INTEGRATED HEALTH, NUTRITION AND FOOD SECURITY SURVEY

EAST POKOT AND MARIGAT DISTRICTS

FINAL REPORT

Consultant Nutritionist
Sophie Ochola (PhD)
Telephone: 651755/552086
Cell Phone: 0721 449 803
sochola@yahoo.com/ocholasa55@gmail.com

Co-funded by UNICEF
Coordinated and implemented by: Ministry of Public Health and Sanitation and World Vision –Kenya

November 2011

ACKNOWLEDGEMENTS

This survey was made possible through the input of various people from the following organizations and government departments; Ministry of Public Health and Sanitation (MOPHS), Ministry of Medical Services (MOMS), World Vision Kenya and UNICEF. I wish to acknowledge the role played by the following people in the planning and coordination of the survey: WVK National Nutrition Coordinator Rose Ndolo; WVK Programme Officer Nutrition Branch Daniel Muhinja; WVK Judith Marisin IPA Manager Marigat IPA; Medical Officer of Health (DMOH) Baringo Central and Marigat Gerishon Abakalwah; WVK Project Nutrition WVK, Lydia Ndungu; and UNICEF Nutrition Officer Joseph Ng'ang'a.

I also wish to acknowledge the role played by Judith Munga the assistant consultant in the planning, training and supervision of the survey. My sincere gratitude also goes to Dr. Festus Kiplamai for his role in data entry and analysis. Special thanks are expressed to the district nutrition officers (DNOs) and other MOH and WVK staff for field coordination of the survey and to the members of the survey teams for their tireless efforts to ensure that the survey was conducted professionally and on time. I am also indebted to the community members who willingly participated in the survey and provided the information needed.

ACRONYMS AND ABBREVIATIONS

ALRMP	Arid Lands Resource Management Project
ANC	Ante-natal clinic
ASAL	Arid and Semi-Arid Lands
CHWs	Community Health Workers
CSB	Corn-Soya Blend
CTC	Community Therapeutic Care
DMOH	District Medical Officer of Health
DNOs	District Nutrition Officers
EC	European Commission
EMOP	Emergency Operation
ENA	Emergency Nutrition Assessment
FFA	Food for Assets
FGDs	Focused Group Discussions
GAM	Global Acute Malnutrition
GFD	General Food distribution
GoK	Government of Kenya
HDDS	Household Dietary Diversity Score
HINI	High Impact Nutrition Interventions
IPC	Integrated Food Security Humanitarian Phase Classification
IRC	International Rescue Committee
IYCF	Infant and Young Child Feeding
IYCF	Infant and Young Child Feeding
KAP	Knowledge, Attitudes and Practices
KCSE	Kenya Certificate Secondary of Education
KFSSG	Kenya Food Security Steering Group
KII	Key Informant Interviews
MCH	Maternal Child Health
MOH	Ministry of Health
MOPHS	Ministry of Public Health and Sanitation
MOPHS	Ministry of Public Health and Sanitation
MUAC	Middle Upper Arm Circumference
NGOs	Non-governmental Organizations
OJT	On the job training
OTP	Outpatient therapeutic Programme
PRRO	Protracted Relief and Recovery Operation
SC	Stabilization Centre
SFP	Supplementary Feeding Programme
SMART	Standardized Monitoring and Assessment of Relief and Transition
VCT	Voluntary Counselling and Testing
WFH	Weight for Height
WFP	World Food Programme
WHO	World Health Organization
WVK	World Vision Kenya

CONCLUSIONS ..... **XI**

RECOMMENDATIONS ..... **XII**

1. INTRODUCTION **1**

1.1 BACKGROUND 1

2. OBJECTIVES **2**

2.1 OVERALL PURPOSE AND OBJECTIVE 2
2.2 SPECIFIC OBJECTIVES 3

3. SURVEY METHODOLOGY **3**

3.1 SURVEY DESIGN 3
3.2 TARGET POPULATION 3
3.2.1 Sampling Technique and Sample Sizes *3*
3.3 SELECTION OF THE SURVEY TEAM, TRAINING AND PRE-TESTING OF THE QUESTIONNAIRES 5
3.3.1 Survey Team *5*
3.3.2 Training of team leaders, measurers and interviewers and pre-testing of questionnaire *5*
3.4 DATA COLLECTION 5
3.5 VARIABLES MEASURED 5
3.6 DATA ANALYSIS 8
3.7 METHODOLOGICAL CHALLENGES 8

4. RESULTS **9**

4.1 HOUSEHOLD DEMOGRAPHY AND SOCIO-ECONOMIC STATUS 9
4.1.1 Household Demography *9*
4.1.2 Livestock Ownership *9*
4.2 ANTHROPOMETRY 10
4.2.1 Age and sex distribution of the sampled children *10*
4.3 PREVALENCE OF MALNUTRITION WEIGHT-FOR-HEIGHT Z-SCORES (WHO STANDARDS 2006) 10
4.3.1 Weight for height z-score distribution based on WHO Standards 2006 ..... *11*
4.4 PREVALENCE OF ACUTE MALNUTRITION (WASTING) BY AGE BASED ON WEIGHT-FOR-HEIGHT Z-SCORES AND OR OEDEMA (WHO STANDARDS 2006) 11
4.5 PREVALENCE OF ACUTE MALNUTRITION BASED ON MUAC 12
4.6 PREVALENCE OF UNDERWEIGHT (WEIGHT-FOR-AGE) 12
4.7 PREVALENCE OF STUNTING 12
4.8 PREVALENCE OF CHILD MORBIDITY (CHILDREN 0-59 MONTHS OF AGE) 13
4.10 MATERNAL MANAGEMENT OF DIARRHOEA 13
4.11 MATERNAL HEALTH SEEKING BEHAVIOUR FOR SICK CHILDREN 13
4.12 COVERAGE OF SELECTIVE FEEDING PROGRAMMES 14
4.12.1 SFP Coverage rate *14*
4.12.2 OTP coverage *15*
4.13 IMMUNIZATION COVERAGE FOR CHILDREN 7-59 MONTHS OF AGE 15
4.13.1 BCG Immunization Coverage *15*
4.13.2 OPVI 1 Coverage *16*
4.13.3 Measles Immunization Coverage for children 9-59 months of age *17*
4.14 VITAMIN A SUPPLEMENTATION COVERAGE FOR CHILDREN 17
4.14.1 Vitamin A supplementation for children less than 59 months old *17*
4.14.2 Vitamins A supplementation for children 6-11 months old *18*
4.14.3 Frequency of vitamin A supplementation for children 12-59 months old *18*
4.15 DE-WORMING OF CHILDREN 19

4.15.1 De-worming of children 24-59 months old *19*
4.15.2 De-worming of children 12-24 months old *19*
4.16 Infant and Young Children Feeding (IYCF) Practices 20
4.16.1 Breastfeeding Practices *20*
4.16.2 Complementary Feeding Practices *21*
4.17 Nutritional Status of Pregnant and Lactating women 22
4.18 Iron/folate supplementation of pregnant women 22
4.19 Mosquito Bed Net Ownership 22
4.20 Household Water Consumption 23
4.20.1 Sources of Water *23*
4.20.2 Amount of water available to the households *23*
4.20.3 Treatment of drinking water *24*
4.20.4 The cost of water *24*
4.21 Sanitation 24
4.21.1 Access to and utilization of toilet facilities *24*
4.22 Hygiene Practices 25
4.23 Household Food Security 26
4.23.1 Food Aid *26*
4.23.2 Frequency of meal Consumption *27*
4.23.3 Household members who missed meals the day prior to the survey and reasons for missing meals *27*
4.23.4 Household Dietary Diversity *28*
4.23.5 Variety of foods consumed *28*
4.23.6 Main source of dominant food item *29*
4.24 Coping Strategies 29
4.25 Mortality 30
5. DISCUSSION 31
5.1 4.1 Nutrition situation in East Pokot and Marigat Districts 31
5.2 Coverage of Selective Feeding Programmes 31
5.3 Immunization, de-worming and Vitamin A supplementation coverage 31
5.4 Child Morbidity and Maternal Health Seeking Behaviour 31
5.5 Infant and Young Child Feeding Practices (IYCF) 32
5.6 Availability of mosquito bed nets 32
5.7 Water and Sanitation and Hygiene Practices 32
5.8 Household Food Security 32
5.9 Factors associated with malnutrition in Turkana 32
5.9.1 Immediate Causes *32*
5.9.2 Underlying causes of malnutrition *33*
5.9.3 Basic causes of malnutrition *33*
6. CONCLUSIONS 33
7. RECOMMENDATIONS 34

LIST OF TABLES

Table 1: Definitions of acute malnutrition using WFH and/or oedema in children aged 6–59 months 8
Table 2: Household Demographic Characteristics 9
Table 3: Livestock Ownership 9
Table 4: Verification of age of index child/children by survey sites 10
Table 5: Distribution of the children by age and sex 10

TABLE 6: PREVALENCE OF MALNUTRITION WEIGHT-FOR-HEIGHT Z-SCORES (WHO STANDARDS 2006)..... 11
TABLE 7: PREVALENCE OF ACUTE MALNUTRITION (WASTING) BY AGE BASED ON WEIGHT-FOR-HEIGHT Z-SCORES AND OR OEDEMA..... 11
TABLE 8: PREVALENCE OF MALNUTRITION BASED ON MUAC..... 12
TABLE 9: PREVALENCE OF WEIGHT-FOR-AGE (UNDERWEIGHT) BY SEX BASED ON Z-SCORES..... 12
TABLE 10: PREVALENCE OF STUNTING BASED ON HEIGHT-FOR-AGE Z SCORE AND/OR OEDEMA..... 12
TABLE 11: PREVALENCE OF MORBIDITY AMONG CHILDREN 0-59 MONTHS OF AGE..... 13
TABLE 12: MANAGEMENT OF DIARRHOEA..... 13
TABLE 13: HEALTH SEEKING BEHAVIOUR BY MOTHERS FOR THEIR SICK CHILDREN..... 14
TABLE 14: SFP COVERAGE BASED ON MUAC..... 14
TABLE 15: SFP COVERAGE BASED ON Z-SCORES..... 14
TABLE 16: COVERAGE OF OTP BASED ON MUAC..... 15
TABLE 17: COVERAGE OF OTP BASED ON Z SCORES..... 15
TABLE 18: MEASLES IMMUNIZATION COVERAGE (CHILDREN ≥9 MONTHS)..... 17
TABLE 19 : BREASTFEEDING PRACTICES..... 20
TABLE 20: COMPLEMENTARY FEEDING PRACTICES..... 21
TABLE 21: NUTRITIONAL STATUS FOR PREGNANT AND OR LACTATING WOMEN BASED ON MUAC MEASUREMENTS..... 22
TABLE 22: IRON/FOLATE SUPPLEMENTATION DURING THE LAST AND CURRENT PREGNANCY..... 22
TABLE 23 : HOUSEHOLD OWNERSHIP AND SOURCE OF MOSQUITO BED-NETS..... 23
TABLE 24: SOURCES OF WATER..... 23
TABLE 25: WATER AVAILABILITY AND ACCESSIBILITY..... 23
TABLE 26: TREATMENT OF DRINKING WATER..... 24
TABLE 27: COST OF WATER..... 24
TABLE 28: ACCESS TO AND UTILIZATION OF LATRINES..... 25
TABLE 29: HAND WASHING PRACTICES..... 26
TABLE 30: HOUSEHOLD MEMBERS WHO MISSED MEALS THE DAY PRIOR TO THE SURVEY AND REASONS FOR MISSING MEALS..... 28
TABLE 31: HOUSEHOLD DIETARY DIVERSITY SCORE BASED ON A 24-HOUR RECALL..... 28
TABLE 32: FOODS CONSUMED BY HOUSEHOLDS BASED ON A 24-HOUR RECALL..... 28
TABLE 33: MAIN SOURCE OF DOMINANT FOOD ITEM..... 29
TABLE 34: COPING STRATEGIES EMPLOYED DURING FOOD SHORTAGE..... 29
TABLE 35: CRUDE AND UNDERFIVE DEATH RATES IN ALL THE FOUR SURVEY SITES..... 30

LIST OF FIGURES

FIGURE 1: BARINGO LIVELIHOOD ZONES..... 1
FIGURE 2: WEIGHT FOR HEIGHT Z-SCORE DISTRIBUTION..... 11
FIGURE 3: BCG IMMUNIZATION COVERAGE..... 15
FIGURE 4: OPV1 IMMUNIZATION COVERAGE..... 16
FIGURE 5: OPV2/PENTAVALENT 2 IMMUNIZATION COVERAGE..... 16
FIGURE 6: OPV3/PENTAVALENT 3 IMMUNIZATION COVERAGE..... 17
FIGURE 7: VITAMIN A SUPPLEMENTATION FOR CHILDREN <59 MONTHS IN THE LAST 12 MONTHS..... 18
FIGURE 8: VITAMIN A SUPPLEMENTATION COVERAGE FOR CHILDREN 6-11MONTHS OLD..... 18
FIGURE 9: FREQUENCY OF VITAMIN A SUPPLEMENTATION FOR CHILDREN 12-59 MONTHS OLD..... 19
FIGURE 10: DE-WORMING COVERAGE FOR CHILDREN 24-59 MONTHS OLD..... 19
FIGURE11: DE-WORMING COVERAGE FOR CHILDREN 12-59 MONTHS OLD..... 20
FIGURE 12: HOUSEHOLDS THAT RECEIVED FOOD AID IN THE THREE MONTHS PRIOR TO THE SURVEY..... 26
FIGURE 13: NUMBER OF TIMES FOOD AID RECEIVED IN THE LAST THREE MONTHS..... 27
FIGURE 14: FREQUENCY OF MEALS USUALLY EATEN AND THAT EATEN THE DAY PRIOR TO THE SURVEY..... 27

EXECUTIVE SUMMARY

Introduction

This report summarizes the outcomes of a nutrition survey undertaken in November 2011 in East Pokot and Marigat districts. The main purpose of the survey was to assess food security, health and nutritional status of children between 6 and 59 months old and to investigate causes leading to long standing poor health and nutrition indicators.

The primary objectives of the survey were to:

1. Assess the prevalence of acute and chronic malnutrition in children aged 6-59 month;.
2. Assess the prevalence of malnutrition in pregnant women and Lactating mothers;
3. Assess care seeking behaviors, rates of exclusive breastfeeding as well as complementary feeding knowledge, attitudes, and practices;
4. Estimate coverage for SFP, OTP, Measles and BCG vaccination, de-worming and vitamin A;
5. Estimate morbidity rates in children 6-59 months;
6. Estimate crude and under five mortality rate;
7. Assess Household food security levels/situation;
8. To establish hygiene and sanitation practices of the community;
9. Provide information for revising the national guidelines for conducting nutrition surveys in Kenya; and
10. To establish baseline for high impact nutrition interventions indicators

Methodology

The survey used a two-stage cluster sampling methodology based on proportion to population size to select 42 clusters of 16 households each. The clusters were selected from a comprehensive list of the smallest geographical unit (sub-locations) for which population statistics was available. Data was collected on the anthropometric measurements of 854 children. Data was also collected on morbidity status, immunization and vitamin A supplementation coverage, feeding programmes' coverage, infant and young child feeding practices, food security status of the households and household dietary diversity. The Emergency Nutrition Assessment (ENA) for Standardized Monitoring and Assessment of Relief and Transitions (SMART) version 2010 was used for the planning, training and for data entry and analysis of anthropometry data. The rest of the data were entered and analyzed in SPSS version 17.0 for Windows. Focus group discussions were conducted with men and women from the community to solicit their perceptions on the causes and possible solutions to the problems of health and nutrition in the camp as well as on the food security situation in East Pokot and Marigat districts.

KEY FINDINGS FOR EAST POKOT AND MARIGAT NUTRITION SURVEY NOVEMBER 2011

	East Pokot and Marigat districts (%)
Demographic Household Characteristics	
Mean (sd) household size	5.6 (sd 2.3)
Total population	2988
Males	1466 (49.1%)
Females	1522 (50.9%)
Sex ratio	1:1
Proportion of underfives	31.7%
Nutritional Status (Children 6-59 months of age) (WHO Standards 2006). Weight-for-height Z scores **(Wasting)**	
Global Acute Malnutrition (GAM)	(65) 7.6 % (5.4 – 10.7 95% C.I.)
Severe Acute Malnutrition (SAM)	(9) 1.1 % (0.5 – 2.1 95% C.I.)
Nutritional Status (Children 6-59 months of age) (WHO Standards 2006) Weight-for-Age Z scores (**Underweight)**	
Prevalence of global underweight (<-2 z-score)	(202) 23.4 % (19.2 - 28.3 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(42) 4.9 % (3.1 - 7.5 95% C.I.)
Nutritional Status (Children 6-59 months of age (WHO Standards 2006) Height-for-age Z scores (**Stunting)**	
Prevalence of global stunting (<-2 z-score)	(292) 36.0 % (30.9 - 41.3 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(104) 12.8 % (10.1 - 16.1 95% C.I.)
Prevalence of acute malnutrition for children 6-59 months of age based on MUAC	
Severe <115 mm	0.8
Moderate 115–<125 mm	4.4
Total malnourished	5.2
At risk125 – <135 mm	17.8
Child morbidity (<59 months old)	
Sick in the two weeks prior to the survey	47.0
Watery Diarrhoea	13.6
Bloody Diarrhoea	0.7
Fever (alone or in combination with other symptoms)	19.2
ARIs (cough and cough with difficult breathing)	13.2

Immunization Coverage for children 6-59 months old	
OPV1	92.5
OPV3	82.3
Measles (children ≥ 9 -59 months	82.3
Vitamin A supplementation Coverage	
Children 6-59 months old	67.3
Children 6-11 months	70.0
Children 12-59 months old (received twice in the last 1 year)	34.3
De-worming of children 2-5 years of age	
Children 2-5 years de-wormed in the last 6 months Children 1- 5 years de-wormed in the last 6 months	52.0 49.4
Zinc supplementation	
<5 yrs supplemented with zinc during the last diarrhoea episode	5.2
Point Coverage of selective feeding programme	
Coverage of OTP (MUAC) **Coverage of OTP (Z scores)**	16.3 11.5
Coverage of SFP (MUAC) **Coverage of SFP (Z scores)**	14.3 5.9
Nutrition Status of caregivers of <5 year old children based on MUAC	
Pregnant and Lactating women <21 cm Non-pregnant and non-lactating women <21 cm	3.4 1.0
MORTALITY	
Crude Death Rate (CDR)	0.30 (0.14 – 0.64 95% CI)
Underfive Death Rate (U5DR)	1.03 (0.24 – 4.25 95% CI)
Household food consumption	
Households that normally eat the following number of meals per day: • 3 meals • 2 meals • 1 meal	 72.1 21.0 2.6
Households ate following number of meals the day preceding the survey: • 3 meals • 2 meals • 1 meal	 72.2 72.2 18.4
Household dietary diversity score	6.5 (sd 2.6)
Infant and Young Child Feeding Practices	
Breastfeeding Practices	
Put to breast within 1 hour	88.1
Exclusive breastfeeding <6 months old	50.4
Breastfeeding at 1 year	78.0
Breastfeeding at 2 years	49.1

Complementary Feeding Practices	
Minimum Dietary diversity (children 6-23 months)	
• Breastfed children consuming 3+ food groups • Non-breastfed children consuming 4+ food groups • Consuming 3+ OR 4+ food groups (breastfed and non-breastfed respectively)	55.6 60.3 56.8
Frequency of meals	
Breastfed infants 6-8 old who ate ≥2 times /day Breastfed children 6-23 months old who ate at ≥3 times/day Non-breastfed children 6-23 months who ate ≥4 times/day ≥ 2 meals for breastfed children 6-8 months, ≥3 for breastfed 6-23 months and ≥4 times for non-breastfed children	91.7 88.8 46.0 80.5
Factors related to malnutrition	
• High burden of morbidity among the children, • inadequate IYCF practices • Limited access to latrines • Poor hygiene practices (washing of hands) • Heavy maternal workload • Food insecurity in some of the households	

Plausibility checks

Indicator	Survey Value	Acceptable value/range	Interpretations/comments
Digit preference - weight	5	0-20	Good
Digit preference - height	5	0-20	Good
WHZ (Standard Deviation)	1.04	0.8 – 1.2	Good
WHZ (Skewness)	0.03	-1 to +1	Good
WHZ (Kurtosis)	-0.09	-1 to +1	Good
Percent flags WFH	2.3%	Less tan 3%	Good
Age distribution %			
6-17 months	28.5	20-25%	Poor
18-29 months	24.3	20-25%	Good
30-41 months	23.2	20-25%	Good
42-53 months	17.1	20-25%	Poor
54-59 months	6.9	Around 10%	Poor
Age Ratio: G1+G2/G3+G4+G5	100	Around 1.0	Good
Sex Ratio	1.13	0.8 – 1.2	Good
General Acceptability	15%		Poor (contributed to by age estimation)

CONCLUSIONS

- The nutritional status of children (wasting) was poor or at alert level. This was contributed to mainly by a high burden of morbidity among the children, inadequate IYCF practices, limited access to latrines, poor hygiene practices (washing of hands) and heavy maternal workload;
- Stunting and underweight were above the national prevalence rates at 35.3% and 16.1% respectively;
- Mortality rates were below emergency cut-off (Sphere Standards, 2004);
- Morbidity burden was highest for fever ARIs and watery diarrhoeal diseases. The prevalence rates for these diseases conditions were higher than both the national and the Rift Valley provincial rates;
- Zinc supplementation for diarrhoeal diseases was extremely low. A relatively high proportion of caregivers did NOTHING about the disease;
- Immunization coverage was high; over 80% for all the antigens;
- Vitamin A supplementation for children 6-59 months was slightly below the 80% acceptable level. Frequency of administration of the supplementation in accordance with the WHO guidelines was poor. Only one-third of the children 12-59 months old had taken the supplement twice;
- De-worming coverage for children was low;

- Iron/folate supplementation for pregnant women was lower than both the national and provincial rates. Compliance to the supplementation was low as only 5% had taken the supplement for ≥ 90 days. The findings may however, have been influenced by recall bias;
- There was no increased household food security at the time of the survey;
- Breastfeeding practices were adequate in terms of timely initiation and continued breastfeeding at 1 year. Nonetheless, continued breastfeeding at 2 years was low. Exclusive breastfeeding rate was in comparison to the national rate, but below the WHO recommended 90% acceptable level;
- Complementary feeding in terms of dietary diversity and frequency of feeding was inadequate;
- Latrine coverage was low;
- The practice of washing hands was inappropriate for most households; and
- Most of the households used unsafe water and the majority did not treat drinking water;

RECOMMENDATIONS

Short-term interventions

- The following indicators of health and nutrition should be improved:
    - De-worming coverage;
    - Appropriate washing of hands;
    - Treatment of drinking water;
    - Exclusive breastfeeding and continued breastfeeding to 2 years;
    - Dietary diversity and frequency of feeding of complementary foods;
    - Zinc supplementation of diarrhoeal diseases;
    - Frequency of vitamin A supplementation;
    - Iron/folate supplementation for pregnant women; and
    - Coverage of supplementary and therapeutic feeding programmes should be conducted using more efficient methods. It is recommended that the estimation of coverage of SFP and OTP be conducted using method such as SQUEAC.

