-0.29) (95% CI)
U5MR (deaths in children under five/10,000 children under five / day): **0.27** (0.07-1.08) (95% CI)

Out of 813 households sampled for mortality data, a total of 5 individuals were reported to have died since 10th January 2011, thus yielding a specific under five mortality rate of 0.27/10,000/day and crude mortality rate of 0.12/10,000/day respectively. Both the mortality rates are within the acceptable levels for emergency situations.

Table 14: Causes of Death

	Cause of Death	<5 (n=2)	>5 (n=3)
1	Diarrhoea	0%	0%
2	Lower Respiratory Infection	0%	67%
3	Fever	0%	0%
4	Malaria	50%	0%
5	Accident/Injury	0%	33%
6	Unknown	50%	0%

The main presumed causes of death among children under-five years were ‘unknown’ and suspected ‘malaria’.

The deaths over 5 years, occurred from ARIs and an accident.

4.1 Children’s Morbidity

Table 15: Prevalence of reported illness in children in the two weeks prior to interview (n= 160)

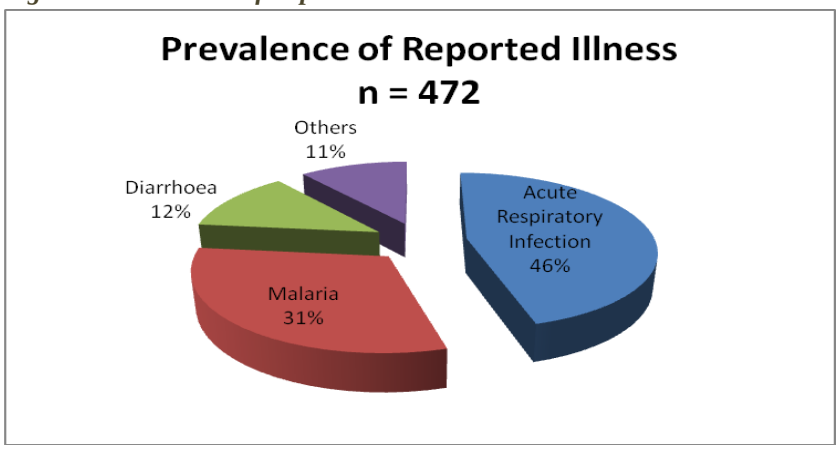
	6-59 months (n=472)
Prevalence of reported illness	**61.0%** (57.4-64.4) (95% CI)

Table 16: Symptom breakdown in the children in the two weeks prior to interview (n=472 responses)

Symptoms of reported episodes of illness	n	%
ARI (Acute Respiratory Illness)	245	45.5%
Malaria	168	31.2%
Diarrhoea	67	12.4%
Others	59	10.9%

'Other' symptoms included skin infections, intestinal worms, stomach-ache, chicken-pox, pneumonia, vomiting and ear and eye infections.

Figure 5: Prevalence of Reported Illness

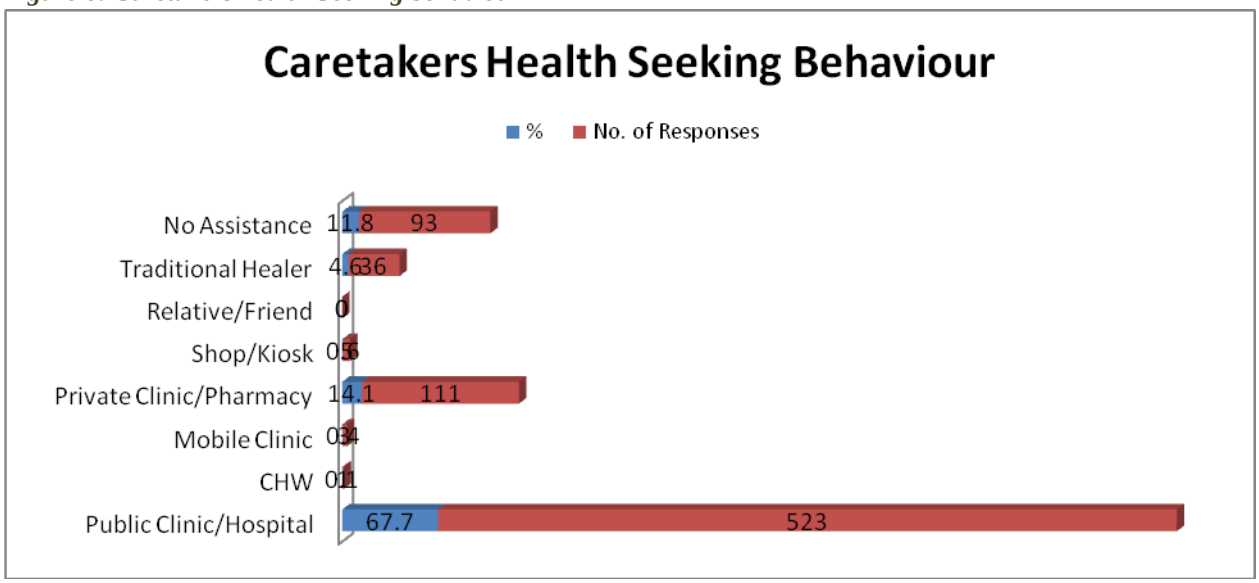


A 2-week child morbidity recall (inclusive of the day of survey) was assessed to establish the prevalence of common illnesses among the children. A high proportion (61.0%) of U5s was reported to have been sick (Table 15). The most prevalent illness were ARI suffered by 45.5% of the children followed by malaria (31.2%), diarrhoea (12.4%) and others (10.6%). 2 cases of suspected measles were reported in Central division[29]. Data from the MoH (Isiolo district hospital) also confirmed these as leading causes of child morbidity in the district in 2010[30]. In addition, malaria and kalazaar are endemic during this time of year (rainy season)[31]. An analysis of the relationship between morbidity and nutritional status established that GAM prevalence was significantly higher among those reported to have been sick compared to those who were not.

15.3% (n=74) of children ill during the recall period were also acutely malnourished (<-2 Z-scores). Chi-square analysis done to determine whether there was any association between sickness and malnutrition showed that there was NO significant association (p>0.05).

4.3 Care Practices

Figure 6: Caretakers health Seeking behaviour



Health care seeking behaviour of caretakers determines the preference and quality of health care services obtained whenever a child falls ill. Quality of health care services and duration taken before a sick child receives medical attention contributes to the severity of the illness. The health seeking behaviour by mothers of sick children was assessed by asking the respondents what they

[29] District Disease Surveillance Officer following up with samples at KEMRI- not confirmed by the report compilation date

[30] Isiolo District Top Ten Leading Causes Of Morbidity Under Five Years, 2010

[31] DMoH

did the last time their U5 child was sick. During the last episode of illness, commendably **87.3 %(79.2-97.6 C.I)** of mothers reportedly sought medical assistance. Of the 87.5% seeking assistance, the larger proportion **82.6 %(75.6-89.4)** (623 responses) sought assistance from a health facility (cumulative of public/mobile/private clinic) A significant number (16.4%) sought assistance from traditional healers or none at all.

4.4 Vaccination Results

Table 17: Vaccination coverage: OPV 1, OPV 3 for 6-59 months and Measles for 9-59 months

	OPV 1 (with card) 6-59 m N: 785	OPV1(card &confirmation) 6-59m N: 785	OPV 3 (with card) 6-59 m N: 785	OPV 3(card &confirmation) 6-59m N: 785	Measles (with card) 9-59 m N: 745	Measles (card &confirm) 9-59m N:745
Yes	n = 424 **54.8%(**51.2-58.3 C.I)	n = 746 **96.4%(**89.3-99.8 C.I)	n = 409 **52.8%(**49.3-56.4 C.I)	n = 730 **94.3%(**87.3-99.6 C.I)	n = 359 **47.9%(**44.3-51.6 C.I)	n = 685 **91.4%(**84.3-99.6C.I)

When estimating measles coverage, only children 9 months of age or older were taken into consideration as they are the ones who were eligible for routine vaccination. The vaccination coverage was calculated as children immunized based on records and recall. Using both card and confirmation, child immunization for polio (OPV), (96.4; 94.3%) and measles (91.4%) was commendably high- above the recommended KEPI coverage cut-off point of 80%[32]. Coverage has been good since 2010 due to supply of vaccines, good maintenance of cold chain and supportive supervision[33]. In addition, CHW support, monthly meetings and a reward system for best-performing health facility are additional motivators for improving coverage[34]. This rate also compares well with the estimated measles coverage by SCUK surveillance survey 2011(87.7%)[35]. Approximately 50% of the coverage reported here was based on recall and not evidenced by an EPI/ANC Health card. This is due to the fact that cards may be lost, or otherwise inaccessible to the caretaker interviewed[36].

4.5 Vitamin A Supplementation/ Deworming

Table 18: Vitamin A supplementation and deworming coverage

Vitamin A supplementation 6-59months N:785 Once	Vitamin A supplement 6-59months N:785 More than once	Deworming (with card) 12-59m N:755	Deworming (card&confirm) 12-59m N:755
n = 286 37.3% (**33.9-40.9 C.I)**	n = 142 **18.9%(**14.4-24.7 C.I)	n = 129 **17.1% (**14.5-20.0 C.I)	n = 347 **46.0%(**40.2-52.2 C.I)

Vit. A supplementation starts at 6 months, and subsequently at 6 months interval until a child reaches age of 5 years[37]. In the previous year months prior to this survey, an overall 56.2% of U5s were reported to have received vitamin A supplementation at least once. The proportion of those who had received it once as recommended was 37.3% **(**33.9-40.9 C.I) and 18.9% **(**14.4-24.7 C.I) reportedly having received more than once. The overall vitamin A coverage among children aged <1yr was 62.5%, out of which 47.2% reportedly had been supplemented once and 15.3% twice or more- comparable to SCUK survey coverage (47.8%).

De-worming is crucial in warding off the debilitating effects that helminthic infections cause among growing children. Using card and confirmation, 46.0% of the children had received de-wormers during the 6-month period prior to this survey. A comparable rate of deworming was reported by SCUK survey (38.1%) Both supplementations fell short of the KEPI optimum cut-off of ≥80%, and project targets. This is a worrying trend as adequate micronutrient supplementation is crucial in the reduction of chronic malnutrition.

4.6 PROGRAMME COVERAGE

Table 19: Selective Feeding Programmes Coverage

Programme type	***Direct Method-coverage estimate***	***Indirect Method-coverage estimate***
Supplementary feeding programme coverage (SFP)	**18.7%**	**64.6%**
Therapeutic feeding programme coverage (OTP)	**0%**	**25.0%**

The currently accepted methods[38] of estimating the coverage of selective feeding programmes uses the two-stage cluster-sampling survey methodology to estimate the prevalence of acute malnutrition in the programme area. It has limitations because PPS approach (two-stage cluster sampling), gives a single wide-area coverage estimate. The CSAS or SQUEAC methodologies are more accurate in estimating programme coverage. This nutrition survey coverage is estimated either directly or indirectly using different methods. The direct method involves adding a question to the anthropometric questionnaire to record whether or

[32] For the population to be protected against epidemics.
[33] SRA Isiolo District- Jan 2011
[34] DPHN-Isiolo District Hospital
[35] SCUK Surveillance Survey- Isiolo District results (March 2011)
[36] DPHN-Isiolo District Hospital
[37] WHO
[38] Mark Myatt (2003). New method of estimating programme coverage. Community Based Approaches to Managing Severe Malnutrition.

not a child is currently registered in the feeding programme.

Cumulative number of children registered in SFP: 29

Cumulative number of children registered in OTP: 0

Cumulative number of children referred for SFP/
(Children with WHZ<-2 z-score and >=-3z-score that are not enrolled):122

Cumulative number of children referred for OTP/
(Children with WHZ<-3 z-score that are not enrolled): 25

SFP coverage = Children registered in SFP / Children registered in SFP+ children with WHZ<-2 z-score and >=-3z-score that are not enrolled x 100

= 29/29+122 x 100 = 18.7%

OTP coverage = Children registered in OTP / Children registered in OTP + children with WHM=<-3 z-score that are not enrolled x 100

= 0/0+25 x 100 = 0%

The indirect coverage estimation method involves comparing the number of malnourished children estimated to exist in a population through a nutrition survey with the actual number of children attending the programme. This method is usually less accurate than the direct method because it requires relatively up-to-date information on population figures.

Coverage is estimated using the following equation:

SFP coverage = Number of children attending the SFP feeding programme[39] / Estimated prevalence of malnutrition[40] × estimated number of children in the population x 100

=1997/0.157 (0.189 x 104,223) x 100 = 64.6%

OTP coverage = Number of children attending the OTP feeding programme / Estimated prevalence of malnutrition[41] × estimated number of children in the population x 100

=128/0.026 (0.189 x 104,223) x 100 = 25.0%

These formulas are an estimator of RECENT coverage in a given period (PERIOD PREVELENCE)

The SFP (64.6%) coverage is commendable with a mean duration of 45days (SD 34.6) but OTP (25.0%) coverage rate calculated using the indirect formula is below the accepted levels of ≥50.0% in rural areas according to the SPHERE Standards (2004). SPHERE[18] also recommends a minimum 60% coverage for community nutrition intervention programmes, and this should be the target for the HINI program currently being implemented for both SFP and OTP. It is important to note that reported coverage rates at best, estimate the true picture of what is on ground because of the limitations inherent in the survey design and formula.

