TURKANA NUTRITION SURVEY

FINAL DRAFT

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

May 2011

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

ALRMP	Arid Lands Resource Management Project
ANC	Ante-natal clinic
ASAL	Arid and Semi-Arid Lands
BSFP	Blanket Supplementary Feeding Programme
CSB	Corn-Soya Blend
CTC	Community Therapeutic Care
DNOs	District Nutrition Officers
EC	European Commission
ENA	Emergency Nutrition Assessment
FFA	Food for Assets
FGDs	Focused Group Discussions
GAM	Global Acute Malnutrition
GFD	General Food Distribution
HDDS	Household Dietary Diversity Score
IRC	International Rescue Committee
IYCF	Infant and Young Child Feeding
IPC	Integrated Food Security Humanitarian Phase Classification
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
MUAC	Middle Upper Arm Circumference
NGOs	Non-governmental Organizations
OJT	On the job training
OTP	Therapeutic Feeding Programme
OTP	Outpatient therapeutic Programme
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

EXECUTIVE SUMMARY

Introduction

This report summarizes the outcomes of four independent nutrition surveys undertaken in May 2011 in Turkana Central District, Turkana South District, Turkana North East and Turkana North West. The main purpose of the nutrition survey was to estimate the level of acute malnutrition and nutritional oedema among children aged 6-59 months of age.

The primary objectives of the survey were to:
1. Determine the prevalence of acute malnutrition among under five year olds children, pregnant and lactating women;
2. Estimate coverage of the current nutrition interventions in the district;
3. Determine the Infant and Young Child Feeding Practices (IYCF) among children 0-23 months of age;
4. Investigate household food security and food consumption practices;
5. To estimate crude and under-five mortality rates;
6. Estimate morbidly rates of children below five years; and
7. Determine the proportion of households with access to safe water and sanitation.

Methodology

The survey used a two-stage cluster sampling methodology based on proportion to population size to select 41 clusters of 15 households each from each of the four survey sites. 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 749 children in Central, 711 from South, 709 in North East and 698 in North West. 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 16.0 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 Turkana.

SUMMARY OF KEY FINDINGS TURKANA NUTRITION SURVEY MAY 2011

	TURKANA CENTRAL	TURKANA SOUTH	TURKANA NORTH EAST	TURKANA NORTH WEST
Demographic Household Characteristics				
Mean (sd) household size	5.5 (sd 1.9)	5.1 (sd 1.8)	4.8 (sd 1.6)	5.0 (sd 1.8)
Total population	3391	2946	2857	2972
Males	1674	1439	1324	1436
Females	1677	1439	1500	1499
Sex ratio	1.0	1.0	0.8	0.9
Total Underfive population	936	900	975	858
Nutritional Status (Children 6-59 months of age) (WHO Standards 2006) WASTING	**N=749**	**N=712**	**N=709**	**N=698**
Weight-for-height Z scores Global Acute Malnutrition (GAM)	(181) 24.4 % (20.3 – 29.1 95% C.I.)	(238) 33.5 % (29.3 – 37.9 95% C.I.)	(265) 37.4 % (33.0 – 42.0 95% C.I.)	(194) 27.8 % (23.4 – 32.7 95% C.I.)
Severe Acute Malnutrition (SAM)	(34) 4.5 % (3.1 – 6.7 95% C.I.)	(48) 6.8 % (5.1 – 8.9 95% C.I.)	(67) 9.4 % (7.2 – 12.3 95% C.I.)	(42) 6.0 % (4.4 – 8.2 95% C.I.)
Nutritional Status (Children 6-59 months of age) (WHO Standards 2006) UNDERWEIGHT	**N=751**	**N = 712**	**N = 708**	**N= 702**
Weight-for-height Z scores Prevalence of global underweight (<-2 z-score)	(278) 37.0 % (32.2 - 42.2 95% C.I.)	(326) 45.8 % (41.2 - 50.4 95% C.I.)	(321) 45.3 % (40.6 - 50.2 95% C.I.)	(256) 36.5 % (30.8 - 42.6 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(69) 9.2 % (6.9 - 12.1 95% C.I.)	(100) 14.0 % (11.2 - 17.5 95% C.I.)	(96) 13.6 % (11.6 - 15.9 95% C.I.)	(87) 12.4 % (9.3 - 16.3 95% C.I.)

Nutritional Status (Children 6-59 months of age (WHO Standards 2006) STUNTING	Central N = 750	South N = 709	North East N = 705	North West N = 669
Prevalence of global stunting (<-2 z-score)	(223) 29.7 % (25.9 - 33.8 95% C.I.)	(260) 36.7 % (32.3 - 41.3 95% C.I.)	(191) 27.1 % (23.4 - 31.1 95% C.I.)	(209) 31.2 % (26.8 - 36.1 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(52) 6.9 % (5.2 - 9.2 95% C.I.)	(77) 10.9 % (8.3 - 14.1 95% C.I.)	(70) 9.9 % (7.7 - 12.7 95% C.I.)	(62) 9.3 % (7.0 - 12.1 95% C.I.)
Prevalence of acute malnutrition for children 6-59 months of age (Percent of the median) WHO Standards 2006	N = 752	N = 714	N = 711	N = 713
Prevalence of global acute malnutrition (<80% and/or oedema)	(66) 8.8 % (6.8 - 11.4 95% C.I.)	(88) 12.3 % (10.0 - 15.3 95% C.I.)	(121) 17.0 % (14.0 - 20.6 95% C.I.)	(72) 10.1 % (8.1 - 13.0 95% C.I.)
Prevalence of moderate acute malnutrition (<80% and >= 70%, no oedema)	(64) 8.5 % (6.6 - 11.1 95% C.I.)	(81) 11.3 % (9.1 - 14.2 95% C.I.)	(119) 16.7 % (13.8 - 20.2 95% C.I.)	(67) 9.4 % (7.4 - 12.3 95% C.I.)
Prevalence of severe acute malnutrition (<70% and/or oedema)	(2) 0.3 % (0.1 - 1.1 95% C.I.)	(7) 1.0 % (0.5 - 2.0 95% C.I.)	(2) 0.3 % (0.1 - 1.1 95% C.I.)	(5) 0.7 % (0.3 - 2.0 95% C.I.)

Prevalence of acute malnutrition for children 6-59 months of age based on MUAC	Central N=751		South N=713		North East N=710		North West N=714	
	n	%	n	%	n	%	n	%
Severe under nutrition < 115 mm	26	3.5	33	4.6	37	5.2	36	5.0
Moderate 115–<125 mm	108	14.4	124	17.4	143	20.1	117	16.4
At risk125 – <135 mm	254	33.7	229	32.1	237	33.4	236	33.1
Well nourished ≥135mm	363	48.3	327	45.9	293	41.3	325	45.5

MORTALITY	Central	South	North East	North West
Crude Death Rate (CDR)	0.74 (95%CI:0.44-1.25)	0.24 (95%CI: 0.14-0.42)	2.42 (95%CI: 1.73-3.37)	2.13 (95%CI:1.38-3.29)
Underfive Death Rate (U5DR)	0.40	1.14	2.12	3.42

	(95%CI:0.13-1.23)	(95%CI: 0.83-1.56)	(95%CI:1.13-3.95)	(95%CI:1.96-5.91)
Child morbidity (<59 months old)	**N= 1015** **%**	**N= 929** **%**	**N= 945** **%**	**N= 945** **%**
Diarrhoea (watery and bloody)	20.5	21.2	28.4	25.2
Fever (alone or in combination with other symptoms)	15.5	19.8	22.5	27.7
ARIs (cough and cough with difficult breathing)	10.5	18.0	18.7	20.2
Immunization of children 6-59 months old	**N=752** **%**	**N= 740** **%**	**N= 716** **%**	**N= 766** **%**
OPV1	95.9	96.9	94.3	91.5
OPV3	83.9	85.2	83.6	78.9
Measles (children ≥ 9 -59 months	80.5	85.8	88.2	84.4
Fully Immunized (children 12-23 months)	70.3	75.7	75.1	69.0
Vitamin A supplementation	**%**	**%**	**%**	**%**
Children 6-59 months old	68.0	73.0	75.5	69.5
Children 6-11 months	77.5	72.1	72.1	60.9
Children 12-59 months old who received the twice in the last 1 year	37.0	36.2	44.7	47.5
Maternal Malnutrition	**%**	**%**	**%**	**%**

Pregnant and Lactating mothers by MUAC:
    Wasted <21 cm
    Well nourished ≥21cm
	16.5
	83.5
		19.0
		81.0
			16.9
			83.1
				17.8
				82.2

	Central	South	North East	North West
Infant and Young Child Feeding Practices				
Breastfeeding Practices	%	%	%	%
Ever breastfed	97.2	98.6	95.4	97.6
Put to breast within 1 hour	31.5	38.6	40.7	57.5
Given colostrum	85.1	88.7	89.7	84.2
Given prelacteal feeds	29.5	42.5	33.5	24.2
Exclusive breastfeeding <6 months old	49.1	63.1	61.5	55.9
Currently breastfeeding (0-23 months)	88.2	86.9	82.5	86.0
Maintenance of breastfeeding:				
Age 6-11 months	95.4	91.2	90.3	96.3
Age 12-17 months	91.9	92.7	76.1	84.3
Age 18-23 months	56.7	68.3	54.2	41.7
Age 6-23 months	83.6	84.1	75.4	81.2
Complementary Feeding Practices				
Complementary Feeding rate (Children 6-9 months who received complementary feeding)	50.9	49.1	50.8	54.9
Minimum Dietary diversity (children 6-23 months who received foods from ≥4 out of 7 groups)	9.6	5.4	2.9	11.5
Frequency of Feeding of complementary foods:	%	%	%	%

Children 6-8 old who ate ≥2 times /day:
    Percentage
    Mean (sd)
	42.3
	1.4 (sd 1.3)
		53.2
		1.4 (sd 1.4)
			50.0
			1.3 (sd 1.1)
				40.3
				1.2 (sd 1.2)

Children 9-23 months old who ate ≥3 times /day Children:
    Percentage
    Mean (sd)
	23.9
	1.7 (sd 1.1)
		20.0
		1.5 (sd 1.1)
			14.9
			1.5 (sd 1.0)
				13.5
				1.4 (sd 1.0)

Household Food Consumption	Central %	South %	North East %	North West %
Households who normally eaten per day ● 3 meals ● 2 meals ● 1 meal	31.5 46.4 22.1	27.8 44.0 28.3	34.2 45.1 18.7	8.1 24.3 61.8
Households who had the following number of meals eaten the day preceding the survey: ● 3 meals ● 2 meals ● 1 meal	13.0 34.9 48.3	13.0 32.9 43.6	19.6 40.0 39.8	6.1 32.6 55.8

PLAUSIBILITY CHECKS

Checks	Acceptable range	CENTRAL	SOUTH	NORTH WEST	NORTH EAST
Missing/flagged data/out of range	0-10%	0.4%	0.6%	2.1%	0.3%
% Flags • WHZ • HAZ • WAZ	0-10%	0.4% 0.4% 0.1%	0.6 0.7 0.1	2.1 6.3 1.4	0.3 0.8 0.3
Overall sex distribution	0-10%	0%	0	0	0
Sex ratio	0.8 – 1.2	1.07	1.05	1.00	1.07
Overall age distribution	0-10%	10%	10	10%	10%
Age Ratio: G1+G2/G3+G4+G5	1.0	1.23	1.11	1.01	1.39
Digit preference • Weight • Height	0-10	4 5	5 5	5 5	5 5
SD WHZ	1.1 – 1.2	1.01	0.99	1.11	0.94
Skewness WHZ	±1.0 - ±3.0	-0.09	0.10	0.13	0.14
Kurtosis	±1.0 - ±3.0	0.02	-0.05	-0.36	-0.15
Poison	0-4	1	0	1	1
OVERALL	0-15	11% (Poor)	10% (Poor)	13% (Poor)	11% (Poor)

POOR overall quality of the data has been contributed to by age estimation which is a major challenge in Turkana

CONCLUSIONS

- The nutritional status of the children deteriorated significantly in all the four survey sites in Turkana. For the first time in many years some of the survey sites recorded GAM rates over 30% signifying an emergency situation. This deterioration may be attributed to the worsened food security situation. The prevalence of diarrhea, ARIs and fever increased in all the survey sites in 2011. Additionally, there was lower coverage of selective feeding programmes;
- The SFP and OTP coverage decreased drastically in 2011 compared to 2010. The coverage rates were not within acceptable Sphere Standards 2004;
- On the whole, IYCF practices deteriorated in 2011 compared to 2010. Breastfeeding practices were inadequate in terms of the duration of breastfeeding, exclusive breastfeeding and timely initiation. Complementary feeding practices were inadequate in terms of timely introduction, dietary diversity and the frequency of feeding of complementary foods;
- There was an increase in the morbidity burden for children in 2011 compared to 2010. The most common illnesses/disease symptoms were fevers, ARIs and diarrhoea;
- The immunization coverage for all the antigens was more or less the same as in 2010;
- The coverage of Vitamin A supplementation was far below the WHO acceptable levels especially in terms of the frequency of supplementation;
- Access to clean safe water and adequate sanitation was limited and probably constrained proper hygiene practices;
- Mosquito bed net ownership was low but utilization by the most vulnerable groups of people was high; and
- The crude mortality levels were not acceptable in North East and North West but acceptable for Central and South based on Sphere Standards. The underfive mortality rates for all the survey sites were within the Sphere Standards acceptable levels.

RECOMMENDATIONS

Short-term interventions
- Provide protection ration linking households with children admitted to SFP and OTP to GFD. This will decrease sharing of the food meant for the malnourished children at household level;
- Introduce blanket supplementary feeding programme (BSFP) for children underfive years of age, pregnant and lactating women up to 6 months. This will act as a stop gap measure and prevent moderately malnourished children becoming severely malnourished;
- Increase the number of SCs in Turkana especially in the North to deal with the large number of severe cases of malnutrition with medical complications;
- Increase the number of households receiving GFD from WFP. The number of households receiving food aid from the government should also be increased;
- Upscale community outreach sites especially in hard-to-reach areas to improve coverage of SFP and OTP. This should be done by the MOH and partner agencies;
- Increase the number of mobile clinics to improve on immunization, vitamin A and de-worming coverage;
- Strengthen the monitoring and evaluation of programmes so that gaps in implementation may be identified and appropriate interventions taken timely to curb malnutrition before it reaches emergency levels;
- Documentation of vaccination needs to improve. A significant proportion of the children did not have health cards and vaccination status was based on recall. Documentation of vaccination on cards is important to prevent unnecessary re-vaccination and monitoring of coverage. All vaccinations given during campaigns should be documented. Lost cards should be replaced as soon as possible;
- There is need for continued and more intensive health and nutrition education focusing on: the value of timely health seeking behaviour and the dangers of self-diagnosis and self prescription of medicine; importance of proper sanitation and hygiene especially using latrines, washing of hands after visiting the toilet; appropriate IYCF feeding practices with special focus on the value and duration of exclusive breastfeeding and the importance of timely introduction of complementary feeding, dietary diversity and appropriate frequency of feeding;

- It is recommended that all available channels such as SFP and OTP distribution points, MCH, ANC, SC and mobile clinics be used to provide health and nutrition education for wider coverage and reinforcement of the information; and
- Upscale the distribution of bed nets to help prevent malaria which is endemic in Turkana.

<u>Medium and long-term Interventions</u>

- An integrated approach, tackling both the immediate and underlying causes of malnutrition should be put into place and/or scaled up. Most of the interventions in the region are humanitarian in nature, dealing with the immediate causes of malnutrition. Whereas these relief services are critical, they need to go hand in hand with developmental activities so as to provide sustainable solutions to the problem of malnutrition. There is need for example, to come up and/or scale up projects which make food more available at the household level;

- The government's efforts in drought mitigation and the provision of health services and alternative means of livelihood in Turkana are acknowledged. There is an urgent need however, to accelerate or re-strategize these efforts. Greater efforts should be made towards the improvement of: the road network; provision of safe water; and availability of health facilities as well as improvement in staffing levels and availability of drugs. The government and the NGOs working in Turkana should also be more actively involved in the diversification of livelihoods and the mitigation of the insecurity in the region. Without the underlying and basic causes of malnutrition being addressed on a large scale, efforts by the humanitarian agencies will continue to address malnutrition on a short-term basis, thus rendering malnutrition chronic in the region; and

- It is recommended that the interventions by the government and the agencies working in Turkana be based on a coordinated, integrated and holistic approach. Integration of humanitarian services and developmental activities should tackle both the immediate and underlying causes of malnutrition. This approach will increase impact because of the synergy created between the two. It is however, acknowledged that various agencies are already adopting this approach. Such activities are few and scattered with some being in the pilot or inception stage. The impact of most of these activities in improving the household food security status and consequently improving the nutrition situation is yet to be determined. There is need therefore to evaluate the impact of these activities with the view to up scaling those with the greatest impact on the food security situation in Turkana.

1. INTRODUCTION

This report summarizes the outcomes of a nutrition survey whose aim was to determine the prevalence of global and severe malnutrition in Turkana. The assessment was commissioned by Ministry of Public Health and Sanitation (MOPHS) and its implementing partners and was meant to monitor the nutritional situation in Turkana. Four surveys were conducted to cover the whole of Turkana; in Turkana Central, Turkana South, Turkana North East and Turkana North West districts. This survey was conducted in June 2010.