  The above indicators can be improved through intensified health and nutrition education. There should be wider dissemination of such information through increased outreaches, campaigns, mobile clinics and the acceleration of the community strategy in offering health services. All the stakeholders; Ministry of Public Health and Sanitation, Ministry of Medical Services, WVK and other NGOs working on child survival programmes and also faith-based or community-based organizations should be involved in the implementation of this recommendation.
- Continue with SFP and OTP particularly during the dry seasons when there is increased household food insecurity to deal with the hunger gap and reduce morbidity and mortality due to malnutrition. The following stakeholders; MOPHS, MMS, APHIA, UNICEF and WFP should be involved in the implementation of this recommendation.
- Increase coverage for Food for Assets (FFA) especially during the dry season and where there is crop failure. The community members in Marigat expressed preference for this intervention rather than GFD as they reported that they were tired of getting hand outs. This should be implemented by WFP and WVK.
- Continue to provide GFD as a stop gap measure during periods of increased food insecurity.
- Improve access to health services mainly through mobile clinics. This should be done by MOPHS, MMS and WVK.
- Increased accessibility to safe water for household use and drinking. It suggested that water harvesting by water pans should be implemented or accelerated.
- Re-stocking of livestock after drought particularly in East Pokot where livestock keeping is the major livelihood of the people.

Long-term interventions

- Improve latrine coverage; to be implemented by MOPHS and other health partners.
- Improve food production by provision of improved quality seeds, short season seeds and irrigation. These sentiments were strongly expressed by the community members especially those in Marigat district. This recommendation should be implemented by MOA and other stakeholders; and
- Protection of crops from destruction by wild animals. This was reported during the FGDs to be a major cause of food insecurity in some parts of the districts. This recommendation should be implemented by MOA and other stakeholders.
- Gender issues should be considered in the implementation of interventions. This aspect came up very strongly during the FGDs as the high maternal workload was reported to be a major issue constraining adequate child care and consequently leading to malnutrition.

General recommendations

- East Pokot and Marigat seem to be different in terms of livelihoods, food security and challenges faced. This was reported in the FGDs and interviews with Key informants.
- The two districts are heterogeneous; most of the cases of malnutrition were in East Pokot. The poison distribution was 3 ($p=0.001$) and the resulting design effect was 2.01
- The districts should therefore have independent surveys to facilitate implementation of appropriate interventions for each one of them.

1. INTRODUCTION

This report summarizes the outcomes of a nutrition survey whose aim was to determine the prevalence of global and severe malnutrition in East Pokot and Marigat districts. The assessment was commissioned by the Ministry of Public Health and Sanitation (MOPHS) and its implementing partner World Vision Kenya (WVK). The overall aim of the survey was to assess food security, health and nutritional status of children between 6 and 59 months old and to investigate causes leading to long standing poor health and nutrition indicators. The survey took place in November 2011.

1.1 Background

Baringo County is in Rift Valley Province and is divided into four administrative districts namely: Baringo Central, Baringo North, Marigat and East Pokot. It borders Turkana to the North, West Pokot to the North West, Keiyo and Marakwet to the West, Koibatek and Nakuru to the South and Laikipia and Samburu to the East.

The County covers an area of 8,655 square kilometres which includes 140.5 square kilometres of Lake Baringo, Lake Bogoria and Lake Kamnarok and the recently a new lake named 94 has developed in the last fifteen years. The district has an estimated population of 406,839 (according to the 2009 National Census) spread in four livelihood zones namely mixed farming, pastoral, agro-pastoral and irrigated cropping (Figure 1).

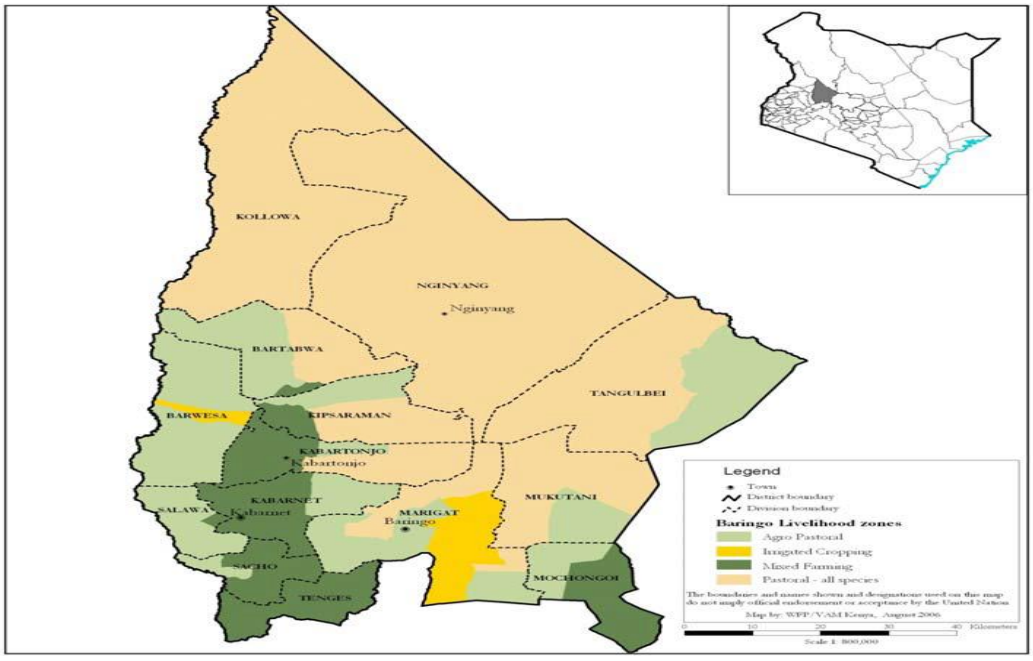

Figure 1: Baringo County Livelihood zones

The food security situation in Baringo County is affected by factors including; poor rainfall performance, poor agronomic practices, human-wildlife conflict and high food prices. Baringo County has been on Emergency Operation (EMOP) food relief support since September, 2004 to August, 2009 after which it was put under Protracted Relief and Recovery Operation (PRRO) whose phase 1 commenced in September, 2009 to date. No relief food was received between the periods of March, 2007 and September, 2008. The Protracted Relief and Recovery Operation phase IV covered the period March, 2011 to August, 2011.The number of people that benefited in this phase was 96,223. There was a joint effort by the government of Kenya (GoK) and the World Food Programme (WFP) in terms of relief food provision accounting to 16,200 beneficiaries under Food for Assets (FFA) and 13,960 beneficiaries under the government of Kenya (GoK) general food distribution (GFD)[1].

[1] Baringo District Long Rains Assessment, August 2011

At the time of the survey, East Pokot district was receiving food relief. The general food distribution was 50% ration in which a cereal, corn soya blend (CSB), a pulse, iodized salt and fortified oil was distributed on a monthly basis. Most of the GFD was provided by WFP[2]. In Marigat district, WFP and partners were implementing Food for Assets targeting 16,000 beneficiaries. There was supplementary feeding programme (SFP) targeting children underfive years of age, pregnant and lactating women and Outpatient Therapeutic Programme (OTP) in both the districts.

Nutrition and Health Activities in Baringo County

WVK, WFP and UNICEF are working in collaboration with the MOPHS on child survival activities in the County. The main responsibility of MOPHS is quality assurance of the nutrition and health-related activities through the coordination of all activities in Baringo County. The main health and nutrition activities in which WVK works in partnership with MOPHS include:

- Implementation of High Impact Nutrition Interventions (HINI) activities from May 2011. These include:
    - Prevention and management of malnutrition through SFP and OTP and in-patient management of severely acutely malnourished children in stabilisation centres (SC). Each of the district hospitals has a SC. WFP provides the corn soya blend (CSB) for treatment of moderate malnutrition (MAM) and UNICEF the plumpy nuts for management of severe acute malnutrition (SAM). The newly developed plumpy sup for moderately malnourished was about to be introduced at the time of the survey;
    - Micronutrient supplementation: iron/folate for pregnant women and children underfive years of age; vitamin A and micronutrient supplementation for children underfive years of age; and zinc supplementation for diarrhoeal diseases;
    - De-worming of children underfive years of age and pregnant women; and
    - Promotion of; appropriate hand washing messages, appropriate IYCF practices (both breastfeeding and complementary feeding) though health education and mother to mother support groups;

Most of the activities are implemented through outreaches services bringing the services nearer to the people since the health facilities are not easily accessible. The outreaches are conducted on a monthly basis.

The main challenges to programme implementation were reported to be:

- Long distances to health facilities which were also few in number;
- Inadequate health staffing. In some of the areas, the health facilities were being manned by community health workers (CHWs);
- Logistics because of the vastness of the areas, the hilly terrain that interferes with transportation and distances to and between health services; and
- Mobility of community members in some areas.

2. OBJECTIVES

2.1 Overall Purpose and Objective

To assess food security, health and nutritional status of children between 6 and 59 months old and to investigate causes leading to long standing poor health and nutrition indicators.

[2] WFP Programme Assistant, Eldoret

2.2 Specific objectives

The following objectives guidelines guided the implementation of the survey. To:

11. Assess the prevalence of acute and chronic malnutrition in children aged 6-59 month;.
12. Assess the prevalence of malnutrition in pregnant women and Lactating mothers;
13. Assess care seeking behaviors, rates of exclusive breastfeeding as well as complementary feeding knowledge, attitudes, and practices;
14. Estimate coverage for SFP, OTP, Measles and BCG vaccination, Deworming and vitamin A;
15. Estimate morbidity rates in children 6-59 months;
16. Estimate crude and under five mortality rate;
17. Assess Household food security levels/situation;
18. To establish hygiene and sanitation practices of the community;
19. Provide information for revising the national guidelines for conducting nutrition surveys in Kenya; and
20. To establish baseline for high impact nutrition interventions indicators (Annex 1 for ToR).

3. SURVEY METHODOLOGY

3.1 Survey Design

The survey used a cross-sectional study design comprising two phases in which both quantitative and qualitative data was collected. In the first phase of the survey, desk review of the following: nutrition surveys; Kenya Food Security Steering Group (KFSSG) Short Rains and Long Rains reports and Arid Lands Resource Management Project (ALRMP) Drought Monitoring Bulletin was conducted. In addition, Key in-depth interviews (KII) were conducted with WFP officials, District Medical Officer of Health (DMOH) for Baringo Central and Marigat districts and the Nutrition Project Manager WVK. Information on the health and nutrition situation in the district and the challenges constraining the provision of services was also obtained. This phase also included a meeting with the MOPHS and its partners to review and agree on the scope of the questionnaire.

The second phase of the survey involved training of the survey team and data collection. Focus group discussions (FGDs) were conducted with a cross-section of the community members (women and men) to solicit their perceptions on the causes and possible solutions to the problems of health and nutrition in the districts. The focus of the FGDs was; malnutrition among the underfives and women, food security issues, morbidity and health seeking behaviour, and Infant and Young Child Feeding Practices (IYCF).

3.2 Target Population

The survey was conducted on children 6-59 months of age in order to determine their nutritional status. In addition, children 0-23 months old were targeted to assess IYCF practices as well as women of the reproduction age (18-45 years) so at to establish their nutritional status.

3.2.1 Sampling Technique and Sample Sizes

Emergency Nutrition Assessment (ENA) for Standardized Monitoring and Assessment of Relief and Transitions (SMART) version 2010 was used in the planning, training, data entry and analysis.

The sampling frame constituted all households in the two districts. The population data was based on the Kenya National Bureau Statistics estimates[3]. Sample size calculation was based on the assumption that the prospected GAM was higher than during the May 2010 nutrition survey. The sample size was calculated using the global acute malnutrition (GAM) for the October 2010 East Pokot survey because there was no other survey conducted in Baringo County in the same year. The upper confidence interval (18.7%) was used for the calculation since it was anticipated that the nutrition status of the children was worse than it was in 2010. A precision of ±4.2% was used for the survey and a design effect of 1.5 for the cluster methodology. The proportion of the under fives was estimated at 15.3%.The average household size was 5.5. The non-response rate was estimated at 3%. The

[3] Baringo County; Kenya National Bureau of Statistics, November 2011

resulting sample size was 676 households expected to yield 497 children underfive years of age for anthropometric measurements. The number of clusters was 42 each comprising 16 households each. The resulting sample size for anthropometric measurements was 854.

The sample size for collection of data on IYCF indicators was 3 infants 0-5 months of age per cluster and 8 infants 6-23 months of age per cluster making a total of 462 infants per district.

For the mortality rates (both crude and underfive mortality) the sample sizes was also calculated using ENA for SMART 2010. The sample sizes were calculated based on the crude mortality estimate (1.4 per 10,000 people per day). A precision of ±0.5% was used for the survey, a design effect of 1.5 for the cluster methodology and the recall period was 90 days. The average household size was 5. The non-response rate was estimated at 3%. The calculated sample size was 739 households expected to yield a population of 3585. This translated to 19 households per each of the 42 clusters.

Selection of Clusters

A two-stage cluster survey, proportional to population size, using the smallest geographical administration (sub-location) was employed in carrying out the survey. The sampling unit/cluster was the sub-location because of lack of population statistics at the village level. In the first sampling stage, the total population for each of the sub-locations in each survey were listed. Clusters were allocated to the sub-locations from the cumulative population list proportional to population size. Sampling was done using the ENA for SMART software 2008 (Annex 2 for selected clusters). Some sub-locations (with large population sizes) had more than one cluster assigned to them making it necessary to further sub divide them into smaller units using the best and most representative option so as to minimize bias.

Selection of Households

The definition of a household was a shelter or more whose residents eat from the same “cooking pot”. The principle of randomness was used in the selection of households. Each survey team moved to the approximate centre of the selected cluster from where a pen was spun to randomly determine the starting direction. The teams then moved along the identified direction to the edge of the cluster. At this point the team spun the pen again until it pointed to the inside of the cluster. The team moved along this direction and carried out a census of all the households from to the edge of the cluster. The first household to be visited was randomly selected from the list of households using the lottery system. Thereafter, the next nearest household as one left the household already visited was selected. The team then carried out interviews in all eligible subsequent households until they visited 15 households per cluster.

If nobody was home at the time of the first visit, after checking with neighbours or family members, to ensure they were not close by, the team attempted to revisit the household at least 2 times. Households where interviews did not take place because the person refused or nobody was available, was recorded as such and the household was not replaced as the sample size took into account non-response.

Selection of children for anthropometry

All children between 6-59 months of age staying in the selected household were measured. The respondent was the primary care giver of the index child/children. If a child and/or the caregiver were temporarily out of the house, then the survey team re-visited the house to collect the data at an appropriate time. This process was repeated until the required number of households (16) per cluster was attained.

Selection of children for assessment of IYCF practices

The sample of children for IYCF practices was attained by enlisting the children in these age categories as they were found in the households visited. In case the required sample size was not realized from the number of households visited, more households were sampled in a similar manner to those for the anthropometric survey (described above) until the required sample was realized.

Selection of women for determination of nutritional status

All women in the reproductive age (18-45 years) in the identified households were enlisted in the study and their MUAC measurements taken.

3.3 Selection of the survey team, training and pre-testing of the questionnaires

3.3.1 Survey Team

The survey was coordinated and supervised by an external consultant, an assistant consultant and a data analyst. The consultants were assisted by the Nutrition Manager WVK. District Nutrition Officers (one from each of the districts) and a nutrition officer from WVK assisted in the coordination of data collection. The survey was undertaken by 5 teams; each team comprised 4 members inclusive of a team leader/supervisor. The team leader doubled as the interviewer while the rest of the team members translated the questions and responses and also took the anthropometric measurements. The team leaders were mainly from MOPHS and partner agencies whereas the rest of the team members were largely drawn from community members with at least Kenya Certificate of Secondary Education (KCSE) and with prior experience in surveys.

3.3.2 Training of team leaders, measurers and interviewers and pre-testing of questionnaire

A five-day training workshop was conducted before the commencement of the survey. The training took place from 22th to 26th November 2011. The training focused on: the purpose and objectives of the survey; familiarization with the questionnaire by reviewing the purpose for each question; interviewing techniques and recording of data; how to take anthropometric measurements; and cluster and household selection. Role-plays on how to administer the questionnaire and record responses were conducted. Demonstrations on how to take anthropometric measurements were also conducted. This was followed by practice to standardize anthropometric measurements. The standardization of anthropometric measurements took one day.

A half day of the training was allocated to pre-testing of the questionnaire (in areas that had not been selected for inclusion in the survey) and reviewing of the data collection tools based on the feedback from the field (Annex 3 for questionnaires). The anthropometric measurements from pre-testing were entered into the ENA for SMART software and a plausibility report developed for each team and this information was used to correct the teams' mistakes.

3.4 Data collection

Data collection took 5 days, from 28th November to 4th December 2011. The consultant, assistant consultant, representatives from the partner agencies and DNOs supervised the teams throughout the data collection period. Teams administered the standardized questionnaire to the mother or caregiver. Each survey team explained the purpose of the survey and issues of confidentiality and obtained verbal consent before proceeding with the interview.

3.5 Variables Measured

Age: The exact age of the child was recorded in months, based on information gathered from the caregiver and confirmed with information from health, baptismal or birth certificates. A calendar of events (Annex 4) was used for those children whose mothers could not remember the date of birth of their children and those who did not have any documentation of the date. A chart for calculation of age in months was used to enable accurate and fast determination of age (Annex 5).

Weight: Children were measured in the nude using a 25 kg hanging spring Salter scale to the nearest 100g.

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

MUAC: Mid Upper Arm Circumference (MUAC) was measured on the left arm, at the middle point between the elbow and the shoulder, while the arm was relaxed and hanging by the body's side. MUAC was measured to the

nearest mm. In the event of a disability the right arm was used or for those who are left-handed, MUAC was taken on the right arm. MUAC measurements were taken for children 6-59 months of age and for women in the reproductive age (18-45 years of age).

Bilateral oedema: Assessed by the application of normal thumb pressure for at least 3 seconds to both feet at the same time. The presence of a pit or depression on both feet was recorded as oedema present and no pit or depression as oedema absent.

Enrolment in the selective feeding programmes: For all children 6-59 months of age, the caretakers were asked to state whether the child was enrolled in a supplementary feeding programme (SFP) or a therapeutic feeding programme (OTP) on the day of the survey. Point coverage for the SFP was calculated as the proportion of children attending the programme divided by the number of cases not attending the programme plus the number of children attending the programme based on MUAC and Z scores. The coverage rate for OTP was similarly calculated as the proportion of severely malnourished children enrolled in the programme. The coverage rate was calculated based on the survey findings and not on the number of children enrolled in the programme at the time of the survey.

Morbidity: Information on two-week morbidity prevalence was collected by asking the mothers or caregivers if the index child had been ill in the two weeks preceding the survey and including the day of the survey. Illness was determined based on respondent's recall and was not verified by a clinician.

Immunization status: For all children 6-59 months, information on BCG, Pentavalent 1-3, DPT 1-3, measles vaccinations and full immunization status was collected using health cards and recall from caregivers. When estimating measles coverage, only children 9 months of age or older were taken into consideration as they are the ones who were eligible for the vaccination and thus the coverage was calculated as the proportion of children 9 months and above who had received measles vaccination. The vaccination coverage was calculated as the proportion of children immunized based on records and recall.

Vitamin A supplementation status: For all children 6-59 months of age, information on Vitamin A supplementation in the 6 months prior to the survey date was collected using child health and immunization campaign cards and recall from caregivers.

De-worming status: Information was solicited from the caregivers as to whether children 24-59 months of age had received de-worming tablets or not in the previous 6 months. This information was verified by card where available.