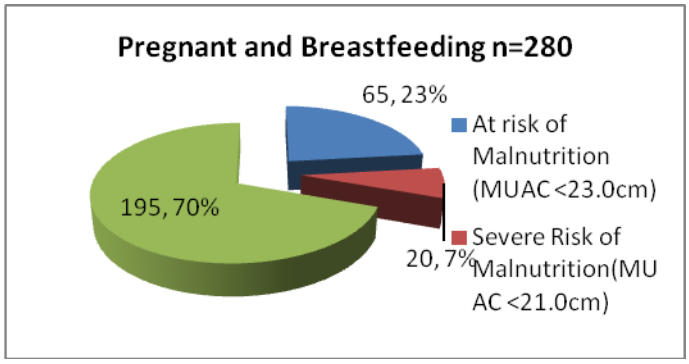
5.0 Primary Child Caregiver Indicators

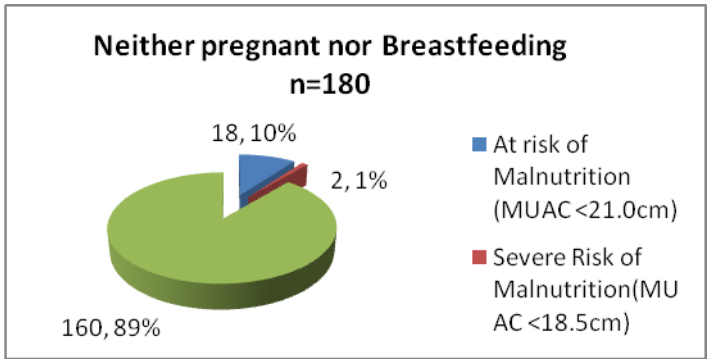
5.0.1 Adult Nutritional Status

Out of the 490 caretakers, 15-49 years, assessed in Isiolo District, 8.4% were pregnant, 52.1% were breast-feeding and 40.3% were neither lactating nor pregnant. The mid-upper arm circumference (MUAC) was measured to assess the nutritional status of 490 eligible caretakers. The survey findings showed that of the 461 total, 28.9% (n=133) of caretakers had MUAC <23cm meaning that they are at risk of malnutrition/have chronic energy deficiency (CED)[42]. Among the pregnant and lactating sub-group, 85 out of 280 caretakers (30.4%) are have moderate chronic energy deficiency while 20 (7.1%) have MUAC<21.0 and have severe chronic energy deficiency. 11.1% of women not pregnant or lactating had moderate CED (MUAC<21.0) and 1.1% severe CED. The admission criteria into SFP is adult MUAC<21.0 for pregnant and lactating mothers of children <6 months old. The magnitude of under-nutrition was low among non-pregnant women compared to those who were pregnant. Pregnancy imposes a big nutrient-need load on mothers, which in the absence of adequate extra nutrients leads to utilization of body nutrient reserves leading to malnutrition. Gestational malnutrition leads to low birth weights and may ultimately culminate in poor child growth and development, thus there is an urgent need to address high rates of malnutrition among pregnant women.

Figure 7: **OVERALL** *Adult nutritional status by MUAC indicating wasting*

[39] SFP/OTP Monthly Report (March 2011)
[40] Survey findings of MAM and SAM
[41] Survey findings of SAM
[18] The SPHERE Project Handbook (2004). Humanitarian Charter and Minimum Standards in Disaster Response.
[42] Cut off points for pregnant mothers and lactating mothers- MUAC < 21.0 for severe risk and <23.0 For moderate risk.
Cut off points for non- pregnant and non-lactating mother –MUAC < 18.5 for severe risk and <21.0 moderate risk.





The figures above indicate that pregnant women and lactating mothers in the district are relatively more vulnerable to malnutrition compared to their non-pregnant counterparts. Poor adult nutritional status is a key indicator to household food insecurity. High figures of malnourished pregnant and lactating mother carry a risk of growth retardation of the foetus and consequently low birth weight. Pearson correlation coefficient test was conducted between the nutritional status of mothers by MUAC and wasting of children. The analysis showed a significant correlation (p=0.035) between them. This could suggest that U5 children and caretakers from the same household are vulnerable to malnutrition, a situation that common during critical emergency levels.

5.0.2 Mother to Mother Support Groups (MtMSGs) and Maternal Health Care

Establishment of mother to mother support groups (MtMSGs) project is a component of the UNICEF-funded HINI project implemented by IMC in Isiolo district. The MtMSG concept has reported progress in addressing some challenges related to behaviour change and cost effectiveness as they build a sustainable community-level structure for health promotion. The main objective of the MtMSG is improvement of the nutritional status of the U5s, pregnant and lactating mothers through self- referral systems, defaulter tracing strategies and through lead mother-led health education forums. This survey assessed the proportion of mothers who were aware of the existence as well as membership to the MtMSGs, ANC attendance, child delivery care and maternal vitamin A supplementation following delivery. The findings on the whole (Table 20), showed that only 68 (12.3%) of mothers were aware of the existence of MMCGs and of those aware, 37 (35.5%) reported being members of the groups.

Table 20: *Impact of MtMSGs and Postnatal care*

Characteristic	**Total (N=551)***	
	n	%
Mother aware of MtMSGs	68	**12.3% (9.8-15.4 C.I)**
Mother member of MtMSGs (Mother Support Group)	19	**18.2% (15.1-23.3 C.I)**
Mother member of MtMSGs (Breastfeeding Group)	18	**17.3% (14.2-22.8 C.I)**
Overall mothers member of MtMSG	37	**6.7% (15.1-23.3 C.I)**
Mother attended ANC	499	**92.5%(89.8-98.4 C.I)**
Where mother delivered:		
-At home by TBA	309	**57.5% (53.2-61.7 C.I)**
-At home without assistance	7	**1.3% (0.6-2.8 C.I)**
-At home with nurse assistance	8	**1.5% (0.7- 3.0 C.I)**
-In hospital	213	**39.7% (35.5-44.0 C.I)**
Time before taking child to clinic for home deliveries:		
-Within first 2 weeks	244	**71.6% (66.4-76.3 C.I)**
-Between 2 weeks and 1 month	29	**8.5% (5.9-12.1 C.I)**
-After 1 month	57	**16.7% (13.0-21.2 C.I)**
-Not taken/no intention to take	11	**3.2% (1.7-5.9 C.I)**
Maternal vitamin A supplementation after last delivery	295	**56.3% (51.9-60.6 C.I)**

****Values of N change by specific characteristics***

Many benefits mount up from ANC clinic attendance by expectant mothers. Chief among these are expert nutritional advice, gestational tetanus immunization, iron folate supplementation, timely detection of possible obstetric complications and general safe motherhood practices. Overall, majority (92.5%) of the expectant mothers reported having attended ANC clinics. The main reason for who did not attend ANC, was that the health facility was too far (48.9%) and they were unaware of importance of ANC (26.7%) However, in spite of the reported high level of ANC attendance, 57.5% of the mothers reported having delivered at home with assistance from traditional birth attendants (TBAs) with only 39.7% delivering their babies in health facilities.

The participation of TBAs in child deliveries is currently discouraged by WHO because the services they offer fall short of the minimum care that delivering mothers should receive. However, in many remote areas where there is limited access to conventional health care, they might be the only practical care that delivering mothers have access to. It is, therefore,

recommended that children who are born outside a health facility setup should be taken to a health facility within 2 weeks of birth to allow for optimal health check-up and administration of the zero dose polio antigens. On the whole, as shown in Table 20 above, 71.6% of the children delivered at home were taken for medical attention within the recommended 2-week period. Maternal vitamin A supplementation within 2 weeks after birth is crucial and recommended by WHO as a means to boost its content in breast milk as well as promote maternal recovery following delivery. Due to the fact that most mothers had their deliveries at home, only half (56.3%) of the mothers, overall, reported having received vitamin A supplementation.

6.0 FOOD UTILIZATION

This section explored the consumption patterns for infants, 6-59months and persons >5years (caregivers). The data was collected based on 24-hour recall. Unusual feeding patterns (both greater and reduced consumption) were excluded from this recall method, so as to evaluate the 'normal' consumption patterns.

6.0.1 Infant and Young Child Feeding (IYCF) and Care Practices

Information on infant and young child feeding practices was obtained based on a 24-hour recall, in line with the WHO guidelines to minimize recall bias and thus obtain more valid information. The indicators used for infant feeding practices are based on Knowledge, Practice and Coverage (KPC) 2000+[43] founded on WHO guidelines .These are also the key indicators for the Global Strategy for Infant and Young Child feeding.

Table 21: Summary of Breastfeeding Practices

Breastfeeding Practices					
Initiation of breast feeding:					
	Age Group	n	%	**Target**	**Comment**
• **Ever breastfed**	0-5m	(94)	**100%**	**>80%**	✓
• **Ever breastfed**	6-59m	(759)	**98.3%(97.1-99.1 C.I)**	**>80%**	✓
• **Given colostrum**	0-5m	(63)	**69.1%(58.8-78.3 C.I)**	**>80%**	✓
• **Given pre-lacteals within 3 days of birth**	0-5m	(42)	**44.7%(34.4-55.3 C.I)**	**n/a**	**Unsatisfactory**
• **Early introduction to complementary foods**	0-5m	(29)	**29.8%(20.8-40.1 C.I)**	**n/a**	**Unsatisfactory**
• **Breastfeeding on Demand**(>12 times)	0-5m	(22)	**23.4%(24.6-50.3 C.I)**	**n/a**	**Unsatisfactory**
Key Indicator 1 **Timely Initiation of Breastfeeding** (within1 hr.)	0-5m	(78)	**75.5%(65.6-83.8 C.I)**	**>80%**	✓
Key Indicator 2 **Exclusive Breastfeeding**	0-5m	(55)	**58.5%(47.9-68.6 C.I)**	**>50%**	✓
Key Indicator 3 **Currently Breastfeeding**	0-24m	(275)	**71.0%(61.6-79.3C.I)**	**>80%**	**Unsatisfactory**
Key Indicator 4 **Median Duration of Breastfeeding**	0-36m	(232)	**18.00 months**	n/a	

Almost all of the children in Isiolo district are reported to have ever breastfed; 98.3% (853). The majority (71.0%) of the children 0-24 months were still being breastfed at the time of the survey. WHO recommends that infants should be breastfed at least twice every 2 hours, which translates to 12 times a day. Only 23.4% of the infants had been breastfed more than 12 times the previous day. More than ¾ of the children (75.5%) had been to put to the breast within one hour after birth as recommended by WHO[44].

69.1%of the children had been given colostrum while 44.7% had been given pre-lacteals, a practice that is not recommended because it interferes with the establishment of breastfeeding. From FGDs a common practice of giving 'small' animal milk or glucose and water. Other common pre-lacteal feeds included honey/dates milk with ghee and food. A high proportion of respondents also felt this was necessary too cool down the infant after birth, the child was hungry, mother had no milk. Among infants given pre-lacteals, the most frequently given items were sugar/glucose water or honey by 51.1% of the respondents, followed by plain water (33.3%) and animal milk (13.3%) From the table above, only 15 (4.1%) of the children less than 6 months of age had been exclusively breastfed (Table 12). Exclusive breastfeeding was computed among infants who had not received pre-lacteals and were not on other foods. The findings revealed that more than half of the infants (58.5%) were exclusively breastfed compared to a national average of 31.9%[16] according to the Kenya Demographic and Health Survey (KDHS) report- but the rate compares well with previous SCUK survey which gave a 76.2% EBF rate. Out of those who were not exclusively breastfed, more than vast majority (89.5%) had been weaned before their first month, 5.3% by first month and 5.2% by third month. Early weaning increases the risk of infections in young children, with the foods given being nutritionally inferior to breast milk, which ultimately aggravates malnutrition.

Complementary feeding practices

Table 22: Summary of Complementary Feeding Practices

[43] WHO Indicators for Assessing Infant and Young Child Feeding Practices (2009), KPC 2000+ and Rapid CATCH 2007 survey guidance.
[44] WHO (1989): Protecting, promoting and supporting breastfeeding: special role of maternity services: a joint WHO/UNICEF Statement. Geneva, WHO.
[16] Kenya National Bureau of Statistics (June 2010): Kenya Demographic and Health Survey.

Complementary Feeding Practices					
	Age Group	n	%	Target	Comment
Key Indicator 6 **Introduction to solid and semi-solid food**	6-8m	(25)	**71.4%**	**n/a**	✓
Key Indicator 7 **Minimum Dietary Diversity**	6-59m	(442)	**57.6%**	**>80%**	**Unsatisfactory**
Key Indicator 8 **Minimum Meal Frequency**	6-59m	(155)	**20.0%**	**>80%**	**Unsatisfactory**
Key Indicator 9 **Minimum Acceptable Diet**	6-59m	(100)	**13.0%**	**>80%**	**Unsatisfactory**
Key Indicator 10 **Consumption of Iron-rich or iron-fortified foods**	6-59m	(138)	**18.0%**	**>80%**	**Unsatisfactory**

Timely Complementary Feeding

The 6-59m survey questionnaire asked the caretakers of the when (in days) they had introduced liquid or food other than breast milk. The introduction to complementary foods should happen at 6months (180days) of age. This is because breast milk alone is not sufficient to provide all the required nutrients for the child's optimal growth from this age onwards. It is also important to consider introduction to other foods too early as the child is not capable of digesting solid food and is therefore at risk of not being able to acquire enough energy if breast-feeding is not maintained.

This is a widely used indicator by Kenya Demographic and Health Surveys (KDHS), UNICEF and WHO. 54.3% (416) children had other foods introduced at <4 weeks old, 39.0% (299)at 4-23 weeks old and only 25, (3.3%) at the optimum time of ≥24 weeks old. A significant proportion of children were weaned late(>9 months)-3.4%, which also poses a threat to optimum nutrition . This indicates poor feeding practice in the community which needs to be addressed. The FGDs provided some insight to this practice as animal milk was not considered 'food'- does not need chewing and is easily digested, and was introduced soon after the child was born- this is likely to account for the high rate of complementary food introduction <4 weeks old. Other 'food' was reported to be introduced to children after 6 months-1 year old, when they had developed teeth to chew.

Dietary diversity score (DDS) and Minimum Dietary Diversity

The dietary diversity indicator is based on the premise that the more diverse the diets are the more likely they are to provide adequate levels of a range of nutrients. For this indicator, the caretaker was asked what the child had eaten/drank in the last 24 hours. The following food groups are summed, with each of the groups scored "1" if the child had the food group yesterday, and "0" if not. Minimum dietary diversity is defined as Proportion of children 6-59 months who receive foods from 4 or more food groups. The 8 food groups used for calculation of this indicator are:

◆ Grains, roots and tubers◆ Legumes and nuts◆ Dairy products (milk, yogurt and cheese)◆ Flesh foods (meat, fish, poultry and liver/organ meats)◆ Eggs◆ Vitamin-A rich fruits and vegetables◆ Fats and Oils

This results in a diversity score ranging from 0 to 8 for each child. Higher scores correspond to a more adequate range of foods groups in the diet. A cross tabulation of the age groups and food categories produced the results shown in Table 27.

Table 23: Food Category and Diversity by Age Group

			Complementary Food Categories								Total
			Grains, Roots and Tubers	Vitamin-A Rich Foods	Fruits and Vegetables	Meat, Poultry and Fish	Eggs	Pulses and Legumes	Fats and Oils	Milk and Products	
Complementary Feeding Age Categories	6-11 months	Count	50	19	17	11	8	15	44	57	221
		% of Total	1.8%	.7%	.6%	.4%	.3%	.5%	1.5%	2.0%	7.7%
	12-17 months	Count	66	25	11	11	5	31	56	60	265
		% of Total	2.3%	.9%	.4%	.4%	.2%	1.1%	2.0%	2.1%	9.3%
	18-23 months	Count	95	36	14	16	10	46	85	91	393
		% of Total	3.3%	1.3%	.5%	.6%	.4%	1.6%	3.0%	3.2%	13.8%
	24-35	Count	156	67	21	29	13	75	135	145	641

	months	% of Total	5.5%	2.3%	.7%	1.0%	.5%	2.6%	4.7%	5.1%	22.5%
	36-47 months	Count	166	60	33	30	23	70	138	147	667
		% of Total	5.8%	2.1%	1.2%	1.1%	.8%	2.5%	4.8%	5.2%	23.4%
	48-59 months	Count	160	68	28	41	15	72	131	150	665
		% of Total	5.6%	2.4%	1.0%	1.4%	.5%	2.5%	4.6%	5.3%	23.3%
Total		Count	693	275	124	138	74	309	589	650	2852
		% of Total	24.3%	9.6%	4.3%	4.8%	2.6%	10.8%	20.7%	22.8%	100.0%

Percentages and totals are based on responses.

a. Dichotomy group tabulated at value 1.