1.1 Background

The greater Turkana region lies in Rift Valley province of Kenya and is situated in the arid north western region of the country. The region borders Uganda, Sudan and Ethiopia to the East, North East and North West respectively. It has area coverage of about 77,000 square kilometres. Until recently, Turkana has been the largest district in Kenya. It has since been sub-divided into six districts namely; Turkana North, Central, West, East, South and Loima. Turkana is classified among the Arid and Semi-Arid Lands (ASALs). The region has been repeatedly classified as a humanitarian emergency (level 4) under the Integrated Food Security Humanitarian Phase Classification (IPC).

Being an ASAL district, Turkana is a drought prone area that experiences frequent, successive and prolonged drought. Turkana has two rainy seasons (April-June & October-December) but rains are often scarce and erratic with frequent total failures. Turkana received heavy rains in December 2009 to January 2010 and in April to May of the same year, in amounts that it has not received since 2007. In 2011, the amount of rainfall received was below the amounts received in normal times in most of the areas in Turkana. Even in areas where adequate rainfall was received, it took time for the impact to be seen on the vegetation (browse) and the livelihood of the people. People flocked to these areas to graze their animals and thus quickly depleted the browse.

The soil type in Turkana is mainly rocky/sandy scattered with clay and black cotton soils in certain areas. There are numerous seasonal dry riverbeds across many parts of the district. According to Arid Lands Resource Management Project (ALRMP) definitions, the district has four main livelihood zones and categories (Figure 1). Nearly 60% of the population is considered pastoral (rearing of mixed herd: goats, sheep, cattle, camels and donkeys), 20% agro-pastoral (pocket areas keep livestock plus grow crops like maize, beans, sorghum, cowpeas and green grams), 12% fisher-folks (people living along the coast of Lake Turkana) and the remaining 8% are in the urban/peri-urban formal employment/casual waged labour/business category. Livestock is considered the mainstay of Turkana household economy that also determines the wealth across all livelihoods (including non-pastoral livelihood)[1].

The larger Turkana district is the second poorest district in Kenya with poverty levels of approximately 20% above the national average. Turkana is constrained by the harsh environment, remoteness coupled with the poor infrastructure and low access to essential services in addition to other underlying causes of poverty that are experienced elsewhere in Kenya.

The nutrition situation in Turkana has remained above the emergency threshold (GAM >15%) in accordance with the WHO guidelines for emergencies[2] for a number of years. In 2010, the nutrition situation improved considerably with some of the areas registering GAM rates below the emergency threshold in a long period of time. The nutrition situation in Turkana has been of a protracted critical nature. The major cause of malnutrition has been reported to be food insecurity necessitating Turkana to be dependent on relief food since colonial days to the present time. The findings on the nutritional situation indicate a need for periodical monitoring, so that strategies can be put into place to prevent worsening of the situation.

---

[1] Kenya Food Security Steering Group KFSSG Turkana Short Rains Assessment Report, 2009
[2] WHO-OMS (1995). Field Guide on Rapid Nutritional Assessment in Emergencies

Nutrition surveillance data in Turkana is routinely collected by ALRM, located in the Office of the President. This is done using mid upper arm circumference (MUAC) of children 12-59 months old as part of its early warning system data gathering on a monthly basis. Other organizations working in collaboration with MOPHS; World Vision Kenya (WVK), OXFAM-GB, International Rescue Committee (IRC), and Merlin have received support from UNICEF to conduct nutrition surveys.

Figure 1: Livelihood zones in Turkana

Nutrition and Health Activities in Turkana

Many agencies, UN and NGOs are working in collaboration with the MOPHS in child survival activities. The main responsibility of MOPHS is quality assurance of the nutrition and health-related activities through the coordination of all activities in Turkana. The NGOs implementing health and nutrition programmes include:

- Merlin works in: Turkana Central (Central, Kalokol, Kerio, Turkwell and Loima divisions); Turkana North East (Lokitaung', Lapur and Kalang' divisions); and Lokichar in Turkana South. Merlin health and nutrition activities include: support of 23 government health facilities, 10 faith-based health facilities and support of outreaches in all these facilities. The number of facilities being supported is being gradually increased as funds become available. Merlin health activities focus on curative, supplementary feeding programmes (SFP), outpatient therapeutic programme (OTP) and antenatal clinic (ANC) services. Merlin supports two stabilization centres (SC) one at the Lodwar hospital and in Lokitaung' hospital by providing personnel to run the centres. Merlin plans to upscale by supporting a SC in Lokichar when funds become available. The outreach activities include: screening for selective feeding admissions; consultations and treatment for minor ailments; and health and nutrition education with particular emphasis on hygiene and infant and young child feeding (IYCF);

- World Vision Kenya works in: Turkana Central district in Kalokol, Kerio and Central divisions; Turkana South district, in Lokichar, Lomelo, Katilu, and Kainuk divisions. With effect from January 2011, WVK changed its strategy from running parallel programmes such as conducting SFP and OTP to providing support to MOPHS in terms of capacity building and provision of material resources. The change of strategy was necessitated by donor funding was not continuous but was also to improve on sustainability. The change in approach resulted in lower coverage in the initial stages but was reported to be gradually[3];

- International Rescue Committee (IRC) has been working in Lokichogio Township in Kakuma division and Lokichoggio town since September 2009. IRC conducted its activities in collaboration with Kakuma Mission hospital and AIC Church. IRC with funded from UNICEF has been conducting outreach activities in the whole of Kakuma division where it implements Integrated Management of Acute Malnutrition (IMAM) programme comprising of 2 SCs in the two hospitals. However, this approach has changed with the introduction of the MOH's Health and Nutrition Integrated strategy whereby the nutrition activities (SC, OTP

---

[3] Personal Communication WVK Nutrition Manager, 03/06/2011

and SFP) are now implemented by the MOH health staff at the health facilities. The NGOs support the health staff in terms of capacity building through the *On the Job training* (OJT) strategy and provide resources to facilitate the MOH to conduct outreach activities. The NGOs are supposed to conduct outreach services in hard-to reach areas where the MOH may not have the facilities/resources to do so; and

- OXFAM-GB strategy has shifted from purely humanitarian to an *Intergrated Project Approach*, what they call *One Programme Approach.* In this approach, humanitarian activities are implemented alongside development and advocacy activities. This approach is considered appropriate to facilitate sustainability of the project activities and impact even after the project life. The OXFAM-GB food security and livelihood activities include the following:

  o Livestock off take/cash transfer. This an ECHO-funded project entails buying weak but palatable livestock particularly small livestock and availing it to 2 or more families for consumption;
  o Piloting of an alternative food delivery mechanism through small scale traders. This EC-funded project is meant to provide the preferred food item (as an alternative) to that provided in the GFR. At the same time, this strategy is meant to stimulate local production and consequently improve the socio-economic status of the people. In this programme, fish or meat for example is used to substitute lentils. The trader receives an incentive for every kilogram of meat sold as a service fee. It was reported that the programme is popular and doing well.
  o Ad hoc Cash for Work projects. The most vulnerable households willing to participate are selected and undertake activities such as fish-net making and boat repair. The community members are paid for the work done and the articles produced are given to them. Such households do not receive food aid; and
  o Hunger-Safety Net Programme a project funded by the government and DFID aimed at improving the lives of the most vulnerable sub-population groups in the community. This is a pension scheme targeting the elderly, disabled, widows and orphans in the community.

In addition to the NGOs, World Food Programme (WFP) provides General Food Distribution (GFD) in addition to providing food for the SFP. The food pipeline was reported to erratic in 2011; there were delays in some distribution cycles and there was shortage of maize because of short of the commodity in the region. In addition, there was disruption in distribution in April 2011 because the transporters' strike in demand for an increase in payment for transport services. This affected both GFD and SFP supplies.

Despite the increasing numbers of children admitted in the selective feeding programmes, the number of people targeted for food relief did not change from 265,000 and the food basket remained at 75% of the full ration (Kcal 2100) as shown in Table 1 below:

Table 1: General Food Distribution (GFD) Food Basket

Food Item	Amount (Kg) provided per person per month
Cereals	10.35
Pulses (split lentils)	1.8
Corn Soya Blend (CSB)	1.2
Oil	0.6

WFP partnered with the following agencies in the distribution of BSFP in the districts indicated:
- Merlin (Turkana North and Turkana Central)
- IRC (Turkana North)
- WVK (Turkana Central and South Turkana)

In addition, WFP implements food for assets (FFA) targeting communities which carry out agriculture viable activities in North, Central and South districts. This activity is growing very fast because of the benefits of the programme to the target group. Activities in FFA include assisting the community to carry out irrigation by being provided with farm implements, capacity building and the resulting crops are given to those admitted in the programme. The government provides the technical expertise for such programmes. This is a developmental

strategy that would have a longer-term impact than the relief services that form the majority of the interventions dealing with food insecurity in Turkana. Nonetheless, FFA is implemented on a much smaller scale compared to the relief services.

Main challenges in the implementation of health and nutrition activities in Turkana

- The vastness of Turkana especially Turkana North East making it a challenge to reach all the population;

- Some of the areas have no implementing partners on the ground because of insecurity;

- Poor infrastructure (poor or no roads, and few inaccessible and poorly staffed health facilities);

- Cultural practices constraining the uptake of some interventions for example, IYCF practices;

- Chronic food insecurity due to persistent drought and insecurity in the district;

- Inadequate basic needs such as water and latrines;

- Low levels of literacy and education hence the communities' low understanding of critical issues in health and hygiene and developmental issues. This consequently affects people's perceptions and uptake of interventions;

- Nomadic lifestyle; and

- People migrate to access water and pasture for their livestock hence the services offered by the government and various agencies may not reach them at all times.

2. OBJECTIVES OF THE SURVEY

2.1 Main Objective
The main purpose was to estimate the level of acute malnutrition and nutritional oedema among children aged 6-59 months of age and to determine the main causes of Malnutrition in Turkana County.

2.2 Specific objectives
Using the Kenya nutritional assessment guidelines, the following objectives guided the implementation of the survey:

8. To determine the prevalence of acute malnutrition among under five year olds children, pregnant and lactating women;
9. To estimate coverage of the current nutrition interventions in the district;
10. To determine the Infant and Young Child Feeding Practices (IYCF) among children 0-23 months of age;
11. To investigate household food security and food consumption practice;
12. To estimate crude and under-five mortality rates;
13. To estimate morbidly rates of children below five years; and
14. To determine the proportion of households with access to safe water and sanitation (Annex 1 for ToR).

3. SURVEY METHODOLOGY

3.1 Survey Design

The survey used a cross-sectional study design involving 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; KFSSG Short Rains reports; Kenya Food Security Update reports; and Arid Lands Resource Management Project (ALRMP)

Drought Monitoring Bulletin was conducted. In addition, informal interviews were conducted with ALRMP and MOPHS and its implementing partners (WVK, IRC, OXFAM-GB, and Merlin.) to obtain information on the health and nutrition interventions conducted in Turkana .Key informant interview (KII)   was also conducted with World Food Programme (WFP) to get information on the GFD food pipeline and to establish any challenges and constraints experienced. 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 to solicit their perceptions on the causes and possible solutions to the problems of health and nutrition in Turkana region. The focus on the FGDs was on food security issues.

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 infant and young child feeding (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. Four independent surveys were conducted in Turkana Central, Turkana South, Turkana North East and Turkana North West as has been the practice since 2009. These surveys covered the whole of Turkana.

The sampling frame constituted all households living in each of the four survey sites in Turkana. The population data was based on the Kenya National Bureau Statistics estimates[4]. Sample size calculation for all the four districts was based on the assumption that the prospected GAM was much higher than that during the May 2010 nutrition survey. The highest upper confidence level (20.1%) was therefore used as the prevalence of malnutrition. A precision of ±4.0% 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 18%.The average household size was 6. The non-response rate was estimated at 3%. The resulting sample size was 613 households which was expected to yield 578 children underfive years of age for anthropometric measurements. The number of clusters visited per survey site was 41 each comprising 15 households. The resulting sample sizes for anthropometric measurements however varied from that anticipated. In Turkana Central the sample size was 751, Turkana South 712, Turkana North East 644 and Turkana North West 702.

The sample size for collection of data on IYCF indicators was 4 infants 0-5 months of age per cluster and 6 infants 6-23 months of age per cluster making a total of 460 infants per district.

For the mortality rates (both crude and underfive mortality) the sample sizes for each of the districts was also calculated using ENA for SMART 2010. The sample sizes for all the survey sites were calculated based on the underfive and crude mortality estimates. A precision of ±1% 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 6. The non-response rate was estimated at 3%. The calculated sample sizes for all the districts was less than the number of households to be visited for anthropometry and therefore questions on mortality was asked in all the households visited.

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-

---

[4] Turkana District; Kenya National Bureau of Statistics, June 2011

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. The sampling frame for the survey was limited to those sub-locations that were geographically accessible and safe in terms of security.

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 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 (15) per cluster was attained.

Selection of children for assessment of IYCF practices

For the IYCF practices 3 children less than 6 months of age were selected from the households visited in each of the 41 clusters making a total of 123 children. Similarly, 6 children 6-23 months of age were selected from each of the 41 clusters making a total of 206. The sample 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 and an assistant consultant. The consultants were assisted by the: Health Coordinator Merlin; Nutrition Manager IRC; and Nutrition Manager WVK. District Nutrition Officers (one from each of the four survey sites assisted in the coordination of data collection. The survey was undertaken by 20 teams, 5 teams per district. Each team comprised 4 members inclusive of a team leader. 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, partner agencies, universities and middle level colleges while 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 24th to 28th May 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 (See 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 place concurrently in all the four districts. The data collection took 10 days, from 30th May to 7th June 2011. The consultant, assistant consultant, the 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 85 cm or less than 2 years of age while those greater or equal to 85 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. The 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 the percentage of the median, 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 indicator for full immunization was the proportion of children 12-23 months who had received all (8) of the vaccinations. 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[5] 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[6]. 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:
- 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

---

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

[6] 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.

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.

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[7]. 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; when it was received, what foods were received; how the ration was used and the duration each 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 both Z-scores and in percentage of median. The expression in Z-scores has true statistical meaning and allows inter-study comparison. The percentage of median on the other hand is commonly used to identify eligible children for feeding programmes and both are reported.

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

Guidelines for the results expressed in percentage according to the median reference:
- Severe malnutrition is defined by WFH < 70% and/or existing bilateral oedema on the lower limbs
- Moderate malnutrition is defined by WFH < 80% and >=70% 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 or less than 80% percentage of the median with/without oedema.

---

[7] 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 2: Definitions of acute malnutrition using WFH and/or oedema in children aged 6–59 months

Acute malnutrition (WFH)	Percentage of the median	Z score	oedema
Severe	< 70 %	< - 3 z scores	Yes / no
	> 70 %	> -3 z scores	Yes
Moderate	>= 70 % - <80%	< –2 z-scores to ≥ –3 z-scores	No
Global	< 80 %	< –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[8]: Cut off <21 cm signifying under nutrition

3.6   Data Analysis

Six data entry clerks were hired by Merlin and an external data analyst were responsible for data entry under the coordination and supervision of the consultant. ENA nutrisurvey 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 16.0 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 a local calendar of events developed for the various survey sites in Turkana. 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 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 vastness of the district, poor communication and transportation and insecurity in some parts of Turkana. It is proposed that in future, the surveys not be conducted for the four districts concurrently. It is recommended therefore that the surveys for Turkana Central and Turkana South districts be conducted concurrently before the team moves on to do the same in Turkana North East and Turkana North West. This will facilitate more intensive supervision so as to improve on the quality of data collected.

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.

The sampling frame for the survey was limited to those sub-locations that were geographically accessible and safe in terms of security.

---

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

4.   RESULTS

The findings for the four survey sites; Turkana Central, Turkana South, Turkana North East and Turkana North West are presented concurrently, similarities and disparities are highlighted. The findings of the FGDs have been used to complement the quantitative findings while highlighting disparities where they exist.

4.1 Household Demography

The mean household sizes were more or less similar in Central and South Turkana at 5.2 (sd 2.1), and 5.4 (sd 2.1) respectively. The same was true for North East and North West at 4.8 (sd 1.6) and 4.5 (sd 1.5) respectively (Table 3). The sex ratio (male to female) was as expected; Central and South had a ratio of 1.0, North East 0.8 and North West 0.9 (Table).

Table 3: Household Demographic Characteristics

	Central	South	North East	North West
Demographic Characteristics				
Mean (sd) household size	5.5 (sd 1.9)	5.1 (sd 1.8)	4.8 (sd 1.6)	5.0 (sd 1.8)
Total population	3391	2946	2857	2972
Males	1674	1439	1324	1436
Females	1677	1439	1500	1499
Sex ratio	1.0	1.0	0.8	0.9
Total Underfive population	936	900	975	858

4.1   Livestock Ownership

Over half of the households in Central (51.4%) and in North East (56.0%) owned livestock whereas 38.5% and 39.2% owned livestock in the South and North West respectively. These findings showed a decrease in livestock ownership compared to the year 2010[9] when over 60% of the households in Central and North East owned livestock with only North West reporting less than 50.0% of the households owning livestock (Table 4).

Of the households that owned livestock, South reported the highest percentage of households (10.0%) having an increase in the size of their livestock in the six months prior to the survey. This was followed by Central at 6.8%, whereas North East and North West recorded only 1.8% and 1.7% of the households having an increase in the size of their livestock. The percentage of households that reported an increase in the size of their livestock was much lower than reported in May 2010 nutrition survey. Most of the livestock increase in Central and South was due to animals giving birth whereas in North East and North West the increase was due to purchase of animals (Table 4).