Information on Infant Feeding Practices: Information on timely initiation of breastfeeding, giving of colostrum and pre-lacteal feeds, exclusive breastfeeding rates, maintenance of breastfeeding, frequency of feeding, diversity of complementary feeds was solicited 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 were based on WHO[4] and Kenya Demographic Health Surveys. The information was obtained for children 0-23 months of age.

Dietary diversity for children 6 to 23 months of age: 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. There is considerable evidence for this idea[5]. For this indicator, the minimum dietary diversity for children 6-23.9 months is ≥4 food groups out of 7 groups. The food groups are summed, with each of the groups scored "1" If the child had the food group yesterday, and "0" if not. This results in a diversity score ranging from 0 to 7 for each child. Higher scores correspond to a more adequate range of foods groups in the diet.

The food groups were as follows:

[4] Indicators for Assessing Infant And Young Child Feeding Practices. Conclusions of a consensus meeting held 6-8 November 2007 in Washington DC., USA.

[5] Ruel M. T. (2002): *Is dietary diversity an indicator of poor food security or diversity quality? A review of measurement issues and research needs.* Food Consumption and Nutrition Division, International Food Policy Research Institute (IFPRI). FCND Discussion Paper NO. 140.

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

Food security status of the households: Information on the number of meals usually eaten and the number of meals eaten on the day preceding the survey was solicited to establish the food security status of the households. Additionally, information on the family members who had missed a meal the day preceding the survey was also solicited. Information on the primary source of the dominant food was also solicited.

Household food diversity: Dietary diversity is a qualitative measure of food consumption that reflects household access to a wide variety of foods, and is also a proxy of the nutrient intake adequacy of the diet for individuals. Dietary diversity scores were created by summing the number of food groups consumed over a 24-hour period to aid in understanding if and how the diets are diversified. (Annex 3). Household dietary diversity score (HDDS) is meant to reflect, in a snap shot the economic ability of a household to consume a variety of foods[6]. A score of 1 was allocated to each food group that was consumed by the household and a score of 0 for each of the food groups not consumed by the household, and thus the highest possible score was 15.

Food Aid: Information was also sought on whether a household had received any food aid in the past three months; the source of the food, the number of times received, what foods were received, how the ration was used and the duration each food commodity lasted.

Coping Strategies: Information on coping strategies households employ during times of food scarcity was obtained from respondents.

Household water consumption and utilization: The indicators used were main source of drinking and household water, time taken to water source and back, cost of water per 20-litre jerry-can and treatment given to drinking water.

Sanitation: Information on household accessibility to a toilet/latrine, disposal of children's faeces and occasions when the respondents wash their hands was obtained.

Nutrition Indicators:

Nutritional Indicators for children 6-59 months of age

The following nutrition indicators were used to determine the nutritional status of the underfives:

- Weight-for-height (WFH) index

Acute malnutrition rates were estimated from the weight for height (WFH) index values combined with the presence of oedema. The WFH indices were compared with WHO Standards 2006. WFH indices were expressed in Z-scores. The expression in Z-scores has true statistical meaning and allows inter-study comparison.

Guidelines for the results expressed in Z-scores:

- Severe malnutrition is defined by WFH <-3 SD and/or existing bilateral oedema on the lower limbs of the child
- Moderate malnutrition is defined by WFH <-2 SD and >=-3 SD and no oedema

Global acute malnutrition (GAM) is therefore defined as the proportion of children presenting with a weight for height index less than -2 Z scores with/without oedema.

[6] Guidelines for measuring household and individual dietary diversity. Version 2, June 2007. Prepared by FAO Nutrition and Consumer Protection Division with the support from EC/FAO Food Security Information for Action Programme and the Food and Nutrition Technical Assistance (FANTA) Project. Rome, Italy

MUAC

Guidelines for the results expressed as follows:

- Severe malnutrition is defined by measurements <115mm
- Moderate malnutrition is defined by measurements >=115mm to <125mm
- At risk is defined by measurements >=125mm to <135mm
- Normal >=135mm

Table 1: Definitions of acute malnutrition using WFH and/or oedema in children aged 6–59 months

Acute malnutrition (WFH)	**Z score**	**oedema**
Severe	< - 3 z scores	Yes / no
	> -3 z scores	Yes
Moderate	< –2 z-scores to ≥ –3 z-scores	No
Global	< –2 z-scores	Yes / No

Adapted from SMART Manual, Version 1, April 2006

MUAC cut off points for the women for pregnant and lactating women[7]: Cut off <21 cm signifying under nutrition

3.6 Data Analysis

Four data entry clerks were hired by WVK and an external data analyst were responsible for data entry under the coordination and supervision of the consultant. ENA for SMARTnutri-survey was used for data entry and analysis of anthropometry data. The rest of the data was analyzed in Statistical Package for Social Science (SPSS) version 17.0 for Windows. The data entry could not be completed at the field and therefore another team of data entry clerks were identified by the consultant and completed the task in Nairobi.

3.7 Methodological Challenges

Age: Age determination was a major challenge as many mothers/caregivers did not know the birth dates of their children and many did not have child health cards. Ages were thus approximated by the use of local calendars of events; one for East Pokot and another for Marigat. It was however realized during data collection that the even the child health cards many times did not have accurate dates of birth because many of these cards were issued at the first visit at the maternal and child health (MCH) clinic for immunization as many births took place at home.

Supervision of data collection: Supervision of data collection was a major challenge due to the heavy rains and extended the data collection period for two days because of swollen rivers which could not be crossed.

Population statistics: There were no population statistics for the smallest geographical unit, the village. The sampling unit was therefore the sub-location for which population statistics were available.

[7] Kenya National Bureau of Statistics and Ministry of Public Health and Sanitation, Guidelines for Nutrition Assessments in Kenya, 2008

4. RESULTS

4.1 Household Demography and Socio-economic Status

4.1.1 Household Demography

The mean household size was 5.6 (sd 2.3). The sex ratio (male to female) was as expected (1.1). The proportion of children underfive years of age was higher than expected for the developing world (18-20%) at 31.7% (Table 2).

Table 2: Household Demographic Characteristics

Demographic Characteristics	
Mean (sd) household size	5.6 (sd 2.3)
Total population	2988
Males	1466 (49.1%)
Females	1522 (50.9%)
Sex ratio	1:1
Proportion of Underfives	31.7%

4.1.2 Livestock Ownership

The majority of the households (81.5%) owned livestock. Of those who owned livestock, for 63.2% of the households the number of livestock increased in the 6 months before the survey (Table 3). The main reason for the increase was that the livestock gave birth (80.7%) whereas in 10.5% of the households more animals were purchased. The number of livestock decreased in 27.0% of the households and the reasons for the decrease was death due to diseases (39.8%) and death due to drought 18.9%. About one-third (34.8%) of the animals were sold. About one-tenth (8.1%) of the households reported no change in the size of their livestock (Table 3).

Table 3: Livestock Ownership

	n	%
Household owns livestock (n=545)	444	81.5
Livestock increased in last 6 months (n=459)	290	63.2
Reasons for increase*: (n=230)		
• Animals gave birth	276	80.7
• Bought	36	10.5
• Dowry	14	4.1
• Donation	12	3.5
• Re-stocking	3	0.9
• Raid	1	0.3
Livestock decreased in the last 6 months	124	27.0
Reasons for decrease*:		
• Sold	70	34.8
• Death caused by drought	38	18.9
• Death caused by disease	79	39.8
Livestock remained the same in the last 6 months	45	8.1

Multiple responses

4.2 Anthropometry

4.2.1 Age and sex distribution of the sampled children

Verification of age of index child/children

The ages of children were verified by; health cards, baptismal cards, birth notification and birth certificates. In the absence of these cards, age was determined by recall, in the majority of cases, based on a local calendar of events developed by the survey team prior to the commencement of the study. Even though some of the children's ages were verified by the use of a health card, it is important to note that for some, no exact date of birth was recorded on the card other than the date the child was first seen at the health facility which was not necessarily the date of birth. The survey teams therefore had to probe and use the local calendar of events to estimate the age of the child in months. For the majority of the children (80.1%) age was verified by health cards and birth certificate or notification (Table 4). For 33.8% age was based on recall and calculated using a local calendar of events.

Table 4: Verification of age of index child/children by survey sites

	N=680	
	n	%
Health card	443	65.1
Birth certificate/notification	7	1.0
Total Verified	**550**	**80.1**
Recall	230	33.8

Distribution of children by age and sex

Of the children surveyed, 53.0% were boys and the 47.0% were girls (Table 5). The overall ratio of boys to girls (calculated by diving the total number of boys with the total number of girls) was 1.1 which was within the recommended range of 0.8 – 1.2[8], demonstrating an unbiased sample. The ratios of boys to girls were within the normal range except for the age category 54-59 months.

Table 5: Distribution of the children by age and sex

	Boys		Girls		Total		Ratio
AGE (months)	**no.**	**%**	**no.**	**%**	**no.**	**%**	**Boy:girl**
6-17	132	53.0	117	47.0	249	28.5	1.1
18-29	116	54.5	97	45.5	213	24.3	1.2
30-41	104	51.2	99	48.8	203	23.2	1.1
42-53	76	50.7	74	49.3	150	17.1	1.0
54-59	36	60.0	24	40.0	60	6.9	1.5
Total	464	53.0	411	47.0	875	100.0	1.1

4.3 Prevalence of malnutrition weight-for-height z-scores (WHO Standards 2006)

The GAM rate; 7.6 % (5.4 - 10.7 95% C.I.) is an indicator of an alert/poor nutrition situation as per the WHO guidelines (Table 6). The SAM rate was 1.1 % (0.5 - 2.1 95% C.I.) which was within acceptable level. The boys were more undernourished 8.4 % (5.5 - 12.6 95% C.I.) compared to the girls (27) 6.7 % (4.4 - 10.2 95% C.I.). however, this difference was not statistically significant.

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

Table 6: Prevalence of malnutrition weight-for-height z-scores (WHO Standards 2006)

Nutritional Status Indicator	All n = 854	Boys n = 453	Girls n = 401
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(65) 7.6 % (5.4 - 10.7 95% C.I.)	(38) 8.4 % (5.5 - 12.6 95% C.I.)	(27) 6.7 % (4.4 - 10.2 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(56) 6.6 % (4.5 - 9.5 95% C.I.)	(34) 7.5 % (4.8 - 11.6 95% C.I.)	(22) 5.5 % (3.4 - 8.7 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(9) 1.1 % (0.5 - 2.1 95% C.I.)	(4) 0.9 % (0.3 - 2.3 95% C.I.)	(5) 1.2 % (0.4 - 3.5 95% C.I.)
% of oedema	0%		

4.3.1 Weight for height z-score distribution based on WHO Standards 2006

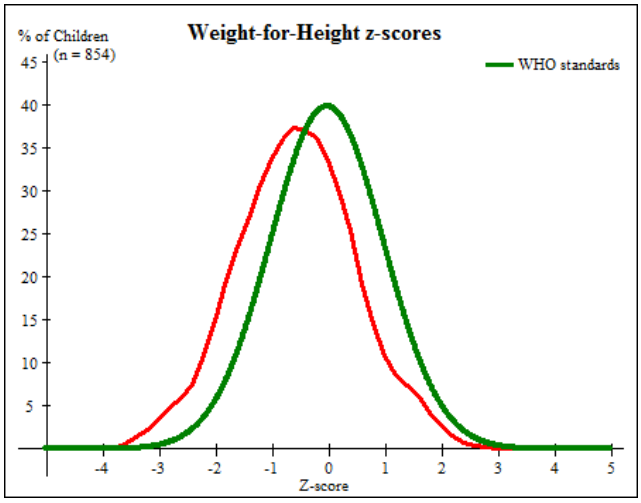

Figure 2: Weight for height Z-score distribution

The sample curve shows displacement to the left of the reference population. This is an indication of poor nutrition status of the sampled population in comparison to the reference population. The standard deviation of this sample was 1.04 (which lies within the acceptable range 0.8 – 1.2), indicating representativeness in the sample selection (Figure 2).

4.4 Prevalence of acute malnutrition (wasting) by age based on weight-for-height Z-scores and or oedema (WHO Standards 2006)

The children were categorized into age groups to examine the effect of age on nutritional status. This is necessary to guide the targeting of interventions taking into account the vulnerabilities in relation to a child's life cycle. The children in the age category 48-59 months had the highest burden of malnutrition (12.5%) followed by the category 36-47 months (10.0%). The lowest prevalence of malnutrition was in the age category 6-11 months at 3.7% (Table 7).

Table 7: Prevalence of acute malnutrition (wasting) by age based on weight-for-height Z-scores and or oedema

		Severe wasting <-3 z-score	Moderate Wasting (>= - 3and <-2 z score	Global Acute Wasting (< -2 z score)
Age in Months	Total No			
6-11	136	0	5 (3.7)	5 (3.7)
12-23	202	1 (0.5)	14 (6.9)	15 (7.4)
24-35	227	3 (1.3)	10 (4.4)	13 (5.7)
36-47	160	3 (1.9)	13 (8.1)	16 (10.0)
48-59	129	2 (1.6)	14 (10.9)	16 (12.5)
Total	854	**9 (1.0)**	**56(6.6)**	**65(7.6)**

4.5 Prevalence of acute malnutrition based on MUAC

The prevalence of malnutrition based on MUAC was lower (5.2%) than that judged by WHZ (7.6%). The total percentage of children at risk of malnutrition was 17.8% (Table 8).

Table 8: Prevalence of Malnutrition based on MUAC

	N=871
Severe under nutrition < 115 mm	(7) 0.8
Moderate 115–<125 mm	(38) 4.4
Total malnourished	(45) 5.2
At risk125 – <135 mm	(155)17.8

The MUAC cut-off points are based on the WHO guidelines

4.6 Prevalence of underweight (weight-for-age)

The rate of underweight was high 23.4% (19.2 - 28.3 95% C.I.) with more boys underweight at 26.6 % (21.8 - 32.1 95% C.I.) compared to girls19.9 % (15.0 - 25.9 95% C.I.) (Table 9). The difference in malnutrition between the girls and the boys was not statistically significant (chi-square test P= 0.498). The prevalance of severe underweight was 4.9 % (3.1 - 7.5 95% C.I.). The prevalence of underweight was higher than the national rate (16.1%) and the Rift Valley Provincial rate (19.1%).

Table 9: Prevalence of weight-for-age (underweight) by sex based on Z-scores

	All **n = 862**	**Boys** **n = 455**	**Girls** **n = 407**
Prevalence of underweight (<-2 z-score)	(202) 23.4 % (19.2 - 28.3 95% C.I.)	(121) 26.6 % (21.8 - 32.1 95% C.I.)	(81) 19.9 % (15.0 - 25.9 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(160) 18.6 % (15.6 - 21.9 95% C.I.)	(98) 21.5 % (17.8 - 25.9 95% C.I.)	(62) 15.2 % (11.4 - 20.0 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(42) 4.9 % (3.1 - 7.5 95% C.I.)	(23) 5.1 % (2.9 - 8.8 95% C.I.)	(19) 4.7 % (2.9 - 7.4 95% C.I.)

4.7 Prevalence of stunting

Stunting rates were and slightly above the national rate (35.3%) and the Rift Valley Province rate (35.7%)[9]. The prevalence of stunting was 36.0 % (30.9 - 41.3 95% C.I.) and severe stunting was 12.8 % (10.1 - 16.1 95% C.I.) (Table10). A higher proportion of boys 41.1% (35.4 - 47.1 95% C.I.) compared to girls at 30.2 % (24.2 - 36.9 95% C.I.) wre stunted. This difference was not statitically signficiant (chi-square test P=0.106). The high level of stunting may be an indication of chronic food insecurity experienced in most parts of East Pokot and Marigat districts because of chronic drought.

Table 10: Prevalence of stunting based on height-for-age Z score and/or oedema

	All n = 812	**Boys** n = 428	**Girls** n = 384
Prevalence of stunting (<-2 z-score)	(292) 36.0 % (30.9 - 41.3 95% C.I.)	(176) 41.1 % (35.4 - 47.1 95% C.I.)	(116) 30.2 % (24.2 - 36.9 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(188) 23.2 % (19.9 - 26.8 95% C.I.)	(111) 25.9 % (21.9 - 30.4 95% C.I.)	(77) 20.1 % (15.8 - 25.1 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(104) 12.8 % (10.1 - 16.1 95% C.I.)	(65) 15.2 % (11.7 - 19.5 95% C.I.)	(39) 10.2 % (6.5 - 15.5 95% C.I.)

[9] KDHS 2008-09

4.8 Prevalence of child morbidity (children 0-59 months of age)

The prevalence of common illnesses was determined based on a two-week recall period thus yielding two-week point prevalence. Overall, the level of morbidity among the children was high since almost half (47.0%) had been ill (Table 11) in the two weeks preceding the survey. The most prevalent symptom was fever alone or in combination with other symptoms (19.2%) followed by watery diarrhoea (13.6%) and ARIs (coughs and cough with difficult breathing) at 13.2%. The morbidity burden was higher than the national and Rift Valley provincial rates[10].

Table 11: Prevalence of morbidity among children 0-59 months of age

Illnesses	**N=831**	
	n	%
Sick in the 2 weeks before the survey	379	47.0
Watery diarrhoea	110	13.6
Bloody diarrhoea	6	0.7
Fever (alone or in combination with other symptoms)	155	19.2
ARIs (cough and cough with difficult breathing)	106	13.2
Others	25	3.1

Multiple Responses

4.10 Maternal Management of Diarrhoea

Most (80.2%) of the mothers/caregivers did not take action to treat the last diarrhoea episode in their children underfive years of age. For those who took action, 6.9% gave the children pre-packaged ORS. Similarly, only 5.2% of the children received the newly recommended zinc supplementation (Table 12). This may partly be because the majority of the mothers did not seek any assistance for the child with diarrhoea. Additionally, the long distances to the health facilities could have been a reason for many mothers not to seek assistance at health facilities.

Table 12: Management of diarrhoea

	N= 116	
	n	%
Pre-packed ORS	8	6.9
Home-made salt-sugar solution	2	1.7
Another home-made liquid	3	2.6
Zinc	6	5.2
Others	4	3.4
Nothing	93	80.2

4.11 Maternal Health Seeking Behaviour for Sick Children

Out of the mothers/caretakers who sought assistance for their sick children, 57.2% did so from public health facilities making it the most common place for them to do so. Over one-tenth (15.3%) of the mothers used herbs and home remedies, whereas 5.7% sought no assistance (Table 13). The relatively high proportions of mothers who bought medicine from shops/kiosks (10.4%) and 6.0% from pharmacy should be discouraged because proper diagnosis should be done before prescription of the appropriate medicine. The self-diagnosis conducted by mothers/caregivers and the decision on the medicines to purchase for their sick children is likely to be a dangerous practice with adverse health consequences on the child.

[10] KDHS 2008-09

Table 13: Health seeking behaviour by mothers for their sick children

	N= 367	
	n	%
Traditional Healer	4	1.1
Community Health Worker	1	0.3
Private clinic / Pharmacy	22	6.0
Shop / kiosk	38	10.4
Public health facility	**210**	**57.2**
Mobile Clinic	14	3.8
Relative / Friend	1	0.3
No assistance sought	21	5.7
Herbs/home remedy	56	15.3

4.12 Coverage of Selective Feeding Programmes

Period coverage[11] expressed in the following formula was used to determine the coverage of the selective feeding programmes:

$$\frac{\text{Number of children attending a selective feeding programme}}{\text{Number of cases NOT attending the feeding programme + Number of children attending the feeding programme}} \times 100$$

Coverage for the selective feeding programmes was calculated using, the percentage of the median, MUAC and Z scores because the three measures of acute malnutrition are used to admit children into SFP and OTP programmes.

4.12.1 SFP Coverage rate

SFP Coverage based on MUAC

Based on the formula above the SFP coverage rate judged by MUAC was 16.3% (Table 14). This coverage is much lower than the 50.0% acceptable coverage based on the Sphere Standards (2004).

Table 14: SFP coverage based on MUAC

Number of children in SFP	7
Children with 115mm - <125mm	38
Number of cases in SFP	2
Number of cases not in SFP	36
Coverage rate	**16.3%**

SFP coverage based on Z- scores

The SFP coverage based on Z–scores was 11.5% and lower than the coverage by MUAC (Table 15).

Table 15: SFP coverage based on Z-scores

Number of children in SFP	7
Children -3 to <-2 z scores	54
Number of cases in SFP	0
Number of cases not in SFP	54
Coverage rate	**11.5%**

[11] In, Myatt et.al., *A field trial of a survey method for estimating the coverage of selective feeding programmes,* Bulletin of the World Organization, January 2005, 83 (1).

4.12.2 OTP coverage

OTP Coverage based on MUAC

The OTP coverage rate was also very low (14.3%) and below the Sphere Standards at 75% (Table 16).

Table 16: Coverage of OTP based on MUAC

Number of children in OTP	1
Children with <115mm	7
Number of cases in OTP	1
Number of cases not in OTP	6
Coverage rate	**14.3%**

OTP Coverage based in Z scores

The OTP coverage based on Z scores was lower (5.9%) than that based on MUAC (Table 17).

Table 17: Coverage of OTP based on Z scores

Number of children in OTP	1
Children with <- 3 Z scores	17
Number of cases in OTP	1
Number of cases not in OTP	16
Coverage rate	**5.9%**

Overall, the selective feeding coverage was very low. It should be noted that the period coverage of feeding programmes does not yield accurate rates especially if the numbers are low as they were in this survey. The findings should therefore be interpreted as estimate of the actual coverage.