The mean diversity score for those children who had received foods/drinks based on the 24-hour recall was 3.7. The diversity score of 3.7 out of an ideal score of 8 implies that the children's meals did not have an adequate range of food groups and is thus likely to be limited in the diversity of nutrients supplied by the meals. From the table above, it is evident that the least consumed category of foods was eggs, vegetable and fruits, while the greatest is carbohydrate foods . This also compares well with the reported favoured weaning foods during the FGD-mashed potatoes and porridge. Fruits and vegetables were only given if the caretaker could afford them- they were inaccessible to the majority of caretakers, and thus constituted the least utilized food group. Of concern is the lack of eggs in the weaning diet, despite the relative accessibility of eggs, (especially in the urban and agro-pastoral livelihood zones) and their value as a cheap source of animal protein.

When analyzed by age group, the same scenario is reported as shown in Table 23.

Table 24: Age disaggregation of children 6-59 months for complementary feeding key indicators

Age Categories	N	Dietary Diversity Score(DDS) **Mean**	Minimum Dietary Diversity(M.D.D)	Minimum Food Frequency(M.F.F)	Minimum Acceptable Diet(M.A.D)
6 – 11 months	73	3.0	40.3%(29)	37.0%(27)	16.7% (12)
12-17 months	73	3.6	56.9%(41)	27.4% (20)	18.1% (13)
18-23 months	109	3.6	56.0%(61)	22.9% (25)	12.8% (14)
24–35 months	173	3.7	57.3%(98)	15.0% (26)	9.4% (16)
36-47 months	175	3.8	65.1%(112)	15.4% (27)	12.2% (21)
48-59 months	171	3.9	59.1%(101)	17.5% (30)	14.0% (24)
6-59 months (OVERALL)	**774**	**3.7**	**57.6% (442)**	**20.0% (155)**	**13.0% (100)**

Hence, more than half of children (442)57.6% had the minimum dietary diversity of 4 or more food groups.

Minimum Food Frequency

For the average healthy breastfed infant, meals of complementary foods should be 2-3 times per day at 6–8 months of age and 3–4 times per day at 9–23 months of age, with additional nutritional snacks offered 1–2 times per day as desired (FANTA, 2003, WHO, 2003). Thus, the child should feed at least 4-5 times a day. As a whole, those children (6-59 months of age) received food/drinks 3.7(S.D 1.03) times. 20% (155) children 6-59 months achieved the minimum food frequency of 4 or more meals.

Minimum Acceptable Diet

This is a composite indicator that is defined as the proportion of *Breastfed* children 6-23 months of age who had at least the minimum dietary diversity and the minimum meal frequency during the previous day. It also includes non-breastfed children who have achieved the same, and in addition, 2 milk feedings. Of the 774 children analysed, only 100 (13.9%) achieved this.

Consumption of iron-rich or iron-fortified foods

Proportion of children 6-23 months old who receive an iron-rich food or iron-fortified food that is specially designed for infants and young children, or that is fortified in the home. Suitable iron-rich or iron-fortified foods include flesh foods, commercially fortified foods (CSB Plus) specially designed for infants and young children which contain iron(infant formulas), or foods fortified in the home with a micronutrient powder containing iron or a lipid-based nutrient supplement containing iron(e.g. Plumpy Nut). The overall outcome for all children 6-259m indicated that 18.0% (60) received iron-rich foods. This is unusual for a community that has a predominantly animal-protein diet. Disaggregation of the age categories is illustrated in Table 23 above.

7.0 ITN Utilization, Hygiene and Sanitation

7.0.1 Insecticide Treated Mosquito Nets (ITN) Holding Rates and Utilization

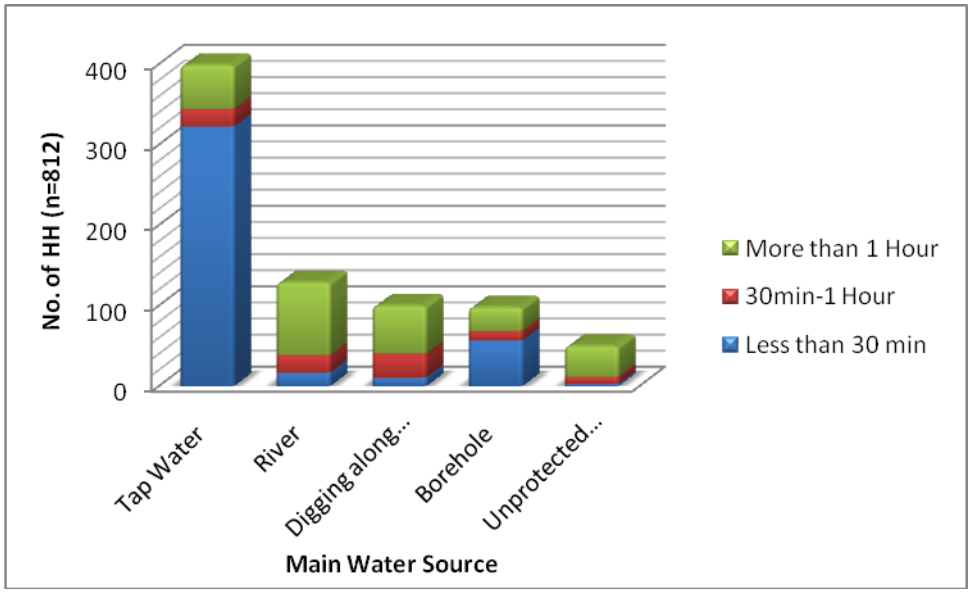
The MoH provides free insecticide treated mosquito nets (ITNs) to expectant mothers attending ANC clinics. 68.5% of 555 households reported having mosquito nets, most (72.4%) of which had been sourced from the MoH or Mission hospitals, while

25.3% and 2.4% had obtained the nets from shops and non-governmental organizations (NGOs), respectively. The nets obtained from hospitals and NGOs are treated with long-term insect-repelling chemicals while the ones obtained from shops or vendors may not be treated, which makes it necessary to wash them in the chemicals to repel mosquitoes and other insects. The proportion of households that reported treating nets they had obtained from shops was 49.2%, with 32.5% having treated them less than a month prior to the survey and 28.1% within 1 and 6 months previously. Half (50.0%) of the households had not treated the nets. The reported utilization of the nets during the night preceding the survey was highest (23.9%) among the U5s followed by caretaker/mother(25.5%), children above five years (22.1%), fathers of children (20.4%), and pregnant women (5.8%). It is necessary to facilitate acquisition of the nets for the households without and further sensitize the community on the importance of ITN use in order to achieve universal utilization rates, Isiolo district being a malaria endemic zone, with rains.

7.0.2 Water, Sanitation and Hygiene Practices

There were several sources of water for household use reported by the survey respondents. From the survey responses of 812 HH, 64.4% were using drinking water from safe sources like water tap (50.1%), boreholes (12.1%), and water tankers (2.2%), while the rest were using drinking water from unsafe sources [45]like river (14.7%) and digging along the laga (12.3%). The reported main sources of water (Figure 12) for both general household use were water tap (49.1%), river (15.9%) digging along the laga(12.3%) and boreholes (12.1%). On average, households to about an hour (58.9 SD 90.1) minutes to access their main source of water and used 85.5 (SD 79.0) litres of water daily (which translates to about four 20-litre jerricans). Households buying water in jerricans paid on average Kshs 9.3 (SD 48.2) per 20-litre jerrican, and those with tap water paid an average of Ksh. 419 per month. The findings show very minimal treatment of drinking water at the household level with 89.9% taking untreated water. Cleary the role of untreated water as the main cause of childhood diarrhoea and subsequent levels of acute malnutrition cannot be underestimated. Of the 82 HH (10.1% (7.3-14.4 C.I)) that treat drinking water, 5.1% boiled and 4.9% used water treatment chemicals. Communities should be encouraged to boil their drinking water at the household level, being the most viable and cheap method.

Figure 8: Main Household Water Source



7.0.3 Environmental Sanitation

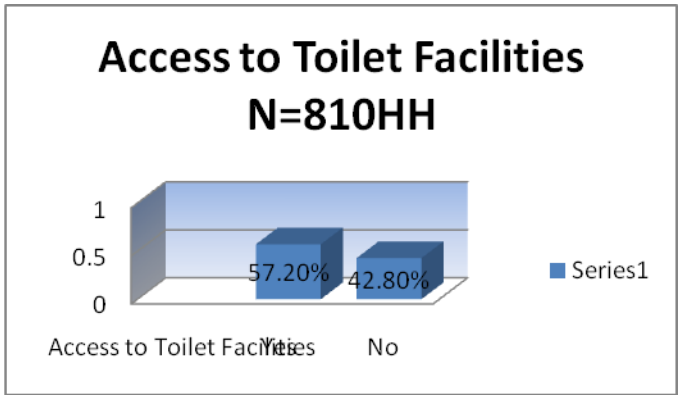
57.2% (53.7-60.6 C.I)of the 810 HH had access to toilet facilities. This is backed up by the current data on latrine access in the district (55%)[46].The 42.8% without access are predisposed to related diseases. The alternative sanitation measures used by these HH were the bushes (84.0%) and open field (8.7%).This is attributed to the migratory and socio-cultural lifestyles of the predominantly pastoralist communities resident in these areas. However, the latrine access has improved from 47% in 2010. It was also confirmed through observation that a significant proportion of children's feaces are also disposed of unhygienically (37.6%), and24.9% of compounds were unclean. The use of open bush/field for faecal disposal coupled with consumption of water from open sources, poses a risk of contamination of drinking water, a pre-disposing factor to diarrhoeal diseases and acute malnutrition. This makes it necessary to educate the community on the health implications of unhygienic faecal disposal. 11.4% of the mothers reported not washing hands before feeding their child, 88.6% (86.0-90.8C.I) practiced basic hygienic hand washing practices.

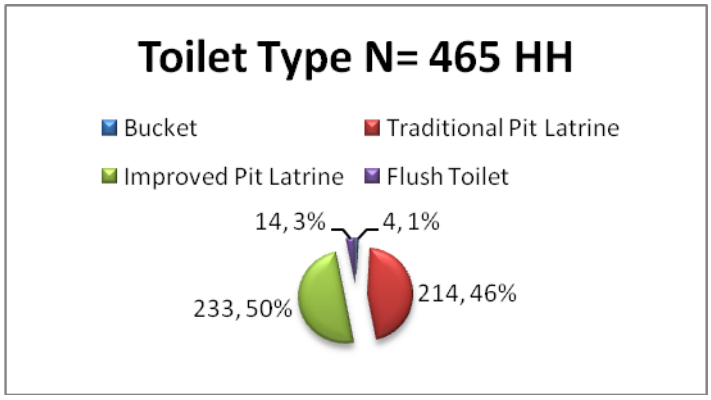
For those who had access to toilets, the types of toilet facilities available in the district were mostly ventilated improved latrines (50.1%) and traditional pit latrines(46.0%) with a small proportion of well-off families using flush toilets(2.8%).

Figure 9: Access to Toilet and Toilet types

[45] Unsafe water sources are defined from the household questionnaire as: River, Lake, Unprotected well, Public pan, Dam and Laga.

[46] DPHN-Isiolo District





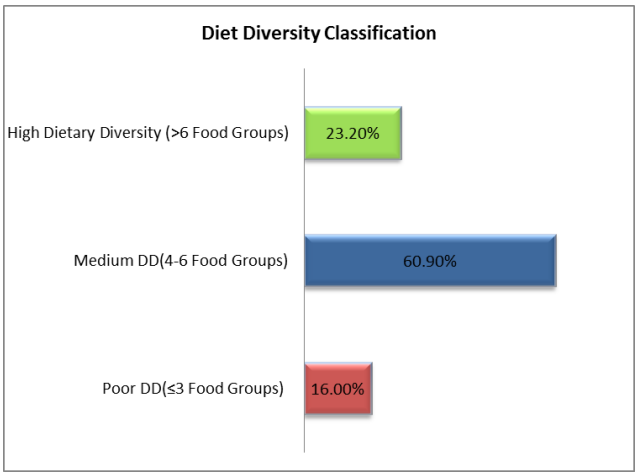
8.0 Household Food Security Indicators

8.0.1 Household Food Consumption, Dietary Diversity and Coping Strategies

On the whole, the reported usual/normal frequency of taking meals by households was 2.5 SD 0.7 times while the one reported for the previous day was 2.4 (SD 0.7). A comparison of means analysis shows a significant variance between the frequency for the means of normal/usual intake and that of the previous 24 hours (P< 0.01). Likewise, an analysis of difference between proportions shows that there was a significant difference between the proportion of households reporting having taken 3 meals the previous day (57.0%) and the usual/normal proportion (53.0%) of members taking three meals a day (P<0.05). This strongly suggests a current prevailing food deficit situation in the community.

The previous 24-hours' food intake by mothers was used as a proxy to assess household dietary diversity in this survey. Food intake by caretakers is a good estimation of the variety of what other members of the households took (excluding the U5s). The dietary diversity questionnaire is a simple qualitative measure of food intake at household or individual level. At the household level, the dietary diversity score (DDS) is indicative of the ability to acquire a variety of foods, including foods that may not have high nutrient value such as beverages and condiments. The reference period for the DDS may be one, three, or seven days[47]. This survey used the 24 hour recall method to obtain information on the type and of food consumed, using a slightly modified version of the FAO[48] tool. The dietary diversity section of the questionnaire assessed the variety of the diet by summing the number of food groups eaten by caregivers in the 24 hours prior to the interview. The 14 major food groups inquired about are cereals, tubers, vegetables, fruits, meat, fish, eggs, legumes, milk and milk products, fats and oils, sugar and sweets, beverages and miscellaneous(spices, sweets, unsweetened beverages).