Over three-quarters of the households in all the four survey sites reported a decrease in the size of livestock owned. The highest decrease was reported in North East (94.1%) and North West (94.0%), followed by Central (87.9%), and lastly South at 77.8%. These figures were much higher than in 2010 when only South reported over half (75.2%) reduction in the size of livestock. Most of the livestock reduction was reported to be as a result of death caused by either disease or drought. Other causes of reduction were sale and raids of livestock. With the exception of the South in which 12.2% of the households had neither a reduction nor an increase in the size of livestock, the rest of the survey sites reported less than 5% households where the size of the livestock remained the same (Table 4).

The overall picture is that fewer households from all the four survey sites owned livestock compared to the same time the previous year (May 2010). Fewer households had increase in the size of their livestock and more

---

[9] Turkana Nutrition Survey May 2010

households had a decrease in the size of their livestock. These findings imply that the households had lower economic power in 2011 compared to 2010. This could have had a negative impact in food security status households because livestock is the major livelihood of Turkana people.

Table 4: Livestock Ownership

	Central N=634		South N=589		North East N=600		North West N=602	
	n	%	n	%	n	%	n	%
Own Livestock	326	(51.4)	227	(38.5)	336	(56.0)	236	(39.2)
Livestock increased in last 6 months Reasons for increase*:	22	(6.8)	22	(10.0)	6	(1.8)	4	(1.7)
• Animals gave birth	22	(57.5)	23	(51.1)	4	(13.3)	9	(12.9)
• Bought	16	(40.0)	9	(20.0)	15	(50.0)	41	(58.6)
• Dowry	0	(0.0)	6	(13.3)	6	(20.0)	15	(21.4)
• Donation	0	(0.0)	0	(0.0)	1	(3.3)	0	(0.0)
• Restocking	0	(0.0)	7	(15.6)	1	(3.3)	5	(7.1)
• Others	1	(2.5)	0	(0.0)	3	(10.1)	0	(0.0)
Livestock decreased in the last 6 months Reasons for decrease*:	284	(87.9)	172	(77.8)	311	(94.1)	218	(94.0)
• Sold	45	(10.7)	113	(41.1)	62	(13.8)	77	(26.8)
• Death caused by drought	234	(55.7)	78	(28.4)	279	(62.4)	157	(53.3)
• Raid	1	(0.2)	1	(0.4)	1	(0.2)	0	(0.0)
• Death caused by disease	93	(22.1)	79	(28.7)	105	(23.5)	56	(19.5)
• Dowry	1	(0.2)	4	(1.5)	0	(0.0)	0	(0.0)
• Others	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Livestock remained the same in the last 6 months	17	(5.3)	27	(12.2)	14	(4.2)	10	(4.3)

*Multiple responses

4.2   Anthropometry

4.2.1   Age and sex distribution of the sampled children

Verification of age of index child/children

Table 5: Verification of age of index child/children by survey sites

	Central N=917		South N=867		North East N=904		North West N=847	
	n	%	n	%	n	%	n	%
Health card	568	61.9	614	70.8	530	58.6	548	64.7
Birth certificate	10	1.1	7	0.8	24	61.3	4	0.5
Baptismal card	1	0.1	5	0.6	1	0.1	1	0.1
Total Verified	**579**	**63.1**	**626**	**72.2**	**555**	**61.4**	**553**	**65.3**
Recall	338	36.9	241	27.8	349	38.6	294	34.7

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.

In three of the four survey sites, age was verified by documents for about two-thirds of the children; North West 65.3%, Central 63.1% and North East 61.4%. South recorded the highest percentage of children whose birth dates were verified (72.2%). Over 30% of the ages of children from each of the survey sites were based on recall. The highest percentage of the ages determined by recall was from North East (38.6%), followed by Central (36.9%) and South recorded the lowest at 27.8% (Table 5).

<u>Distribution of children by age and sex</u>

In Turkana Central, slightly over half of the survey children (51.7%) were boys compared to 48.3% girls (Table 6). 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[10], demonstrating an unbiased sample. The ratios of boys to girls for all the other age categories were within the normal range.

Table 6: Distribution of the children in Turkana Central District by age and sex

	Boys		Girls		Total		Ratio
AGE (months)	no.	%	no.	%	no.	%	Boy:girl
6-17	119	51.7	111	48.3	230	30.5	1.1
18-29	98	53.0	87	47.0	185	24.6	1.1
30-41	83	48.3	89	51.7	172	22.8	0.9
42-53	68	54.0	58	46.0	126	16.7	1.2
54-59	21	52.5	19	47.5	40	5.3	1.1
Total	389	51.7	364	48.3	753	100.0	1.1

In Turkana South, slightly over half (51.3%) of the surveyed children were boys and 48.7% were girls (Table 7). The overall ratio of boys to girls was 1.1 which was within the recommended range of 0.8 – 1.2 and thus the sample was unbiased. The sex ratios across the child age groups were also within the accepted range except that of 54-59 months old and 18-29 months old whose ratios of boys to girls was unbalanced at 2.1 and 0.9 respectively (Table 7).

Table 7: Distribution of the children in Turkana South District by age and sex

	Boys		Girls		Total		Ratio
AGE (mo)	no.	%	no.	%	no.	%	Boy:girl
6-17	94	51.6	88	48.4	182	25.5	1.1
18-29	94	48.5	100	51.5	194	27.2	0.9
30-41	93	52.0	86	48.0	179	25.1	1.1
42-53	60	49.2	62	50.8	122	17.1	1.0
54-59	25	67.6	12	32.4	37	5.2	2.1
Total	366	51.3	348	48.7	714	100.0	1.1

In Turkana North East, 50.1% of the children surveyed were boys and 49.9% were girls. The overall ratio of boys to girls was 1.0 which was within the recommended range of 0.8 – 1.2. With the exception of the age category 42-53 months, the sex distributions for the other age groups were within the acceptable ranges (Table 8).

---

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

Table 8: Distribution by age and sex of children in Turkana North East

AGE (mo)	Boys no.	%	Girls no.	%	Total no.	%	Ratio Boy:girl
6-17	92	50.0	92	50.0	184	25.9	1.0
18-29	90	51.7	84	48.3	174	24.5	1.1
30-41	86	51.5	81	48.5	167	23.5	1.1
42-53	68	46.3	79	53.7	147	20.7	0.9
54-59	20	51.3	19	48.7	39	5.5	1.1
Total	356	50.1	355	49.9	711	100.0	1.0

In Turkana North West 51.4% of the children were boys compared to 48.6%. The overall sex distribution by age categories was unbiased as it was within the acceptable levels of 0.8 – 1.2 (Table 9). Nonetheless, the sex ratio for the age categories 30-41 months and 42-53 months were biased at 0.9 and 1.6 respectively.

Table 9: Distribution by age and sex of children from North West

AGE (mo)	Boys no.	%	Girls no.	%	Total no.	%	Ratio Boy:girl
6-17	125	54.1	106	45.9	231	32.4	1.2
18-29	83	45.1	101	54.9	184	25.8	0.8
30-41	77	48.1	83	51.9	160	22.4	0.9
42-53	67	60.9	43	39.1	110	15.4	1.6
54-59	15	51.7	14	48.3	29	4.1	1.1
Total	367	51.4	347	48.6	714	100.0	1.1

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

Table 10: Prevalence of malnutrition weight-for-height z-scores (WHO Standards 2006)

Nutritional Status Indicator	Central N=749	South N=711	North East N=709	North West N=698
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(181) 24.4 % (20.3 – 29.1 95% C.I.)	(238) 33.5 % (29.3 – 37.9 95% C.I.)	(265) 37.4 % (33.0 – 42.0 95% C.I.)	(194) 27.8 % (23.4 – 32.7 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(149) 19.9 % (16.4 – 19.9 95% C.I.)	(190) 26.8 % (23.4 - 30.4 95% C.I.)	198) 27.9 % (24.0 - 32.2 95% C.I.)	152) 21.8 % (18.1 - 25.9 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(34) 4.5 % (3.1 – 6.7 95% C.I.)	(48) 6.8 % (5.1 – 8.9 95% C.I.)	(67) 9.4 % (7.2 – 12.3 95% C.I.)	(42) 6.0 % (4.4 – 8.2 95% C.I.)
% of oedema	(0) 0%	(1) 0.1%	(1) 0.1%	(1) 0.1%

The malnutrition levels unveiled by this survey indicate rates above the emergency GAM threshold (15.0%) in the four survey sites. In two of the survey sites; North East and South the GAM rates were above 30% indicating an emergency and in the other two the situation was critical[11]. The GAM rate was lowest in Central at 24.4% (95% CI: 20.3 – 29.1) followed by North West at 27.8% (95% CI: 23.4 – 32.7). In South, the GAM rate was 33.5% (95% CI: 29.3 – 37.9) and the highest GAM rate was in North East, 37.4% (95% CI: 33.0 – 42.0). The trend was the same for SAM levels. The highest SAM rate was in the North East, 9.4% (95% CI: 7.2 – 12.3); South 6.8%

---

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

(95% CI: 5.1 – 8.9); North West 6.0% (95% CI: 4.4 – 8.2); and lastly Central 4.5% (95% CI: 3.1 – 6.7). The SAM rates were above the acceptable level (<3%) for all the survey sites (Table 9). Oedema cases were observed in North East (0.1%), South (0.1%) and in North West (0.1%) [Table 10]. There were no cases of oedema in Central.

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

Turkana Central District
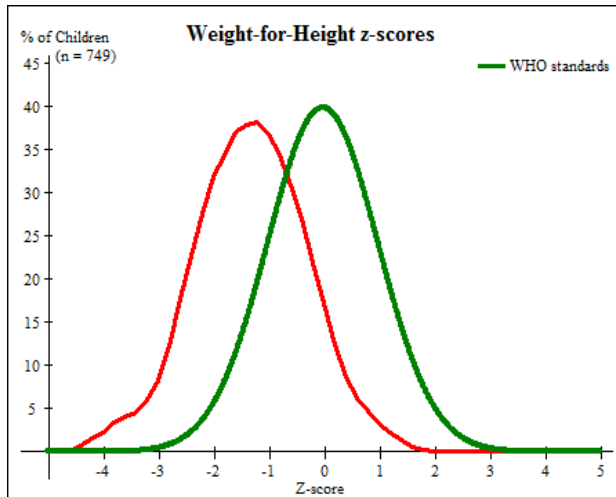
The sample curve shows displacement to the left of the reference population. This is an indication of poor nutrition status of the sampled population in comparison to the reference population. The standard deviation of this sample was 1.01, (which lies within the acceptable range 0.8 – 1.2), indicating representativeness in the sample selection (Figure 2).

Figure 2: Weight for height Z-score distribution in Turkana Central

Turkana South District
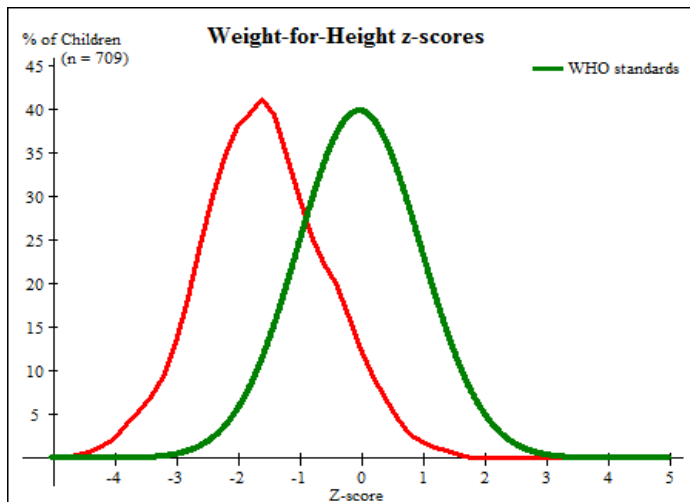
The sample curve shows a marked displacement of the curve of the sampled population to the left of the reference curve, indicating poor nutritional status of the sampled population. The WHZ standard deviation of the sampled population was 0.99, which was within acceptable levels (Figure 3).

Figure 3: Weight for height Z-score distribution in Turkana South

Turkana North East District
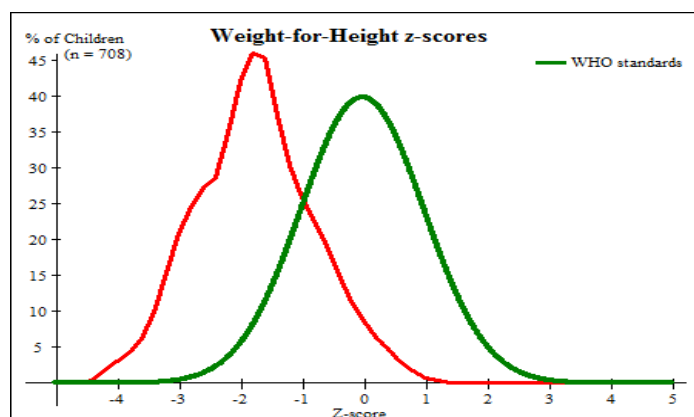
Figure 4 indicates a poor nutritional status of the sampled population, because their curve is skewed to the left of that of the reference population. Sample selection is representative since the WHZ standard deviation (0.94) was within the acceptable range.

Figure 4: Weight for height Z-score distribution in North East

Turkana North West District
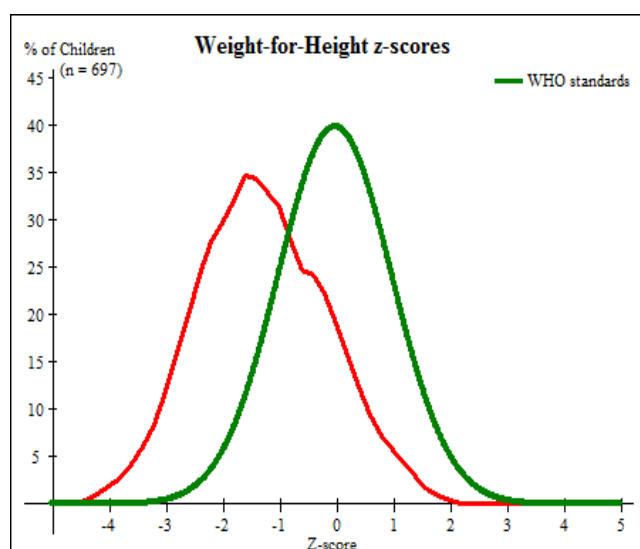
The WHZ distribution curve of the children from North West shows a similar trend like those for the other survey sites, indicating poor nutritional status. The standard deviation for the sampled population for WHZ was 1.11 indicating that it was representative of the study population (Figure 5).

Figure 5: Weight for height Z-score distribution in Turkana North West

4.2.4 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.

Turkana Central

In Turkana Central, acute malnutrition was high (GAM 26.7%) in the younger children (ages 6-17months), a time when the effects of poor or inappropriate feeding practices are experienced most. Acute malnutrition was also high (GAM 25.3%) in the age category 18-29 months and 25.0% among children 54-59 months old (Table 11). The relatively high level of GAM in the age group 54-59 months old may probably be explained by the relatively small sample size (40 children) in this age category compared to the other categories which had more than 120

children each (Table 11). The smaller sample size is explained by the fact that this category comprises a range of 6 months whereas the other categories comprise a range of 12 months each.

Table 11: Prevalence of acute malnutrition (wasting) by age based on weight-for-height Z-scores and or oedema in Central Turkana

Age (mo)	Total no.	Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-17	229	15	6.6	46	20.1	168	73.4	0	0.0
18-29	182	10	5.5	36	19.8	136	74.7	0	0.0
30-41	172	6	3.5	33	19.2	133	77.3	0	0.0
42-53	126	2	1.6	25	19.8	99	78.6	0	0.0
54-59	40	1	2.5	9	22.5	30	75.0	0	0.0
Total	749	34	4.5	149	19.9	566	75.6	0	0.0

Turkana South

In the South, the highest of wasting (38.7%) was observed in the age category 18-29 months followed by 34.4% in the age category 6-17 months. These two categories are the ages when the effect of poor feeding is demonstrated on the health of the child. The age category 42-53 months also recorded a relatively high level of wastng (34.45%). The lowest level of wasting was observed in the age category 54-59 months (Table 12).

Table 12: Prevalence of acute malnutrition (wasting) by age based on weight-for-height Z-scores and or oedema in South Turkana

Age (mo)	Total no.	Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-17	180	13	7.2	49	27.2	118	65.6	0	0.0
18-29	194	13	6.7	62	32.0	119	61.3	0	0.0
30-41	177	14	7.9	36	20.3	126	71.2	1	0.6
42-53	122	7	5.7	35	28.7	80	65.6	0	0.0
54-59	37	0	0.0	8	21.6	29	78.4	0	0.0
Total	710	47	6.6	190	26.8	472	66.5	1	0.1

North East
The highest GAM rate (41.5%) was observed in the age category 42-53 months of age. The next high levels of GAM (39.4%) were in the age category 54-59 months followed by 37.3% in the age category 18-29 months and the rest of the age categories, 6-17 months and for 30-41 months were at 34.4% and 35.9% respectively (Table 13).