4.13 Immunization Coverage for Children 7-59 months of age

4.13.1 BCG Immunization Coverage

The immunization coverage for BCG (88.2%) was above the WHO recommended acceptable level (80.0%). The majority (75.5%) of these cases were verified by card (Figure 3).

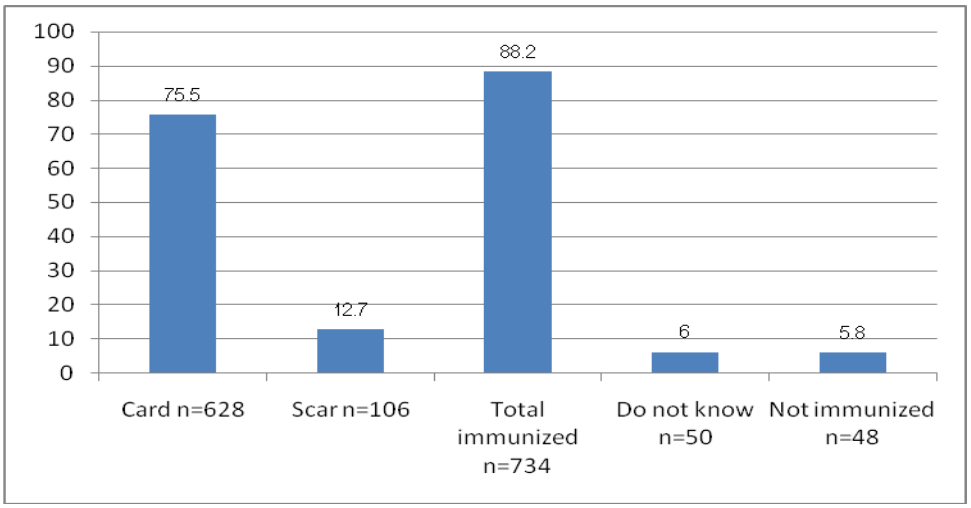

Figure 3: BCG Immunization Coverage

4.13.2 OPVI 1 Coverage

OPV1/pentavalent1 Immunization Coverage

The immunization coverage rate for OPV1/pentavalent1 (by card and recall) was high (92.5%) and above the acceptable WHO cut-off of 80%. Nonetheless, the relatively large proportion of children (17.4%) for whom immunization was based on recall is of concern because this can lead to unnecessary re-vaccination (Figure 4).

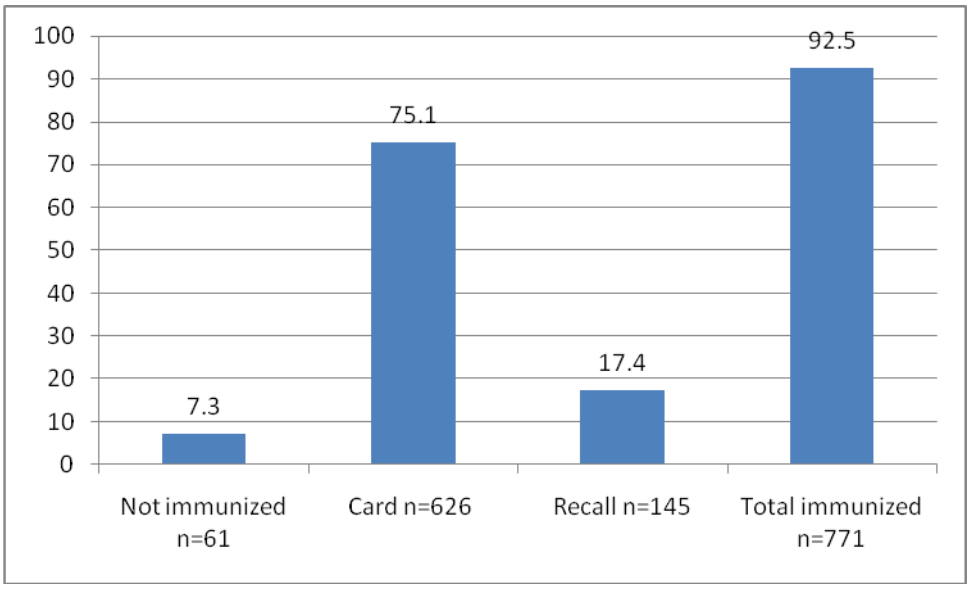

Figure 4: OPV1 immunization coverage

OPV2/pentavalent 2 Immunization Coverage

The immunization coverage for OPV2/pentavalent 2 was high (87.9%) and above the WHO 80% acceptable level. Nonetheless, 12.0% were not immunized and a relatively large proportion (17.5%) of the reported immunized cases were based on recall (Figure 5).

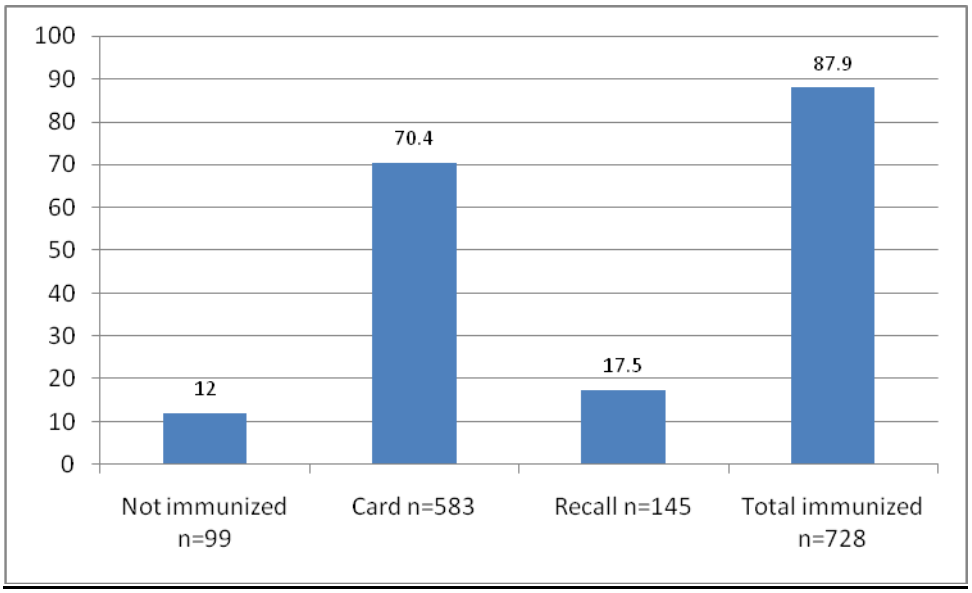

Figure 5: OPV2/Pentavalent 2 Immunization Coverage

OPV3/pentavalent 3 Immunization Coverage

Immunization coverage rate (82.3%) for OPV3 was slightly above the 80% WHO acceptable level when cases verified by card and those by recall were considered (Figure 6). Again about one-fifth (17.2%) of the reported immunized were based on recall and almost an equal proportion (17.6%) were not immunized.

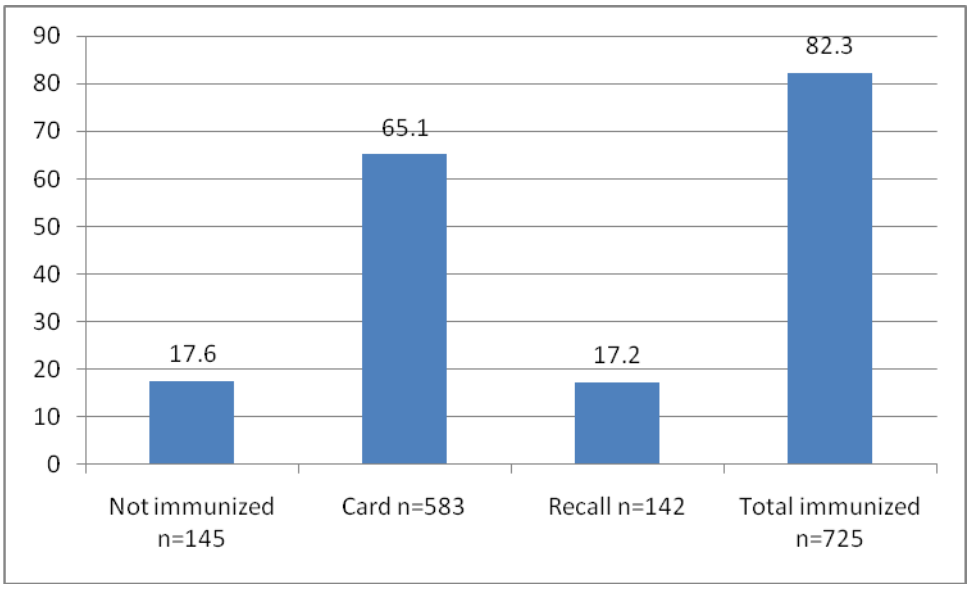

Figure 6: OPV3/Pentavalent 3 immunization coverage

4.13.3 Measles Immunization Coverage for children 9-59 months of age

The coverage of measles immunization based on both recall and those cases verified by card was 82.3% (Table 18). Almost one-fifth (17.1%) of the children had not received the immunization.

Table 18: Measles Immunization Coverage (Children ≥9 months)

	N=621	
	n	%
Not immunized	106	17.1
Card	399	64.3
Recall	112	18.0
Total Immunized	**511**	**82.3**

4.14 Vitamin A Supplementation Coverage for Children

The WHO guidelines, stipulate that children below five years of age living in areas where the vitamin intake is inadequate receive vitamin A supplement every 6 months. Kenya has adopted these guidelines and aims to provide the supplementation once every 6 months for children 6-59 months old. According to these guidelines; children 6-11months of age should receive the supplement once in a period of 12 months. The number of times a child receives the supplement may be higher than once in a 12-month period because of the integration of vitamin A supplementation with immunization during national days, which are meant to improve coverage especially in areas where there is limited accessibility to health facilities.

4.14.1 Vitamin A supplementation for children less than 59 months old

The coverage for vitamin A supplementation for children less than 59 months old was below the WHO accepted rate of 80% with 30.1% of the children having not received the supplement. Below half (45.9%) of the cases reported to have received the supplement were based on recall. Documentation of the supplementation is critical to avoid toxicity from over-dosing.

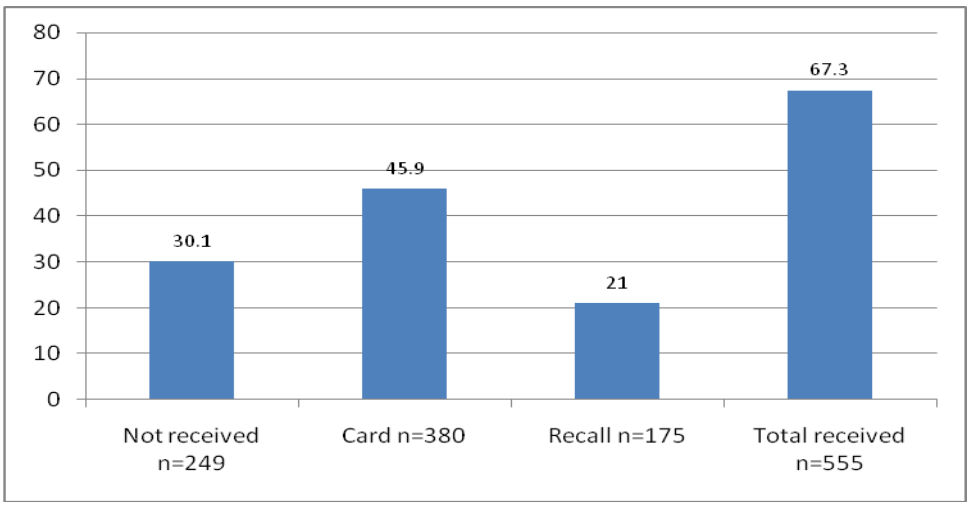

Figure 7: Vitamin A supplementation for children <59 months in the last 12 months

4.14.2 Vitamins A supplementation for children 6-11 months old

Vitamin A supplementation coverage rate for children 6-11 months old (70.0%) was below the acceptable rate (Figure 8). Furthermore, 28.3% of the children had not received the supplement. More concerted efforts are required to improve vitamin A supplementation for this age category of children.

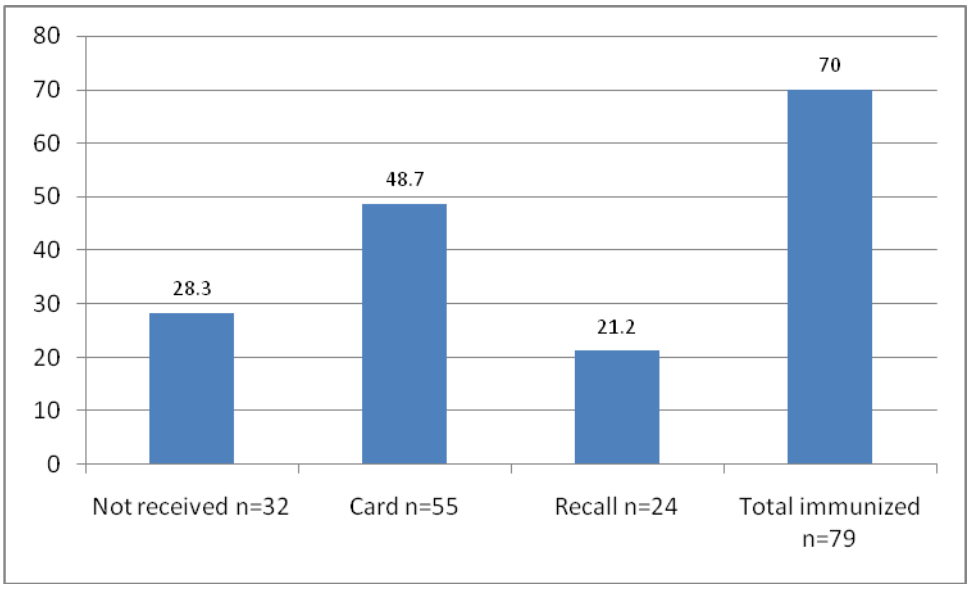

Figure 8: Vitamin A supplementation coverage for children 6-11months old

4.14.3 Frequency of vitamin A supplementation for children 12-59 months old

The WHO guidelines stipulate that children 12-59 months old should receive vitamin A supplement twice in a period of 12 months. Again, the number of times a child receives the supplement may be higher than twice in a 12-month period because of the integration of vitamin A supplementation with immunization during national days.

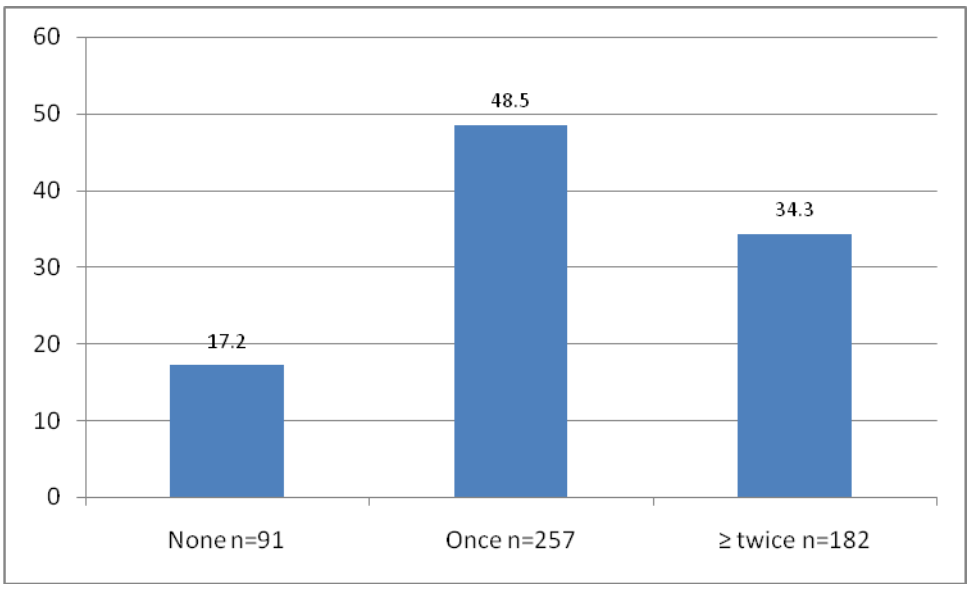

Figure 9: Frequency of vitamin A supplementation for children 12-59 months old

The findings indicated that only 34.3% of the children had received vitamin A supplementation at least twice in the previous 12 months in accordance with the WHO guidelines. About half (48.5%) of the children had received the supplement once and 17.2% had not received the supplement. This is an aspect that needs emphasis in the health messages.

4.15 De-worming of Children

4.15.1 De-worming of children 24-59 months old

Certain types of intestinal parasites can cause anaemia. Periodic de-worming for organisms like helminthes and schistosomiasis (bilharzia) can improve children's micronutrient and nutritional status. WHO recommends that children in developing countries exposed to poor sanitation and poor availability of clean safe water be de-wormed once in a 6-month period. The de-worming coverage for children 24-59 months old was 52.0%. Of those de-wormed, the majority 29.9%) were based on recall and only 22.1% of the cases were verified by card. The importance of de-worming should be emphasized in the health education messages.

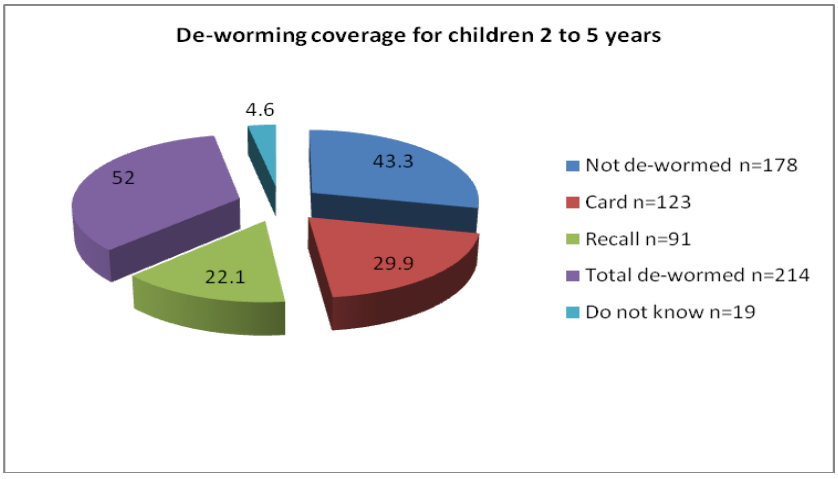

Figure 10: De-worming coverage for children 2-5 years old

4.15.2 De-worming of children 12-24 months old

The de-worming coverage for children 12-59 months old was 49.4%, slightly less than for those 24-59 months of age at 52.0% (Figure 11). The cases of de-worming based on recall (40.4%) was double that verified by card (20.4%) calling for more concerted efforts to document de-worming or for emphasis to the mothers on the importance of safe keeping child health cards.

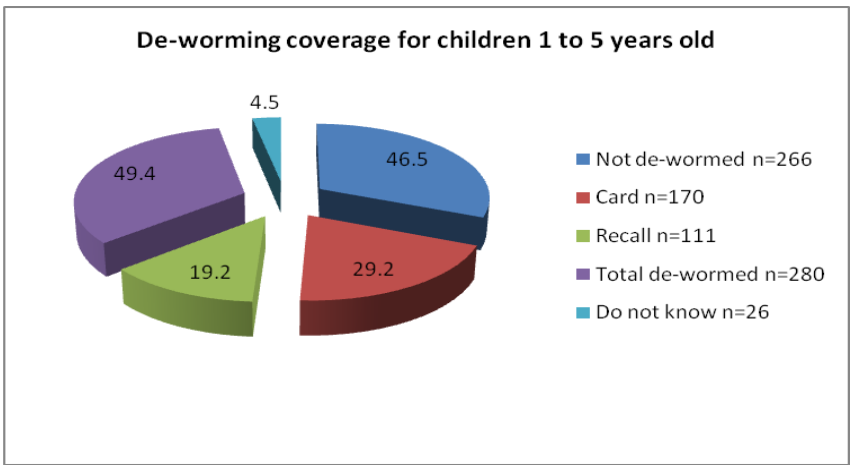

Figure11: De-worming coverage for children 1 to 5 years old

4.16 Infant and Young Children Feeding (IYCF) Practices

4.16.1 Breastfeeding Practices

Information on infant and young child feeding (IYFC) practices was obtained based on the previous day recall period because it has been widely used and found appropriate in surveys of dietary intake when the objective is to describe infant feeding practices in populations. This is line with the WHO guidelines to minimize recall bias and thus obtain more valid information. Previous day recall will cause the proportion of exclusive breastfeeding in infants to be overestimated, as some infants who are given liquids irregularly may not have received them the day before the survey (Ochola et. al., 2008; Engebtresen et. al, 2007; Bland, Rollins & Coutsoudis, 2002). The indicators used for infant feeding practices in this survey are based WHO (2007) guidelines the Kenya National Guidelines for Health and Nutrition surveys. The indicators are based on children 0-23 months old. This period provides the window of opportunity for interventions after birth because from 24 months of age, the damage caused by poor and inappropriate feeding practices are essentially irreversible.