Figure 10: Diet Diversity Classification



The analysis of findings was conducted using the FAO classification framework. A diverse diet was indicated by consumption of four or more food groups. Analysis of aggregate data of the 543 caretakers indicates a mean Individual Diet Diversity Score (I DDS) of 5.2 (SD 1.79) and median of 5.0 for the number of food groups consumed. Overall, majority of the caretakers consumed at least four food groups in the previous 24 hours (above the threshold for a diverse diet). However, 10.5% HH have a diet diversity score of <3, which highlights serious food insecurity[1]

Table 25: Main Sources of Foods Consumed

Diet Diversity Classification * Main Source Crosstabulation

			Main Source					
			Own Production	Purchase	Food Aid	Borrowed/Credit	Gifts/Bartered	Total
Diet Diversity Classification	Poor DD	Count	3	68	4	1	3	79
		% of Total	.6%	12.8%	.8%	.2%	.6%	14.9%
	Medium DD	Count	20	267	33	6	1	327

[47] Household Dietary Diversity Score (HDDS) for Measurement of Household Food Access: Indicator Guide, VERSION 2, 2006,

[48] FAO Guidelines for measuring dietary diversity, March 2007.

		% of Total	3.8%	50.3%	6.2%	1.1%	.2%	61.6%
	High DD	Count	0	123	0	2	0	125
		% of Total	.0%	23.2%	.0%	.4%	.0%	23.5%
Total		Count	23	458	37	9	4	531
		% of Total	4.3%	86.3%	7.0%	1.7%	.8%	100.0%

During the completion of the section on consumption the respondent was asked to identify the main source of food. From this it was observed that, as a main source, as much as 86.3% and 7% of food comes from purchases and Food Aid respectively. With increasing food prices, the diversity is set to decrease. Few of the food items reported by the HH are sourced from "own production" is likely to reflect the fact that a large proportion of the population are pastoralists, many of the commodities listed in the DD questionnaire are not grown in the district and that there have been adverse growing conditions in the agropastorol zone during the last season. 'Borrowed on credit' and 'Gifts from relatives/friends' would reinforce the idea that sharing between households is a relatively common occurrence.

Figure 11: Foods consumed in 24-hour recall

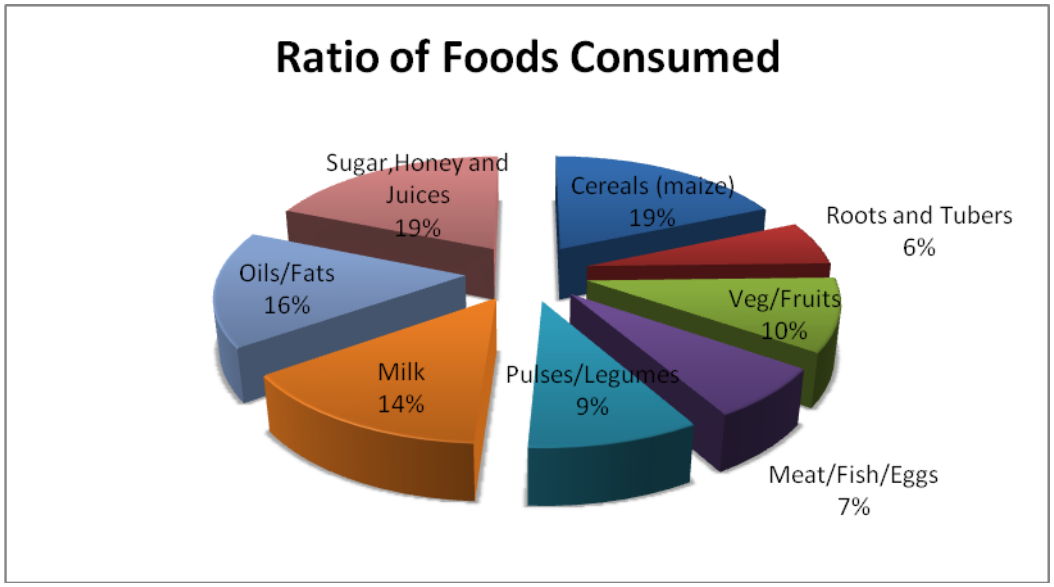
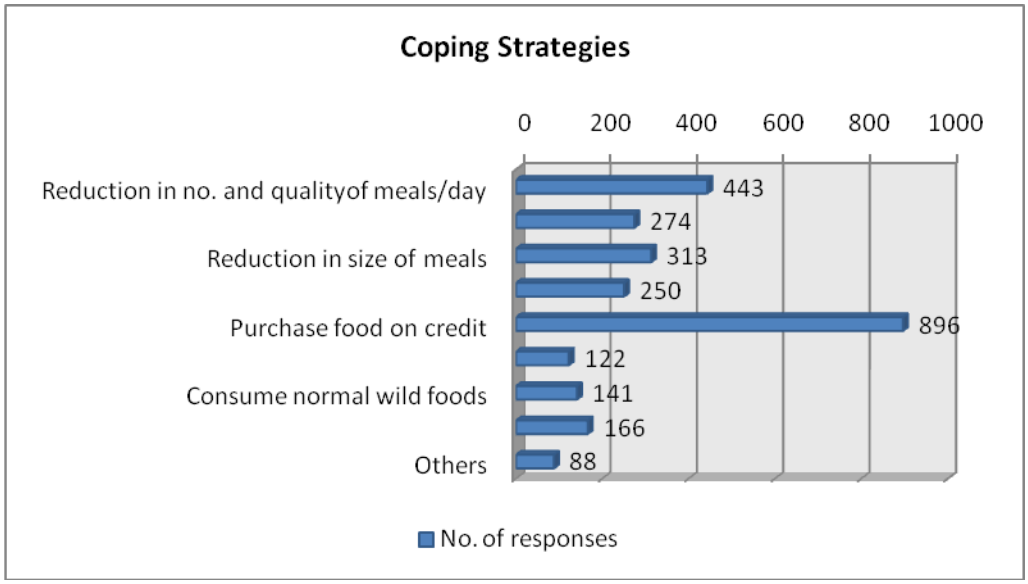


Figure 9 shows that the most common food consumed by the households were sugar, cereal based food items (mainly maize and maize-meal(CSB) and pasta), oils and fats(commercial fats, animal fats and home-made ghee) and milk. In the surveyed HH, the major sources of protein are milk and pulses/legumes (beans). A very small proportion of caretakers consumed meat, eggs, vegetables and fruits. The uncharacteristic low consumption of meat among this pastoral HH was explained in FGDs by the poor body condition and productivity of livestock due to the on-going drought, which had also led to out-migration of animals at time of survey. Vegetables and fruits were inaccessible because of increased prices. In addition, lack of sufficient nutritional knowledge on the importance of the consumption of food groups such as vegetables, fruits, eggs and pulses due to cultural reasons that shape food selection habits, also attributed to the low consumption of these food groups. With regard to caloric provision, sugar, cereals, Unimix and oil/fats still remain the important sources of calories in the district. As expected the caloric provision of sugar amongst the study population was high as it is consumed almost in all the meals (The people of the community normally add sugar to all types of food e.g pulses, rice, injera etc in addition to high sugar consumption in tea and commercial juices).Overall, this indicates a poor balanced diet in most households, which is exercabated by the current high food insecurity situation. Significantly is that this Food Aid food basket (Maize, CSB, pulses and oils) contributes significantly to a balanced diet. Without it, in the diet, food diversity/quality was generally poor in the district at the time of the survey.

Coping Strategies

A high proportion (94.5%) of households reported that all members took the meals prepared the previous day, with the main reason given for those (5.4%) who did not take meals at home being that they had taken their meals elsewhere (68.8%) and lack of adequate food in the household (31.3%). During the previous 2-month period, close to half (47.3%) of the sampled households reported having experienced a food shortage. As shown in Figure 10, 4 out of the 5 main food stress coping mechanisms employed by households implied reduced nutrient intake by household members. These include reduction in the number and quality of meals taken (16.5%), reduction in the size of meals (11.6%) and skipping food consumption for an entire day (10.1%). In Isiolo district where purchase is the main source of food, purchasing power has reduced dramatically, resulting in buying food on credit becoming the major coping strategy (33.3%), a clear indicator that food insecurity is a major cause of malnutrition.

Figure 12: Coping Strategies



8.0.2 Food Aid

During the survey period, Isiolo has been under Emergency Operations, now Protracted Relief and Recovery Operation (PRRO) since 2004, distributed through the implementing agency Action Aid. EMOP is currently in Phase 11(Jan-October 2011). PPRO consists of General Food Distribution (GFD), Food for Assets (FFA), Protection Ration(P.R) and targeted SFP and OTP.

The GFD mode provided most of all food aid (80.2%), with FFA providing 12.4%, PR-4% and the other 3.4% received from the DC or mosque.When asked if they had received food aid in the previous 3 months, a relatively high proportion of respondents (63.1%) replied in the affirmative with the majority (39.5%) of those who had received having done so within the previous 1-2 months, 33.7% within the previous 1 month and the rest (26.8%) more than 2 months previously. As shown in Table 26, the biggest amount of foodstuff received was maize, with households reporting receiving, on average, 32.5 (SD 23.4) kgs, followed by beans(19.4 SD 33.8) kgs, rice(9.6 SD 12.5) kgs, maize/corn meal (9.1 SD 12.4) kgs, and peas(4.5 SD4.0). The food aid received lasted the recipient households an average of 10 (SD 11.1) days.

Table 26: *Quantities of food aid received by households*

Type of food	Quantity received (mean)	SD	How long did food last (mean)
Maize	32.5kg	23.4	20.5
Maize/corn meal	19.4kg	33.8	17.5
Rice/Sorghum/Wheat	9.6 kg	12.5	8.9
Beans	9.1kg	12.4	12.2
Peas	4.5kg	4.0	8.5
CSB(Corn Soy Blend)	4.0kg	3.1	8.4
Vegetable Oil	2.0kg	1.7	9.6

The utilization of food aid indicates that households consumed less amount of food compared to what was received from the final distribution points (FDP), this was mainly because of inter household food sharing (17.7%) and sale of relief food as a source of income or saving for seed (0.8%). Also, during this time of drought, there was a particular challenge of under targeting, especially since mobile populations are not specifically targeted. The coverage is set to be reviewed upwards, according to lead agency.

The lead agency's records(Action Aid) indicated that each person residing in a targeted household received a75% ration size; that included; 10.35kg of cereals, 0.6kg of oil, 1.2kg of CSB, and 1.8kg of pulses. These amounts were adequate to provide the required daily kilocalories[49]. With rampant inter-household sharing and sale of relief food, it is likely that this leads to reduced ration levels and kcal per person per day.

Table 27 gives estimates of actual ration sizes per person per month based an average household size of 6 persons:

Table 27: Estimated actual ration per person per month

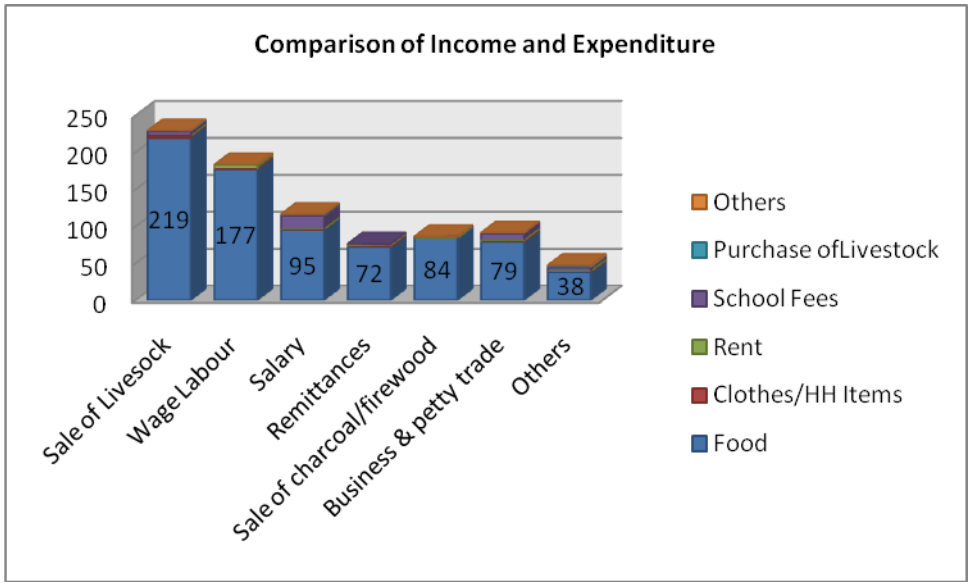
[49] Based on UNHCR/UNICEF/WFP/WHO Guidelines for Food and Nutrition Needs in Emergencies

Type o f food	Quantity (kg)		
	Mean /household	Expected /person (75% ration)	Estimated actual per person
Maize	21.8	10.35	3.5
Pulses (lentils)	5.5	1.8	1.0
CSB	10.8	2.4	1.8
Oil	2.6	0.6	0.5

8.0.3 Sources/Use of Income and Wealth Ranking

Overall, the inhabitants of Isiolo district (Figure 11) depended on three main sources of income during the previous 3 months namely; sale of livestock and livestock products (28.4%) wage labour (23.3%) and salary (14.4%). Other sources of income included business/petty trade (11.2%) and sale of charcoal/firewood (10.8%). The mix in incomes may be a reflection of the shift of the traditional occupation of a pastoral community, most households having lost their animals in recurrent droughts, have settled near the urban centres and have resorted to wage labour, charcoal /firewood selling and petty trade as a source of income. Figure 11 also shows that food purchase was the main expenditure, again a reflection of food insecurity.

Figure 13: Income and Expenditure



Further reinforcing poor food security in the district, is the livestock situation which indicates that of the 382HH that kept livestock, more than half (53.4%) had a reduction in stocks, mainly due to death because of drought (65.1%). The FGDs indicated that though livestock body condition is improving with the current rains, milk availability is still poor- impacting on nutrition status of women and children. The FGDs indicated that within the wealth ranking system, the bigger majority is ranked as medium and poor. The data also indicated that on average, there is one breadwinner in the HH, and this is also the main decision-maker. Of concern is that 30.1% of all HH reported having no breadwinner with income that directly benefits the HH. This may indicate that these HH mainly rely on female caretaker who is a housewife that has no viable livelihood activity.

The impact of livelihoods and income cannot be underestimated because food accessibility is both asset and food-based. Where HH are reliant on their own food production household food security is affected by seasonality changes. This phenomenon is more severe amongst HH dependent on livestock production and farming as their main source of both food and income. Across the board, the current food security situation was attributed to scarcity of food resources and water because of prolonged drought which has hit the whole district.

In FGDs the main causes of food insecurity and malnutrition in the community were attributed to:

- Cyclic droughts that reduce animal stocks
- High cost of living especially increasing food prices
- Environmental degradation (overgrazing)
- lack of technical skills,
- ignorance and
- Frequent migration of animals which supply milk and meat

The main suggestions for addressing the problems outlined above are:

- Poverty eradication through income generating activities.