Table 13: Prevalence of acute malnutrition (wasting) by age based on weight-for-height Z-scores and or oedema in North East District

Age (mo)	Total no.	Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-17	183	13	7.1	50	27.3	119	65.0	1	0.5
18-29	174	15	8.6	50	28.7	109	62.6	0	0.0
30-41	167	13	7.8	47	28.1	107	64.1	0	0.0
42-53	147	21	14.3	40	27.2	86	58.5	0	0.0
54-59	38	4	10.5	11	28.9	23	60.5	0	0.0
Total	709	66	9.3	198	27.9	444	62.6	1	0.1

North West

The highest GAM rate (37.0%) was in the age category 6-17 months and the lowest 13.8% in the category 54-59 months. In the rest of the age categories, the GAM rates were more or less equal at round 23.0% (Table 14).

Table 14: Prevalence of acute malnutrition (wasting) by age based on weight-for-height Z-scores and or oedema (WHO Standards 2006) in North West

Age (mo)	Total no.	Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-17	227	25	11.0	59	26.0	142	62.6	1	0.4
18-29	180	6	3.3	37	20.6	137	76.1	0	0.0
30-41	155	6	3.9	31	20.0	118	76.1	0	0.0
42-53	107	4	3.7	21	19.6	82	76.6	0	0.0
54-59	29	0	0.0	4	13.8	25	86.2	0	0.0
Total	698	41	5.9	152	21.8	504	72.2	1	0.1

Further disaggregation by age (6-29 months) and 30-59 months was conducted to further investigate risk as a factor to malnutrition. On the whole, younger children (6-29 months old) were at higher risk of malnutrition than the older ones (30-59 months old). In Central, 26.0% of the younger children were malnourished compared to 22.5% of the older ones whereas in South 36.6% of the younger children were malnourished compared to 29.8% of the older ones. In North West, 31.1% of the younger children were malnourished whereas 22.7% of the older ones were malnourished. It was only in the North East where a higher proportion of older children 38.6% were malnourished compared to 35.9% younger ones (Table 15). The overall picture was that younger children were at higher risk of malnutrition most likely due to inappropriate feeding practices.

Table 15: Prevalence of malnutrition weight-for-height Z scores by age

Malnutrition	Central		South		North East		North West	
	n	%	n	%	n	%		%
Age 6-29 months	n=411		n=374		n=357		n=409	
Prevalence of global malnutrition (<-2 z-score and/or oedema)	107	26.0	137	36.6	128	35.9	127	31.1
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	25	6.1	26	7.0	28	7.8	31	7.6
Age 30-59 months	n=338		n=336		n=352		n=291	
Prevalence of global malnutrition (<-2 z-score and/or oedema)	76	22.5	100	29.8	136	38.6	66	22.7
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	9	2.7	21	6.3	38	10.8	10	3.4

4.2.5   Prevalence of malnutrition weight-for-height Z-scores by Sex

In all the survey sites boys were more malnourished than girls. In Central, 25.1% boys compared to 23.8% were malnourished. In South, 36.4% boys and 30.4% of the girls were malnourished and in North East, 40.6% boys compared to 34.2% were malnourished. In North West, 29.8% of the boys compared with 25.7% of the girls were malnourished (Table 16). The cause of this disparity in the nutritional status of the children by sex is not known.

Table 16: Prevalence of malnutrition weight-for-height Z-scores by sex

Malnutrition	Central		South		North East		North West	
	n	%	n	%	n	%	n	%
Boys	n=387		n=365		n=355		n=359	
Prevalence of severe malnutrition (**<-3 z-score and/or oedema**)	97	25.1	133	36.4	144	40.6	107	29.8
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	25	4.5	28	7.7	38	10.7	26	7.2
Girls	n=362		n=345		n=354		n=339	
Prevalence of severe malnutrition (**<-3 z-score and/or oedema**)	86	23.8	105	30.4	121	34.2	87	25.7
Prevalence of severe malnutrition (**<-3 z-score and/or oedema**)	9	2.5	20	5.8	29	8.2	16	4.7

4.2.6 Distribution of acute malnutrition and oedema based on weight for height Z scores WHO Standards 2006

Turkana Central

Table 17: Distribution of acute malnutrition and oedema based on weight-for-height z-scores in Central District

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 36 (4.8 %)	Not severely malnourished No. 716 (95.2 %)

There were no children with marasmic kwashiorkor and kwashiorkor in Central. Those with marasmus were 4.8% (Table 17).

Turkana South

Table 18: Distribution of acute malnutrition and oedema based on weight-for-height z-scores in Turkana South

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor No. 1 (0.1 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 51 (7.1 %)	Not severely malnourished No. 662 (92.7 %)

There was one child (0.1%) with marasmic kwashiorkor and no child with kwashiorkor whereas 7.1% had marasmus in the South Table 18).

North East District

Table 19: Distribution of acute malnutrition and oedema based on weight-for-height z-scores in Turkana North East

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor No. 1 (0.1 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 66 (9.3 %)	Not severely malnourished No. 644 (90.6 %)

There were no children with kwashiorkor whereas there was one (0.1%) with marasmic kwashiorkor and 9.3% with marasmus in North East (Table 19).

North West

There were one child (0.1%) with marasmic kwashiorkor and none with kwashiorkor whereas those with marasmus were 6.5% (Table 20).

Table 20: Distribution of acute malnutrition and oedema based on weight-for-height z-scores in North West Turkana

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor No. 1 (0.1 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 46 (6.5 %)	Not severely malnourished No. 666 (93.4 %)

4.2.7 Mean weight for height Z scores WHO Standards 2006

Turkana Central

The mean weight-for-height Z scores was -1.33±1.01 with a design effect of 1.96 whereas the height-for-age mean Z scores -1.67±1.02 with a design effect of 1.99. There were 3 Z scores out of range for weight-for-height and 1 was not available (Table 21).

Table 21: Mean z-scores, Design Effects and excluded subjects in Central District

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	749	-1.33±1.01	1.96	1	3
Weight-for-Age	751	-1.67±1.02	1.99	1	1
Height-for-Age	750	-1.38±1.11	1.39	0	3

* contains for WHZ and WAZ the children with oedema.

Turkana South

The mean weight-for-height Z scores was-1.57±0.99 with a design effect of 1.42 and the height-for-age mean Z scores -1.51±1.25 with a design effect of 1.51. There were 4 Z scores out of range for weight-for-height and 1 was not available. There were 5 Z scores out of range for the height-for-age and one score not available (Table 22).

Table 22: Mean z-scores, Design Effects and excluded subjects in South District

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	709	-1.57±0.99	1.42	1	4
Weight-for-Age	712	-1.92±1.01	1.48	1	1
Height-for-Age	709	-1.51±1.25	1.51	0	5

* contains for WHZ and WAZ the children with oedema.

Turkana North East

The mean weight-for-height Z scores for Turkana North East was -1.75±0.94 with a design effect of 1.48 whereas the height-for-age mean Z scores -1.27±1.26 with a design effect of 1.30. Two scores were out of range for WHZ score and one was not available. For the HFA 6 scores were out of range but all were available (Table 23).

Table 23: Mean z-scores, Design Effects and excluded subjects in North East District

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	708	-1.75±0.94	1.48	1	2
Weight-for-Age	708	-1.91±0.99	1.64	1	2
Height-for-Age	705	-1.27±1.26	1.30	0	6

* contains for WHZ and WAZ the children with oedema.

Turkana North West

Table 24: Mean z-scores, Design Effects and excluded subjects in North West District

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	697	-1.29±1.11	1.85	2	15
Weight-for-Age	702	-1.55±1.17	2.62	2	10
Height-for-Age	669	-1.28±1.28	1.65	0	45

* contains for WHZ and WAZ the children with oedema.

The mean weight-for-height Z scores for Turkana North West District was 1.29±1.11 with a design effect of 1.1.85 whereas the height-for-age mean Z scores -1.28±1.28 with a design effect of 1.65 (Table 24).

4.2.8 Prevalence of acute malnutrition based on Percentage of the Median and/or oedema

The highest GAM was in North East, 17.0% (95% CI; 14.0 – 20.6) and SAM was 0.3% (95% CI; 0.1 – 1.1). This was followed by South with a GAM of 12.3 % (95% CI; 10.0 – 15.3) and SAM of 1.0% (95% CI; 0.5 – 2.0). North West had a GAM rate of 10.1% (95% CI; 8.1– 13.0) and SAM of 0.7% (95% CI; 0.3 – 2.0). The lowest GAM was in Central at 8.8% (95% CI; 6.8 – 11.4) and SAM of 0.3% (95% CI; 0.1 –1.1) (Table 25).

Table 25: Prevalence of acute malnutrition based on Percentage of the Median and/or oedema for all the districts

	Central N = 752	South N = 714	North East N = 711	North West N = 713
Prevalence of global acute malnutrition (<80% and/or oedema)	(66) 8.8 % (6.8 - 11.4 95% C.I.)	(88) 12.3 % (10.0 - 15.3 95% C.I.)	(121) 17.0 % (14.0 - 20.6 95% C.I.)	(72) 10.1 % (8.1 - 13.0 95% C.I.)
Prevalence of moderate acute malnutrition (<80% and >= 70%, no oedema)	(64) 8.5 % (6.6 - 11.1 95% C.I.)	(81) 11.3 % (9.1 - 14.2 95% C.I.)	(119) 16.7 % (13.8 - 20.2 95% C.I.)	(67) 9.4 % (7.4 - 12.3 95% C.I.)
Prevalence of severe acute malnutrition (<70% and/or oedema)	(2) 0.3 % (0.1 - 1.1 95% C.I.)	(7) 1.0 % (0.5 - 2.0 95% C.I.)	(2) 0.3 % (0.1 - 1.1 95% C.I.)	(5) 0.7 % (0.3 - 2.0 95% C.I.)

4.2.9 Prevalence of acute malnutrition based on MUAC

Table 26: Prevalence of Malnutrition based on MUAC in all the four districts

	Central N=751		South N=713		North East N=710		North West N=714	
	n	%	n	%	n	%	n	%
Severe under nutrition < 115 mm	26	3.5	33	4.6	37	5.2	36	5.0
Moderate 115–<125 mm	108	14.4	124	17.4	143	20.1	117	16.4
At risk 125 – <135 mm	254	33.7	229	32.1	237	33.4	236	33.1
Well nourished ≥135mm	363	48.3	327	45.9	293	41.3	325	45.5

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

MUAC is a rapid assessment tool and a good indicator of the risk of mortality among children. The findings showed that the highest rate of severe acute malnutrition was in North East at 5.2%, followed by North West (5.0%), then south (4.6%) and the least was in Central (3.5%). Although severe malnutrition was lower by MUAC in comparison to Z scores, the rates were also above the acceptable <3% according to WHO guidelines.

Moderate acute malnutrition was also highest in North East (20.1%), followed by South (17.4%), North East (16.4%) and lastly Central (14.4%). The highest proportion of children at risk (33.7%) was from Central, and the least (32.1%) from South (Table 26).

4.2.10   Prevalence of underweight

The rate of underweight was high in Turkana. The rate was highest in the South 45.8% (95% CI: 41.2 – 50.4) followed by North East at 45.3% (95% CI: 40.6 – 50.2). In Central the underweight rate was 37.0% (95% CI: 32.2 – 42.2). North West registered an underweight rate of 36.5% (95% CI: 30.8 – 42.6) (Table 27).

Table 27: Prevalence of underweight based on weight-for-age z-scores

Nutritional Status Indicator	Central N=751	South N = 712	North East N = 708	North West N= 702
Prevalence of global underweight (<-2 z-score)	(278) 37.0 % (32.2 - 42.2 95% C.I.)	(326) 45.8 % (41.2 - 50.4 95% C.I.)	(321) 45.3 % (40.6 - 50.2 95% C.I.)	(256) 36.5 % (30.8 - 42.6 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(209) 27.8 % (24.4 - 31.5 95% C.I.)	(226) 31.7 % (28.2 - 35.5 95% C.I.)	(225) 31.8 % (27.3 - 36.6 95% C.I.)	(169) 24.1 % (20.1 - 28.6 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(69) 9.2 % (6.9 - 12.1 95% C.I.)	(100) 14.0 % (11.2 - 17.5 95% C.I.)	(96) 13.6 % (11.6 - 15.9 95% C.I.)	(87) 12.4 % (9.4 - 16.3 95% C.I.)

4.2.11   Prevalence of stunting

Stunting rates were high but below the national rate (35.3%) and the Rift Valley Province rate (35.7%)[12] except for Turkana South which recorded higher rates. The highest rate of stunting was in the South at 36.7% (95% CI: 32.3 – 41.3) and severe stunting at 10.9% (95% CI: 8.3 – 14.1). North West had a stunting rate of 31.2% (95% CI: 26.8 – 36.1) with severe stunting at 9.3% (95% CI: 7.0-12.1). In Central, the stunting rate was 29.7% (95% CI: 25.9 – 33.8%) and severe stunting of 6.9% (95% CI: 5.2 – 9.2). The lowest rate of stunting was in North East 27.1% (95% CI: 23.4-31.1). The severe stunting rate for North East was 9.9% (95% CI: 7.7 – 12.7) (Table 28).

Table 28: Prevalence of stunting based on height-for-age Z score and/or oedema

Nutritional Status Indicator	Central N = 750	South N = 709	North East N = 705	North West N = 669
Prevalence of global stunting (<-2 z-score)	(223) 29.7 % (25.9 - 33.8 95% C.I.)	(260) 36.7 % (32.3 - 41.3 95% C.I.)	(191) 27.1 % (23.4 - 31.1 95% C.I.)	(209) 31.2 % (26.8 - 36.1 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(171) 22.8 % (19.6 - 26.3 95% C.I.)	(183) 25.8 % (22.2 - 29.7 95% C.I.)	(121) 17.2 % (14.1 - 20.7 95% C.I.)	(147) 22.0 % (18.3 - 26.1 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(52) 6.9 % (5.2 - 9.2 95% C.I.)	(77) 10.9 % (8.3 - 14.1 95% C.I.)	(70) 9.9 % (7.7 - 12.7 95% C.I.)	(62) 9.3 % (7.0 - 12.1 95% C.I.)

---

[12] KDHS 2008-09

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

Table 29: Prevalence of morbidity among the children in all the four survey sites

Illnesses	Central N= 1015		South N= 929		North East N= 945		North West N= 945	
	n	%	n	%	n	%	n	%
Diarrhoea (watery and bloody)	208	20.5	197	21.2	268	28.4	238	25.2
Fever (alone or in combination with other symptoms)	157	15.5	184	19.8	213	22.5	262	27.7
ARIs (cough and cough with difficult breathing)	107	10.5	167	18.0	177	18.7	191	20.2

Multiple Responses

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 in all the survey sites with North East recording the highest point prevalence at 63.6%, followed by North West (54.6%), South (53.1%) and Central 51.1%.

The most prevalent illness was diarrhoea, with children from North East having the highest burden (28.4%) followed by North West at 25.2%. In the South the prevalence was 21.2% and the lowest (20.5%) was in Central. These rates of diarrhoea were much higher than those recorded during the May 2010 nutrition survey. The second most prevalent illness was fever either alone or in combination with other symptoms. The highest prevalence (27.7%) was in North West and second highest in North East (22.5%). South recorded a prevalence rate of 19.8% and lastly Central at 15.5%. ARIs were the third most common illnesses. Again, the highest prevalence was in North West (20.2%), followed by North East 18.7% and then South 18.0% and the lowest was in Central 10.5% (Table 29). The burden of morbidity due to ARIs was much higher than in May 2010.

4.4 Maternal Health Seeking Behaviour

Overall, the majority of the mothers/caretakers sought assistance for their sick children with less than one fifth of them not doing so. The highest proportion of mothers who did not seek assistance for their sick children (17.6%) was from North West followed by South at 15.8%, North East 13.3% and Central 9.9% (Table 30). These relatively high proportions of mothers who did not seek assistance for their sick children is of concern and needs to be addressed through appropriate health education.

Table 30: Health seeking behaviour by mothers for their sick children

	Central N= 525		South N= 518		North East N= 601		North West N= 505	
	n	%	n	%	n	%	n	%
Traditional Healer	5	0.5	3	0.3	19	3.2	5	1.0
Community Health Worker	10	1.0	42	8.1	41	6.8	3	0.6
Private clinic / Pharmacy	11	1.1	5	1.0	5	0.8	23	4.6
Shop / kiosk	20	2.0	59	11.4	20	3.3	19	3.8
Public Clinic	**302**	**57.5**	**275**	**53.1**	**298**	**49.6**	**325**	**64.4**
Mobile Clinic	10	1.0	28	5.4	63	10.5	5	1.0
Relative / Friend	5	0.5	2	0.4	6	1.0	1	0.2
No assistance sought	89	9.9	82	15.8	80	13.3	89	17.6
Herbs/home remedy	46	7.1	22	4.2	66	11.0	24	4.8
Others	1	0.1	0	0.0	3	0.5	11	2.2

For the majority of mothers/caretakers who sought assistance, public health facility was the most common place for them to seek assistance for their sick children. The highest percentage of mothers who sought assistance

from the public health facilities were from North West (64.4%) followed by Central (57.5%) and lastly North East (49.6%) (Table 30). Mobile clinics were visited by many mothers in North East (10.5%) whereas less than 5.0% of the mothers did so in the rest of the survey sites. Herbs or home remedy was used by more mothers from North East (15.8%) than in the other survey sites. In Central 7.1% of the mothers/caregivers used herbs or home remedy for their sick children with less than 5.0% doing so in each of the other survey sites.