Table 19 : Breastfeeding Practices

	n	%
Ever breastfed (n=402)	397	98.8
Giving of colostrum (n=403)	361	89.6
Timely Initiation of breastfeeding (within 1hr) (n=405)	357	88.1
Exclusive breastfeeding <6 months (n=121)	61	50.4
Pre-lacteal feeds given (n=405):	169	41.7
Types of pre-lacteal feeds:		
Plain Water	115	28.4
Sugar/Glucose water	17	4.2
Powdered/animal milk	6	1.5
Continued breastfeeding at 1 year (12 – 15 months) (n=59)	46	78.0
Continued breastfeeding at 2 years (20- 23.9 months) (n=53)	26	49.1

Breastfeeding was universal, with 98.8% of the children 0-23 months old having been initiated to breastfeeding. The practice of timely initiation was appropriate as 84.9% of the children were initiated within 1 hour of birth (Table 19). These rates are much higher than both the national and the Rift Valley Provincial rates of 58.1% and 63.7% respectively. The giving of colostrum was common with 89.6% of the children having received it. Half (50.4%) of the infants less than 6 months of age were exclusively breastfed. Although this rate is below the WHO acceptable level of 90%, it is much higher than the national rate at 32%.

Pre-lacteal feeds were given to 41.7% of the children which compare with the national rate at 41.8% and lower than the Rift Valley province rate at 48.0%. The most commonly given pre-lacteal was plain water given to 28.4% a finding that is agreement with the national findings. In terms of continued breastfeeding, the majority of the children (78.0%) were still breastfeeding at the age of one year. In contrast, only 49.1% of the children were still breastfeeding at 2 years implying that half the children had stopped breastfeeding prematurely and thus were not getting the benefits of breastmilk for the duration recommended.

4.16.2 Complementary Feeding Practices

Table 20: Complementary feeding practices

Complementary Feeding Practices	**Central**	
	n	%
Complementary Feeding rate: Proportion of infants 6-8.9 months who received complementary feeding	28/55	(50.9)
Minimum dietary diversity: Breastfed children 6-23 months of age who received ≥3 food groups (n=205)	114	55.6
Non-breastfed children 6-23 months of age who received ≥4 food groups (n=68)	41	60.3
Breastfed children consuming ≥3 food groups + non-breastfed children consuming ≥4 food groups (n=273)	155	56.8
Minimum meal frequency: Breastfed children 6-8 months who received complementary foods ≥2 times (n=48)	44	91.7
Breastfed children 6-23 months who received complementary foods ≥ 3 times per day (n=197)	175	88.8
Non -breastfed children 9-23.9 months who received complementary foods a ≥4 times (n=63)	29	46.0
Breastfed children 6-8 months old ≥ 2 times +Breastfed children 6-23 months old ≥3 times + non-breastfed children 6-23 months old ≥ 4 times (n=308)	248	80.5

Minimum dietary diversity of complementary foods

Minimum dietary diversity is calculated for children 6-23 months of age and is further disaggregated by the breastfeeding status of the children. For non-breastfed children the minimum dietary diversity is considered to be consumption of foods from ≥4 food groups out of 7 food groups per day. For breastfed children the minimum dietary diversity is considered to be ≥3 food groups. 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. There is considerable evidence for this idea[12]. For this indicator, each of the groups is scored "1" if the child had the food group yesterday, and "0" if not. This results in a diversity score ranging from 0 to 7 for each child. Higher scores correspond to a more adequate range of food groups in the diet.

[12] Ruel M. T. (2002): *Is dietary diversity an indicator of poor food security or diversity quality? A review of measurement issues and research needs.* Food Consumption and Nutrition Division, International Food Policy Research Institute (IFPRI). FCND Discussion Paper NO. 140.

Minimum meal frequency

The minimum meal frequency indicators are also based on the breastfeeding status of the children. The minimum meal frequency indicator is ≥2 times per day inclusive of snacks for the breastfed children 6-8 months of age and ≥ 3 times per day for breastfed children 6-23 months old. For non-breastfed children, the minimum indicator is ≥4 (Table 20). A high percentage (91.7%) of the breastfed children 6-8 months old attained the minimum meal frequency and 88.8% of the breastfed children between 6-23 months old also did the same. The proportion of non-breastfed children 6-23 months old that attained the minimum frequency was 46.0%. These findings imply that the majority of the non-breastfed children did not eat meals at the recommended frequency and were therefore likely not to be getting adequate nutrients. The composite indicator from the three indicators of minimum meal frequency showed 80.5% of the children having achieved the minimum meal frequency (Table 20) for their breastfeeding status.

4.17 Nutritional Status of Pregnant and Lactating women

MUAC was used to determine the level of under nutrition among pregnant and lactating women. The cut-off used was <21 cm[13] (Table 21). Overall, the maternal nutritional status was good. Only 3.4% of the pregnant and lactating women were wasted and only 1.0% of the non-pregnant and non-lactating women were wasted (Table 21).

Table 21: Nutritional Status for pregnant and or lactating women based on MUAC measurements

Pregnant and Lactating Women (n=116)	n	%
Wasted (< 21cm)	4	3.4
Well nourished (≥ 21cm)	112	96.6
Non-pregnant and non-lactating Women (n= 204)		
Wasted (< 21cm)	2	1.0
Well nourished (≥ 21cm)	202	99.0

4.18 Iron/folate supplementation of pregnant women

Less than one-third (59.8%) of the pregnant women took iron/folate supplementation during the current or the last pregnancy. Only 7.8% took the supplement for at least 90 days in line with the HINI recommendations (Table 22) implying low compliance to the supplement.

Table 22: Iron/folate supplementation during the last and current pregnancy

	n	%
Received iron/folate supplementation (n=463)	277	59.8
Took iron supplementation for ≥90 days (n=313)	21	7.8

4.19 Mosquito Bed Net Ownership

Household ownership and source of bed-nets

The majority of the households (70.1%) owned mosquito bed-nets with most of them (87.4%) having received them from the Ministry of Health (Table 23). The rest of the households received the bed nets from an agency or church (7.4%) and 4.9% purchased the nets from the shops.

[13] Kenya National Guidelines

Table 23 : Household ownership and source of mosquito bed-nets

	n	%
Own mosquito bed net (n=562)	384	70.1
Source of bed nets (n=390)		
• Shop	19	4.9
• Agency/church	29	7.4
• MOH	341	87.4

4.20 Household Water Consumption

4.20.1 Sources of Water

Table 24: Sources of water

Sources of water	Water for household use N=545		Sources of drinking water N=545	
	n	%	n	%
River	279	51.2	248	45.5
Lake	2	0.4	1	0.2
Tap water	26	4.8	34	6.2
Borehole	34	6.2	51	9.4
Unprotected well	7	1.3	9	1.7
Protected well	7	1.3	8	1.5
Public pan	45	8.3	53	9.7
Water tanks	1	0.2	1	0.2
Dam	18	3.3	10	1.8
Laga	91	16.7	77	14.1
Springs	14	2.6	0	0
Others	21	3.9	53	9.7

The main source of household and drinking water was the river for 51.2% and 54.5% of the households respectively (Table 24). The second most common source of water for both household use and drinking water was the laga with 16.7% using water from this source for household use and 14.1% for drinking. The overall, picture was that few households had access to safe drinking water.

4.20.2 Amount of water available to the households

Table 25: Water availability

Mean (sd) litres of water used by household per day	54.6 (29.0)
Amount of water used/available per person/day	10.8 (6.4)
% Households with <20 litres of water/person/day	86.8%
% Households with ≥20 litres of water/person/day	13.2%

The mean amount of water available to households per day was 54.6 (sd 29.0) litres. The mean amount of water available per person per day was 10.8 (sd 6.4) litres. The proportion of households that had ≥20 litres per person per day as recommended by Sphere Standards 2004 was only 13.2%. The majority of the households (86.8%) had less than this amount of water (Table 25). Water accessibility is a major challenge in Marigat and East Pokot

districts in terms of the long distances that most households have to walk to get the commodity, and also in terms of accessibility of safe water. Scarcity of water can compromise hygiene standards and consequently result in infections.

4.20.3 Treatment of drinking water

The majority (82.4%) of the people did not treat drinking water despite the fact that the source (river) of the drinking water for the majority of the households was unsafe. Only 13.5% of the households boiled water before drinking and only 2.6% used chemicals to treat drinking water (Table 26). The treatment of drinking water needs to be encouraged particularly because of the unsafe sources of drinking water for the majority of the households.

Table 26: Treatment of drinking water

Treatment given to water before drinking	N=541	
	n	%
Boiling	73	13.5
Use chemicals	14	2.6
Filters/sieves	6	1.1
Decant	1	0.2
Use of traditional herbs	1	0.2
Nothing	446	82.4

4.20.4 The cost of water

On average the cost of water for those households that paid for the commodity was Kenya shillings (Ksh) 5.1±3.4 per 20 litre jerry can. Those households that paid for water on a monthly basis, the mean cost per month was Ksh 142.9 ±194, implying that there was a large variation in the amount of money households paid (Table 27).

Table 27: Cost of water

Cost of water	
Cost of water (Kshs) of per 20 litre jerry-can [mean (sd)]	5.1 (3.4)
Cost of water (Kshs) per month [mean (sd)]	142.9 (194.2)

4.21 Sanitation

4.21.1 Access to and utilization of toilet facilities

Only 27.4% of the households had access to toilet facilities with most (78.5%) of the facilities being the traditional pit latrine (Table 28). The proportion of households with ventilated improved pit latrines was only 3.3%. For the majority (90.3%) of the households, the latrines were within 100 metres from the house. About one-quarter (24.3%) of the households shared the latrines whereas 75.7% were solely used by the families. The majority (93.8%) of the latrines were in use at the time of the survey (Table 28).

Table 28: Access to and utilization of latrines

Sanitation practices	N=575	
	n	%
Households with access to toilets or latrines	149	27.4
Type of toilet facilities (n=149)		
• Traditional pit latrine	117	78.5
• Ventilated improved pit latrine	5	3.3
• Flush toilet	0	0
Pit latrines within 100 metres (n=145)	131	90.3
Shared or family latrine: (n=136)		
• Shared	33	24.3
• Family latrine	103	75.7
Toilet facilities in use (n=140)	131	93.8
Pit latrine has an aperture cover or fly screen on vent pipe	26	18.7
Those without toilets used: (n=414)		
• Bush	383	92.5
• Open field	6	1.0
• River/laga	6	1.0
• Out of the compound	12	2.9
How children's faeces is disposed: (n=530)		
Immediately and hygienically	122	23.0
Immediately in the bush	390	73.6
Scattered in the compound	5	0.9
Other	13	2.4

The majority (92.5%) of the households without toilet facilities used the bush with a few using the open field and the river/laga (1.0% and 1.0%) respectively. Children's faeces was disposed appropriately by 23.0% and 73.6% disposed the faeaces inappropriately by throwing it in the bush (Table 28). This practice should be strongly discouraged because inappropriately disposed faeces can be a source of contamination especially for children.

4.22 Hygiene Practices

Hand washing is one of the practices designated as a high impact nutrition interventions (HINI) based on empirical evidence[14],[15] because of the role it plays in promoting child health and nutrition. Only 56.9% of the respondents practiced appropriate hand washing (with water and soap) and 41.5%% washed their hands with only water (Table 29). Just over half (54.3%) of the respondents reported washing their hands after visiting the toilet, 77.9% before preparing a meal, and 45.9% after attending to a child who has defaecated. Only 4.5% of the households had a hand washing facility near the latrine and 3.6% had soap at the hand washing place (Table 29).

[14] The Lancet (2008). Maternal and Child Undernutrition, Special Series.

[15] The World Bank. Repositioning Nutrition as Central to Development: A strategy for Large Scale Action. International Bank for Reconstruction and Development/World Bank: Washington, DC, 2006.

Table 29: Hand washing practices

	n	%
Items used for hand washing (n=511):		
• Water only	212	41.5
• Water and soap	291	56.9
• Water and ash	5	1.0
• Washing facility near the latrine/in the compound (n=484)	22	4.5
Occasions when hands are washed (n=516)*:		
• After using the toilet	451	54.3
• After attending to a child who has defaecated	237	45.9
• Before feeding a child	251	48.6
• Before preparing a meal	402	77.9
• After handling animals	143	24.9
• When washing face	90	17.4
• When bathing	26	4.5
• Others	17	3.2
Presence of soap/ash at hand washing facility (n=506)		
• Yes	18	3.6
• No	159	31.4
• No strategic hand washing facility	329	65.0

Multiple responses

4.23 Household Food Security

4.23.1 Food Aid

The majority of the households (67.2%) received food aid in the three months prior to the survey.

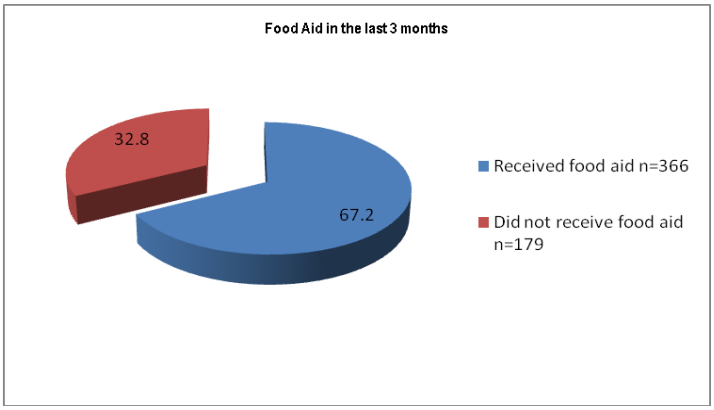

Figure 12: Households that received food aid in the three months prior to the survey

Number of times food aid received in the three months prior to the survey

The majority of the households received the food aid once in the three months prior to the survey and 20.0% received it twice. An almost similar proportion (19.4%) of the households received food aid three times (Figure 13). These findings imply that for most households, food aid was not the major source of food.

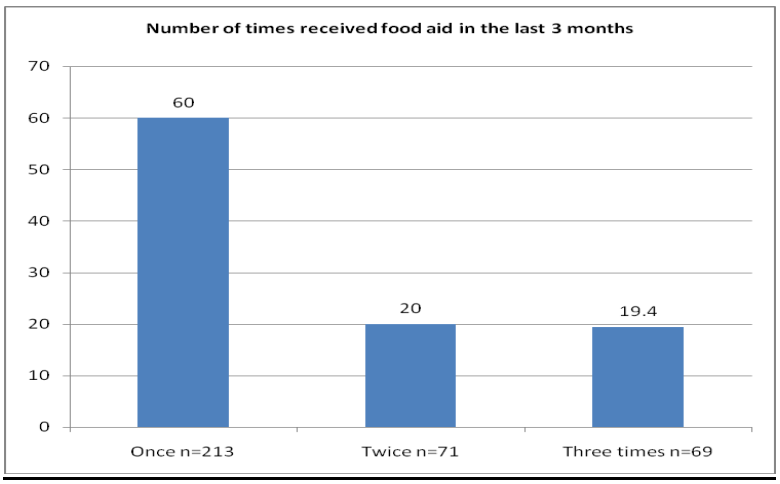

Figure 13: Number of times food aid received in the last three months

4.23.2 Frequency of meal Consumption

The respondents were asked how many meals the household members usually ate per day and how many meals they ate the day before the survey. This was in order to get an indication of the household food security situation at the time of the survey. The majority (72.1%) of the households normally ate 3 meals per day. The same proportion (72.2%) also ate 3 meals the day prior to the survey (Figure 14). The proportion of households that usually ate one meal was 2.6% whereas those who ate one meal the day prior to the survey was 24.4%. More or less the same proportions ate two meals or ≥4 meals the day before the survey as normal times.

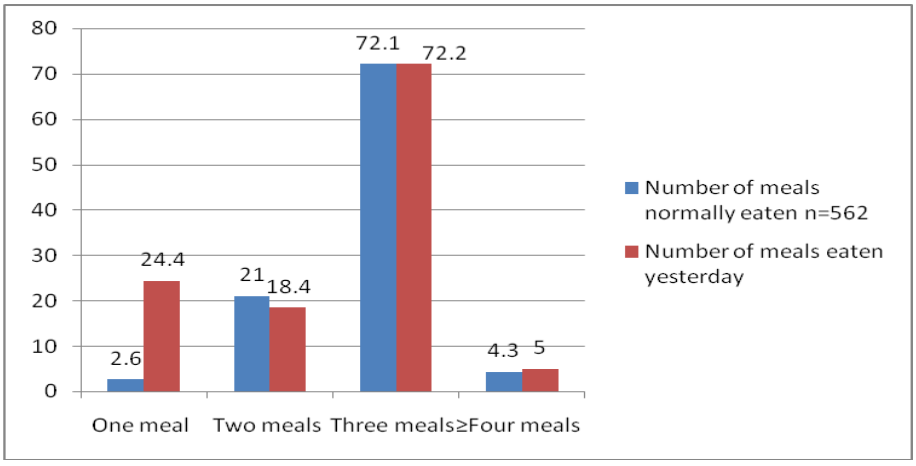

Figure 14: Frequency of meals usually eaten and that eaten the day prior to the survey

4.23.3 Household members who missed meals the day prior to the survey and reasons for missing meals

The majority of the households (85.4%) reported that no member missed a meal the day prior to the survey (Table 30). Most (57.1%) of those who missed a meal were fathers and the major reason for missing a meal was because of being away from home (80.0%). These findings imply that food insecurity was not a major issue at the time of the survey.

Table 30: Household members who missed meals the day prior to the survey and reasons for missing meals

	n	%
Missing of meals (n=562):		
Households where no member missed a meal	455	85.4
Households where some members missed a meal	78	14.6
Members who missed meals: (n=84)		
• Children under five years	13	15.5
• Children 5-12 years	4	4.8
• 13-19 years	6	7.1
• Mother	9	1.6
• Father	48	57.1
• Above 19 years	4	4.8
Reasons for missing meals:		
• Food not enough	10	13.3
• Away from home	60	80.0

4.23.4 Household Dietary Diversity

Household Dietary Diversity

A 24-hour dietary diversity score was calculated to determine the households' economic capacity to consume various foods. The household dietary diversity score (HDDS) was 6.5 (sd 2.6) implying that on average the households consumed 6 food out of 15 groups. About one-third (33.5%) of the households consumed 8 food groups or more (Table 31).

Table 31: Household dietary diversity score based on a 24-hour recall

	N=562 Mean (sd)
Household dietary diversity score (HDDS)	6.5 (±2.6)
% of households consuming ≥8 food groups	33.5%

4.23.5 Variety of foods consumed

Table 32: Foods consumed by households based on a 24-hour recall

Food groups	**N=562**	
	n	%
Cereals and cereal products	537	97.5
Vitamin A rich vegetables & tubers	94	17.8
White tubers and roots	87	16.4
Dark green leafy vegetables	422	79.2
Other vegetables (tomatoes, cabbage etc)	314	58.7
Vitamin A rich fruits	80	15.1
Other fruits (including wild)	114	21.5
Organ meat	35	6.7
Flesh meat and offal	81	15.7
Eggs	82	14.6
Fish	13	2.5
Pulses and legumes	370	69.0
Milk and milk products	496	91.0
Oils/fats	458	84.3
Sweets/sugar/honey etc	474	87.5

As expected, cereals and cereal products were consumed by the majority of the households (97.5%). The other commonly consumed foods were milk and milk products (91.0%), oils and fats (84.3%), sweets and sugar (87.5%), dark green leafy vegetables (79.2%) and pulses by 69.0% of the households (Table 32). The least consumed food groups by less than 20% of the households were organ meats, fish and vitamin A-rich fruits.

4.23.6 Main source of dominant food item

The main source of the dominant food item (cereals) in the diet was purchases for 51.4% of the households and 33.9% own production (Table 33). Food aid was a source of food for 14.3% of the households.

Table 33: Main source of dominant food item

Food sources	**N=531**	
	n	%
Own production	180	33.9
Purchases	273	51.4
Gifts from friends	1	0.2
Food Aid	76	14.3
Borrowed	1	0.2

4.24 Coping Strategies

Respondents were asked to state the coping strategies that their households had employed in the month prior to the survey. The findings showed that a number of strategies were used by the households (Table 34). The majority of the households (71.1%) purchased food on credit, followed by reduction in the number of meals (68.0%), borrowing food from neighbours (65.5%), reduction in the size of meals (65.1%), sale of livestock (63.5%) and engaging in casual labour (57.3%).

Table 34: Coping strategies employed during food shortage

Coping Strategies	**N=547**
	%
Reduction of no of meals per day	68.0
Skip meals for an entire day	52.7
Reduce size of meals	65.1
Restrict consumption for adults to allow more children to eat	52.9
Shift to less preferred food	58.3
Hunting and gathering	28.4
Engaging in casual labour	57.3
Borrow Food	65.6
Purchase food on credit	71.1
Consume wild foods	11.4
Consume decomposed fish	10.0
Send household members to eat elsewhere	16.0
Send child/children to school	21.7
Begging	30.8
Sale of livestock	63.5
Sale of charcoal/firewood/small scale business	37.1
Part of family migrating with animals to look for pasture	25.5
Sale of milk, meat, fish	29.5
Donation	22.7

4.25 Mortality

Mortality measurements and indices

The *crude death rate* (CDR) is defined as the number of people in the total population who die over a specified period of time. It is calculated using the following formula:

$$\text{CDR} = \frac{\text{Number of deaths}}{\text{Total population}} \times \frac{\text{Time Interval}}{10,000} = \text{Deaths/10,000 people/day}$$

In the formula, total population is the population present at the midpoint of the time interval. The time interval is the length of time within which the respondents are asked to state if any deaths have occurred; this is usually referred to as the "recall period." The units for the formula are deaths per 10,000 per day when the "time interval" is expressed in days. In this survey the "recall period" was 90 days as recommended for use in developing countries.

The same formula was used for calculating the Under five Death Rate (U5DR).