- Restocking.
- Improve farming activities.
- Training mothers and other community members on health.
- Family planning and child spacing

9. DISCUSSION

9.1 Nutritional Status

Nutritional status of 6-59months old in Isiolo District (WHO 2006)

Table 28: Summary of Nutritional Indicators of 6-59 Months Old Children in Isiolo Nutrition Survey

Nutritional indicator	**N**	**Weight-for-length/height (Acute Malnutrition) -Wasting**			
		SAM < -3z-score	(95% CI)	GAM < -2z-score	(95% CI)
Weight-for-length/height	741	**2.6%**	**(1.8-3.7)**	**15.7%**	**(12.0 - 20.2)**
		Weight-for-Age (Underweight)			
		Severe Underweight		Underweight	
Weight-for-Age (Underweight)	742	4.4%	(3.0-6.5)	22.1%	(17.9-27.0)
		Length/Height for Age (Chronic Malnutrition)- Stunting			
		Severe Stunting		Stunting	
Length/height-for-Age (Stunting)	725	5.2%	(3.5-7.7)	19.7%	(16.5-23.4)

The overall sex ratio of the survey sample was 1.0 which indicates that boys and girls were equally represented as a whole. The sample was also within the acceptable ranges between all age groups and thus this survey used a valid and unbiased sample.
The results indicate **emergency levels of acute malnutrition** because they are above the WHO critical levels set at 15% for GAM [50]. The SAM levels are high but below the emergency levels of >4%. The levels of underweight- 22.1% (17.9-27.0) and stunting- 19.7% (16.5-23.4) are also alarming. The reported high rate of stunting shows the effects of cumulative chronic food insecurity and recurrent illnesses overtime. No incidence of oedema was reported in the survey.

There is a deterioration, but non-significant increase in acute malnutrition levels (Weight for Height Z-score)compared to the SCUK small sample survey of Isiolo district in February 2011 that reported Global Acute Malnutrition (GAM) at 11.3% (CI=8.3 - 15.2) and Severe Acute Malnutrition (SAM) at 0.2% (CI=0.0 - 1.9) among children aged 6-59 months. This survey coincided with the hunger gap period, after failed short rains, when elevated malnutrition rates may be expected to rise. Though long rains have started,

9.2 Mortality

The recall period for questions relating to the mortality questionnaire was 90 days (3 months) from the start date of the survey. This minimised information recall bias and the reported events would have been sufficiently accurate. In addition, data collection and analysis were done using SMART methodology and software so no bias is suspected in the findings.

The survey reported an under-five mortality rate of 0.27/10,000/day and crude mortality rate of 0.12/10,000/day. Both the mortality rates are within the acceptable levels for emergency situations[51]; U5 mortality rate <2deaths/10,000/day and crude mortality rate <1 death/10,000/day. The under-five mortality rate reported is also lower than the rate reported in SCUK small sample survey (0.66/10,000/day) in February 2011. Though mortality rates reported in this survey are at acceptable levels and do not predict future mortality, with the high levels of malnutrition, this may be expected to increase if the conditions do not improve.

9.3 Causes of Malnutrition

When contemplating the increase the % of GAM in relation to the current food security situation several factors need to be considered:

[50] Global Acute Malnutrition (GAM): prevalence of GAM <5% termed as acceptable, 5-9% poor, 10-14% serious and >15% critical.
[51] The Sphere Standards, 2004. Under Five Mortality Rate (U5MR): emergency threshold is 2.3/10,000/day, Alert 1.0/10000/day

1) The GFD is undergoing a phase out process, ration size has been reduced to 75% in Isiolo district and will be reduced further with change to FFA modality.
2) The long rains were already delayed in starting and have been erratic and following failed short rains dry spell, the impact on the animals and food security in terms of foods available and market prices, is already taking toll.
3) High rates of mortality (61.0%) were recorded during the survey period following the start of long rains
4) Rains during the last week in March through to May in Isiolo, have alleviated water shortage but have had little impact on food insecurity.

It is also important to note that the survey was conducted during the the hunger gap period (January-April/May) after a prolonged dry spell since failed short rains, following the La-Nina phenomenon. The effect of the on-going hazards is likely to further lower the resilience of vulnerable groups. With high migration of both people and animals to water points, there has been a reduction in household food security. The marginalization of pastoral livelihoods negatively impacts on the health and nutritional status of all the inhabitants, since they cannot adequately supplement the food basket.

An adequate hunger 'safety net' is crucial so the situation does not deteriorate further. Of paramount importance is rapid response to the impending water crisis. Partners from all sectors need coordinate effectively to buffer the community until the start of the long rains. Any further water stress may tilt the balance into even greater malnutrition and morbidity. With sufficient long rains, the trend should reverse readily however, this is increasingly unlikely with erratic rains so far.

Looking beyond the seasonal shifts, it is important to address the causes of chronic malnutrition. To put it in context 1 in every 5 children is stunted (≈20%GLM). Adequate food alone does not result to improved nutritional status if child care practices such as hygiene and child feeding practices are poor. Malnutrition has been found to be present in food secure households[52]. Though the Z-score findings of the survey did not support 6-29 age-group as the most vulnerable, chi-square analysis indicates that there is indeed a significant difference ($p<0.01$) between the younger (6-23 m) and whole (24-59) sample, when acute malnutrition is expressed in MUAC. This suggests that infant feeding practices are related to malnutrition levels. Protecting optimal infant and young child feeding practices by education of caregivers will go a long way in buffering the U5. Also, the high levels of malnutrition among all the age groups, demonstrates the influence of factors beyond poor child caring practices on the nutritional status of the children. Increased knowledge on dietary diversity for caregivers would benefit the whole family. Given that the availability and accessibility of water in Isiolo district is below the SPHERE standards, the problem may also be related to hygiene practices and inadequate sanitation.

Community concerns were mostly related to food shortage, loss of livestock and increasing food prices. Key informant interviews and observations collaborated this view. Mass vaccinations of shoats and cattle were also being planned- there was already observable deterioration in animal conditions. Evidently, partners are already making efforts to contain the situation.

In the long term, drought preparedness systems need to be strengthened by government policy so that the community becomes better able to cope with persistent drought, the cause of chronic malnutrition. The shift to FFA is also a positive and sustainable step that hopes to curb dependence on food aid and strengthen livelihoods. The key is to help the community 'bounce back' from shock as painlessly as possible.

9.4 Programme Coverage

Immunization and vitamin A/deworming coverage are basic health services and are a reflection of how the population accesses health services. The high immunization coverage rate (over 90%) is commendable. But only 49.2% of caretakers had the EPI immunization cards to confirm the coverage. However, micronutrient supplementation and deworming coverage were below 50%.

The fact that SFP coverage (18.7%) in the survey continues to be a challenge in terms of meeting SPHERE standards, may be an indication that available services may not be fully utilized. No children attending OTP programme were identified during survey, resulting in 0% coverage, using period prevalence. However, using the indirect method for coverage estimation[53], SFP coverage was 64.6% and OTP-25%. The high migration of the population currently may partly explain the reflected low coverage of OTP feeding programmes. Also, a majority of caregivers do not understand the program rationale and commitment to household chores (fetching water and firewood) affects their programme attendance (absentees, defaulters, refusals).

Given the level of malnutrition found, 2581 children (19,698/13.1%) should be enrolled in the SFP programme and 512 children (19698/2.6%) in OTP, using WHZ as admission criteria. So far, the MoH/IMC CMAM program has admitted 1997 Under-fives (U5), 749 pregnant and lactating mothers (PLM) in SFP and 128 U5 in OTP[54]. SFP programme coverage is commendable- the programme coverage is high and meets the sphere standard set out for coverage of therapeutic feeding programmes in rural areas(>50%). The high programme coverage of 64.6% was achieved mainly through sustainable methods of community

[52] International Food Policy Research Institute (IFPRI), 2000, The Constraints of good child care in Accra: Implications for programmes.
[53] Mark Myatt. New method of estimating programme coverage. Community Based Approaches to Managing Severe Malnutrition.
[54] March 2011 SFP/OTP Admission Data

mobilisation. The mobilisation efforts were integrated into existing Ministry of Health outreach system and other community based institutions. Community volunteers, Community Health Workers (CHWs), and malaria agents, all active in routine health facility outreach activities, have played a significant role in community mobilisation, absentee and defaulter tracing[55]. On the other hand, the identification of 118 new SFP/OTP referrals during the seven-day survey period indicates that CHWs need to intensify their efforts in continuous case identification at the community level.

10. CONCLUSION

Overall the key underlying factors of nutrition status are morbidity, inadequate health and nutrition programme coverage, IYCF practices- poor breastfeeding, food frequency and dietary diversity; poor hygiene and lack of adequate and safe drinking water. Integrated approaches should be undertaken to reduce risk factors such as sub-optimal childcare and feeding practices, unsafe drinking water and low access to essential nutrition services. Measures to improve coverage of nutrition programmes would play a critical role in both preventing and treating morbidity and malnutrition. In spite of the current situation, it is important to note the role of chronic food insecurity, increased food prices and inadequate water and pasture which have affected the animal sales and milk availability (hence directly affecting the income of the households) in Isiolo district. Food insecurity remains a big challenge that cannot be ignored and is likely the direct cause of inadequate food intake in the households.

11. RECOMMENDATIONS

Intervention efforts that address both immediate needs for the acute malnutrition cases and chronic malnutrition in the vulnerable population should be mobilized. In addition, developing longer term strategies to enhance the provision of basic services, sustainable strategies for livelihood support and social protection mechanisms are recommended. Specific recommendations include:

Immediate Interventions

Nutrition and Health

- Isiolo district is recommended for targeted SFP and OTP for children age 6 to 59 months to address the micro-nutrient and macronutrient food gap, justified by the critical rate of GAM. This intervention would be most effective with a strong general food distribution system and good coverage for IMAM interventions. Relevant support mechanism should be installed immediately to facilitate this.
- As a contingency measure, households with children recently discharged from SFP programme should be targeted as beneficiaries of GFD, to reduce the relapse cases, due to HH food insecurity
- An immediate up scaling-up of both SFP and OTP interventions modelled on the community-based IMAM with a strong outreach component (beyond and in addition to health-facilities) to cover all divisions of Isiolo district accompanied by strong active case-finding at the community level
- Recruitment of additional CHWs to improve rehabilitation of acutely malnourished children through the existing selective feeding and outreach programs and active case finding until household food security is restored and critical public health issues are addressed. This will require capacity-building in IMAM implementation of CHWs and community volunteers (village health committees) to appropriately identify and manage acutely malnourished children. CHWs should be paid through support from the existing Health Sector Support Fund (HSSF).
- Decentralize essential health components to improve access to health services by:

✓ strengthening outreach vaccination services by providing vaccine carriers and transportation to periphery areas

✓ Strengthen the mobile clinics and community strategy components of primary health care, with a focus on IMAM community-based component.

- Addressing the high morbidity load among U5s and poor access to essential health and nutrition services by strengthening the integrated outreach component- primarily focusing on regular medical outreach camps/mobile clinic to improve access by the nomadic and remote populations.
- Strengthen programmes and strategies currently addressing infant and young child nutrition (IYCN) with a view to improving the protection, promotion, and support of optimal IYCF. Viable action points include:

✓ Formation of peer-led mother-to-mother support groups (MtMSG) and support of existing ones(‘chamas’) as forums to reinforce IYCF key messages, CHW monitoring and feedback and also act as a sustainable avenue in addressing child care issues

[55] DPHN- Isiolo District Hospital

- ✓ Systems strengthening would ensure facility and community level care for pregnant women and lactating mothers This would ensure key support for exclusive breast feeding and iron-folate/Vitamin A supplementation. Efforts such as the MtMSG, Baby Friendly Hospital Initiative and Community Strategy, Malezi Bora as well as outreach efforts should optimize the care for maternal, infant and young child nutrition.
- ✓ As the HINI program is rolled out there is need for continual monitoring of both facility and community based interventions to track progress while also documenting the process to assess the trends in the outcomes as well as impact indicators. Particular attention should go to improved maternal nutrition, iron/folate supplementation during the prenatal period and ensuring ORS/zinc support for diarrhoea.
- ✓ Delivery of key messages could use the following avenues: community-based promotion through CHWs, peer-led mother support groups, and community groups/meetings and religious leaders. Facility-based promotion would include-strengthening mother support groups in facilities and delivery of context and culturally specific IYCN messages. These messages will address key barriers for improved feeding practices as well as improved nutritional recommendations. Recommended areas for key messages include: elimination of pre-lacteals, time of introduction of complementary foods, risks of early or late introduction of complementary foods, food choices and preparation of appropriate complementary foods. Use of national tools/job aids and local adaptation of community mobilization and sensitization strategies (including community level materials), for BCC.
- Improving coverage for child health programmes, especially for Vitamin A supplementation and deworming. This is feasible through strengthening of the outreach component, ensuring that these are distributed concurrently during vaccination campaigns.
- Strengthening of hygiene practices to reduce the incidence of diarrhoeal disease associated with contaminated water in the household including health education to educate the community on domestic treatment of drinking water and effective hand washing (soap/ash) after helping a child in the latrine, during food preparation and before child feeding. This should be backed-up with provision of free water treatment chemicals where feasible.

Water and Sanitation

- Provision of stand-by Gen-set, submersible pumps and fuel subsidy for borehole supplies as emergency drought mitigation measures, for community owned borehole in Isiolo to support free water distribution to communities as well as schools and health facilities.
- Continued water trucking to areas affected by water stress by Ministry of Water and Irrigation and Kenya Red Cross
- Implementation of mechanisms for regular water treatment at water points and establishment of a rota-system to separate human and animal use of earth pans concurrently. This will improve access to safe water in all impact areas.
- Provision of water purification chemicals for water treatment at Household level

Food Distribution, Food Security and Livelihoods Rehabilitation

- Continue GFD until start of short rains and upscale the food aid targets as recommended by DSG assessment considering the poor long rains. In addition, WFP, through Action Aid would support the use of CSB Plus to ensure optimal micronutrient fortified foods for young children.
- Carry out de-stocking programme (livestock off-take), to protect livelihoods.
- Planning and allocation of contingency fund for drought mitigation following the failure of the long rains.

Long-Term Interventions

Nutrition and Health

- Focus on programmes by relevant actors that improve and sustain dietary diversity and consumption of micronutrient.-rich foods. This can be led by assessing the viability of introducing market voucher system (that has been implemented by SCUK in other ASAL districts). This would address improved complementary food access for children six months to two years.
- Establish regular nutrition surveillance through nutrition surveys.
- Strengthen community interventions for high impact nutrition interventions, including maternal micronutrient supplementation during pregnancy (iron and folate), ensuring ORS/zinc support, and critical hygiene and sanitation practices and messages.
- Establish or strengthen outreach health facilities and community and satellite services, and maintain IMAM-trained CHW and community volunteers, with priority in locations with low HC coverage.