Many mothers/caregivers (11.4%) from North East bought drugs from shops/kiosks compared to less than 5.0% from each of the other three the survey sites. This practice needs to be discouraged because 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.

4.5 Coverage of Selective Feeding Programmes

Period coverage[13] expressed in the following formula was used to determine the coverage of the selective feeding programmes:

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

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.

4.5.1 SFP Coverage rate

<u>SFP Coverage based on percentage of the median</u>

Overall, the SFP coverage rates were much lower than the minimum SPHERE Standards 2004 (>50%) in all the survey sites. Compared to 2010, there was a significant decrease in the rate of coverage in all the survey sites. The highest SFP coverage rate (23.2%) was observed in the South followed by 17.8% in North East, North West 6.2% with Central recording the lowest coverage at 3.4% (Table 31).

Table 31: SFP coverage based on percentage of the median

Coverage based on % of the Median	Central	South	North East	North West
Number of children in SFP	4	36	32	7
Children with WHM ≥ 70% - <80%	116	155	180	110
Number of cases in SFP	1	17	18	4
Number of cases not in SFP	115	119	148	106
Coverage rate	**3.4%**	**23.2%**	**17.8%**	**6.2%**

<u>SFP Coverage based on MUAC</u>

The SFP coverage rates based on MUAC were very close to those by percent of the median. Again, the highest coverage (25.9%) was reported in the South, followed by North East (19.4%) and lastly 3.6% in Central (Table 32).

---

[13] 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).

Table 32: SFP coverage based on MUAC for all the districts

Coverage based on % of the Median	Central	South	North East	North West
Number of children in OTP	4	36	32	7
Children with 115mm - <125mm	108	120	143	112
Number of cases in OTP	1	17	15	5
Number of cases not in OTP	107	103	128	107
Coverage rate	**3.6%**	**25.9%**	**19.5%**	**6.1%**

<u>SFP coverage based on Z- scores</u>

The SFP coverage based on Z–scores was lower than those by MUAC and percent of the median. The Highest coverage was reported in the South (17.2%), followed by North East (17.2%) and the lowest in Central at 2.7% (Table 31).

Table 33: SFP coverage based on Z-scores for all the districts

Coverage based on % of the Median	Central	South	North East	North West
Number of children in OTP	4	36	32	7
Children <-3 z scores	149	188	198	138
Number of cases in OTP	0	15	12	3
Number of cases not in OTP	149	173	186	135
Coverage rate	**2.7%**	**17.2%**	**14.7%**	**4.9%**

4.5.2   Coverage of OTP

<u>Coverage based on percentage of the median</u>
The coverage of OTP was higher than that of SFP. Nonetheless, the rates were low. The highest coverage was in North East (69.2%) followed by Central at 60.0%, North West at 38.5% and the lowest at 37.5% in the South (Table 34). These showed a significant decrease from 2010 when three of the survey sites reported 100% coverage.

Table 34: Coverage of OTP based on percentage of the median in all the districts

Coverage based on % of median	Central	South	North East	North West
Number in OTP	3	3	9	5
Children with WHM <70%	2	8	5	8
Number of cases in OTP	0	0	1	0
Number of cases not in OTP	2	8	4	8
Coverage rate	**60.0%**	**37.5%**	**69.2%**	**38.5%**

<u>Coverage based on MUAC</u>

Table 35: OTP Coverage based on MUAC

Coverage based on MUAC	Central	South	North East	North West
Number in OTP	3	3	9	5
Children with <115 mm	26	31	37	36
Number of cases in OTP	0	2	2	5
Number of cases not in OTP	26	29	35	31
Coverage rate	**11.5%**	**9.8%**	**20.5%**	**13.9%**

The coverage based on MUAC was much lower than that by percentage of the median. The highest coverage was recorded in North East at 20.5% and the lowest in Central at 11.5% (Table 35).

Coverage based on Z-scores

Like in the case of SFP, the coverage based on Z scores was lower than those by MUAC and percent of the median. The highest coverage was reported in North East (12.5%), followed by North West 10.9% and the lowest was in the South at 5.6% (Table 36).

Table 36: OTP Coverage based on Z scores

Coverage based on Z-Score	Central	South	North East	North West
Number in OTP	3	3	9	5
Children <-3 z scores	36	49	67	44
Number of cases in OTP	0	1	4	3
Number of cases not in OTP	36	48	63	41
Coverage rate	**8.3%**	**5.6%**	**12.5%**	**10.9%**

4.6 Immunization Coverage for Children 7-59 months of age

4.6.1 BCG Immunization Coverage
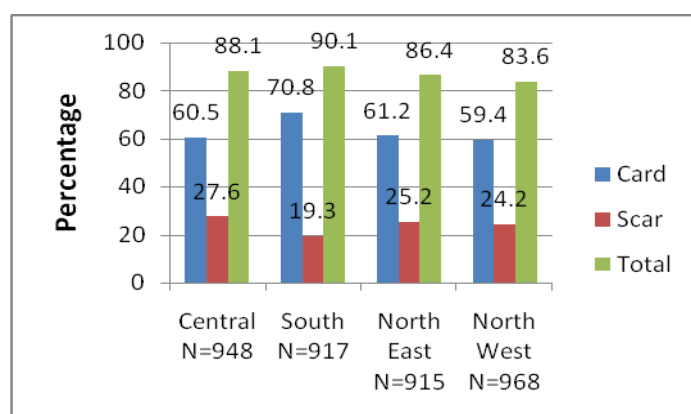
The immunization coverage rates for BCG across the four survey sites was relatively high (over 80.0%) and were thus within the WHO recommended 80% acceptable level. Overall, the highest coverage was recorded in South (90.1%), followed by Central (88.1%), North East (86.4%) and lastly North West (83.6.0%) (Figure 6).

Figure 6: BCG Immunization Coverage for all the survey sites in Turkana

4.6.2 OPV Immunization Coverage

OPV1 Immunization Coverage
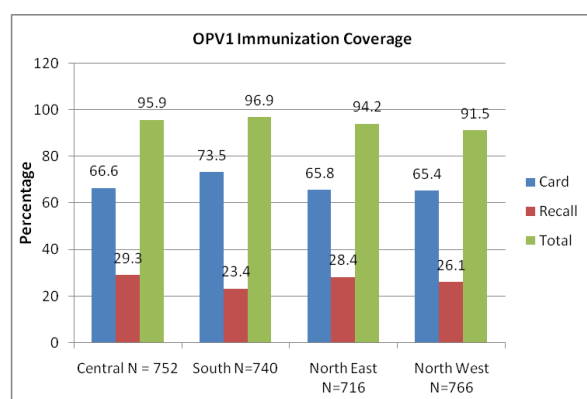
The immunization coverage rates for OPV1 in all the survey sites were high (80.0% and above) when cases verified by card and those verified by recall were considered. These rates are within the acceptable WHO cut-off of 80%. The highest coverage rate (96.9%) was reported in South while the lowest (91.5%) was in North East. The coverage rates are higher than those reported in 2010. Of concern is the relatively large proportion of children for whom immunization was based on recall (Figure 7).

Figure 7: OPV1 immunization coverage for all the survey sites in Turkana

OPV3 Immunization Coverage
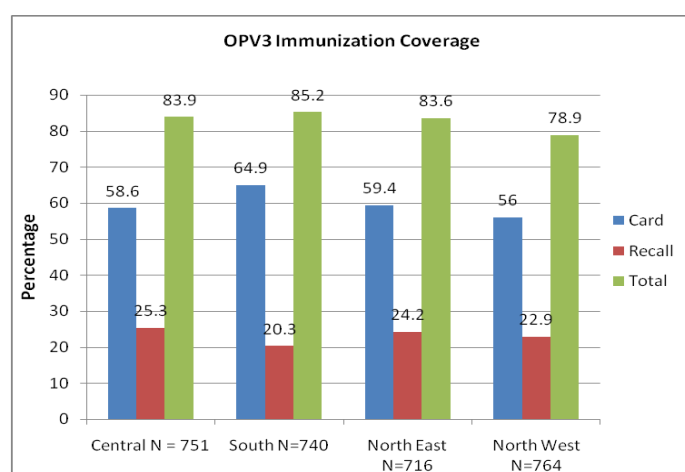
Immunization coverage rates for OPV3 were relatively lower than those for OPV1. When cases verified by card and those by recall were considered, the highest coverage rate was in South (85.2%) and the lowest (78.9%) in North West. The coverage rate in North West was therefore below the WHO acceptable rate of 80% (Figure 8).

Figure 8: OPV3 immunization coverage in the four survey sites in Turkana

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

Based on both recall and those cases verified by card, high coverage rates for measles (above the WHO 80% acceptable cut-off) were realized in all the survey sites. Coverage in North East was highest at 88.2%, followed by South at 85.8%, North West at 84.4% and lastly Central at 80.5% (Table 37). The immunization coverage rates were higher than those of 2010.

Table 37: Measles Immunization Coverage (Children ≥9 months)

	Central N=690		South N=687		North East N=653		North West N=682	
	n	%	n	%	n	%	n	%
Card	390	56.5	434	63.2	384	58.8	385	56.5
Recall	193	28.0	155	22.6	192	29.4	190	27.9
Total	**583**	**80.5**	**589**	**85.8**	**576**	**88.2**	**575**	**84.4**
No	106	15.4	95	13.8	70	10.7	106	15.5
Don't Know	1	0.1	2	0.3	7	1.1	1	0.1

4.6.4 Fully Immunized (Children 12-23 months old)
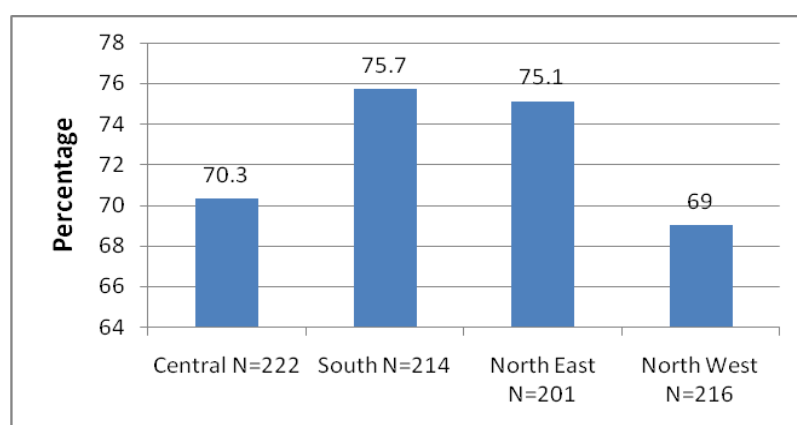
Coverage for children 12-23 months old who were fully immunized varied across the four survey sites. South registered the highest coverage at 75.7% followed by North East at 75.1%, Central at 70.3 and lastly North West at 69.0% (Figure 9). On the whole, the coverage rates for fully immunized children were higher than in 2010.

Figure 9: Fully immunized children 12-23 months old from all the survey sites in Turkana

4.7 Vitamin A Supplementation Coverage for children

4.7.1 Vitamin A supplementation for children <59 months of age
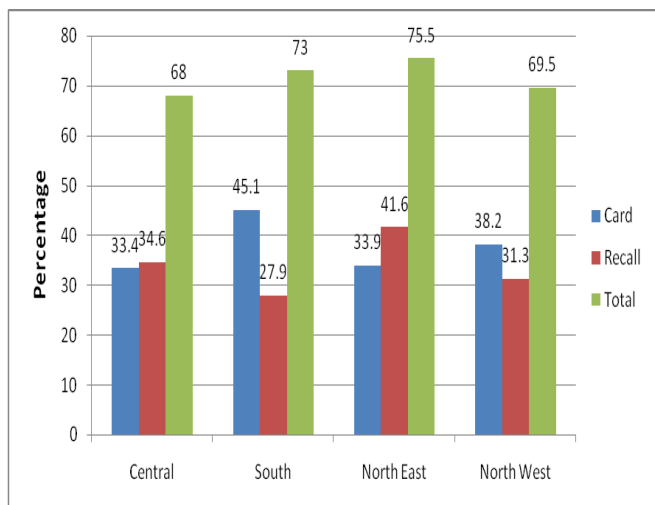
Vitamin A supplementation coverage rates for children <59 months in the 6 months prior to the survey varied in the four survey sites. Overall, coverage was highest in North East with 75.5%, followed by South at 73.0%. The lowest rates were in North West and Central at 69.5% and 68.0% respectively (Figure 10). Compared to the year 2010, North East improved significantly from a coverage rate of 43.0%. The same trend was observed in South where the coverage improved from 48.0%. North West was the only survey site where the coverage dropped from 77.0%.

Figure 10: Vitamin A supplementation coverage for children 6-59 months old

4.7.2 Vitamin A supplementation for children 6-11 months old

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.
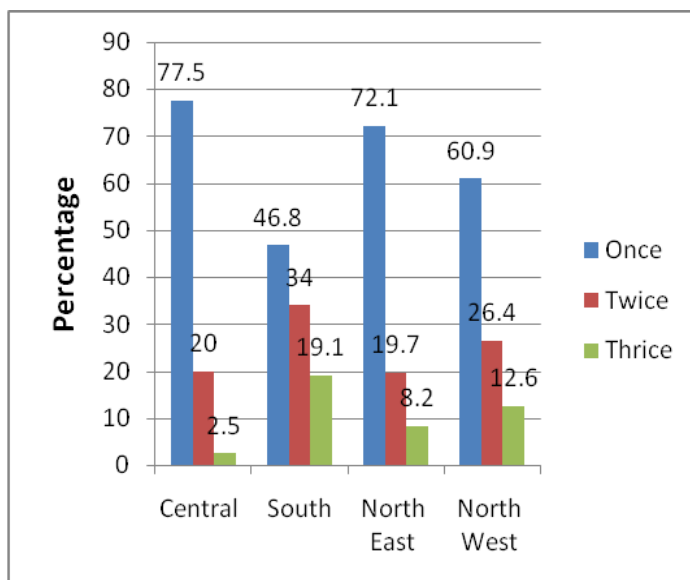
The proportion of children who received vitamin A supplementation at least once in the 6 month-period prior to the survey varied across the survey sites with none of them meeting the WHO acceptable rate of 80%. The highest proportion of children 6-11 months old who received the supplement was 77.5% in Central, followed by 72.1% in North East. North West recorded a coverage rate of 60.9% and South the least at 46.8% (Figure 11). A relatively high proportion of children received the supplement twice; 26.4% in North West, 20.0% in Central and 19.7% and 19.1% in North East and South respectively.

Figure 11: Frequency of vitamin A supplementation among children 6-11 months old

4.7.3   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.
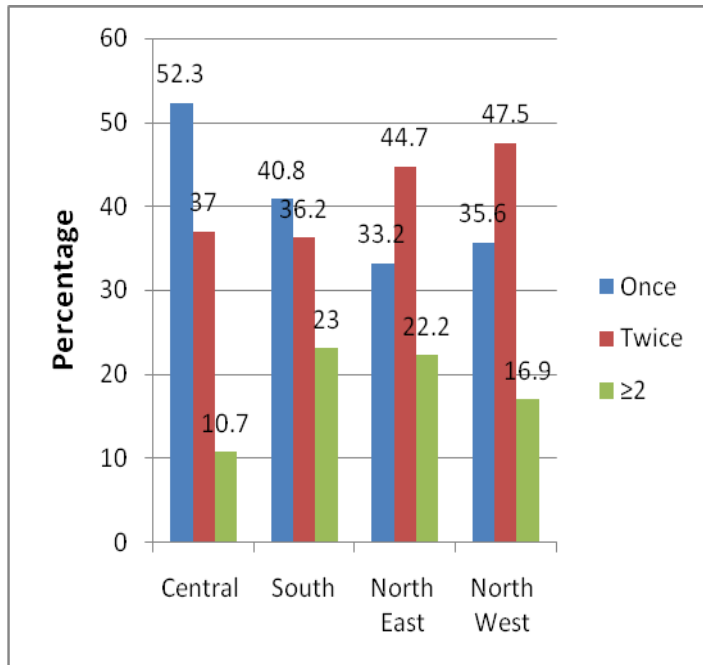
For children 12-59 months old, the overall picture was that the majority of the children had not received the supplementation twice as per the stipulated WHO guidelines. The highest proportion of the children who had received the supplementation twice was in South (23.0%) followed closely by North East at 22.2%. The coverage rate in North West was 16.9% and in Central 10.7% (Figure 13). Even for those who received the supplementation once, the coverage was low. It was only in Central that half or more of the children (52.3%) received the supplement. The coverage for the other survey sites varied from 40.8% in the South to 47.5% in North West (Figure 12).