Crude Death Rate

The crude death rate (CDR) was within acceptable level (<2 deaths/10,000 people/day) as per the SPHERE Standards 2004 (Table 35). The crude death rate was 0.30 (95%CI: 0.14– 0.64) deaths/10,000/day.

Underfive Death Rate

The underfive death rates (U5DR) for all the districts were within acceptable levels (<4 deaths/10,000 people/day) as per the SPHERE Standards 2004. The U5DR was1.03 (95%CI: 0.24 – 4.25) (Table 35).

Table 35: Crude and Underfive Death Rates in all the four survey sites

Crude Death Rate (CDR)	0.3 (95%CI: 0.14-0.64)
Underfive Death Rate (U5DR)	1.03 (95%CI: 0.24-4.25)

5. DISCUSSION

The findings of the FGDs have been used to complement the quantitative findings while highlighting disparities where they exist.

5.1 4.1 Nutrition situation in East Pokot and Marigat Districts

No survey has ever been conducted in East Pokot and Marigat districts as one entity and therefore a trend analysis could not be done. A survey was conducted in East Pokot district in 2010 which is not directly comparable with the present survey. The GAM depicts a state of poor nutrition situation or an alert level based on the WHO guidelines (1995). The two districts are prone to chronic drought which renders them food insecure most of the times. The survey however took place during heavy rains and the household food security status of the households was better than most of the times. This sentiment was expressed by the community members during the focus group discussions. The situation was likely to deteriorate as soon as the rains stopped. There was likelihood of a hunger gap before the long rains begin in March 2012 increasing the vulnerability of the households.

5.2 Coverage of Selective Feeding Programmes

The coverage for SFP did not reach the Sphere Standards 2004 (>50%) based on MUAC and Z scores. The OTP coverage rates were also very low. The coverage should be interpreted with caution because of the small numbers involved and the that fact that the formula used includes children who may not be eligible for entry into the programme on the day of the survey (children who are in the recovery phase and whose weight-for-height is higher than that required for entry into the programme or who no longer exhibit nutritional oedema). These children, now in recovery, were recently undernourished. This formula is therefore an estimator of RECENT coverage in a given period (PERIOD PREVELENCE). The findings should therefore be interpreted as estimates, rather than actual coverage rates.

5.3 Immunization, de-worming and Vitamin A supplementation coverage

Immunization coverage for most of the antigens were above the Kenya Expanded Immunization Programme (KEPI) and WHO acceptable level. The relatively high level of coverage may be attributed to the newly implemented HINI programme and the increased community outreaches moving the services nearer to the people. The outreaches are important in improving coverage because of the limited accessibility of health services due to the few health facilities which are far from one another. Vitamin A supplementation for children did not meet the WHO recommended acceptable level. The frequency of administration was poor with only 34.3% of the children 12-59 months of age having received the supplementation twice within a 12-month period as per the WHO protocol. De-worming coverage was low despite the poor availability of clean safe water as well as poor sanitation for most households predisposing the children to helminthes infestation, making de-worming a crucial exercise.

5.4 Child Morbidity and Maternal Health Seeking Behaviour

Compared to the national and Rift Valley Provincial rates, the prevalence of ARIs, diarrhoea diseases and fever were higher in the survey districts. The majority of the mothers/caregivers sought assistance for their sick children from public health facilities. Relatively high percentage of caregivers sought no assistance for their sick children. Of equal concern is the practice of buying medicines for sick children from shops or kiosks. This practice needs to be discouraged because the self-diagnosis conducted by mothers/caregivers and then the decision on what medicines to purchase is likely have adverse health consequences on the child. The importance of seeking medical attention from health professionals should be re-emphasized in the health education messages. It is noteworthy that for many people in the two districts, health services are not easily accessible because of the poor infrastructure and the few health facilities which are, in many cases, poorly staffed.

The management of diarrhoeal diseases is an area needing attention. Very few cases of diarrhoea were supplemented with zinc as per the WHO standard protocol requirement. The majority of the mothers (80.2%) did not do anything either at home or in terms of seeking assistance for the last diarrhoeal episode for their children.

5.5 Infant and Young Child Feeding Practices (IYCF)

Breastfeeding Practices

Breastfeeding practices in terms of timely initiation, giving of colostrum and continued breastfeeding at 1 year was appropriate for most children. Despite the fact that exclusive breastfeeding rate in this survey was higher than the national rate it was lower than the WHO accepted rate of 90% and therefore still needs attention. A relatively high proportion of children were given prelacteal feeds and less than half of the children were still breastfeeding at 2 years indicating that they stopped getting the benefits of breastfeeding prematurely.

Complementary Feeding Practices

As a whole, the complementary feeding practices inadequate in terms of frequency of feeding and minimum dietary diversity. This meant that many children were not getting adequate nutrients for healthy growth and development. In this respect, the non-breastfed children were worse of than the breastfed child. The non-breast child needs special attention in the promotion of appropriate IYCF messages.

5.6 Availability of mosquito bed nets

5.7 Water and Sanitation and Hygiene Practices

Access to safe water both for domestic use and for drinking was limited. Despite this, the majority of the households did not treat drinking water therefore rendering the household members particularly children to infections. Latrine coverage was poor and the majority of the households used the bush and also disposed children's faces inappropriately in the bush. Less than two-thirds of the respondents washed their hands with soap and after visiting the latrine and before preparing meals. There is need for improvement in washing hands, particularly before feeding children.

5.8 Household Food Security

The findings on the proxy indicators of household food security indicated that there was an improvement in household food security at the time of the survey. The dietary diversity was 6 out of 15 food groups. There was no difference in the number of meals consumed the day before the survey and that consumed normally. The number of family members who missed meals the day before the survey was low, and the majority of them were the fathers. The main the reason for missing meals was because of being away from home and not food shortage. The same findings were reported during the FGDs when the community members reported that at the time of the survey the most of the households were food secure. This finding implies that the nutritional status of the children could have been worse if the survey was conducted during the dry season leading to increased household food insecurity status.

5.9 Factors associated with malnutrition in Turkana

5.9.1 Immediate Causes

Dietary Intake

The findings of this survey revealed a fairly adequate dietary intake by the households. Many households ate 3 meals per day and the number of meals. The household dietary diversity was fair with large proportion of households having consumed foods from cereals, dark green leafy vegetables, pulses and legumes and milk and milk products. The food groups not consumed by many households were fish, eggs, and organ and flesh meats.

Disease

The burden of morbidity was higher than both the national and provincial rates indicating that the children higher burden of morbidity. ARIs, diarrhoeal diseases and fever have a profound negative effect on the nutritional status of children and therefore the high prevalence of morbidity most likely compromised the nutritional status of the children.

5.9.2 Underlying causes of malnutrition

The major underlying causes that may have contributed to malnutrition among the children were inadequate health services and unhealthy environment. The health facilities were not easily accessible for the majority of the population and many public ones were understaffed. In some of the places, health services were offered through outreaches. Despite this, some of the respondents did not seek services for their sick children. This was especially true for diarrhoeal diseases for which 80.0% did nothing when their children were ill. Zinc supplementation for diarrhoeal diseases was low and could have contributed to longer episodes of the disease.

Many households depended on water from unsafe sources such as the river. This was compounded by the fact that most of the households did not boil drinking water. The scarcity of water may have interfered with hygiene practices. Overall, sanitation was inadequate as less than a quarter of the households had access to latrines. The majority of the respondents did not practice appropriate hand washing and this could have contributed to the high level of malnutrition especially diarrhoeal diseases.

It was reported during the FGDs that poor health and nutrition knowledge was also a factor contributing to malnutrition in the districts.

Heavy maternal workload was reported during the FGDs to be a major issue contributing to malnutrition among children. Many times children were left in the care of older siblings as the mothers were away attending to other duties. The women reported during the FGDs that they were stressed because the men left with the sole responsibility of fending and feeding for their families. This was compounded by the fact that when a woman gave birth, the husbands left them and went away to stay with the other wives, leaving them desperate for help. This was a very emotive issue reported in all the FGDs. The men also acknowledged that the women had high workload but reported that they could not come to their aid because these roles are gender determined.

5.9.3 Basic causes of malnutrition

Marigat and East Pokot districts have low levels of development; there is poor infrastructure in terms of roads, health facilities and schools. There is high level of poverty caused by the chronic drought resulting in death of livestock, the main livelihood of the people, particularly in East Pokot district. The constant cattle raids and animal diseases such as PPR have also contributed, to a large extent to loss of livestock.

6. CONCLUSIONS

- The nutritional status of children (wasting) was poor or at alert level. This was contributed to mainly by a high burden of morbidity among the children, inadequate IYCF practices, limited access to latrines, poor hygiene practices (washing of hands) and heavy maternal workload;
- Stunting and underweight were high and above the national prevalence rates at 35.3% and 16.1% respectively;
- Mortality rates were below emergency cut-off (Sphere Standards, 2004);
- Morbidity burden was highest for fever ARIs and watery diarrhoeal diseases. The prevalence rates for these diseases conditions were higher than both the national and the Rift Valley provincial rates;
- Zinc supplementation for diarrhoeal diseases was extremely low. A relatively high proportion of caregivers did NOTHING about the disease;
- Immunization coverage was high; over 80% for all the antigens;
- Vitamin A supplementation for children 6-59 months was slightly below the 80% acceptable level. Frequency of administration of the supplementation in accordance with the WHO guidelines was poor. Only one-third of the children 12-59 months old had taken the supplement twice;
- De-worming coverage for children was low;
- Iron/folate supplementation for pregnant women lower than both the national and provincial rates. Compliance to the supplementation was low as only 5% had taken for ≥ 90 days. The findings however, could have been influenced by recall bias;
- There was no increased household food security at the time of the survey;

- Breastfeeding practices were adequate in terms of timely initiation and continued breastfeeding at 1 year. Nonetheless, continued breastfeeding at 2 years was low. Exclusive breastfeeding rate was high in comparison to the national rate, but below the WHO recommended 90% acceptable level;
- Complementary feeding in terms of dietary diversity and frequency of feeding was inadequate;
- Latrine coverage was low;
- The practice of washing hands was inappropriate for most households; and
- Most of the households used unsafe water and the majority did not treat drinking water;

7. RECOMMENDATIONS

Short-term interventions

- The following indicators of health and nutrition should be improved:
    - De-worming coverage;
    - Appropriate washing of hands;
    - Treatment of drinking water;
    - Exclusive breastfeeding and continued breastfeeding to 2 years;
    - Dietary diversity and frequency of feeding of complementary foods;
    - Zinc supplementation of diarrhoeal diseases;
    - Frequency of vitamin A supplementation;
    - Iron/folate supplementation for pregnant women; and
    - Coverage of supplementary and therapeutic feeding programmes should be conducted using more efficient methods. It is recommended that the estimation of coverage of SFP and OTP be conducted using method such as SQUEAC.

  The above indicators can be improved through intensified health and nutrition education. There should be wider dissemination of such information through increased outreaches, campaigns, mobile clinics and the acceleration of the community strategy in offering health services. All the stakeholders; Ministry of Public Health and Sanitation, Ministry of Medical Services, WVK and other NGOs working on child survival programmes and also faith-based or community-based organizations should be involved in the implementation of this recommendation.

- Continue with SFP and OTP particularly during the dry seasons when there is increased household food insecurity to deal with the hunger gap and reduce morbidity and mortality due to malnutrition. The following stakeholders; MOPHS, MMS, APHIA, UNICEF and WFP should be involved in the implementation of this recommendation.

- Increase coverage for Food for Assets (FFA) especially during the dry season and where there is crop failure. The community members in Marigat expressed preference for this intervention rather than GFD as they reported that they were tired of getting hand outs. This should be implemented by WFP and WVK.

- Continue to provide GFD as a stop gap measure during periods of increased food insecurity.

- Improve access to health services mainly through mobile clinics. This should be done by MOPHS, MMS and WVK.

- Increased accessibility to safe water for household use and drinking. It suggested that water harvesting by water pans should be implemented or accelerated.

- Re-stocking of livestock after drought particularly in East Pokot where livestock keeping in the major livelihood of the people.

Long-term interventions

- Improve latrine coverage; to be implemented by MOPHS and other health partners.
- Improve food production by provision of improved quality seeds, short season seeds and irrigation. These sentiments were strongly expressed by the community members especially those in Marigat district. This recommendation should be implemented by MOA and other stakeholders; and
- Protection of crops from destruction by wild animals. This was reported during the FGDs to be a major cause of food insecurity in some parts of the districts. This recommendation should be implemented by MOA and other stakeholders.
- Gender issues should be considered in the implementation of interventions. This aspect came up very strongly during the FGDs as the high maternal workload was reported to be a major issue constraining adequate child care and consequently leading to malnutrition.

General recommendations

- East Pokot and Marigat seem to be different in terms of livelihoods, food security and challenges faced. This was reported in the FGDs and interviews with Key informants.
- The two districts are heterogeneous; most of the cases of malnutrition were in East Pokot. The poison distribution was 3 (p=0.001) AND the resulting design effect was 2.01
- The districts should therefore have independent surveys to facilitate implementation of appropriate interventions for each one of them.

ANNEX 1: TOR

Nutrition Survey

Terms of Reference

Baringo County
(Baringo Central and Marigat)

World Vision Kenya

© Sept 2011

Survey Summary

Province	Rift Valley Province
Districts	Baringo and East Pokot
Evaluation Type	Nutrition Survey
Evaluation Purpose	To assess food security, health and nutritional status of children between 6 and 59 months old and to investigate causes leading to long standing poor health and nutrition indicators.
Primary Methodologies	**Key informant Interviews, Focus Group Discussions, Review of secondary data**
Evaluation Period	**September**
Anticipated Evaluation Report Release Date	**30th October**

Description of the district

The larger Baringo District is in Rift Valley Province and is divided into four administrative districts namely: Baringo Central, Baringo North, Marigat and East Pokot. It borders Turkana to the North, West Pokot to the North West, Keiyo and Marakwet to the West, Koibatek and Nakuru to the South and Laikipia and Samburu to the East.

The district covers an area of 8,655 square kilometres which includes 140.5 square kilometres of Lake Baringo, Lake Bogoria and Lake Kamnarok and the recently a new lake named 94 has developed in the last fifteen years. The district has an estimated population of 406,839 (according to the 2009 National Census) spread in four livelihood zones namely mixed farming, pastoral, agro pastoral and irrigated cropping as shown in the in Table 1.

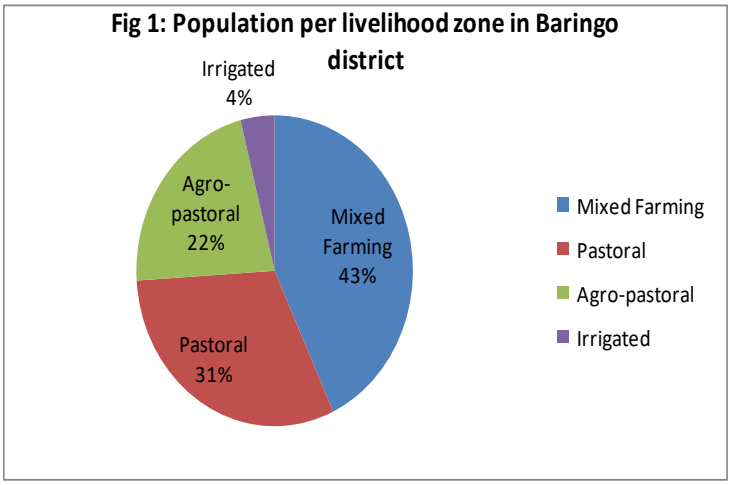

Figure 15: Population by livelihood zone

In the last six months Baringo district has been under stressed (Borderline/moderate) phase and has been worsening in all livelihood zones as a result of the erratic rains. Livestock prices have gone down as food prices continue to go up. (Long Rains 2011 Assessment Report)

Current factors affecting food security

Poor rainfall performance.

Conflict over resources (cattle rustling along the border of East Pokot and Turkana, and within the district).

Land degradation in East Pokot.

Poor agronomic practices.

Human –wildlife conflict in Churo, Tangulbei, Koloa, Sacho and Salawa divisions.

Very high food price that is currently experienced in the country.

In order to guide programming in these two districts, a nutrition survey is needed. The survey will provide not only nutrition information, but also information related to WASH, health and food security.

Evaluation Target Audiences

Proposed Collaboration

Ministry of Public Health & Sanitation/Ministry of Medical Services

District Health Management Teams (DHMTs)

District Medical Officers of Health (DMoH)

District Nutrition Officers

District Statistics Officers (DSO)

District Commissioners

At the community level, the survey will target children under five years, pregnant and lactating mothers for anthropometric measures, care givers and household heads for questioners and general population for focus group discussions.

Justification for the nutrition survey

The last nutrition survey in the district was done in October 2010 and covered only East pokot and depicted a Global Acute Malnutrition (GAM) rate of 16.4% and a Severe Acute Malnutrition (SAM) rate of 2.3%. There has been no recent survey in Baringo North, Central and Marigat.

Generally, the nutrition status of children under five years old is poor. The percentage of children at risk of malnutrition as measured using the mid upper arm circumference (MUAC) is above average for 2011 data from January to July.

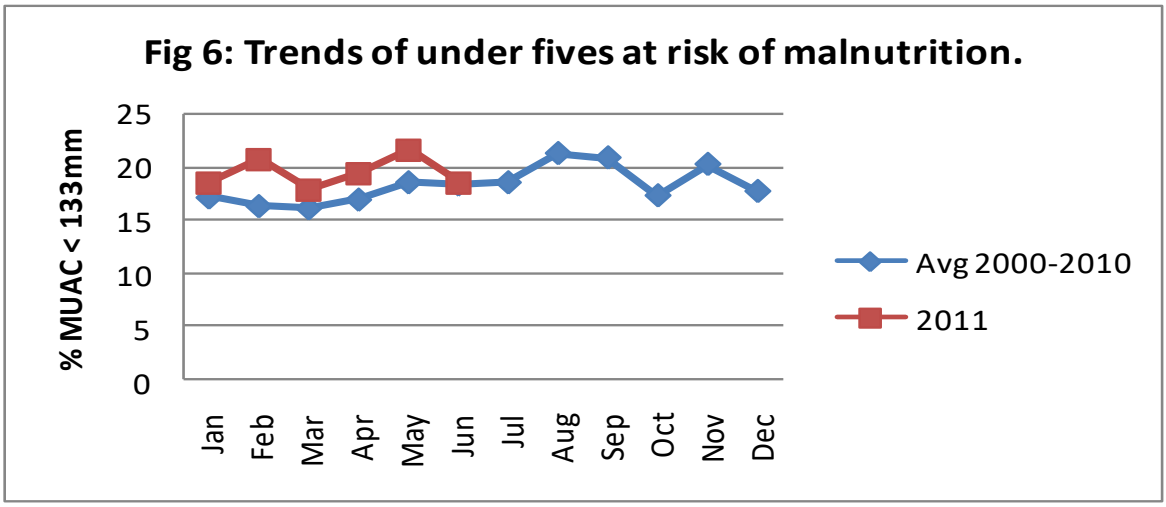

Figure 2: Malnutrition trends-MUAC data

The district food security situation is currently stressed owing to the erratic temporal distribution of the rains across the livelihood zones and flooding in some regions. Very high food price that is currently experienced in the country, Conflict over resources (cattle rustling along the border of East Pokot and Turkana, and within the district) have impacted negatively on the communities living in the areas affected. Livestock rustling limit access to health facilities in some parts of the districts.

Latrine coverage is poor, the situation is worse in the lowlands where the bigger population uses the bush to relieve themselves. The major leading diseases among under fives include malaria, pneumonia, diseases of respiratory tract and diarrhea diseases and these impact negatively to the nutritional status of children under five as well as the general population as they also lead to shifting of resources that would otherwise be used positively at household levels.

This has affected household food security, and has contributed to high numbers of children who are currently reported by health facilities as having moderate and severe acute malnutrition (Fig 3)

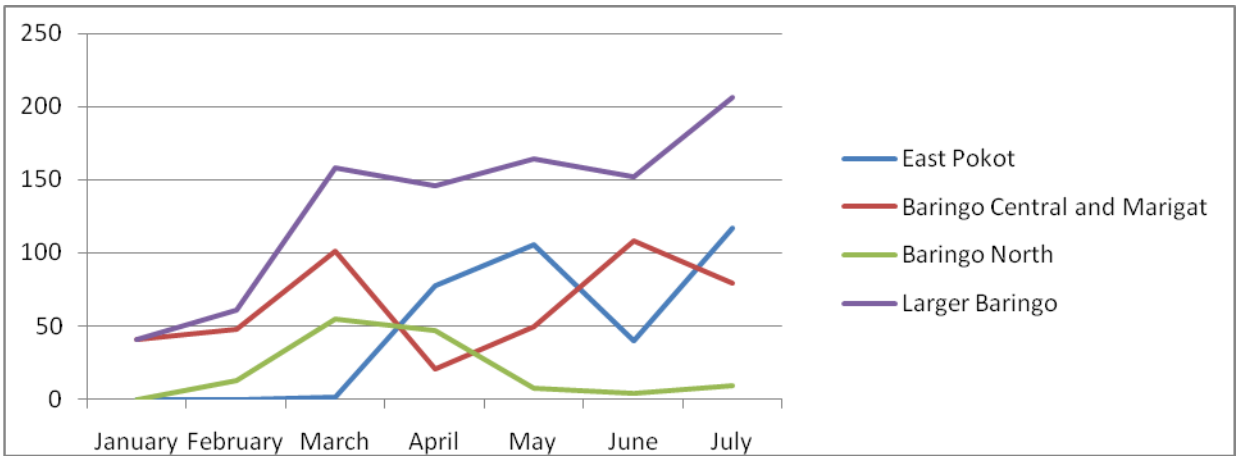

Figure 3:OTP admissions trend from January.