Water and Sanitation

- To address the issues of limited access to safe water, there is a need for rehabilitation/protection of water systems including the unprotected wells (e.g. capping of wells), to upscale water storage.
- Orderly and efficient resource utilization should be championed by water-use management committees (members selected by the community) to regulate and reduce conflicts at water points, especially during shortage periods.
- Advocacy/public health campaigns on domestic water treatment such as boiling of drinking water and use of purification chemical to minimise risks of water-borne diseases, should be carried out.

Food Distribution, Food Security and Livelihood Rehabilitation

- Implementation of drought preparedness strategies as well as data collection, monitoring and evaluation should be comprehensively done
- Effective linkages and collaboration between the community and the DSG, an effective feedback system and coordination so as to enhance drought preparedness strategies
- Strengthening by relevant actors of sustainable management of rangelands. During rainy/abundant season, priority activities should be re-seeding of fodder species, controlled grazing and making hay in preparation for downturn.
- Grazing committees to reinforce building reserves during abundant periods and ordered management of rangeland
- Since traditional animal husbandry is very vulnerable to drought, building of alternative and sustainable livelihoods to enhance resilience to drought, with a focus on gender empowerment should be encouraged. This is primarily targeted at increasing the household food security. Initiatives that have shown promise in Isiolo district include bee-keeping and poultry-keeping. This has the additional benefit of increasing HH dietary diversity diversity (e.g. consumption of eggs).
- Livelihoods programmes like FFA and P.R should continue to strengthen sustainable coping strategies during the lean times.
- Improve the road infrastructure to open up markets

APPENDICES

APPENDIX 1: PLAUSIBILITY REPORT

Plausibility check for: KEN_ISIOLO_APRIL2010_IMC.as

Standard/Reference used for z-score calculation: WHO standards 2006

(If it is not mentioned, flagged data is included in the evaluation. Some parts of this plausibility report are more for advanced users and can be skipped for a standard evaluation)

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	**Score**
Missing/Flagged data	Incl	%	0-2.5	>2.5-5.0	>5.0-10	>10	
(% of in-range subjects)			0	5	10	20	**0** (2.2 %)
Overall Sex ratio	Incl	p	>0.1	>0.05	>0.001	<0.000	
(Significant chi square)			0	2	4	10	**0** (p=0.666)
Overall Age distrib	Incl	p	>0.1	>0.05	>0.001	<0.000	
(Significant chi square)			0	2	4	10	**2** (p=0.058)
Dig pref score - weight	Incl	#	0-5	5-10	10-20	> 20	
			0	2	4	10	**0** (4)

```
Dig pref score - height  Incl    #    0-5   5-10     10-20     > 20
                                       0     2        4         10        2 (8)
Standard Dev WHZ         Excl    SD   <1.1  <1.15    <1.20     >1.20
                                       0     2        6         20        0 (1.07)
Skewness  WHZ            Excl    #    <±1.0 <±2.0    <±3.0     >±3.0
                                       0     1        3         5         0 (0.04)
Kurtosis  WHZ            Excl    #    <±1.0 <±2.0    <±3.0     >±3.0
                                       0     1        3         5         0 (-0.10)
Poisson dist WHZ-2       Excl    p    >0.05 >0.01    >0.001    <0.000
                                       0     1        3         5         3 (p=0.001)
Timing                   Excl   Not determined yet
                                       0     1        3         5
OVERALL SCORE WHZ =                   0-5   5-10     10-15     >15       7 %
```

At the moment the overall score of this survey is 7 %, this is good.

APPENDIX 2: CLUSTER ALLOCATION LIST

Central Division	Geographical unit	Population size	Cluster	Wage Labour					
	Bulla Pesa Sub-Loc	23640	1,2,3,4,5,6,7,8, RC,9,10,11						
	Odha Sub-Loc	6161	12,RC,13						
	Burat Sub-Loc	8937	14,15,RC,16	Mixed Farming					
	Isiolo West Sub-Loc	4434	17,18						
	Kiwanjani	3117	19,20						
	Wabera	15018	21,22,RC,23,24 ,25,26						
	Ngare Mara Sub-Loc	3738	27,28	Charcoal Burning/Turkan					

				a					
	Gotu	2005							
Oldonyiro Division	Oldonyiro Sub-Loc	7254	29,30,31,32	Pastrolism					
	Lonkopito	2971	33						
	Kipsing Sub-Location	3545	34,RC						
	Lenguruma Sub-Loc	2240	35						
Merti/Dadashabaza Division	Merti North Sub-Loc.	5018	36,37,38	Pastrolism					
	Merti South Sub- Loc	2611	39						
	Bisan Biliku Sub-Loc	1403							
	Kom Sub-Loc	549	40						
	Bulesa Sub-Location	1809	41						
	Goda Sub-Location	1212							
	Malkagalla Sub-Loc.	2264	42						
	Korbesa Sub-Loc	1883	43						
	Mata-Arba Sub-Loc	523							
	Bulto Bonsa Sub Loc	783	44						
	Yamicha Sub-Loc.	1634	45						
	Duma Sub-Loc	371							
	Urura Sub-Loc.	1100							
		Day 1	***Day 2***	***Day 3***	***Day 4***	***Day 5***	***Day 6***	***Day 7***	***Day 8***
	Team 1	1	7	21	36	37	38	39	18
	Team 2	2	8	22	29	30	31	32	19
	Team 3	3	9	23	33	34	35	14	20
	Team 4	4	10	24	40	43	27	15	RC
	Team 5	5	11	25	41	44	28	16	RC
	Team 6	6	12	26	42	45	13	17	RC

APPENDIX 3: DATA COLLECTION CHECKLIST

Date	No.	Division	Location	Village	Cluster No	Supervisor Name	Team No.	No. Households done (Mortality)	No. of Children Assessed	HH Food Consumption No.	Checked by Consultant Yes/No	Under 6 months
04/10/2011	1	Central	Central	Safi-Estate	1	Lilian	1	18	18	18	_	1
04/10/2011	2	Central	Central	Bulla- Bao	2	Mark	2	18	19	18	_	5
04/10/2011	3	Central	Central	Ola-Jarole	3	Dan	3	18	18	18	_	1
04/10/2011	4	Central	Central	Rural	4	Noela	4	18	28	18	_	2
04/10/2011	5	Central	Central	Bulla-Zamani	5	Alex	5	18	18	19	_	4
04/10/2011	6	Central	Central	Bulla-Kati	6	Marylyne	6	18	20	18	_	1
04/11/2011	7	Central	Central	Kambi-Turkana	9	Dan	3	18	18	18	_	0
04/11/2011	8	Central	Central	Bulla-Arera	8	Mark	2	18	20	18	_	5
04/11/2011	9	Central	Central	Soko-mjinga	7	Lilian	1	18	18	18	_	2
04/11/2011	10	Central	Central	waso	10	Lea	4	18	18	18	_	0
04/11/2011	11	Central	Central	Milimani	11	Alex	5	18	18	19	_	4
04/11/2011	12	Central	Central	Odha-Odha	12	Marylyne	6	18	24	18	_	6
04/12/2011	13	Central	Central	Soweto	21	Lilian	1	18	18	18	_	1
04/12/2011	14	Central	Central	Chechelesi	22	Mark	2	18	11	18	_	4
04/12/2011	15	Central	Central	Wabera	23	Dan	3	18	18	18	_	3
04/12/2011	16	Central	Central	Tuluroba	24	Noela	4	18	14	18	_	0
04/12/2011	17	Central	Central	Acacia	25	Alex	5	18	22	18	_	2
04/12/2011	18	Central	Central	Kambi-Asharaf	26	Marylyne	6	18	19	18	_	1
13/4/2011	19	Merti	Merti	Shambole	36	Lilian	1	18	12	18	_	1
14/4/2011	20	Merti	Bulesa	Bulesa	41	Alex	5	18	15	18	_	1
14/4/2011	21	Merti	Merti	Lakole	37	Lilian	1	18	13	18	_	1
13/4/2011	22	Oldonyiro	Oldonyiro	Loruko	29	Dan	3	18	18	18	_	1
14/42011	23	Cherab	Malkagala	Malkagala	42	Marylyne	6	19	15	18	_	0
14/4/2011	24	Merti	Bisan-Biliqo	Komu	40	Noela	4	18	18	18	_	2
14/4/2011	25	Oldonyiro	Oldonyiro	Matundai	30	Dan	3	18	17	18	_	3
14/4/2011	26	Oldonyiro	Kipsing	Lengurma	35	Mark	2	18	12	18	_	2
13/4/2011	27	Oldonyiro	Oldonyiro	Longopito	33	Mark	2	18	17	18	_	2
15/04/2011	28	Oldonyiro	Kipsing	Kipsing	34	Mark	2	18	21	18		1
15/4/2011	29	Cherab	Iyamicha	Dadacha-Basa	45	Marylyne	6	18	18	18		4
14/4/2011	30	Cherab	Korbesa	Bulto-Bonsa	44	Alex	5	18	17	18		0
15/04/2011	31	Cherab	Korbesa	Korbesa	43	Noela	4	18	15	18		2
15/04/2011	32	Merti	Merti	Manyatta Sakuye	38	Lilian	1	18	16	18		1
16/04/2011	33	Central	Central	Camp Garba	13	Marylyne	6	18	20	18		3
16/04/2011	34	West	west	Kilimani	14	Mark	2	18	17	18		1
16/4/2011	35	East	Ngaremara	Daaba	28	Alex	5	18	19	18		4
16/4/2011	36	East	Ngaremara	Kiwanja	27	Noela	4	18	13	18		4
16/4/2011	37	Oldonyiro	Oldonyiro	Kambi juu	32	Dan	3	18	17	18		4
15/4/2011	38	Oldonyiro	Oldonyiro	Narasha	31	Dan	3	18	18	18		4
16/04/2011	39	Merti	Merti	Manyatta- Gama	39	Lilian	1	18	16	18		1
17/4/2011	40	Isiolo West	west	Kabarnet	15	Noela	4	18	13	18		1
17/4/2011	41	Isiolo East	East	Kiwanjani	20	Mark	2	18	9	18		1

17/4/2011	42	Isiolo Central	west	Lotik	17	Marylyne	6	18	18	18		4
17/4/2011	43	Central	West	Eremet	18	Dan	3	18	18	18		1
17/4/2011	44	East	East	Kiwanjani	19	Lilian	1	18	12	18		3
17/4/2011	45	Central	West	Burat	16	Alex	5	18	18	18		3

APPENDIX 5: QUESTIONNAIRES

SMART NUTRITION SURVEY FOR HIGH IMPACT NUTRITION INTERVENTIONS IN ISIOLO DISTRICT, KENYA

Questionnaire for mortality rate calculation (one sheet/cluster)

Province: _____ District: _____ Division: _____

Village/sub-location: _____ Cluster Number: _____ Date: ____/____/_____

Team Number: _____ T. Leader: _____

HH No	Current HH members[56]		Join HH since New Years[57] (Last 3 months)		Leave HH since New Years[58] (Last three months)		Number of Births since start date (last 3 months)	Deaths since start of New Years (Last 3 months)		Cause of Death	Location of Death
	Total	<5	Total	<5	Total	<5		Total	<5		
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											

[56] Total number (of all ages) currently in the household
[57] Current HH members who arrived during recall period, which is three months (exclude births)
[58] Past HH members who left during the recall period, which is three months (exclude deaths)

13											
14											
15											
16											
17											
18											

Signature of Team leader: _____

Qnn D - Household Mortality Questionnaire

(One sheet per household)

Province: _____ District: _____ Division: _____

Village/sub-location: _____ Cluster Number: _____ Date: ____/____/_____

Team Number: _____ T. Leader: _____ HH No. _____

	1	2	3	4	5	6	7	8	9	10

ID	HH members	Present now (Yes/No)	Present at the beginning of New Year (excluding births)	Left HH after New Year (excluding deaths)	Sex 1=M 2=F	Date of birth *(Enter months for children under 5 years and years for over 5's)*	Born after New Year?	Died after New Year	Cause of death*	Location of Death**
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										

Instructions for asking deaths: This is a sensitive/emotional question especially if the HH had just lost a child!

Tally (these data are entered into ENA for each household):

Current HH members total	
Current HH members <5y	
Current HH members joining the HH - total	
Current HH members joining the HH <5y (excluding births)	
Past HH members leaving the HH - total	
Past HH members leaving the HH <5y (exclude deaths)	
Number of births since start data (last 3 months)	
Deaths total	
Deaths <5y	
Total births	

***CAUSES OF DEATH:**

0 = N/A [Applies to Qns 12 and 13 only)
1= Diarrhoea (minimum of 3 watery stools/24hrs)
2= Bloody Diarrhoea;
3= Malaria (Fever with malaria-like chills)
4= Measles (fever with skin rash, red eyes)
5= Lower respiratory tract infection (fever, productive cough, chest pain, difficulty breathing)
6= Malnutrition (bilateral oedema and or wasting)
7= Accidents/Killed
8= Old Age
9=Other (specify) _____
10=Unknown

****Location of Death**: 1= In current location; 2=During Migration; 3= In last place of residence 4= Other (Specify)_____

Qnn A: Household Questionnaire Nutrition and Food Security Survey for Isiolo District

Name of District	Name of Division	Division No	Name of Village/ Sub-location	Cluster No	Household No	Date of Interview (dd/mm/yy)	Name of Interviewer	Name of Team Leader	Team No
						_____/_____/_____			

*Note: This Questionnaire must be filled in **ALL the households visited** regardless of whether they have children 6-59 months or not.*

Household Demographic Information:

1. How many people live in this household together and share meals? (Household size) [_____] .
2. How many of them are: Total < 5 years [_____] Total 0-<6 months [_____] Total 6-59 months [_____] Total > 5 years [_____]
3. Who is the head of this household? [_____] (**Codes: 1=Husband 2=Self (Mother) 3=My parent 4=Other (specify)** _____
4. Is your family monogamous or polygamous? [____] (**Codes: 1=Monogamous 2=Polygamous 3=Single parent**) **(If Monogamous SKIP to Q6)**
5. **If polygamous (i.e. Q4 =2)**, how many wives does your husband have? [_____]
6. **Household Water Sources and Consumption**