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

4.8   De-worming of Children 24-59 months of age

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.
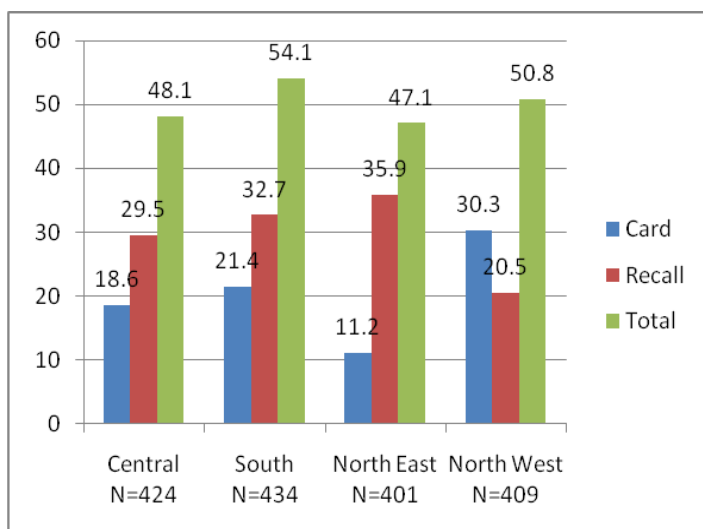
De-worming coverage for children 24-59 months of age was established by asking mothers/caregivers whether their children had received de-worming tablets in the six months prior to the survey. De-worming coverage was low in all the survey sites. South registered the highest coverage at 54.1% followed by North West at 50.8% whereas in Central 48.1% and in 47.1% of the children in North East had been de-wormed six months before the survey (Figure 13).   The de-worming coverage increased considerably compared to 2010. Documentation of de-worming was poor in all the survey sites.

Figure 13: De-worming coverage of children 24-59 months of age from all the survey sites

4.9 Infant and Young Children Feeding (IYCF) Practices

4.9.1 Breastfeeding Practices

Timing of initiation of breastfeeding

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 (WHO, 2007) and the indicators used in Kenya Demographic Health 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.

The samples sizes of children for the analyses of IYCF practices were small and therefore the findings should be interpreted cautiously. Nonetheless, the findings give an indication of the practices among in Turkana.

Breastfeeding was universal, with over 95.0% of the children 0-23 months old from all the survey sites having been initiated to breastfeeding. The highest rate of initiation was in the South (98.6%) and the lowest in North East at 95.4%. These rates are more or less similar to those reported in 2010. Nonetheless, timely initiation of breastfeeding was not adequate. In North West 57.5% of the children were initiated to breastfeeding within 1 hour as per the WHO recommendations. The rest of the survey sites reported rates less than half, with Central at 31.5%, South 38.6% and North West at 40.7% (Table 38).

Other breastfeeding practices

As in the previous year, the majority of the children (80.0% and above) from all the survey sites had received colostrum. North East had the highest proportion (89.7%) of children who received colostrum and the lowest was North West at 84.2%. Relatively high proportions of children received pre-lacteal feeds. In North West over half of the children (57.5%) received pre-lacteal feeds and in North East 40.7% received the same. The lowest proportion of children who received pre-lacteals was in Central at 31.5%. These findings showed a slight reduction in the proportion of children who received pre-lacteal feeds compared to the year 2010. The type of pre-lacteal given to most children varied from one study site to another. The most common pre-lacteal feed in Central and North East was animal milk whereas in the South and North West it was sugar/glucose water (Table 38).

With the exception of North East, more than 90.0% of the children were still breastfeeding at 1 year. The highest proportion of children being breastfed at 1 year was recorded in Central (95.1%) and the lowest in North East at 77.4%. In 2010, North East also recorded the lowest rate of breastfeeding at 1 year. At 2 years less than two-thirds of the children from all the survey sites were still breastfeeding. In the South, 59.6% were still breastfeeding, in Central 58.7%, in North East 49.1% and 48.6% in North West (Table 38). This finding implies that for over one-third of the children aged 2 years, breastfeeding had been stopped prematurely and thus were missing the health benefits of breastmilk. WHO recommends breastfeeding for 2 years or longer. Nonetheless, many of the children 0-23 months of age were still breastfeeding; 88.8% from Central, 86.9% from South, 82.6% from North East and 86.0% from North West (Table 38).

Disaggregated further by age, over 90% of the children 6-11 months of age from all the survey sites were still breastfeeding. Over 90% of the children 12-17 months of age in Central and South were still breastfeeding whereas 76.1% from North East and 84.3% from North West were still breastfeeding. Breastfeeding rates reduced drastically for children 18-23 months of age with the highest rate in the South at 68.3% followed by 56.7% in Central, 54.2% in North East and 41.7% in North West. These findings imply that many children did not

have the health benefits of breastfeeding up to the WHO recommended 2 years or longer. Overall, breastfeeding rates were lower compared to those in 2010.

Table 38: Breastfeeding practices

	Central	South	North East	North West
	%	%	%	%
Ever breastfed	97.2	98.6	95.4	97.6
Giving of colostrum	85.1	88.7	89.7	84.2
Timely Initiation of breastfeeding (within 1hr)	31.5	38.6	40.7	57.5
Pre-lacteal feeds given:	29.5	42.5	33.5	24.2
Types of pre-lacteal feeds:				
Plain Water	4.7	14.3	6.5	7.4
Sugar/Glucose water	9.9	15.7	4.4	8.5
Powdered/animal milk	13.1	9.4	17.0	6.2
Continued breastfeeding at 6-11 months	95.4	91.2	90.3	96.3
Continued breastfeeding at 12-17 months	91.9	92.7	76.1	84.3
Continued breastfeeding at 18-23 months	56.7	68.3	54.2	41.7
Continued breastfeeding at 6-23 months	83.6	84.1	75.4	81.2
Continued breastfeeding at 1 year (12 – 15.9 months)	95.1	91.4	77.4	91.0
Continued breastfeeding at 2 years (20- 23.9 months)	58.7	59.6	49.1	48.6
Continued breastfeeding (0 - 23.9 months)	88.2	86.9	82.5	86.0

Exclusive breastfeeding
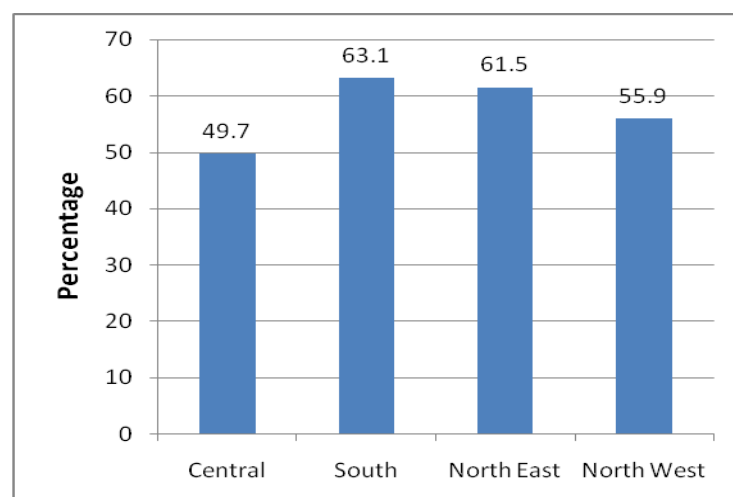
Figure 14: Exclusive breastfeeding rates for children 0-5 months old

Exclusive breastfeeding rates were analyzed for infants below 6 months of age. The rates of exclusive breastfeeding varied across the four survey sites. South registered the highest rate (63.1%) followed by North East at 61.5%, North West (55.9%) and lastly Central at 49.7% (Figure 14). These findings show a slight improvement compared to 2010 except for North West where exclusive breastfeeding rate dropped from 68.5%. Nonetheless, the rates are much higher than the national rate at 32.0%[14].

---

[14] Kenya Demographic and Health Survey (KDHS) 2008-09

4.9.2   Complementary Feeding Practices

Complementary feeding rate

Complementary feeding rate is calculated based on the number of breastfed infants 6-8.9 months of age who received solid, semi-solid or soft foods the day preceding the interview (as the numerator) and all infants of the same age as the denominator. The proportion of infants who received these foods was highest in North West (54.9%) followed by Central at 50.9%. North East had a complementary feeding rate of 50.8% and lastly South at 49.1% (Table 39). The complementary finding rates were much lower than in 2010 when up to three-quarters of the children in North West and Central had been introduced to complementary feeding. These findings indicate that a large number of infants (over 45.0%) had not been introduced to complementary feeding as per the WHO recommendations.

Minimum dietary diversity of complementary foods

Minimum dietary diversity is considered to be consumption of foods from ≥4 food groups out of 7 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[15]. 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.

The minimum dietary diversity was analyzed for children 6-23.9 months of age. The findings showed that less than 15.0% of the children from all the survey sites attained the minimum dietary diversity. North West had the highest percentage (11.5%) of children 6-23.9 months of age having received food from at least 4 food groups, followed by Central at 9.6%, South at 5.4% and the least was North East at only 5.4% (Table 39). These findings imply that for the majority of the children, the meals did not have an adequate range of food groups and were thus likely to be limited in the diversity of nutrients received. Compared to 2010, smaller proportions of children attained the minimum dietary diversity. It is recommended that complementary foods be introduced at 6 months as breast milk is not adequate to provide all the necessary nutrients in the required quantities from this age onwards.

Minimum meal frequency

The minimum meal frequency indicators are 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 6-8.9 months of age. The highest proportion of children 6-8.9 months of age who attained the minimum meal frequency was from the South (53.2%) followed by North East (50.0%), Central 40.0% and North West 40.3%. The indicator for the minimum meal frequency for breastfed children 9-23.9 months of age is 3 times per day inclusive of snacks. Less than one-quarter of the children in all the survey sites attained the recommended minimum meal frequency. Central had the highest percentage of children who attained the minimum meal frequency (23.9%). The next was Central at 20.0% whereas in North East it was 14.9% and 13.5% in North West (Table 39). The minimum meal frequency for the children 6-23 months were lower than those recorded in 2010. The findings suggest that many children were not getting the appropriate quantity of nutrients for adequate growth and healthy development.

---

[15] 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.

Table 39: Complementary feeding practices

Complementary Feeding Practices	Central		South		North East		North West	
	n	%	n	%	n	%	n %	
Complementary Feeding rate: Proportion of infants 6-8.9 months who received complementary feeding	28/55	(50.9)	26/53	49.1	31/61	(50.8)	39/71 (54.9)	
Minimum dietary diversity: Children 6-23.9 months of age who received ≥4 food groups	32/332	(9.6)	16/296	(5.4)	9/308	(2.9)	39/339 (11.5%)	
Minimum meal frequency: Breastfed children 6-8.9 months who received complementary foods ≥2 times	22/52	(42.3)	25/47	(53.2)	26/52	(50.0)	27/67 (40.3)	
Breastfed children 9-23.9 months who received complementary foods a ≥3 times	52/218	(23.9)	39/195	(20.0)	24/161	(14.9)	28/207 (13.5)	

4.10   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. The South had the highest proportion of undernourished pregnant and lactating women (19.0%). followed by North West at 17.8%. The rate of malnutrition was more or less the same in North East and Central at 16.9% and 16.5% respectively (Table 40).

Table 40: Nutritional Status for pregnant and or lactating women based on MUAC measurements

	Central		South		North East		North West	
Pregnant and Lactating Women	N=406		N=390		N=390		N=455	
	n	%	n	%	n	%	n	%
Wasted (< 21cm)	67	16.5	74	19.0	66	16.9	81	17.8
Well nourished (≥ 21cm)	339	83.5	316	81.0	324	83.1	374	82.2

4.11   Mosquito Bed Net Ownership and Utilization

Mosquito bed net ownership

As a whole, ownership of bed nets was low. South had the highest proportion of households (51.0%) owning bed nets followed by North East (50.0%), Central with 46.2% and the lowest in North West at 28.7% (Table 41). There was a significant reduction in bed net ownership in North West from 48.1% in 2010. Most of the bed nets in all the survey sites were provided by MOH. In Central, 68.7% of the households reported that the bed-nets were provided by MOH, whereas in North East 65.4% were obtained from the same source, in South 55.3% and in North West 46.3% (Table 41). Agencies or Churches were the next most common source of bed-nets having provided 22.3% of the bed-nets in Central, 34.9% in the South, 16.8% in North East and 20.5% in North West. Relatively lower proportions of households from all the survey sites purchased the bed nets.

Table 41: Mosquito bed net ownership

	Central		South		North East		North West	
	n	%	n	%	n	%	n %	
Household that own mosquito bed net	289/626	46.2	293/575	51.0	296/592	50.0	172	28.7
Source of bed nets:	N=278		N=295		N=295		N=171	
• Shop	19	6.8	13	4.4	21	7.0	49	28.7
• Agency/church	62	22.3	103	34.9	50	16.8	35	20.5
• MOH	191	68.7	163	55.3	195	65.4	80	46.8
• Others	6	2.2	15	5.1	32	10.7	7	4.1

Mosquito bed net utilization
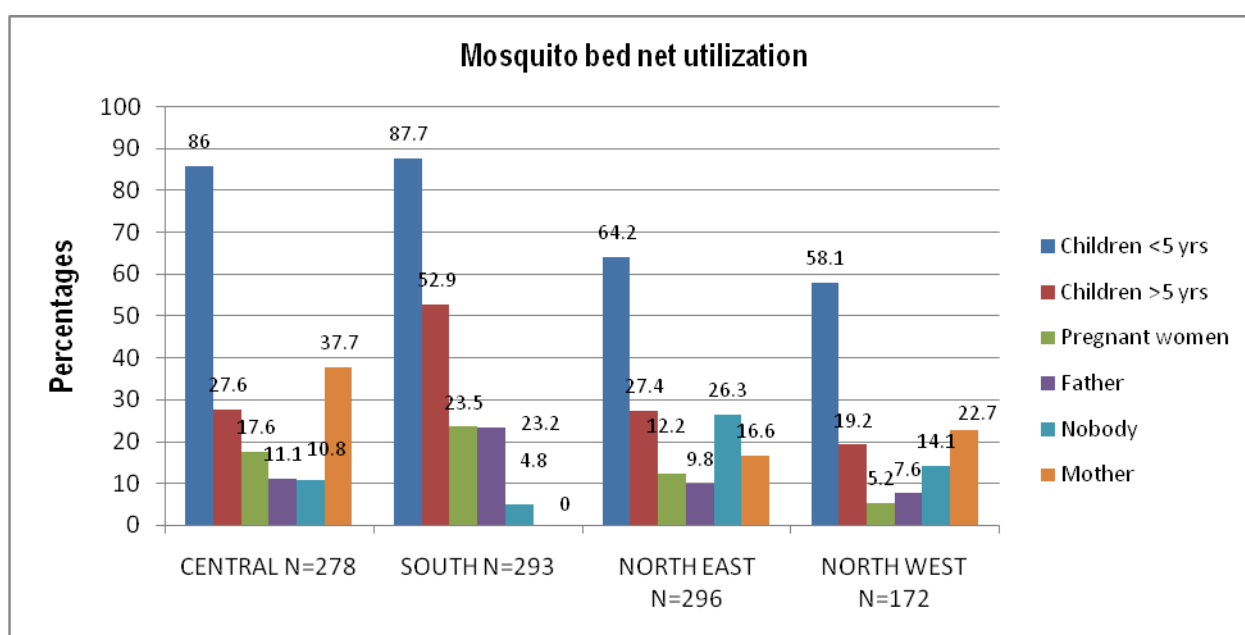
Figure 15: Mosquito bed net utilization from all the survey sites

To establish the utilization of bednets, the respondents were asked to state the members of the household who used the bednet the night before the survey. In all the survey sites, the majority of households members who used the a bednets were children underfive years of age. In South 87.7% underfives used bed nets followed by 86.0% from Central, 64.2% from North East and 58.1% from North West. The proportion of pregnant women who slept under a bed net varied from one survey site to another. South recorded the highest proportion (23.5%), Central 17.6%, North East 12.2% and North West 5.2%. The number of mothers who slept under a bed net also varied across the survey sites, with Central reporting the highest (37.3%) proportion and in South no mother reportedly slept under a bed net. Relatively smaller proportions of fathers and children over five years also slept under the bed net. Of concern, is the relatively high proportion of households which did not utilize the bed nets; 10.8% in Central, 16.6% in North East and 22.7% in North West (Figure 15).

4.12   Household Water Consumption

4.12.1 Sources of Household Water

In Central, the river and water taps were the main sources of household water were the borehole for 23.4% of the households, water tap 24.2% and the river at 24.5%. In the South, the river was the main source of water

(27.5%) and borehole (22.9%). In North East borehole was the main source of water for 53.0% of the households and water tap for 21.8%. For about two-fifths of the households from North West, the river was the main source of household water and about one-third 30.5% it was the borehole (Table 42). Unprotected wells were a source of household water for relatively large proportions of households ranging from 7.3% in North West to 18.6% in the South. Another source of water for relatively fewer households was the laga.

Table 42: Sources of water for household use

Main source of household water	Central N=538		South N=665		North East N=583		North West N=604	
	n	%	n	%	n	%	n	%
Laga	163	6.5	67	10.1	10	1.7	37	6.1
Borehole	126	23.4	152	22.9	309	53.0	184	30.5
Unprotected well	84	15.6	124	18.6	80	13.7	44	7.3
Water tap	130	24.2	102	15.3	127	21.8	74	12.3
River	132	24.5	183	27.5	6	1.0	254	42.1
Lake	23	4.3	0	0.0	35	6.0	1	0.2
Protected well	1	0.2	24	3.6	6	1.0	4	0.7
Public pan	0	0.0	1	0.2	6	1.0	0	0.0
Water tanks	0	0.0	0	0.0	0	0.0	0	0.0
Springs	6	1.1	11	1.7	2	0.3	5	0.8
Dam	0	0.0	1	0.2	2	0.3	1	0.2
Other	1	0.1	0	0.0	0	0.0	0	0.0

4.12.2 Main sources of drinking water

The main source of drinking water varied from one district to another. In Central, the main sources of drinking water were the borehole for 24.4% of the households, the river for 23.6% and water tap for 22.4%. In the South, the river was the main source of drinking water for 26.7%, borehole for 25.3% and unprotected well for 8.5% of the households. In North East, the borehole was the main source of drinking water for 47.8% followed by water tap for 22.0% and unprotected well for 12.9% of the households. In North West, the most common sources of drinking water were the river (40.5%), borehole (30.1%), and water tap for 10.8% of the households (Table 43).