World Vision Kenya (WVK) has previously undertaken nutrition surveys in the region and currently providing nutrition services in the county.

The survey will provide clear baseline information as well as progress for the Higher Impact Nutrition Intervention that is currently being implemented in the larger Baringo County.

Overall Purpose and Objective:

To assess food security, health and nutritional status of children between 6 and 59 months old and to investigate causes leading to long standing poor health and nutrition indicators.

Specific objectives:

Assess the prevalence of acute and chronic malnutrition in children aged 6-59 months.

Assess the prevalence of malnutrition in pregnant women and Lactating mothers

Assess care seeking behaviors, rates of exclusive breastfeeding as well as complementary feeding knowledge, attitudes, and practices.

Estimate coverage for SFP, OTP, Measles and BCG vaccination, Deworming and vitamin A.

Estimate morbidity rates in children 6-59 months.

Estimate crude and under five mortality rate.

Assess Household food security levels/situation.

To establish hygiene and sanitation practices of the community.

Provide information for revising the national guidelines for conducting nutrition surveys in Kenya.

To establish baseline for high impact nutrition interventions indicators

Expected results:

% of GAM and SAM for children 6-59 months

Provide a measure of child care and feeding practices related to nutrition

% coverage of immunization, and vitamin A supplementation, Deworming and nutrition interventions programs

Morbidity rates of children below five years

Crude and under five mortality rate

Provide measure of food security situation

Provide information for revising the national guidelines for conducting nutrition surveys in Kenya

Latrine coverage, number of household that have knowledge on hand washing as well as water treatment practices

Baseline indicators for all high impact nutrition interventions

Sustainability of results

Information obtained from the survey will be used for effective planning of sustainable nutrition services in the county. Conducting Standardized Monitoring Assessment for Relief and Transitions (SMART) survey is one way of building the capacity of government staff especially the Ministry of Health. At district level, the MOH staff will be involved in all levels survey from planning and implementation to validation and dissemination of the result for

use. It is envisaged that the capacity developed among the MOH staff will be critical in future surveys where the MOH will be able to conduct the surveys with minimal assistance.

Methodology

The evaluation will utilize several methodologies among them:

Review of secondary data from MOH especially on statistical reports from district health records and information officers, District Nutrition Officers and other DHMTs

Review Food security reports

Focus Group discussions with caregivers, household heads, health workers, and key decision makers in the community.

Questionnaires to caregivers and household heads

Anthropometric data from children between 6-59 months, pregnant and lactating mothers.

Two surveys will be conducted. One survey will cover East Pokot and parts of Baringo North while the other shall over the Marigat, Baringo Central. East Pokot and Baringo North is in the pastoral livelihood zone while Marigat, Baringo Central are in the agro-pastoral zone. The two surveys will be conducted independently.

Authority and Responsibility

Authority	**Responsibility**
National Office	-Hiring of consultants -Review evaluation report
Integrated Program Manager	Provide logistical support to consultant
Ministry of Health	-Provide data -Participation in evaluation
Project manager	-Support the consultant -Review evaluation report
Sub branch ICD/Program officer/National nutrition coordinator	-Review evaluation report
Consultant	-Data collection - Analysis of statistical report from MOH - Develop evaluation data collection tools -Generate evaluation report including lessons learnt

Logistics

Activity	Responsible Person
Accommodation and meals for consultant	Nutrition Manager
Travel and field facilitation for consultant	Nutrition Manager
Supervisors and data collectors	Nutrition Manager
Provider interpreters where necessary	Nutrition Manager
Provide room for briefings	Nutrition Manager
Stationeries	Nutrition Manager

Products

The consultant will:

Develop a consultancy proposal detailing methodology, work plan and budget

Develop data collection tools and share with WVK for review before use

Undertake data collection and analysis

Generate an evaluation report

Share the preliminary report with stakeholder's forum at district level and incorporate feedback

Present draft report to the nutrition information working group at national level

Incorporate the feedback from stakeholders and produce final report

Nutrition Technical Forum will review and adopt the survey report and release it to the relevant ministries and partners for use interventions.

Documents review

The following documents will be reviewed as part of secondary data.

Statistical reports on nutrition indicators from District Health Information Record

Integrated Management of Acute Malnutrition data

High Impact Nutrition baseline and progress reports

Food security reports

Previous nutrition survey reports

Result Framework

Level	Narrative Summary	Indicators	Baseline	Target	Means of Verification
Goal	To reduce the magnitude of malnutrition for children under five years of age and to provide information for an effective interventions and management of current nutrition programming in Baringo County.	Improved food security status indicators Mortality and morbidity rates Malnutrition levels	2010 Health Nutrition Survey of East Pokot and 2009 Nutrition Survey Baringo Central, Marigat and North.	Baringo County	Nutrition survey reports
Purpose	To assess food security, health and nutritional status of children between 6 and 59 months old and to investigate causes leading to long standing poor health and nutrition indicators.	Immunization coverage Vitamin A supplementation and Deworming coverage Coverage of selective feeding programmes	2010 Health Nutrition Survey of East Pokot and 2009 Nutrition Survey Baringo Central, Marigat and North	Children aged 6-59 months of age	Nutrition survey reports
	Assess the prevalence of acute and chronic malnutrition in children aged 6-59 months	Malnutrition levels (NCHS and WHO) - GAM - SAM - % with oedema - % under weight - % stunting - MUAC	2010 Health Nutrition Survey of East Pokot and 2009 Nutrition Survey Baringo Central, Marigat and North	Children aged 6-59 months of age	Nutrition survey reports
	Assess the prevalence of malnutrition in pregnant women and mothers with children <5 years of age.	MUAC Iron Folate supplementation coverage	2010 Health Nutrition Survey of East Pokot and 2009 Nutrition Survey Baringo Central, Marigat and North	Pregnant women and Mothers of children<5 years	Nutrition survey reports
	Estimate coverage for	Immunization coverage	2010 Health	Baringo County	Nutrition survey

	SFP, OTP, measles and BCG vaccination and vitamin A.	Vitamin A supplementation coverage Coverage of selective feeding programmes	Nutrition Survey of East Pokot and 2009 Nutrition Survey Baringo Central, Marigat and North		reports
	Estimate morbidity rates in children 6-59 months and pregnant women and lactating mothers with children <5 years.	Fever (alone or in combination with other symptoms) ARIs: % Diarrhea: %	2010 Health Nutrition Survey of East Pokot and 2009 Nutrition Survey Baringo Central, Marigat and North.	Baringo County Children aged 6-59 months of age	Nutrition survey reports
	Estimate crude and under five mortality rate.	Crude mortality rates (CMR) – number/10,000/day Under 5 mortality rates (U5MR) – number/10,000/day	2010 Health Nutrition Survey of East Pokot and 2009 Nutrition Survey Baringo Central, Marigat and North	Baringo County Children aged <5 years	Nutrition survey reports
	Assess the nutrition intervention coverage in the District.	Immunization coverage Vitamin A supplementation coverage Coverage of selective feeding programmes	2010 Health Nutrition Survey of East Pokot and 2009 Nutrition Survey Baringo Central, Marigat and North	Baringo County	Nutrition survey reports
	Asses Household food security levels/situation in Baringo and East Pokot districts	Source of food Source of Income Coping Strategies Number of meals eaten per day Role of food aid		Baringo County.	Nutrition survey reports

ANNEX 2: SAMPLED CLUSTERS

Assignment of Clusters – Marigat and East Pokot

Geographical unit	Population size	Assigned cluster
AKORET	1522	1, 2
AKWICHATIS	2645	3
AMAYA	4475	4
ANGORITIANG	2100	5, 6
Arabal	2853	
BARPELLO	3707	
Chebinyinyi	1942	
Chelaba	1086	
CHEMOIGUT/MUKUTANI	2270	7
CHEMURO	699	
CHEPELION	1521	8
CHEPELOW	1375	RC, 9
CHEPKERERAT	3203	
CHESAKAM	2190	
CHESIRIMION	6033	10
CHURO	1979	
Eldume	2638	11
Endao	1146	12
Ilngarua	1321	13, 14
Kabusa	794	15
Kailer	709	
Kamailel	3537	
KAPEDDO NORTH	2179	16
KAPEDO EAST	7454	17, 18

KAPEDO WEST 1643
Kapkechir 4260 19, 20
Kapkuikui 499
Kapnarok 3794
Kaptombes 581
KAPTUYA 1849
KAPUNYANY 3307
Kasiela 1110
KECHI LORUK KONGASIS 1430
KECHII 1032
ketemwa 662
Kibingor 695
Kimalel 969
Kimoriot 4945 21, 22
Kiserian 2256
Koitilion 572
KOKORE 2260
KOKWOTOTO 1345
KOLLOWA 5652 23
KOMOLION 1236
koriema 1927
KOROSSI 769
KOSITEI2045
KULAL 2485 24
Logumgun 1279 RC, 25
LOIWAT 1857
LOKIS 1991 26
Longewan 1242
LOSIKIRIAMOI 4136 27

Maji ndege	1059	RC, 28
MAKANY	2406	RC
MARON 2202	29	
Mbechot	1374	
Meisori 2846	30	
MIRGISI 3629	31	
Mochongoi	2306	32, 33
MUKEKAMAR	4431	
Mukutani	1188	
NAKOKO	2059	
NAKORETE	1134	
NASOROT	5651	34, 35
NG'ORON	3304	
NGAINA 3152		
Ngambo	3347	36
Ngelecha	990	
NGINYANG WEST	3632	RC
ORUS 2929	37	
PAKA 3463		
Perkerra	7451	38, 39
PUTERO	4102	40
Rugus 937		
Sabor 1366		
Salabani	1915	
Sandai 1206		
SERETION	2860	
Sintaan 1979		
TANGULBEI	4130	
TEBELEKWO	3016	

TILINGWO 1114

TIRIOKO 5407 41

TUWO 1139 42

Yatoi 4393

(RC = Reserve Clusters, approx. 10% of the original clusters, all of the reserve clusters should be surveyed when it was not possible to collect some of the other clusters.)

unicef

Nutrition and Food Security Survey Questionnaire

Name of District	Name of Division	Name of sub location	Cluster Number	Team number	Household Number	Date of Interview (dd/mm/yy)	Name of Interviewer	Name of Team Leader
						____/____/____		

1. HOUSEHOLD DATA

How many people live in this household together and share meals? (Household size) ☐

1.1 Age group	1.2 Person ID and Name (*Start with the youngest to the oldest member of the household. Insert the names of the persons and ensure that numbering is continuous*)		1.3 Approx.* Age Enter months for children under 5 years and years for over 5's		1.4 Childs age verified by (1=Health card, 2=Birth certificate/notification, 3=Baptism card, 4=Calendar of events, 5=Recall)	1.5 Sex (1= Male, 2= Female)	1.6 Main Occupation of the household head and the respondent or caregiver (enter code from list)
	ID	NAME	Date of birth dd/mm/yy	AGE (MONTHS)		SEX	OCCUPATION
Under 5 years	1						
	2						
	3						
	4						
over 5 years	ID	NAME		AGE (YRS)		SEX	OCCUPATION
	5. HH						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
CODE 1.6	1=Agricultural labour, 2=Livestock herding, 3=Own farm labour, 4=Employed(salaried), 5=Waged labour (Casual), 6=Petty trade, 7=Unemployed, 8=Student, 9=Merchant/trader, 10=Mining 11=Housewife (Only those who completely stay home and have no other source of income),12=Domestic help, 13=Hunting, gathering, 14=Firewood/charcoal selling, 15= Brewing, 16=Weaving/basketry, 17=Fishing, 18= Very old, 19=Others (Specify)……..						

Name of District	Name of Division	Name of sub location	Cluster Number	Team number	Household Number	Date of Interview (dd/mm/yy)	Name of Interviewer	Name of Team Leader
						_____/_____/_____		

2. IMMUNIZATION COVERAGE: ASK FOR ALL CHILDREN LESS THAN 59 MONTHS

	Name of the child	Sex of the child M =1 F = 2	AGE IN MONTHS copy from page 1	Has the child received **vitamin A** supplement in **last 12 months?** 0=No **1=Yes (Card)** 2=Yes (Recall) 4=Do not know	If YES, How many times in the **last 12 months?**	Has the child received **deworming medicine** in **last 6 months?** 0=No **1=Yes (Card)** 2=Yes (Recall) 4=Do not know	**BCG** 0=No **1=Yes (Card)** 2= Yes (Recall) 3=Yes (by scar) 4=Do not know	**OPV1** 0=No **1=Yes (Card)** 2=Yes (Recall) 4=Do not know	**OPV2** 0=No **1=Yes (Card)** 2=Yes (Recall) 4=Do not know	**OPV3** 0=No **1=Yes (Card)** 2=Yes (Recall) 4=Do not know	**PENTA 1** 0=No **1=Yes (Card)** 2=Yes (Recall) 4=Do not know	**PENTA 2** 0=No **1=Yes (Card)** 2=Yes (Recall) 4=Do not know	**PENTA 3** 0=No **1=Yes (Card)** 2=Yes (Recall) 4=Do not know	**Measles** 0=No **1=Yes (Card)** 2=Yes (Recall) 4=Do not know
1														
2														
3														
4														

Name of District	Name of Division	Name of sub location	Cluster Number	Team number	Household Number	Date of Interview (dd/mm/yy)	Name of Interviewer	Name of Team Leader
						____/____/_____		

3. MORBIDITY: ASK FOR ALL CHILDREN LESS THAN 59 MONTHS

	Name of the child	Sex 1=M 2=F	In the last 2 weeks including today, has [name] been sick? Yes--Ask the mother to describe illness No--continue with IYCF question	**Watery Diarrhea** An episode of 3 or more loose /watery stools in 24 hours	**Bloody diarrhea** An episode of 3 or more watery stools with blood in 24 hours	**Cough with difficult breathing** Any episode with difficult breathing,, rapid breathing or severe or persistent cough	**Fever** High temperature/Hot body-anything that is used to describe a high temperature	**Fever with chills** High body temperature with feelings of hot and cold spells	**Other Specify** **Anything that does not fit other categories**	**When the child was sick, where did you first seek assistance? (enter code)** 1=Traditional healer 2=Community health worker 3=Private clinic/ pharmacy 4=Shop/kiosk 5=Public health facility 6=Mobile clinic 7=Relative or friend 8=No assistance sought 9= Herbs/home remedy 10=Prayer 11= Others (specify)
1			**Yes** ☐ No☐	☐ **Watery diarrhea** ☐ **Bloody diarrhea** ☐ **Cough with difficult breathing** ☐ **Fever** ☐ **Fever with chills** ☐ **Other (specify)**_____ _____	If diarrhoea is YES. Was [name] given any of the following: CIRCLE THE RESPONSE 1. A fluid made from a special packet called ORS? 2. A home-made sugar-salt solution **3.** Another home-made liquid such as porridge, soup, yoghourt, coconut water, fresh juice, tea 4. Zinc 5. Others (specify)_____					
2			**Yes** ☐ No☐	☐ **Watery diarrhea** ☐ **Bloody diarrhea** ☐ **Cough with difficult breathing** ☐ **Fever** ☐ **Fever with chills** ☐ **Other (specify)**_____ _____	If diarrhoea is YES. Was [name] given any of the following: CIRCLE THE RESPONSE 1. A fluid made from a special packet called ORS? 2. A home-made sugar-salt solution **3.** Another home-made liquid such as porridge, soup, yoghourt, coconut water, fresh juice, tea 4. Zinc 5. Others (specify)_____					
3			**Yes** ☐ No☐	☐ **Watery diarrhea** ☐ **Bloody diarrhea** ☐ **Cough with difficult breathing** ☐ **Fever** ☐ **Fever with chills** ☐ **Other (specify)**_____	If diarrhoea is YES. Was [name] given any of the following: CIRCLE THE RESPONSE 1. A fluid made from a special packet called ORS? 2. A home-made sugar-salt solution **3.** Another home-made liquid such as porridge, soup, yoghourt, coconut water, fresh juice, tea 4. Zinc. 5. Others (specify)_____					
4			**Yes** ☐ No☐	☐ **Watery diarrhea** ☐ **Bloody diarrhea** ☐ **Cough with difficult breathing** ☐ **Fever** ☐ **Fever with chills** ☐ **Other (specify)**_____	If diarrhoea is YES. Was [name] given any of the following: CIRCLE THE RESPONSE 1. A fluid made from a special packet called ORS? 2. A home-made sugar-salt solution **3.** Another home-made liquid such as porridge, soup, yoghourt, coconut water, fresh juice, tea 4. Zinc 5. Others (specify)_____					

Name of District	Name of Division	Name of sub location	Cluster Number	Team number	Household Number	Date of Interview (dd/mm/yy)	Name of Interviewer	Name of Team Leader
						____/____/_____		

4. INFANT AND YOUNG CHILD FEEDING PRACTICES (IYCF) FOR CHILDREN 0-23 MONTHS OF AGE

Make every effort to speak with the mother. If she is not available, speak with the primary caregiver responsible for feeding of the child. For every question use the child's name.

CH. No	Name of child	Background Information				Infant Feeding information					
		4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	4.10
		Child's date of Birth: dd/mm/yy	Source of birth date (Record the approp. code) 1 = CARD 2 = RECALL 3 = DNK	Age of child in months	Sex of child 1 = M 2 = F	Did you ever breastfeed [name]? 1= Yes 2= No 3=DNK If No, go to 4.6 If yes, go to 4.7	If No, why? See code below for the answers	If yes, How long after birth did you put [name] on the breast? See code below for the answers	During the first 3 days after delivery, did you give [Name] the fluid/liquid that came from your breasts? 1= Yes, 2= No, 3= DNK	In the first 3 days after delivery, was [Name] given anything to drink other than breast milk? Codes below	Are you still breastfeeding [Name]? 1= Yes 2= No

Question 4.6: 1= No milk; 2= Did not want to breast feed;3= Medical advice 4= Mother died 5=Other_____
Question 4.7: 1= Within I hr; 2= Within 24 hours; 3=After 24 hours; If mother does not know, record: **88** :
Question 4.9: 1= Plain water; 2= Sugar water or glucose water; 3= Powdered milk (Milki, hayat, coast), animal milk; 4 = Infant formula (Lactogen, Nan), 5= Gripe water; 6= Not given; 7 = Ghee 8=Other (specify)

Name of District	Name of Division	Name of sub location	Cluster Number	Team number	Household Number	Date of Interview (dd/mm/yy)	Name of Interviewer	Name of Team Leader
						____/____/_____		

Now, I will ask you about what [Name] drank YESTERDAY during the day and the night. During the day and the night, did [Name] receive any of the following fluids? Refer to the name of the child for each question. READ OUT EACH FOOD ONE BY ONE TO THE MOTHER AND RECORD THE RESPONSE.

CH. No	Name of child	4.11	4.12	4.13	4.14	4.15	4.16	4.17	4.18
		Breast milk Only one answer coded as below: 1. Yes	Infant formula (Lactogen, Nan) 1. Yes 2. No	Other milks: animal milk, - reconstituted powdered milk (Safari land etc) - Sour milk /mursik lolon/ngakibuk/naoto	Sweetened flavored juices (Quencher, Juissy, afia, juice cola) Soda	ORS/dawa ya chumvi	Tea/Coffee	Plain water	Porridge

		2. No 3. DNK	3. DNK	1. Yes 2. No 3. DNK	1. Yes 2. No 3. DNK	1. Yes 2. No 3. DNK	1. Yes 2. No 3. DNK	1. Yes 2. No 3. DNK	1. Yes 2. No 3. DNK

Name of District	Name of Division	Name of sub location	Cluster Number	Team number	Household Number	Date of Interview (dd/mm/yy)	Name of Interviewer	Name of Team Leader
						_____/_____/_____		

Now, I will ask you about what [Name] drank YESTERDAY during the day and the night. During the day and the night, did [Name] receive any of the following fluids? Refer to the name of the child for each question. READ OUT EACH FOOD ONE BY ONE TO THE MOTHER AND RECORD THE RESPONSE.