6.1 What is your current MAIN source of water for general household use? Codes: 1=River 2=Lake 3=Tap water 4=Borehole 5=protected well 6=Unprotected well 7=Public pan 8=Water bowser/tanker 9=Dam 10=Digging along the Laga 11=Rain water 12=Other _____	6.2 How long does it take to go to the MAIN source of water, fetch it and come back (including waiting time at the water point) in minutes?	6.3 On average, how many jerricans of water does the household use per day? [Enter in litres]	6.4 How much do you pay for a 20 litre jerrican of water currently? (enter zero if water is free)	6.5 What is your Current main source of DRINKING water? Codes: 1=River 2=Lake 3=Tap water 4=Borehole 5=Protected well 6=Unprotected well 7=Public pan 8=Water bowser 9=Dam 10=Digging along the Laga 11=Rain water 12=Other Specify_____	6.6 Do you do anything to the water before drinking it? Codes: 1=Nothing 2=Boiling 3= Add chemicals 4= Use traditional herbs 5=Filters/Sieves 6=Decant
Main source	Minutes	Litres	Kshs		

Household Food Consumption

7. **Usually,** how many times does your household take meals in a day? [_____]
8. How many times did the household take meals **YESTERDAY?** [_____]
9. Did **all eligible** members of your household (excluding those who are away from home or very young children) take all the meals prepared **YESTERDAY?** [_____] (**Codes: 1=Yes 2=No**)
10. **(If NO),** for what reason did some members who were present not take ALL meals? [_____] **Codes: 1=Not enough food 2=Took meals elsewhere 3=Food prepared not suitable for them**

Maternal Health Care Information

11. Are you aware of any mother support/breastfeeding groups in your village? [Excluding HIV/AIDS/Self help groups, merry-go rounds, home-based care groups] [_____] **Codes: 1=Yes 2=No**
12. **[IF YES],** are you a member of any of the groups? [_____] **Codes: 1=Mother Support group 2=Breastfeeding group 3=No**
13. During your last pregnancy, did you attend Ante-Natal Clinic (ANC)? [_____] **Codes: 1=Yes 2= No 3= Mother never delivered [If Never delivered SKIP to Q 19]**
14. **[IF YES],** how many times did you attend the clinic? [_____]
15. **[IF NO],** why did you not attend? [_____] **Codes: 1=Not aware of existence/importance of ANC 2=Health facility too far 3=Unfriendly health workers 4=TBA services adequate 5= Cultural barriers e.g. staff too young, male staff etc 6=Other (Specify)**_____

16. Where did your last delivery take place? [_____] **Codes: 1=At home by TBA 2=At home by Nurse 3=At home without assistance 4=Hospital**
17. **[If at HOME],** how long did it take before you took child to clinic? [_____] **Codes: 1=Within first 2 weeks 2= Between 2 weeks and 1 month 3=After 1 month 4= Child not taken/does not intend to take child to clinic**

18. After your last delivery, did you receive vitamin A supplementation? (Show mother Vitamin A Capsule) [_____] **1= Yes 2= No**

19. **Food consumption for mother or primary child giver**: Since you **(mother)** woke up yesterday morning to the time you slept in the evening, what types of food and drinks did you take? Enter 1 for food groups reported as having been consumed and 0 for those not consumed. If a food group was consumed more than once, entre 1 only once. [Do not read the list to the respondent]. [This question applies only to the caretaker and not any other household member]

	Food group	Examples	1=Yes 0=No	**19b)** What was the **main** source of food consumed in HHD yesterday?
19.1	**Cereals and Cereal Products**	Maize, rice, pasta, ugali, porridge, bread, biscuits, millet, sorghum, wheat [and any *other locally available grains*]	19.1	
19.2	**Fish and Sea Foods**	fresh or dried fish or shellfish	19.2	
19.3	**Roots and Tubers**	Irish potatoes, sweet potatoes, yams, cassava, or foods made from roots or wild roots and tubers	19.3	
19.4	**Vegetables**	Sukuma wiki, cabbages, carrots, spinach, and any other locally available vegetables including wild vegetables	19.4	Codes: 1= Own production 2= Purchase 3= Gift from relatives 4= Food aid 5= Bartered 6= Borrowed/credit 7= Wild food 8= Other (Specify) [_____]
19.5	**Fruits**	Oranges, ripe bananas, mangoes, avocados,	19.5	
19.6	**Meats and Poultry**	Camel, beef, lamb, goat, rabbit, wild game, chicken or other birds, liver, kidney, heart or other organ meats or blood-based foods	19.6	
19.7	**Eggs**	Chicken, bird eggs	19.7	
19.8	**Pulses / Legumes / Nuts and Seeds**	Beans, peas, lentils, nuts, seeds or foods made from these	19.8	
19.9	**Milk and Milk Products**	Fresh/fermented milk, cheese, yogurt, or other milk products	19.9	
19.10	**Fats and Oils**	Oil, fats, ghee, margarine or butter added to food or used for cooking	1910	
19.11	**Sugars / Honey and Commercial Juices**	Sugar in tea, honey, sweetened soda or sugary foods such as commercial juices, chocolates, sweets or candies	19.11	
19.12	**Miscellaneous**	Spices, sweets, unsweetened beverages,	19.12	

20. **Sanitation – Toilet facility**

20.1. Does your household have access to a toilet facility that you use? [If NO, Skip to 20.3] 1=Yes 2=No	**20.2. (If yes), what type of toilet facility do you have?** 1=Bucket 2=Traditional pit latrines 3=Ventilated improved pit latrine 4=Flush toilet 5=Other Specify _____	**20.3. (If No), where do you go/use? (probe further)** 1= Bush 2=Open field 3.=Near a water source 4.=Behind the house 5.=Other (specify)_____	**20.4 [OBSERVE] how children's faeces is disposed** 1= disposed of immediately and hygienically 2= Not disposed (scattered in the compound)	**20.5 Do you wash your hands before you feed your child?** 1 = Yes 2 = No	**20.6 [OBSERVE] Is the compound clean?** 1 = Yes 2 = No

21. **Food Aid**

21.1 Did your household receive **any food relief** distributed between January and April this year? [____]1**= Yes** 2**=No** [If NO skip to Q22]

21.2 [IF YES], which programme did you receive relief from? **1=**Protection Ration **2=**GFD **3=** FFA **4=**Others (Specify) [_____]

21.3 If Yes when? [_____] 1**=** Less than 1 month ago 2**=** between 1 and 2 months 3**=** Over 2 months ago

21.4 **(If YES)** Please indicate the food commodities received in the last distribution, quantity received, how it was utilized and duration that each foodstuff lasted.

		How was each of the foodstuffs received used? **Multiple responses possible** (Please TICK appropriately)					How many days did each of the received food last?
FOOD AID COMMODITY	QUANTITY Received(KGS)	Resold	Bartered	Shared with kin	Saved for seed	Consumed In the HHD	
21.6 Maize							
21.7. Beans							
21.8 Corn meal/maize meal							
21.9 Vegetable oil (litres)							
21.10 Peas							
21.11 CSB (Corn soya blend)							
21.12 Rice/Sorghum/Wheat							

22. **Coping Strategies**

	22.1 In the previous TWO months, (**i.e. Since FEBRUARY)** did your household experience a food shortage? [_____] **1=Yes 2=No [If NO Skip to Q23]** **[If Yes]** what did you do to **mitigate/solve** the food shortage? First tick all the coping strategies mentioned. Do not read the list to the respondent but **PROBE** **COPING STRATEGIES**	**22.2 [IF YES]**, How many times **in a WEEK (Frequency)** did HHD engage in the coping strategies mentioned? **Enter Number of times**
22.3	Reduction in the number of meals per day	22.3
22.4	Skip food consumption for an entire day	22.4
22.5	Reduction in size of meals	22.5
22.6	Restrict consumption of adults to allow more for children	22.6
22.7	Feed working members at expense of non-working	22.7
22.8	Swapped consumption to less preferred or cheaper foods	22.8
22.9	Borrow food from a friend or relative	22.9
22.10	Purchase food on credit	22.10
22.11	Consume wild foods (normal wild food)	22.11
22.12	Consume toxic/taboo foods (acacia pod/bitter fruit)	22.12
22.13	Consume immature crop	22.13
22.14	Consumption of seed stock	22.14
22.15	Send children to eat elsewhere e.g. neighbours, school, religious centres	22.15
22.16	Withdraw child(ren) from school	22.16
22.17	Begging or engaging in degrading jobs	22.17
22.18	Individual migration out of the area	22.18
22.19	Household migration out of the area	22.19
22.20	Sale of farm implements	22.20
22.21	Sale of milking livestock	22.21
22.22	Sale of household goods	22.22
22.23	Disintegration of families	22.23
22.24	Abandonment of children or elderly	22.24
22.25	Sale of charcoal and/or fire wood	22.25
22.26	Part of family migrating with animals to look for grazing	22.26
22.27	Ask for food assistance from religious organizations	22.27

23. **Possession and Utilization of ITNs**

23.1 **Does this household have a mosquito net or nets?** **Codes:** 1 = Yes 2 = No **[IF NO, GO TO Q 24]**	23.2 **[If YES], Where did you get it from?** **Codes:** 1 = A shop/vendors 2 = An agency/NGO 3 = MOH/Mission hospital **[If 2 or 3 Skip to Q 23.5]**	23.3 **[If from the shop] Have you ever treated your net (soaked or dipped it in dawa or chemical to repel mosquito or insects)?** 1 = Yes 2 = No [If NO, Skip to 23.5]	23.4 **[If YES], When did you last treat it?** **Enter code** 1) Less than one month ago 2) Between one and six months ago 3) More than six months ago 4) Cannot remember	**23.5 Who slept under the mosquito net last night? (Probe - enter all responses mentioned)** **1**) Children less than 5 years **2**) Children over 5 years **3**) Pregnant woman **4**) Non-pregnant woman **5**) Father **6**) Nobody used **7)** Other

24. **Livestock Situation**

	Livestock Size	
24.1	Has the number of your livestock changed since the **last rainy season [October/November]?** **Codes** **Codes: 1=**Increased **2=**Reduced **3=**Remained the same	
24.2	If increased/decreased what are the reason(s)? **Note: Multiple responses possible** **Codes:** (**1**= Animals gave birth **2**= Bought **3=** Given **4**= Death because of drought **5**= Death because diseases **6**= Sold **7**= Raid **8**= Other (specify)---------	

25. **Sources of Income**

25.1	**Main Source of Income**	
	In the last **three** months **[i.e. Since JANUARY this year]** what was the **MAIN** source of income for your household? **Codes:** **1=** Sale of livestock **2**= Sale of livestock products **3**= Sale of food ration **4**= Sale of own crop **5**= Wage labour **6**= Salaried employment **7**= Petty trade **8=** Remittances **9=** Sale of charcoal/firewood **10**= Beadwork **11**= Business **12=** Quarrying **13=** Other (Specify) _____	
25.2	In the last **three** months **[i.e. Since JANUARY this year]** what was the **MAIN** expenditure?	

	Codes: **1=** Food **2**= Clothing/Household Items **3**= Rent **4**= School Fees **5**= Purchase of livestock **6=** Other (Specify) _____	

26. **Household Wealth Ranking**

	Household Wealth Ranking	
26.1	According to your community's wealth ranking system, how do other people classify your household?**1**= Better off **2**= Poor **3**= Very Poor	
26.2	How many people in your household earn some income that **directly benefits** the household?	

Qnn B: Isiolo District Survey - Child Immunization, Anthropometric and Breast Feeding Data Form (Only for Children 6-59 months Old)

1	2	3		4	5	6	7	8	9	10	11	12	13	14	15	16	17		18
HHD No. (Copy from main **HHD Qnn for ALL children)**	Child No	**Child's Intra-Household ID number and Name** Give youngest child in the household ID no 1. If more than one child, record them **sequentially by age**) **Child Intra-HHD** ID No.**	**Child's Name**	**Enter the Age** of child in **months** **(Use Clinic Cards and Calendar of EVENTS**	**Child age Verification** **1**= Vaccination card **2**= Birth certificate **3**= Baptism card **4**= Recall	**Child Sex** 1= **M** 2= **F**	How many times has (Name) received vit A capsules in the last **1 Year?** (Show the mother the Red capsules) If none, enter **zero**	Has (Name) Been Immunized against **measles?*** **Codes: 1**=Yes by Card **2**=Yes by Recall **3**=No **4**=DNK	Has (Name) received **OPV1?** **Codes: 1**=Yes by Card **2**=Yes by recall **3**=No **4**=DNK	Has (Name) received **OPV3?** **Codes: 1**=Yes by Card **2**=Yes byrecall **3**=No **4**=DNK	Has (Name) been dewormed in the last 6 months?) **Codes: 1**=Yes by Card **2**=Yes by recall **3**=No **4**=DNK	**Oedema present?** 1=Yes 2=No	**Height** In **cm** (Nearest 0.1cm) Write down the decimal and do not round off	**Weight** In **KGs** (Nearest 0.1kg) Write down the decimal and do not round off	**MUAC** In **cm** (Nearest 0.1cm) Write down the decimal and do not round off	Has (Name) **ever been breast fed?** 1=Yes 2=No	Is (Name) currently breastfeeding? **1=Yes 2=No** If **NO**, for how long was he/she breastfed? **(in months)** B/F?	Duration	At what age was (Name) given **any liquid or solid food** other than breast milk for the first time after birth **including** water? Convert and record in **DAYS**. If given **immediately** record zero
	1.												.	.	.				
	2.												.	.	.				
	3.												.	.	.				
	4.												.	.	.				
	5.												.	.	.				
	6.												.	.	.				
	7.												.	.	.				
	8.												.	.	.				

	9.													.	.	.			
	10.													.	.	.			
	11.													.	.	.			
	12.													.	.	.			
	13.													.	.	.			
	14.													.	.	.			
	15.													.	.	.			
	16.													.	.	.			
	17.													.	.	.			
	18.													.	.	.			