Table 43: Sources of drinking water

Main source of drinking water:	Central N=535		South N=660		North East N=582		North West N=602	
	n	%	n	%	n	%	n	%
Borehole	132	24.4	167	25.3	278	47.8	181	30.1
Laga	35	6.5	57	8.6	10	1.7	27	4.5
Unprotected well	80	15.0	122	18.5	75	12.9	45	7.5
River	126	23.6	176	26.7	15	2.6	244	40.5
Water tap	120	22.4	88	13.3	128	22.0	65	10.8
Lake	22	4.1	0	0.0	38	6.5	0	0.0
Protected well	15	2.8	36	5.5	30	5.2	34	5.6
Water tanks	0	0.0	0	0.0	0	0.0	0	0.0
Public pan	0	0.0	1	0.2	6	1.0	0	0.0
Dam	0	0.0	1	0.2	0	0.0	1	0.2

4.12.3 Time taken to water source and amount of water used by households

The mean (sd) time taken to the water source and back varied across the four survey sites with Central at 31.3 minutes (sd 47.8), South 64.8 minutes (sd 74.8), North East 47.4 (sd 56.8) and North West 41.0 minutes (sd 49.8) [Table 44]. With the exception of Central in which the households used 56.0 litres (sd 58.9) litres of water

per day, there was minimum variation in the amount of water used. The mean amount of water used by households per day in South 44.8 litres (sd sd 28.3), North East 45.6 litres (sd 69.6) and North West 43.4 litres (sd 29.6 (Table 44).

Table 44: Amount of time taken to water source and back and the amount of water (litres) used per day

	Central	South	North East	North West
Mean (sd) time taken (in minutes) to go to main water source and back	**N=535**	**N=665**	**N=582**	**N=604**
	31.3 (sd 47.8)	64.8 (sd 74.8)	47.4 (sd 56.8)	41.0 (sd 49.8)
Mean (sd) litres of water used by household per day	**N=535**	**N=663**	**N=582**	**N=603**
	56 (sd 58.9)	44.8 (sd 28.3)	45.6(sd 69.6)	43.4(sd 29.6)
	N=533	**N=564**	**N=577**	**N=597**
Amount of water used/available per person/day	10.7 (sd 8.2)	9.0 sd 5.6)	9.6 (sd 6.4)	9.5 (6.9)
% Households with <20 litres of water/person/day	85.9	94.3	91.9	89.9
% Households with ≥20 litres of water/person/day	14.1	5.7	8.1	10.1

Analysis of the amount of water used/available per person per day revealed that the majority of the people are not getting/using adequate water judged by the Sphere Standards of ≥20 litres per person per day[16]. In all the study sites the amount of water available per person per day was less than recommended by the Sphere Standards. In Central the amount of water available per person per day was 10.7 litres (sd 8.2), in South 9.0 litres (sd 5.6), North East 9.6 litres (sd 64.) and North West 9.5 litres (sd 6.9) (Table 44). Analysis of the proportion of households that had with ≥20 litres of water available per person per day in accordance with the Sphere Standards was 14.1% in Central, 5.7% in the South, 8.1% in North East and 10.1% in North West (Table 44).

The overall picture was that water accessibility is a major challenge in Turkana in terms of the long distances that most households have to walk to get the commodity, and also in terms of accessibility of safe drinking water. Scarcity of water can compromise hygiene standards and consequently result in infections.

4.12.4   Treatment of drinking water

Table 45: Treatment of drinking water

Treatment given to water before drinking	Central N=520		South N=645		North East N=551		North West N=569	
	n	%	n	%	n	%	n	%
Boiling	53	10.2	82	12.7	33	6.0	28	4.9
Use chemicals	8	1.5	13	2.0	2	0.3	9	1.6
Filters/sieves	2	0.4	2	0.3	0	0.0	0	0.0
Decant	5	0.7	1	0.2	1	0.2	1	0.2
Use of traditional herbs	1	0.2	5	0.8	2	0.3	0	0.0
Nothing	456	84.3	542	84.0	513	93.1	531	93.3

Overall, very few households (less than 15.0%), treated drinking water. For those households that treated drinking water, the most common method in the four districts was boiling practiced by 12.7% of households in

---

[16] SPHERE Standards 2004

South, 10.2% in Central, 6.0% in North East and 4.9% in North West (Table 45). The treatment of drinking water needs to be encouraged particularly because of the unsafe sources of drinking water for the majority of the households.

4.12.5   The cost of water

The majority of the households purchased water for household use and for drinking. The unit of measurement was the 20 litre jerry can. The cost of water was, on the average, Kenya shillings (Kshs) 0.8 (sd 2.8) in Central, Kshs 0.9 (sd 2.4) in South, Kshs 1.4 (sd 4.7) in North East in Kshs 1.5 (sd 2.4) (Table 44). For those households that paid water on a monthly basis, the cost varied across the districts. The households who paid the most for water were in North East at a mean of Kshs 72.2 (sd 205.1.), followed by Central at Kshs 62.4 (sd 188.4) and lastly South at Kshs 17.9 (sd 49.4) (Table 46).

Table 46: Cost of water

Cost of water	**Central**	**South**	**North East**	**North West**
Cost of water (Kshs) of per 20 litre jerry-can [mean(sd)]	**N=509**	**N=635**	**N=547**	**N=591**
	0.8 (sd 2.8)	0.9 (sd 2.4)	1.4 (sd 4.7)	1.5 (sd 2.4)
Cost of water (Kshs) per month [mean (sd)]	**N=375**	**N=435**	**N=365**	**N=325**
	62.4 (sd 188.4)	17.9(sd 49.4)	72.2 (sd 205.1)	24.7(sd 73.6)

4.13 Sanitation

4.13.1   Access to toilet facilities

Access to toilet facilities in all survey sites was poor. Less than one-fifth of the household had access to toilet or latrine facilities. In Central, only 18.1% of households had access to toilets or latrines, in South 16.4%, North East 12.4% and 13.8% in North West. The most common types of toilet facility were either the traditional pit latrine or the ventilated improved pit latrine. In Central, 10.8% of the households had access to traditional pit latrine and 5.9% to the ventilated pit latrine. In South the most common toilet facility was the ventilated pit latrine of which 11.2% of the households had access and 4.7% had access to the traditional pit latrine. In North East the scenario was the same, 6.5% of the households had access to the ventilated pit latrine and 4.5% to the traditional pit latrine. In North West, the most common type of toilet facility was the traditional pit latrine (6.2%) and the ventilated pit latrine 3.5% (Table 47).

Table 47: Access to latrines by households in the survey sites

Sanitation practices	Central %	South %	North East %	North West %
Households with access to toilets or latrines	18.1	16.4	12.4	13.8
Type of toilet facilities				
• Bucket	0.1	1.4	0.3	0.3
• Traditional pit latrine	10.8	4.7	4.5	6.2
• Ventilated improved pit latrine	5.9	11.2	6.5	3.5
• Flush toilet	0.1	0.0	0.0	0.0
• Other	0.5	0.0	0.0	0.1
Pit latrines with 100 metres	70.7	83.3	56.9	72.0
Pit latrine has an aperture cover or fly screen on vent pipe	35.9	61.6	46.4	30.0

In Central, for 70.7% of the households with latrines, they were within a distance of 100 metres. About four-fifths (83.3%) and 72.0% households in the South and North West respectively had latrines within a distance of 100 metres. The lowest proportion (56.9%) of households with had latrines within a distance of 100 metres was in North East (Table 47). The proportion of households with latrines which had a vent pipe was 35.9% in Central, 61.6% in South, 46.4% in North East and the lowest was in North West (30.0%).

4.13.2 Utilization of latrines

Table 48: Utilization of latrines and other sanitation practices

Utilization of latrines	Central %	South %	North East %	North West %
Latrine in use (from observation)	87.3	90.5	67.1	83.0
Who uses the latrine:				
All members of the family	83.1	84.9	68.6	92.3
Selected members of the family	16.9	15.1	31.4	7.7
Where houses with no toilet facilities defaecate:				
Bush	90.6	82.4	43.3	83.9
Open field	5.4	3.5	26.3	5.6
Near river	2.7	12.9	30.1	10.6
Other	1.3	1.2	0.4	0.0
How children's faeces is disposed:				
Immediately and hygienically	14.1	13.1	8.6	19.5
Immediately in the bush	62.8	81.8	80.0	75.5
Scattered in the compound	1.0	2.2	6.5	2.0
Use of dogs	1.9	1.1	1.0	1.0
Other	20.1	1.4	3.3	1.2

The majority of the latrines were in use at the time of the survey and this was confirmed through observation. In Central 87.3% of the latrines were in use and a slightly higher proportion (90.5%) in the South. In the North West 83.3% were in use and the least proportion of households in use was in the North East at 67.1%. With the exception of North East, in over 80.0% of the households the latrines were used by all members of the households. The highest proportion of households where all members used the toilet was North West (92.3%) while the least was in North East (68.6%). In some of the households the latrines were used by selected members of the households with North East leading at 31.4% and the least 7.7% in North West (Table 48). The most common place where households with no access to toilet facilities defaecated was the bush with over 80% doing so in all except the North East where 43.3% did so. About one-quarter of the households (26.3%) in North East defaecated in the open field and 30.1% near the river whereas relatively smaller proportions of households did so from the other three survey sites (Table 48).

Few households, less than one-fifth of the households disposed children's faeces correctly (immediately and hygienically). In Central 14.1% of the households disposed the faeces correctly, 13.1% in the South, 8.6% in North East and 19.5% in North West. Majority of the households indicated that children's faeces were disposed immediately in the surrounding bush. The highest proportion of households practicing this was in the South (81.8%), followed closely by North East at 80.0%, North West 75.5% and the least in Central at 62.8%. A few households reported scattering the faeces in the compound (Table 48).

4.14 Hygiene Practices

Table 49: Hand washing practices

Hand washing practices	Central %	South %	North East %	North West %
Occasions when hands are washed*:				
• After using the toilet	56.2	42.7	45.3	24.4
• After attending to a child who has defaecated	52.1	39.9	49.1	36.4
• Before feeding a child	33.0	37.4	37.0	14.6
• Before preparing a meal	63.5	69.1	67.6	79.7
• After handling animals	2.2	1.5	1.6	1.2
• After changing sanitary pads	0.3	0.1	0.1	0.6
• When washing face	13.3	9.9	11.7	10.3
• When bathing	7.1	6.8	6.9	7.1
• Others	0.5	0.8	1.3	1.0
Presence of a hand washing facility near toilet or in the compound (observation)	2.3	4.3	3.3	2.2
Use of soap when washing hands				
• Yes	22.6	10.7	18.2	13.6
• No	46.9	55.6	48.2	73.2
• Sometimes	30.4	33.7	33.6	12.0
Presence of soap/ash at hand washing facility				
• Yes	1.4	2.0	4.0	1.5
• No	61.0	61.0	61.1	57.5
• No strategic hand washing facility	37.6	37.1	34.9	41.0

Multiple responses

Washing of hands is one of the high impact nutrition interventions that can improve the health and nutrition status of children. The majority of the respondents reported that they washed their hands before preparing meals; 79.7% from North West, 69.1% from South, 67.6% from North East and 63.5% from Central. The other occasion when many respondents washed their hands was after using the toilet although in North West less than a quarter (24.4%) of the respondents did so (Table 49). The other occasions were after attending to a child who has defaecated and before feeding a child. Nonetheless, the proportion of respondents who used soap to wash their hands was less than one-quarter; 22.6% in Central, 10.7% in South, 18.2% in North East and 13.6% in North West. Washing of hands with soap is an important hygiene practice because the soap contains chemicals that kill germs.

There were very few households with a designated hand washing facility near the toilet or in the compound, ranging from 2.3% households in Central to 4.3% in the South (Table 47). Similalry, very few households had soap/ash at the hand washing facility; ranging from 1.4% in Central to 4.0% in North East (Table 49).

4.15   Household Food Security

4.15.1   Food Aid

Table 50: Households that received food aid in the three months prior to the survey

	Central N=650		South N=582		North East N=586		North West N=591	
	n	%	n	%	n	%	n	%
Received	113	17.4	186	32.0	157	26.8	54	9.1
Did not receive	537	82.6	396	68.0	429	73.2	537	90.9

The findings from the survey showed variations in the percentage of households that received food aid across the four survey sites in the three months prior to the survey. The highest percentage of households that received food aid was in the South (32.0%) followed by North East (26.8%), Central (17.4%) and lastly North West 9.1% (Table 50). These findings showed a significant decrease the proportion of households that received food aid in May 2010 when about two-thirds of the households in Central and North East, over one-third in North West and over two-fifths in South reported having received food aid.
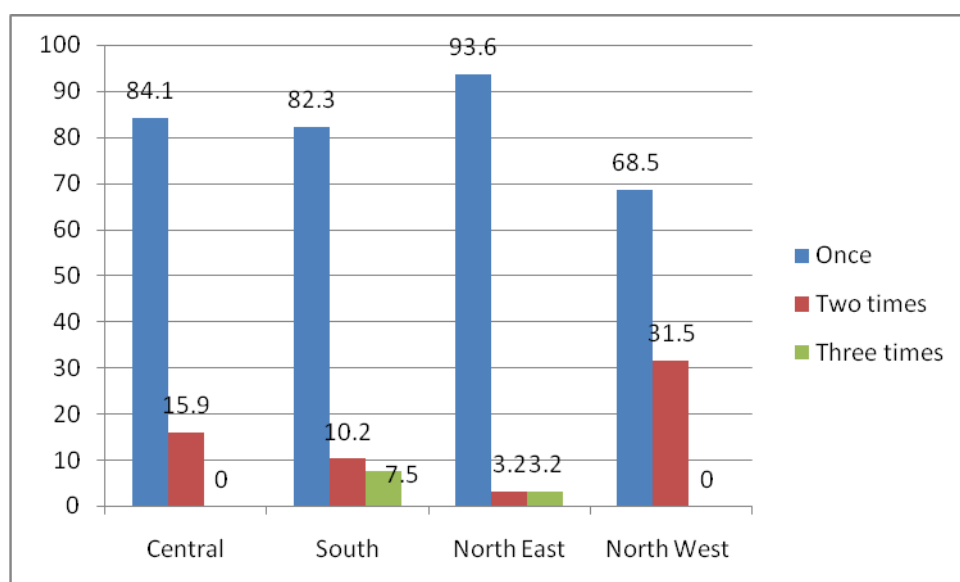
Figure 16: Number of times food aid received in the last three months

Of those who received food aid, majority received it once in the three months prior to the survey, with North East registering the highest (93.6%) of households, followed by Central with 84.1%, South with 82.3% and lastly North West with 68.5% (Figure 16). These findings showed significantly higher proportions of households having received food aid once compared to 2010. With the exception of North West where 31.5% received food aid twice, during the same period, the other survey sites reported lower proportions doing so. In Central 15.9% received food aid twice, in South 10.2% and only 3.2% in North East (Figure 16). The proportions of households who received food aid three times were very low as reported by 7.5% in South and 3.2% in North East and no households in Central and North West.

The overall picture was that larger proportions of households suffering from food insecurity in 2011 compared to the same time in 2010. Fewer households received food aid and yet the targeted proportion of households in the two years remained the same[17]. Higher proportion of households received food once instead of three times since the GFD is supposed to be distributed monthly.