CH. No	Name of child	4.11	4.12	4.13	4.14	4.15	4.16	4.17	4.18
		Breast milk Only one answer coded as below: 1. Yes 2. No 3. DNK	Infant formula (Lactogen, Nan) 1. Yes 2. No 3. DNK	Other milks: animal milk, - reconstituted powdered milk (Safari land etc) - Sour milk /mursik lolon/ngakibuk/naoto 1. Yes 2. No 3. DNK	Sweetened flavored juices (Quencher, Juissy, afia, juice cola) Soda 1. Yes 2. No 3. DNK	ORS/dawa ya chumvi 1. Yes 2. No 3. DNK	Tea/Coffee 1. Yes 2. No 3. DNK	Plain water 1. Yes 2. No 3. DNK	Porridge 1. Yes 2. No 3. DNK

Name of District	Name of Division	Name of sub location	Cluster Number	Team number	Household Number	Date of Interview (dd/mm/yy)	Name of Interviewer	Name of Team Leader
						____/____/_____		

SANITATION (CIRCLE RESPONSES) - ASK IN HOUSEHOLDS WITH CHILDREN 0-59 MONTHS OLD

6.1. Does your household have access to a toilet/ latrine facility? 1=Yes 2=No(**IF NO, GO TO QUESTION 6.3**) **6.1.1 Observe if latrine is within**	**6.2. If yes, what type of toilet facility do you have?** 1=Traditional pit latrines 2=Ventilated improved pit latrine 3=Flush toilet	**6.3. If No, where do you go (defecate)/use? (probe further)** 1= Bush 2=Open field 3.=Near the river/Lagga	**6.4. How is children's faeces disposed (Probe and OBSERVE)** 1= Disposed of immediately (and hygienically) in a toilet 2= Disposed of immediately in	**6.5. On what occasion (s) do you wash your hands?** **Record ALL that applies** **See codes for 6.5 below** _____

100 meters distance from houses. 1=Yes 2=No 6**.1.2 Observe if latrine is in use.** 1=Yes 2=N 6.1.3 If YES, is it: A. Shared latrine B. Family latrine 6.14 If shared by how many families? _____	4=Other Specify _____ 6.2 **.1 Does latrine have the aperture cover or fly screen on vent pipe?** 1=Yes 2=No _____ **6.2.2 Who uses this Latrine?** 1= ALL members 2= Selected members	4.=Behind the house 5.=Out of the compound 6.=Other (specify)_____	the nearby bushes 3= Not disposed (scattered in the compound) 4= Use of dogs(left for/ given to dogs goats sheep and other domestic animals to clear) 5= Bury 6=Burn 7=Sprinkling soil on top 8=Putting a stone on top 9=Other (specify).....	**6.5.1 Observe for presence of a hand washing facility next to the latrine/ in the compound**. 1=Yes 2=No **6.5.2** **What do you use to clean (wash) your hands?** (Multiple responses) 1=Water only 2=Water and soap 3=Water and ash 4=Water and cow dung 5=Animal urine 6=Other (specify) _____ **6.5.3 Observe for strategic presence of**

				soap/ash at hand washing facility 1=Yes 2=No 3= No strategic hand washing facility
6.5 1= After using the toilet/ defecating ; 2= After attending to a child who has defecated, 3= Before feeding a child (including before breastfeeding a child), 4=Before eating or preparing a meal; 5=After handling animals, 6= After changing sanitary pads 7= When washing the face 8. When bathing, 9=others specify				

Name of District	Name of Division	Name of sub location	Cluster Number	Team number	Household Number	Date of Interview (dd/mm/yy)	Name of Interviewer	Name of Team Leader

						____/____/_____		

7. 7. FOOD CONSUMPTION AND DIET DIVERSITY - ASK IN HOUSEHOLDS WITH CHILDREN 0-59 MONTHS OLD

Twenty four hour recall food consumption in the households. The interviewers should establish whether the previous day and night was usual or normal for the households.

7.1 Food group consumed Were the foods consumed Usual? Not usual (Circle the response)	**7.2. Did a member of your household consume food from any of these groups in the last 24 hours (from this time yesterday to now)? Include any snacks consumed** 1= Yes 0= No	**7.3 What is the main source of the dominant food item consumed** **(Please insert the appropriate code)** 1=Own production 2= purchases 3=gifts from friends/ family 4= food aid 5= traded or bartered 6=borrowed 7=Gathering /wild 8= Others specify
Type of food		
Cereals and cereal products (e.g. sorghum, maize, spaghetti, rice, bulga wheat, bread, Millet, chapati)		
Vitamin A rich vegetables and tubers: Pumpkin, carrots, yellow fleshed sweet potatoes		

White tubers and roots: Potatoes, white yams , cassava or foods from roots, white sweet potatoes,		
Dark green leafy vegetables: Dark green leafy vegetables including wild ones + locally available vitamin A rich leaves such as, pumpkin leaves, kunde leaves, sukuma wiki, spinach, managu,mrenda		
Other vegetables (e.g. tomatoes, biringanya, onions, cabbages)		
Vitamin A rich fruits: Ripe mangoes , papayas + others locally available like watermelon,		
Other fruits like oranges, tamarinds, wild fruits		
Organ meat (Iron rich): Liver, kidney, heart, tongue or other organ meats or blood based foods , spleen		
Flesh meat and offal's (matumbo): Meat, poultry, (cow goat, camel, sheep, game meat etc)		
Eggs		
7.1 Food group consumed	**7.2. Did a member of your household consume food from any of these groups in the last 24 hours (from this time yesterday to now)? Include any snacks consumed** 1= Yes 0= No	**7.3 What is the main source of the dominant food item consumed** **(Please insert the appropriate code)** 1=Own production 2= purchases 3=gifts from friends/ family 4= food aid

		5= traded or bartered 6=borrowed 7=Gathering /wild 8= Others specify
Fish: Fresh or dried fish or shell fish or smoked , salted, fried		
Pulses legumes or nuts (e.g. beans , lentils, green grams, cowpeas, dried peas, groundnuts, macadamia nuts, edapal, eduung, eruit, ngimare)		
Milk and milk products (e.g. goat , camel, fermented milk , cow's milk, donkey's milk, powdered milk)		
Oils/ fats (e.g. cooking fat or oil, butter , ghee, margarine, goat's fat, sheep's fat)		
Sweets: Sugar, honey, sweetened juice, soda/sugary foods such as sweets, ekaamit, glucose		

Please probe and accurately indicate the number of meals consumed per day and the previous day. Information on household members who ate the previous day, those who did not eat as well as reasons for not eating should be probed and recorded appropriately

7.4. Including food eaten in the morning, how many meals does your family normally eat per day? (Please indicate the number of meals consumed e.g. 1, 2, 3, 4, 5 ,6)	**7.5. Including food eaten in the morning, how many meals did your family eat <u>YESTERDAY</u>?** (Please indicate the number of meals consumed e.g. 0, 1, 2, 3, 4, 5,6)	**7.6. Did all the members of your family eat yesterday?** (Please record all responses) 1.Yes**(If Yes, Go to question 8 Food Aid)** 2.No **(If No, Go to 7.7)**	**7.7. If some household members did not eat, Who did not eat yesterday?** (Please record all the responses) 1=Child under 5 2= 5-12 years old 3=13-19 years old 4= Mother 5= Father 6= Above 19 years	**7.8. Why did the person/s not eat?** (Please record all the responses**)** 1= Food not enough 2= Sickness 3= Away from home 4=Fasting 5=Other (specify)

Name of District	Name of Division	Name of sub location	Cluster Number	Team number	Household Number	Date of Interview (dd/mm/yy)	Name of Interviewer	Name of Team Leader
						____/____/_____		

8. FOOD AID - ASK IN HOUSEHOLDS WITH CHILDREN 0-59 MONTHS OLD

8.1. Have you received **FOOD AID** in the last **three (3)** months? (Please circle) **1 = Yes 2 = No (If no go to section 9 on coping strategies)**

8.2 If, YES which one? 1= GFD; 2= FFA 3=From the DC or government (Multiple responses allowed)

8.3 How many times have you received food aid in the last 3 months? **1= Once 2= Two times 3= Three times 4= More than three times**

Of the food aid received please indicate how it was used					
8.4 **FOOD AID COMMODITY**	**8.5** **Resold in the market**	**8.6** **Bartered for other item**	**8.7** **Shared with kin**	**8.8** **Consumed by household members**	**8.9** **How many days did each food commodity last?** **Write number of days**
Bulga wheat					
Maize					
Beans					
CSB					
Oil					
Salt					

Name of District	Name of Division	Name of sub location	Cluster Number	Team number	Household Number	Date of Interview (dd/mm/yy)	Name of Interviewer	Name of Team Leader
						____/____/_____		

9.0 COPING STRATEGIES

	In the previous month, has the household done any of the following?	**1=Yes** **2=No** **88 = Do not know**
9.1	**Reduction in the number of meals per day**	
9.2	**Skip food consumption for an entire day**	
9.3	**Reduction in size of meals**	
9.4	**Restrict consumption of adults to allow more for children**	
9.5	**Swapped consumption to less preferred or cheaper foods**	
9.6	**Hunting and gathering**	
9.7	**Engaging in casual labour**	

9.8	**Borrow food from a friend or relative**	
9.9	**Purchase food on credit**	
9.10	**Consume wild foods (normal wild food)**	
9.11	**Consume decomposed fish/ food**	
9.12	**Send household members to eat elsewhere**	
9.13	**Send child(ren) to School**	
9.14	**Begging**	
9.15	**Sale of livestock**	
9.16	**Sell of charcoal and/or fire wood/small scale business**	
9.17	**Part of family migrating with animals to look for grazing**	
9.18	**Sale of milk and/or meat, and/or fish/ hides/ chicken**	
9.19	**Donation**	
9.20	**Others (Specify)**	

Name of District	Name of Division	Name of sub location	Cluster Number	Team number	Household Number	Date of Interview (dd/mm/yy)	Name of Interviewer	Name of Team Leader
						____/____/_____		

10. MOSQUITO AND BEDNET USE

10.1. Does this household have a mosquito net? 1 = Yes 2 = No **(IF NO, GO TO 11)**	**10.2. Where did you get it from:** 1 = A Shop 2 = An agency/ 3=Church 4 = Ministry of Health 5= Others (specify)_____	**10.3. Who slept under the mosquito net last night?** **(Probe - enter all responses mentioned)** Children less than 5 years Children over 5 years Pregnant mother or other pregnant woman Father Mother Other members of the house hold Nobody uses; WHY? It is difficult to fix the net Torn Too large for size of house Others (specify)_____

LIVESTOCK OWNERSHIP

11.1	Does the house hold own livestock? (Chicken not included) 1=Yes; 2=NO. **IF NO, GO to question 12.**	
11.2	Has the size of the livestock herd changed in the last 6 months? (1=increased, 2=reduced, 3=remained the same, DNK=4). **IF REMAINED THE SAME OR DNK GO to question 12.**	
11.3	If increased what are the reasons? **(Multiple responses are acceptable)** (1=animals gave birth, 2=bought, 3=given, 4=raid, 5= Dowry; 6=restocking; 7=donation; 8=Other (specify)	
11.4	If decreased, What are the reasons? **(Multiple responses are acceptable)** (1=sold, 2=death because of drought, 5=death because diseases, 6=raid, 7= Dowry; 8=Other (specify)	

Name of District	Name of Division	Name of sub location	Cluster Number	Team number	Household Number	Date of Interview (dd/mm/yy)	Name of Interviewer	Name of Team Leader
						____/____/_____		

ADULTS NUTRITIONAL STATUS - ASK IN HOUSEHOLDS WITH CHILDREN 0-59 MONTHS OLD

QUESTIONS TO BE ANSWERED IF CARE GIVER IS A FEMALE: Measure MUAC of RESPONDENT RESPONDENT must be female between 15 and 49 years of age If there are multiple caregivers, interview only the one who is a primary caregiver			
WOMAN 1 **12.1. How old are you?** a)_____ years b) DNK	**12.2. What is the woman's current physiological status? (Ask carefully and Circle)** **1** = Pregnant and breastfeeding 2= Not pregnant/not breastfeeding 3= Currently pregnant 4= Breastfeeding (<6months infant) 5= Breastfeeding (6-24months) **FOR THOSE WOMEN WHO ARE NOT PREGNANT** **Did you take iron/folate supplementation during your last pregnancy?** 1 =YES 2= NO	**12.4. MUAC (cm), left arm (To the nearest 0.1 cm), do not round up** _____.____cm	**12.5 FOR PREGNANT WOMEN ONLY** **Are you currently taking iron/folate supplementation?** 1=YES 2=NO 12.5 If YES, Where did you get it from? Health Facility Brought from the shops **12.6 IF NO, Why NOT?** 1= Do not see the need of taking them

	3= DNK IF YES, For how many days did you take the supplementation? _____days		2= Not available at the ANC 3= They make me sick 4= Have not started attending clinic 5= Any other, specify_____
WOMAN 2	**12.2 .....** **12.3.....**	 **12.4.....**	**12.5.....** **12.6.....**

Name of District	Name of Division	Name of sub location	Cluster Number	Team number	Household Number	Date of Interview (dd/mm/yy)	Name of Interviewer	Name of Team Leader
						____/____/_____		

ANTHROPOMETRY AND SELECTIVE FEEDING PROGRAMMES FOR ALL CHILDREN 6-59 MONTHS

	Name of children 6-59 months	**Sex** **1=M** **2=F**	**Birth date** **dd/mm/yyyy**	**Age in months**	**Weight** **(to the nearest 0.1kg)**	**Height** **(to the nearest 0.1cm)**	**Oedema** **Yes=Y** **No=N**	**MUAC** **cm**	**Is the child currently in any feeding programme?** **0=No** **1=SFP** **2=OTP** **3=SC** **4= Not sure/Do not know**
1									

2									
3									
4									
5									

NB: FILL IN THE MORTALITY QUESTIONNAIRE

QUESTIONNAIRE FOR MORTALITY RATE CALCULATION (ONE SHEET PER CLUSTER)

Name of District	Name of Division	Name of sub location	Cluster Number	Team number	Household Number	Date of Interview (dd/mm/yy)	Name of Interviewer	Name of Team Leader
						____/____/____		

HH No.	Total no in household	Total under 5 in House-hold	Total Join House-hold since 28th August 2011	Total Under 5 join Household since 28th August 2011	Total Leave Household since28th August 2011	Total under 5 leave Household since 28th August 2011	No. of births since 28th August 2011	Total deaths since 28th August 2011	Cause of death SEE CODES BELOW	Total No. under 5 deaths since 28th August 2011	Cause of death SEE CODES BELOW
1											
2											
3											
4											
5											

6											
7											

1= Diarrhoea 2= Fever 3= Measles 4= Difficulty in breathing 5= Malnutrition 6= Violence 7= Other (Specify)

FOCUS GROUP DISCUSSION GUIDE (FGDs)

Name of District	Name of sub location	Name of Cluster	Cluster Number	Date dd/mm/yy	Facilitator/Moderator	Recorder	No of participants	Indicate if FGD is with men or women

Start time: _____ **Finish Time:** _____

You are to visit 5 clusters per survey site

In each cluster, conduct two (2) FGDs one with women of childbearing age (15-49 years old) and the other with fathers of young children.

In total, carry TEN FGDs per district (~~4~~ 5 with women and ~~4~~ 5 with men).

The FGD group should comprise of 8 – 12 community members residing in the sampled geographic area. Representations should be sought from pastoralists, crop farmers, agro-pastoralists, and other community members (rich, medium and poor; women and men]. Indicate if FGD was for women or men. Community leaders should not be part of the FGD

FGD QUESTIONS

1.0 Major causes of malnutrition

1.1 How would you describe the nutritional situation of children in this community?

1.2 Please comment on the trends **(improved/worsened/no difference)** of malnutrition in this community over the last two years?

1.3 What in your view are the major causes of malnutrition in children in this community?

1.4 What interventions are in place by NGOs, MOH and other agencies to address malnutrition in this community?

1.5 What impact have the interventions had in improving the nutrition status of children?

1.6 What else do you think should be done to improve the situation?

1.7 What can the community do to improve the situation?

2.0 Food Security

2.1 What is the current food security situation in your community [Probe to find out whether people are having enough food to eat or are having food access problems].

2.2 Why is the situation the way it is? [Probe to find out what food resources have become scarce/plenty and why].

2.3 If food is scarce, how are people coping?

2.4 How is the current food situation compared to other times? (Probe for improvement or decrease in access and why)

2.5 For how long in the future is this situation expected to continue?

2.6 What should be done to sustain or avert the situation, and by whom?

2.7 -What can the community do to sustain/improve the situation?

3.0 Food Aid

3.1 What are the types of food aid given to this community? (PROBE for GFD, FFA, from the DC and Kenya for Kenyans)

3.2 Do the food aid programmes reach the needy people in the community? If NOT, why?

3.3 What food programmes are in place for malnourished children and women? [PROBE FOR SFP and OTP]

3.4 What is the impact of food aid on the nutritional status of the children?

3.5 Are you aware of a new strategy targeting households where children enrolled in SFP and OTP come from and linking them to GFD? What is your opinion on this strategy in the management of malnutrition?

3.6 What do families who receive food aid (GFD, CSB, Plumpy and pumby nut) and supplementary food do with it?

3.7 For each use, probe why?

3.8 Is the food given adequate? (Probe for quantity and variety)

4.0 Maternal Nutrition

4.1 Do most pregnant women in this community attend ANC?

4.2 Is iron/folate supplementation commonly given to pregnant women attending ANC

4.3 What is the level of compliance to taking these supplements? PROBE FOR REASONS.

4.4 Are these supplements useful?

5.0 Illness and health seeking behavior

5.1 What are the common childhood illnesses in this community?

5.2 What are the contributing factors to these illnesses?

5.3 How are the following illnesses managed in this community?

a) Diarrhoea

b) Fever

c) Acute respiratory infections (coughs, colds and difficult breathing)

d) Malaria/fever with chills

5.4 In your view, are these illnesses adequately managed? If NOT, which areas and how can the management be improved?

5.5 What factors influence maternal health seeking behavior?

6.0 Coverage of health services

6.1 Do most children get immunized against childhood diseases; de-worming, vitamin A supplementation and zinc supplementation during diarrhoea?

6.2 If YES, what factors contribute to this?

6.3 If NO, what are the challenges/hindrances.

Infant and Young Child Feeding Practices

In your opinion, are the breastfeeding practices in this community satisfactory?

Do you belief that a child can survive on breastmilk alone without even water? If YES, for how long?

Is exclusive breastfeeding common in this community?

What are the benefits of exclusive breastfeeding?

What factors influence women to either exclusively breastfeed or not?

What challenges did you experience/discouraged you from practicing exclusive breastfeeding for 6 months?

At what age are children commonly introduced to solid and semi-solid foods?

What foods are commonly given to children?

How frequently are children fed?

ANNEX 4: MARIGAT CALENDAR OF EVENTS

MONTHS	MAJOR EVENTS	2007	2008	2009	2010	2011
January	New year celebrations	**59**	**47** Post election violence	35 Drought-serious water shortage	**23**	**11**
February	Secondary schools form ones	**58**	**46** Secondary schools form one	**34** Drought-serious water shortage	**22**	**10**
March		**57** Registration of voters	**45** Kericho plane crash	**33** Drought-serious water shortage	**21** Registration of voters Floods	**9**
April	Schools Close	**56** Rift valley fever	**44**	**32**	**20** Floods	**8** Police Recruitment
May	Heavy Rains	**55**	**43**	**31** Mass tetanus vaccination	**19** East pokot Cholera	**7**
June	Heavy Rains	**54**	**42**	**30** Rhino Charge-KIBINGOR	**18** KNUT ELECTIONS	**6** Rhino Charge Yatya Ocampo Six
July	Heavy Rains	**53**	**41** World cup	**29** Army Recruitment	**17** Gravelling of irrigation scheme roads	**5** Wanjiru's Death

August	Schools Close	**52**	**40**	**28**	**16**	**4**

MONTHS	**MAJOR EVENTS**	**2007**	**2008**	**2009**	**2010**	**2011**
January	New year	**59**	**47**	**35**	**23**	**11**
September MUU	Harvesting of Sorghum	**51**	**39** Post election violence	**27**	**15** ACTED	**3** Confirmation of hearings
February	Secondary schools form ones	**58**	46	**34**	**22**	**10**
October		**50**	**38**	**26**	**14**	2

			Raid Njemps and Pokots	Start of FFA		Wangari Mathai's Burial
November	Start of KCSE	**49** Circumcision	**37** Pokot Raids in Kinyach, Kalabata, Chepkesit Start of KCSE	**25** Circumcision	**13** End of KSCE	**1**
December	Preparations of Land For Planting Sorghum CHRISTMAS	**48** Post Election Violence	**36** Circumcision	**24** Circumcision	**12** Circumcision	

EAST POKOT CALENDAR OF EVENTS

TIRTIR			Secondary schools form one			Akoret by election
March **POKPOKWO**		**57** Registration of voters	**45** Kericho plane crash	**33**	**21** Registration of voters Floods	**9** Pogho pstrioch
April **RUKUSE**	Schools Close	**56** Rift valley fever Marmar	**44**	**32**	**20** Cholera Amaya	**8** Police Recruitment
May **POROWON**	Heavy Rains	**55** Kolowa Porio Todomug	**43**	**31** Mass tetanus vaccination	**19** East pokot Cholera	**7** Planting Begins
June **MELWON**	Heavy Rains	**54**	**42**	**30**	**18** ACTED Chemolingot	**6** Planting Begins Ocampo Six
July **SIKUKUU**	Heavy Rains	**53**	**41** Porio Rayia	**29** Army Recruitment	17 Porio Kanamcho	**5** Mutata Tipin
August **MIKEYON**	Schools Close	**52** A matatu accident	**40** Polio Campaign	**28** HiNi Census Cepanga (Famine)	**16** Referendum YES/NO	**4** Alemirioruto ompo Chemolingot
September **TAPACH**	Harvesting of Sorghum	**51**	**39**	**27**	**15**	**3** Osoponut konyinete

October **KIPSIT**		**50**	**38** Porio Lorumrum	**26** Start of FFA	**14**	**2** Parapara loruk
November **KOKELION**	Start of KCSE	**49** Kacheptiwawai	37 Pokot Raids in Kinyach, Kalabata, Chepkesit Start of KCSE	**25** Circumcision Cholera/Kamwamcho Mega kapnyunginy	**13** End of KSCE	**1** Polio campaign chanjokut
December **KWEGHE**	Preparations of Land For Planting Sorghum CHRISTMAS	**48** Post Election Violence	36 Circumcision	**24** Circumcision Lotiriri Rescue	**12** Murkutwo	