Name of District _____Name of division_____Division Number_____Sub-Location_____Cluster No. _____ Date of Interview_____/_____/_____TeamLeader _____Team No._____

Note: ** Child Intra-HHD Id No = Number/serial number for each child in a given household starting with the youngest to the oldest child and repeated in each of the households visited. If there is only one child 6-59 months in the household, the Intra-household number for this child = 1

Isiolo District Survey - Child Immunization, Anthropometric and Breast Feeding Data Form (Only for Children 6-59 months Old)

1	2	3		4	5	6	7	8	9	10	11	12	13	14	15	16	17		18
HHD No. (Copy from main **HHD Qnn for ALL children)**	Child No	**Child's Intra-Household ID number and Name** Give youngest child in the household ID no 1. If more than one child, record them **sequentially by age**) **Child Intra-HHD** ID No.**	**Child's Name**	**Enter the Age** of child in **months** **(Use Clinic Cards and Calendar of EVENTS**	**Child age Verification** 1= Vaccination card 2= Birth certificate 3= Baptism card 4= Recall	**Child Sex** 1= **M** 2= **F**	How many times has (Name) received vit A capsules in the last **1 Year?** (Show the mother the Red, Blue & translucent capsules) If none, enter **zero**	Has (Name) Been Immunized against **measles?*** **Codes: 1**=Yes by Card **2**=Yes by Recall **3**=No **4**=DNK	Has (Name) received **OPV1?** **Codes: 1**=Yes by Card **2**=Yes by recall **3**=No **4**=DNK	Has (Name) received **OPV3?** **Codes: 1**=Yes by Card **2**=Yes byrecall **3**=No **4**=DNK	Has (Name) been dewormed in the last 6 months?) **Codes: 1**=Yes by Card **2**=Yes by recall **3**=No **4**=DNK	**Oedema present?** 1=Yes 2=No	**Height** In **cm** (Nearest 0.1cm) Write down the decimal and do not round off	**Weight** In **KGs** (Nearest 0.1kg) Write down the decimal and do not round off	**MUAC** In **cm** (Nearest 0.1cm) Write down the decimal and do not round off	Has (Name) **ever been breast fed?** 1=Yes 2=No	Is (Name) currently breastfeeding? **1=Yes 2=No** If **NO**, for how long was he/she breastfed? **(in months)** B/F?	Duration	At what age was (Name) given **any liquid or solid food** other than breast milk for the first time after birth **including** water? Convert and record in **DAYS**. If given **immediately** record zero
	19.												.	.	.				
	20.												.	.	.				
	21.												.	.	.				
	22.												.	.	.				
	23.												.	.	.				
	24.												.	.	.				
	25.												.	.	.				
	26.												.	.	.				
	27.												.	.	.				
	28.												.	.	.				
	29.												.	.	.				
	30.												.	.	.				
	31.												.	.	.				
	32.												.	.	.				
	33.												.	.	.				
	34.												.	.	.				
	35.												.	.	.				

	36.													.	.	.			

Name of District _____Name of division_____Division Number_____Sub-Location_____Cluster No. _____ Date of Interview_____/_____/_____TeamLeader _____Team No._____

Note: ** Child Intra-HHD Id No = Number/serial number for each child in a given household starting with the youngest to the oldest child and repeated in each of the households visited. If there is only one child 6-59 months in the household, the Intra-household number for this child = 1

Isiolo District Survey – Child Morbidity and Child Feeding Data Form (Only for Children 6-59 months Old) **[Continue from Page 1]**

Name of District _____Name of division_____Division Number_____Sub-Location_____Cluster No. _____ Date of Interview____/____/_____TeamLeader _____Team No._____

1	2	3		19	20	21			22	Questions 23.1 – 23.8 I would like to ask you about the type of foods and drinks the index child(ren) aged 6-59 months ate or drank yesterday from the time they woke up in the morning to the time they slept. [Enter 1 against a food group that is reported as having been consumed by each child 6-59 months assessed in the household and 0 for foodstuffs NOT consumed]. Do not read the list of foodstuffs in the table below to the respondent. Note: 1=Yes 0=No							
HHOLD No. Copy HHD Numbers in exactly the same order in which they appear on **page 1**	Child No.	**Child's Intra- HHD ID number and Name** Copy child **intra-household ID Numbers** and **Names** in exactly the same order in which they appear on **page 1**		Has (Name) been sick **in the last TWO (2) WEEKS)*** 1= Not sick 2= Cough/ARI 3= Measles 4= Eye infect 5= Diarrhoea 6= Malaria 7= Stomache 8= Skin infect 9= Others specify____	When (Name) was sick the **LAST** time did you seek assistance? **IF YES, where?** **1=** Public Clinic/Hospital **2=** CHW **3=** Mobile Clinic **4=** Private Clinic/Pharmacy **5=** Shop/Kiosk **6=** Relative/Friend **7=** Traditional Healer **8=** No Assistance sought	Is (Name) currently enrolled in the hospital Feeding Programme? **1=Yes 2=No** **[If YES**, for how long? [convert time and indicate how long in **days]** **[If YES, indicate which type of programme]** **1=Supplment Feed Prog 2=Theraptic Prog (OTP)**			How many times was (Name) **given meals** since he/she woke up in the morning up to the time of sleeping at night **yesterday?**	23.1 **Grains, Roots or Tubers** Eg Maize, Bread, Sorghum, Wheat, Rice, Pastas, Irish and Sweet Potatoes, Porridge	23.2 **Vitamin-A rich Plant Foods** E.g. Dark green leafy vegetables (e.g. Sukuma wiki, Spinach) and Bright-colored vegetables e.g. Carrots, Pawpaw, Pumpkins	23.3 **Fruits and Other Vegetables** Any other vegetables or fruits eg Oranges, Mangoes, Avocado, Ripe bananas, Cabbages	23.4 **Meat, Poultry, Fish, Seafood** E.g. Beef, Poultry, Fish Shellfish, Organ meats e.g. Matumbo, Liver, Kidney	23.5 **Eggs** E.g. Chicken Bird eggs	23.6 **Pulses Legumes Nuts and Seeds** E.g. Beans, Peas, Nuts, Seeds, Ground Nut	23.7 **Fats and Oils** E.g. Food cooked in oil, Animal fats Ghee Butter, BBand	23.8 **Milk and Milk products** Milk, Cheese Tea with milk
		Child Intra-HHD ID No.**	**Child Name**			In Prog?	Duration	Progrmm									
	1.																
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Isiolo District Survey – Child Morbidity and Child Feeding Data Form (Only for Children 6-59 months Old) **[Continue from Page 2]**

Name of District _____Name of division_____Division Number_____Sub-Location_____Cluster No. _____ Date of Interview____/____/_____TeamLeader _____Team No._____

1	2	3		19	20	21			22	Questions 23.1 – 23.8 I would like to ask you about the type of foods and drinks the index child(ren) aged 6-59 months ate or drank yesterday from the time they woke up in the morning to the time they slept. [Enter 1 against a food group that is reported as having been consumed by each child 6-59 months assessed in the household and 0 for foodstuffs NOT consumed]. Do not read the list of foodstuffs in the table below to the respondent. Note: 1=Yes 0=No						
HHOLD No. Copy HHD Numbers in exactly the same order in which they appear on **page 1**	Child No.	**Child's Intra- HHD ID number and Name** Copy child **intra-household ID Numbers** and **Names** in exactly the same order in which they appear on **page 1** **Child Intra-HHD** ID No.**	**Child Name**	Has (Name) been sick **in the last TWO (2) WEEKS)*** 1= Not sick 2= Cough/ARI 3= Measles 4= Eye infect 5= Diarrhoea 6= Malaria 7= Stomache 8= Skin infect 9= Others specify____	When (Name) was sick the **LAST** time did you seek assistance? **IF YES, where?** **1=** Public Clinic/Hospital **2=** CHW **3=** Mobile Clinic **4=** Private Clinic/Pharmacy **5=** Shop/Kiosk **6=** Relative/Friend **7=** Traditional Healer **8=** No Assistance sought	Is (Name) currently enrolled in the hospital Feeding Programme? **1=Yes 2=No** **[If YES**, for how long? [convert time and indicate how long in **days]** **[If YES, indicate which type of programme]** **1=Supplment Feed Prog** **2=Theraptic Prog (OTP)** In Prog?	Duration	Progrmm	How many times was (Name) **given meals** since he/she woke up in the morning up to the time of sleeping at night **yesterday?**	23.1 **Grains, Roots or Tubers** Eg Maize, Bread, Sorghum, Wheat, Rice, Pastas, Irish and Sweet Potatoes, Porridge	23.2 **Vitamin-A rich Plant Foods** E.g. Dark green leafy vegetables (e.g. Sukuma wiki, Spinach) and Bright-colored vegetables e.g. Carrots, Pawpaw, Pumpkins	23.3 **Fruits and Other Vegetables** Any other vegetables or fruits eg Oranges, Mangoes, Avocado, Ripe bananas, Cabbages	23.4 **Meat, Poultry, Fish, Seafood** E.g. Beef, Poultry, Fish Shellfish, Organ meats e.g. Matumbo, Liver, Kidney	23.5 **Eggs** E.g. Chicken Bird eggs	23.6 **Pulses Legumes Nuts and Seeds** E.g. Beans, Peas, Nuts, Seeds, Ground Nut	23.7 **Fats and Oils** E.g. Food cooked in oil, Animal fats Ghee Butter, BBand	23.8 **Milk and Milk products** Milk, Cheese Tea with milk
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	35.																
	36.																

Isiolo District Survey – Maternal MUAC Data Form [Continued from page 3]

Name of District _____Name of division_____Division Number_____Sub-Location_____Cluster No. _____ Date of Interview____/____/_____TeamLeader _____Team No._____

1	2	3		24	25	26
HHOLD Number Copy HHD Numbers in exactly the same order in which they appear on **pages 1 and 3**	Child No	**Child's Intra-Household ID number and Name** Copy child **intra-household ID Numbers** and **Names** in exactly the same order in which they appear on **pages 1 and 3** **Child Intra-HHD** ID No.**	**Child Name**	Age of Mother/ Primary Childcare Taker in **years**	**Physiological status of mother/child care taker** **1**=Pregnant **2**=Lactating **3**=Preg &lact **4**=Not preg/ not lactating	**Maternal MUAC** **Mother MUST be between 15-49 years For MUAC to be taken** Record maternal MUAC in mm
	1.					
	2.					
	3.					
	4.					
	5.					
	6.					
	7.					
	8.					
	9.					
	10.					
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	12.					
	13.					
	14.					
	15.					
	16.					

	17.					
	18.					

Isiolo District Survey – Maternal MUAC Data Form [Continued from page 4]

Name of District _____Name of division_____Division Number_____Sub-Location_____Cluster No. _____ Date of Interview____/____/_____TeamLeader _____Team No._____

1	2	3		24	25	26
HHOLD Number Copy HHD Numbers in exactly the same order in which they appear on **pages 2 and 4**	Child No	**Child's Intra-Household ID number and Name** Copy child **intra-household ID Numbers** and **Names** in exactly the same order in which they appear on **pages 2 and 4** **Child Intra-HHD** ID No.**	**Child Name**	Age of Mother/ Primary Childcare Taker in **years**	**Physiological status of mother/child care taker** **1**=Pregnant **2**=Lactating **3**=Preg &lact **4**=Not preg/ not lactating	**Maternal MUAC** **Mother MUST be between 15-49 years For MUAC to be taken** Record maternal MUAC in mm
	19.					
	20.					
	21.					
	22.					
	23.					
	24.					
	25.					
	26.					
	27.					
	28.					
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	31.					

	32.					
	33.					
	34.					
	35.					
	36.					

Qnn No C: < 6 MONTH-OLD CHILD BREAST FEEDING QUESTIONNAIRE - ONLY to be filled for Children 0 to <6 Months Old found in the Households visited

- Make every effort to speak with the mother. If she is not available, speak with the primary caregiver responsible for feeding of the child.
- Fill in the identification information in the table below from the **Main Household Questionnaire**

Name of district	Name of Division	Division No	Name of Village/ Sub-location	Cluster No	Household Number	Date of Interview (dd/mm/yy)	Name of Team Leader	Team No
						_____/_____/_____		

1	2	3	4	5	6	7	8	9	10	11	12	13	14
HHD No.	**Child No.**	**Child Name**	**Child Age in DAYS (Convert months to days)**	**Sex of child** 1= M 2= F	**Did (Name) ever breastfeed?** 1= Yes 2= No	**(If No), why did (Name) not breastfeed?** **Codes:** 1= No milk from breasts 2= Refused to breastfeed 3= Traditional beliefs 4= Child deformity 5= Other (Specify)	**(If yes), How long after birth did you put (Name) on the breast? (For those who do not answer immediately, probe why)** **Codes:** 1=Immediate (within 1 hr) 2= Within first day 3- Within first 3 days 4=After 3 days 5=Other (specify) 6= Don't know	**(If Yes), During the first 3 days after delivery, did you give (Name) the fluid/liquid that came from your breasts?** **Codes** 1= Yes 2= No	**In the first 3 days after delivery, was (Name) given anything to drink other than breast milk?** **Codes:** 1= Plain water 2=Sugar/glucose water 3=Animal milk 4=Infant formula 5=Fruit juice 6=Other (Specify)	**Is (Name) still breast-feeding?** **Codes:** 1= Yes 2= No	**(If Yes) how many times did (Name) breastfeed Yesterday?** **Codes:** 1= <5 times 2= >5 times 3= >10 times 4= >12 times 5= Don't know	**Is (Name) taking other foods or drinks including water currently?** **Codes:** 1=Yes 2=No	**(If Yes), at what age did you start giving (Name) other foods and drinks (including water) in Days?** (Convert if months to days)
	1.												
	2.												
	3.												
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	17.												

Questionnaire E: FOCUS GROUP DISCUSSION CHECKLIST

Name of district	Name of Division	Division No	Name of Village/ Sub-location	Cluster No	Date of Interview (dd/mm/yy)	Name of Team Leader	Team No
					_____/_____/_____		

There should be 8-10 people in each FGD. Representation should be sought from a wide cross-section of community members including local leaders, women leaders, TBAs, and community members of different socio-economic status (rich, medium and poor). Separate FGDs should be conducted for men and women.

[Note: Probe ALL responses given]

1. What is the **current** livestock situation in this community in terms of:
    a) Body condition
    b) Pasture availability and condition
    c) Access to animal products by children and women e.g. milk and meat
    d) Any recent serious disease outbreaks
    e) Who makes important decisions e.g. selling and slaughter on livestock (cattle, shoats and chicken)
2. How are the various **socio-economic** groups categorized in this community?
    a. In case of drought or food shortage, which of these groups is most adversely affected? Give reasons why
    b. What proportion of households fall under each of the categories mentioned in this area (cluster) **currently?** (Use proportional piling if necessary).
3. What is the **current food availability situation** in this community in terms of:
    a. Household food production
    b. Availability of food in the market
    c. Prices of food in the market
4. What are the **main coping strategies** that this community has used to deal with food shortage in the **last two months?** List those stated.

5. For each coping strategies listed in **Q4**, ask **when** it is usually practiced: is it when the food shortage situation is **severe or mild?**
6. **At what age** are babies given foods other than breast milk for the **first time** in this community? **(food is any solid or liquid such as animal milk, water, juice, glucose, porridge etc which is not breast milk)**
7. What type of food is **mainly** given to babies for the first time after birth and what are the reasons for giving the mentioned food?
8. What is the major problem facing this community **currently?**
9. What do you think your **Community** can do to recover from the problem listed in **Q8?**
10. What **external assistance** do you think the community would need to recover from the problem listed in **Q8?**
11. What are the main causes of maternal and underfive malnutrition in this community?
12. What do you think should be done at the community level to address this problem among mothers and the children?