---

[17] Personal Communication, Head of Sub-Office, WFP Turkana

4.15.2   Frequency of meal Consumption

Frequency of meal consumption by households in Turkana Central

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. In Central, 22.1% of the households reported that they normally took one meal per day, 46.4% two meals while those who took three meals were 31.5% (Figure 18). The distribution of the number of meals taken the day preceding the survey showed that the proportion of households who took one meal was more than double those who normally take one meal at 48.3%. In contrast, the proportion of households who ate two meals the day before the survey reduced to 34.9% compared with those who usually eat two meals. Similarly, the proportion of households that took three meals the day preceding the survey was significantly lower (13.0%) compared to who usually took two meals per day (Figure 17). These findings demonstrate an increased level of household food insecurity at the time of the survey compared to the normal times.
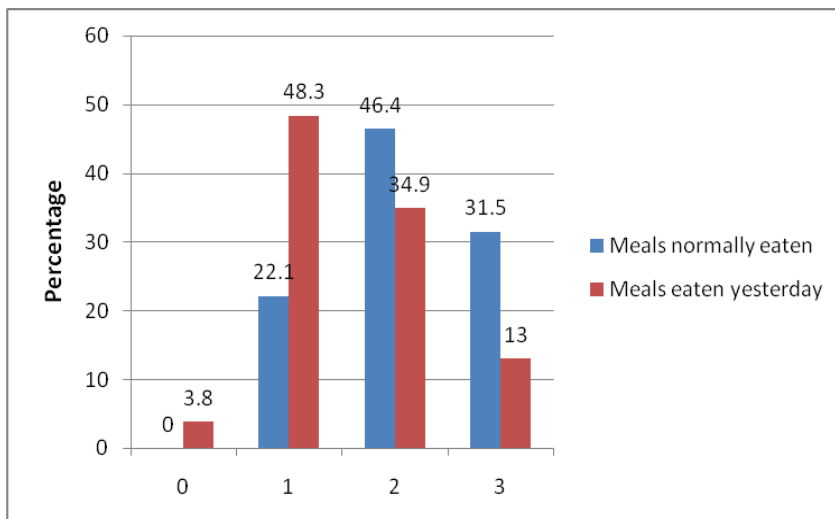
Figure 17: Frequency of meals usually eaten and that eaten the day prior to the survey in Central

Frequency of meal consumption by households in Turkana South

In South, 28.3% of the households reported that they usually took one meal per day. Over two-fifths of the households (44.0%) of the households reported that they usually took two meals and 27.8% three meals. In contrast, the proportion of households that took one meal the day before the survey was much higher at 43.6% that those who usually take one meal. In contrast, the households that took two meals the day preceding the survey was much lower (32.9%) than those who usually take two meals. Similarly, the proportion of households that took three meals the day prior to the survey was less than half those who usually took three meals (13.0%) [Figure18]. Of concern is the relatively large proportion (10.5%) of households that did not eat any meal the day before the survey. As a whole, the findings indicate a deteriorating food security situation in the households at the time of the survey compared to normal times.
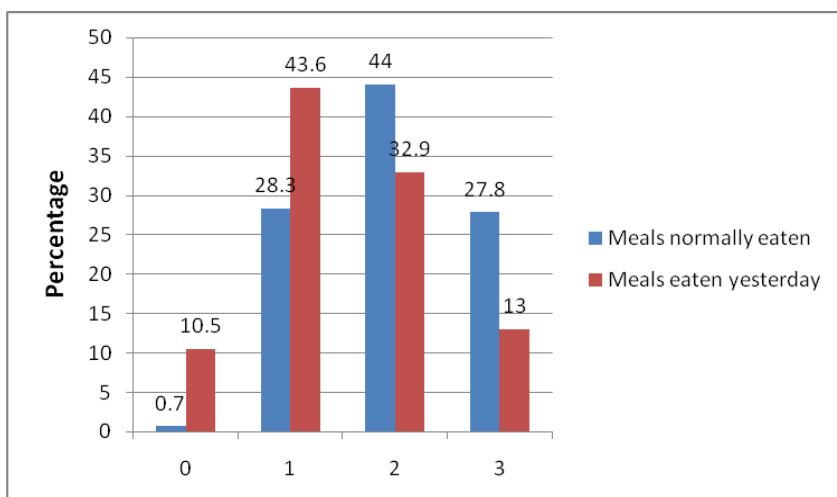
Figure 18: Frequency of meals usually eaten and that eaten the day prior to the survey in South

<u>Frequency of meal consumption by households in Turkana North East District</u>

In North East, 18.7% of the households reported that they usually took one meal per day, 45.1% two meals while those who took three meals were 34.2% (Figure 19). A few households (1.6%) indicated that they normally took four meals or more. On the day preceding the survey, the proportion of households that took one meal was about three times those who usually took one meal (61.8%). In contrast, those that took two meals was about half those who usually take the same number of meals (24.3%). Similarly those who took three meals the day prior to the survey were about one-third of those who usually take the same number of meals. These findings imply a decreased food security status of the households at the time of the survey compared to normal times.
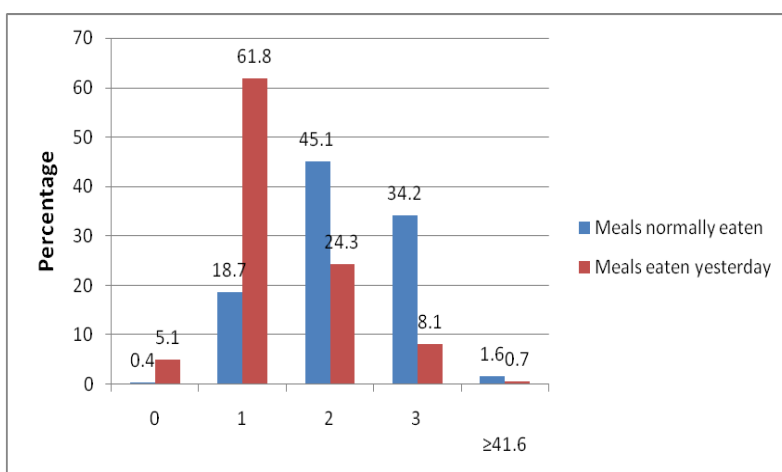
Figure 19: Frequency of meals usually eaten and that eaten the day prior to the survey in North East

<u>Frequency of meal consumption by households in Turkana North West</u>

In North West, 39.8% of the households reported that they normally took one meal per day, 40.0% took two meals and 19.6% three meals per day (Figure 20). On the day preceding the survey, the proportion of households that took one meal was much higher (55.8%) compared to those who usually took one meal. In contrast, those that took two meals the day before the survey was lower (32.6%) than those who normally ate the same number of meals. Similarly, the proportion of households that ate three meals the day prior to the survey

43

was much lower (6.1%) than those who usually ate the same number of meals. It should be noted that 5.1% of the households reported not eating any meal the day before the survey. These findings indicate that the food security status of the households had not worsened in recent times.
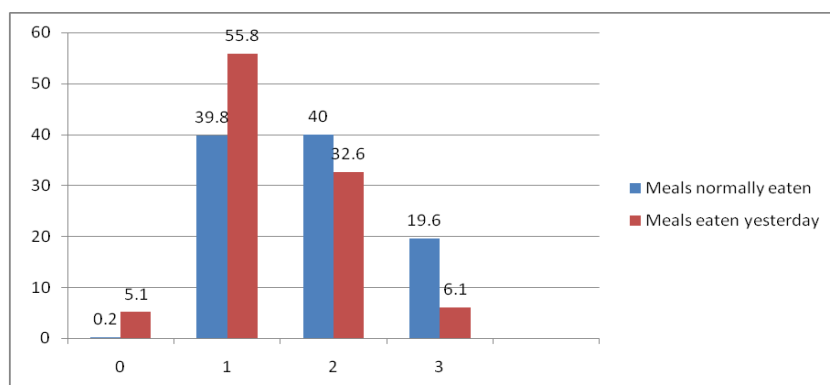
Figure 20: Frequency of meals usually eaten and that eaten the day prior to the survey in North West

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

Table 51: Household members who missed meals the day prior to the survey and reasons for missing meals

	Central %	South %	North East %	North West %
Households where some members did not eat	28.2	29.9	34.4	26.8
Members who missed meals:				
• Children under five years	11.2	14.4	16.0	19.3
• Children 5-12 years	5.1	13.6	9.6	10.9
• 13-19 years	9.3	12.7	13.4	11.7
• Mother	27.9	22.5	24.9	26.3
• Father	34.9	31.8	29.4	19.7
• Above 19 years	11.5	3.4	6.9	10.2
Reasons for missing meals:				
• Food not enough	61.3	60.7	52.6	65.6
• Sickness	1.2	1.4	8.4	2.6
• Away from home	23.7	18.6	20.1	9.3
• Other	13.9	19.3	17.5	22.5

North East had the highest percentage (34.3%) of households where some members missed meals the day before the survey. This was followed by South (29.9%), North West (26.8%) and lastly Central (28.2%) [Table 51]. The proportion of households that missed meals were about double those that missed meals during the 2010 nutrition survey. In all the survey sites, the majority of those who missed meals were fathers and mothers with about one-quarter of them doing so in all the survey sites. For children underfive years of age, between 11.2% in Central and 19.3% of those in North West missed meals the day prior to the survey. These findings may imply that the parents missed some of the meals probably to allow their children to have food.

The main reason for missing meals across all the survey sites was because food was not enough. The highest percentage of households reporting this was in North West (65.6%), followed by Central at 61.3%, then South at 60.7% and North East at 52.6% (Table 51). Another reason given for missing meals was being away from home although the survey did not establish why. A considerable number of those who missed meals did so because they were sick. The proportions varied from 9.3% in the North West to 23.7% in Central.

4.15.4   Household Dietary Diversity

Household Dietary Diversity
A 24-hour dietary diversity score was calculated to determine the households' economic capacity to consume various foods. On the whole, the 24-hour dietary diversity scores for all the survey sites were lower than those recorded during the 2010 nutrition survey. Central registered the highest score 3.7 (sd 2.1) followed by North West with 3.4 (sd 2.4), South 3.0 (sd 2.4) and lastly North East 2.3 (sd 1.4) [Table 52]. These findings indicate that households from Central, South and North West consumed foods from less than one-third out of 15 food groups, while those in North East consumed less than one-fifth, thus implying a limited diversity in their nutrient intake.

Table 52: Household dietary diversity score based on a 24-hour recall

	Central N=663 Mean (sd)	South N=593 Mean (sd)	North East N=556 Mean (sd)	North West N=616 Mean (sd)
24-hour diversity score	3.7 (2.1)	3.0 (2.4)	2.3 (1.4)	3.4 (2.4)

4.15.5   Variety of foods consumed

As is expected, cereals and cereal products were consumed by the majority of the households across the four survey sites. The percentages of households consuming these foods were lower than that reported during the nutrition survey 2010. The highest percentage of households consuming cereals and cereal products were from South (88.1%) followed by Central (87.5%), North West (92.6%) and lastly North East (90.4%) [Table 53]. Oils and fats were the second most commonly consumed foods in all the four survey sites with the highest percentage recorded in Central (46.7%), followed by North West with 54.7%, South (42.7%) and finally North East (37.4%) [Table 53]. The consumption of oils/fats was much lower than recorded in the 2010 nutrition survey. Pulses/legumes were the third most consumed foods in the majority of the survey sites. In Central 46.5% of the households consumed the foods, 45.0% from North East, 35.7% from North West and 28.0% from South/ Sweets (mainly in the form of sugars) was the most commonly consumed foods across all the survey sites.
Milk and milk products were consumed by about one-third of the more households in the survey sites with the exception of North East where only 6.1% consumed these products (Table 51).

Table 53: Foods consumed by households based on a 24-hour recall

Food groups	Central N=663 %	South N=593 %	North East N=556 %	North West N=616 %
Cereals and cereal products	87.5	67.1	83.8	88.1
Vitamin A rich veges & tubers	2.7	3.5	0.5	2.4
White tubers and roots	5.9	5.6	3.6	10.4
Dark green leafy veges	23.8	21.9	0.5	31.3
Other vegetables (tomatoes, cabbage etc)	21.6	11.8	2.2	15.7
Vitamin A rich fruits	4.8	3.7	3.6	7.6
Other fruits (including wild)	16.6	25.1	3.2	4.7
Organ meat	8.7	4.4	4.1	11.4
Flesh meat and offal	12.8	12.8	5.8	10.7
Eggs	1.7	1.9	0.2	3.2
Fish	10.3	3.7	8.3	3.6
Pulses and legumes	46.5	28.0	45.0	35.7
Milk and milk products	27.1	32.4	6.1	31.0
Oils/fats	56.0	42.7	37.4	54.7
Sweets	40.1	39.1	22.8	24.7

On the whole, consumption of dark green leafy vegetables was low and varied across the districts. In North West about one-third of the households (31.3%), reported consumption of the vegetables while in Central 23.8% of consumed the vegetables. In South, dark green leafy vegetables were consumed by 21.9% of the households while only 0.5% indicated consumption in North East (Table 51). Organ meats and flesh meats were consumed by relatively low proportion of households despite the fact that pastoralism is the main livelihood for the majority of the people. Other food groups were consumed by less than 10% of the households in most of the survey sites (Table 53).

In summary, the most frequently consumed foods, with the exception of sugar, were those provided as general food ration, implying that these foods form the diet for the majority of the households. The relatively low consumption of dark green vegetables may be partly explained by the fact that Turkana is drought-prone and because of poor infrastructure vegetables from *down country* cannot be easily transported to many areas. This could be the reason why North West recorded the least consumption of these vegetables. Additionally, the proportion of households consuming various foods from various food groups was much lower than that reported in the 2010 nutrition survey implying a heightened level of food insecurity.

4.15.6 Main source of dominant food item

The main source of the dominant food item in the diet was through purchases. This was reported by 69.7% from Central, 48.1% from South, 48.0% from North East and 52.1% from North West. Food aid was the second most common source of the dominant food with about one-quarter (22.2%) of the households reporting this in North East. Relatively lower proportions of households reported this source in the rest of the survey sites; 9.5% from Central, 16.0% from South and 13.9% from North West (Table 54).

Table 54: Main source of dominant food item

Food sources	Central	South N=562	North East N=556	North West N=599
Own production	1.7	6.4	2.0	2.7
Purchases	69.7	48.1	48.0	52.1
Gifts from friends	5.2	3.0	4.4	8.7
Food Aid	9.5	16.0	22.2	13.9
Traded/bartered	2.1	0.2	0.9	2.0
Borrowed	4.1	4.7	8.6	13.4
Gathered (wild)	6.3	14.7	9.6	3.2
Others	0.3	0.3	3.3	3.2

14.16 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 55). Many households reported reduction in the number of meals consumed per day as a strategy commonly used; in Central, South and North West over 90% of the households (96.1%, 95.0% and 95.5% respectively) indicated that they employed this strategy while 80.7% employed this strategy in North East. Reducing the size of meals was another common strategy practiced by over 90.0% of the households in all the survey sites with the exception of North East where 69.7% of the households employed this strategy.

Another common coping strategy was skipping meals for an entire day, reported by over 80.0% of the households from all the survey sites with the exception of North East which reported 69.7% of the households adopting this strategy. Being that the mainstay of the community is pastoralism, many of the households did not sell their livestock as a coping strategy. The sale of milk, meat and fish; and the consumption of decomposed fish were practiced by relatively fewer households in all the four districts (Table 55).

Table 55: Coping strategies employed during food shortage

Coping Strategies	Central N=616 %	South N=572 %	North East N=617 %	North West N=601 %
Reduction of no of meals per day	96.1	95.1	80.7	95.5
Skip meals for an entire day	80.2	82.2	69.7	91.8
Reduce size of meals	92.7	95.1	69.7	91.5
Restrict consumption for adults to allow more children to eat	84.7	78.1	59.0	81.0
Shift to less preferred food	62.0	72.4	45.4	70.0
Hunting and gathering	40.6	40.2	36.0	26.6
Engaging in casual labour	35.2	41.6	28.7	36.9
Borrow Food	78.9	69.1	57.9	78.4
Purchase food on credit	63.3	39.7	41.3	37.9
Consume wild foods	56.3	55.6	40.7	35.9
Consume decomposed fish	17.5	8.2	4.7	8.5
Send household members to eat elsewhere	47.6	42.0	26.3	48.4
Send child/children to school	57.3	66.4	60.1	59.1
Begging	22.9	38.1	14.9	27.1
Sale of livestock	25.5	22.6	28.0	29.8
Sale of charcoal/firewood/small scale business	38.3	33.4	29.3	49.9
Part of family migrating with animals to look for pasture	22.9	15.4	23.8	29.5
Sale of milk, meat, fish	9.3	11.5	7.8	9.5
Donation	21.6	28.3	26.3	

4.17 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:

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

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 rates (CDR) for Central and South were within acceptable levels (<2 deaths/10,000 people/day) as per the SPHERE Standards 2004 (Table 54) whereas those for North East and North West were not acceptable. The highest crude death rate was observed in North East at 2.42 (95%CI: 1.73 – 3.37) deaths/10,000/day, followed by North West at 2.13 (95%CI: 1.38 – 3.29).

<u>Underfive Death Rate</u>

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 highest rate of U5DR was observed in North West 3.24 (95%CI: 1.96 – 5.91), followed by North East 2.12 (95%CI: 1.13 – 3.95) (Table 56).

Table 56: Crude and Underfive Death Rates in all the four survey sites

	Central	**South**	**North East**	**North West**
Crude Death Rate (CDR)	0.74 (95%CI:0.44-1.25)	0.24 (95%CI: 0.14-0.42)	2.42 (95%CI: 1.73-3.37)	2.13 (95%CI:1.38-3.29)
Underfive Death Rate (U5DR)	0.40 (95%CI:0.13-1.23)	1.14 (95%CI: 0.83-1.56)	2.12 (95%CI:1.13-3.95)	3.42 (95%CI:1.96-5.91)

5   DISCUSSION

The discussions are conducted for the whole of Turkana because of the similarities in the findings across the survey sites and where there are disparities these are pointed out appropriately. The findings of the FGDs have been used to complement the quantitative findings while highlighting disparities where they exist.

5.1 Nutrition Situation in Turkana

The nutrition situation in Turkana has deteriorated significantly in 2011 despite having significantly improved in 2010 from 2009 (Figure 21). All the survey sites recorded significant decline in the GAM rates judged by the lack of overlap in the confidence intervals for 2010 and 2011. The GAM rates for all the survey sites were above the 15% emergency threshold. North East and South recorded GAM rates above 30.0% depicting emergency situations with North East having the highest GAM rate. The lowest GAM rate was observed in Central. The GAM rates for 2011 are the highest observed in Turkana for a long period of time. It should be noted that in 2009 Lotus Quality Assurance (LQAS) methodology was used and therefore the confidence intervals are wide because of the small sample size used in this methodology.

The highest rate of GAM in North East may be attributed to the vastness, remoteness, poor infrastructure and insecurity in the area. Consequently, there are few health facilities which are very far apart and outreaches are limited. The only NGOs working in the area provide services on a mobile basis. North East was affected most by the erratic GFD food pipeline having experienced delayed food aid in March and no food aid in April 2011.
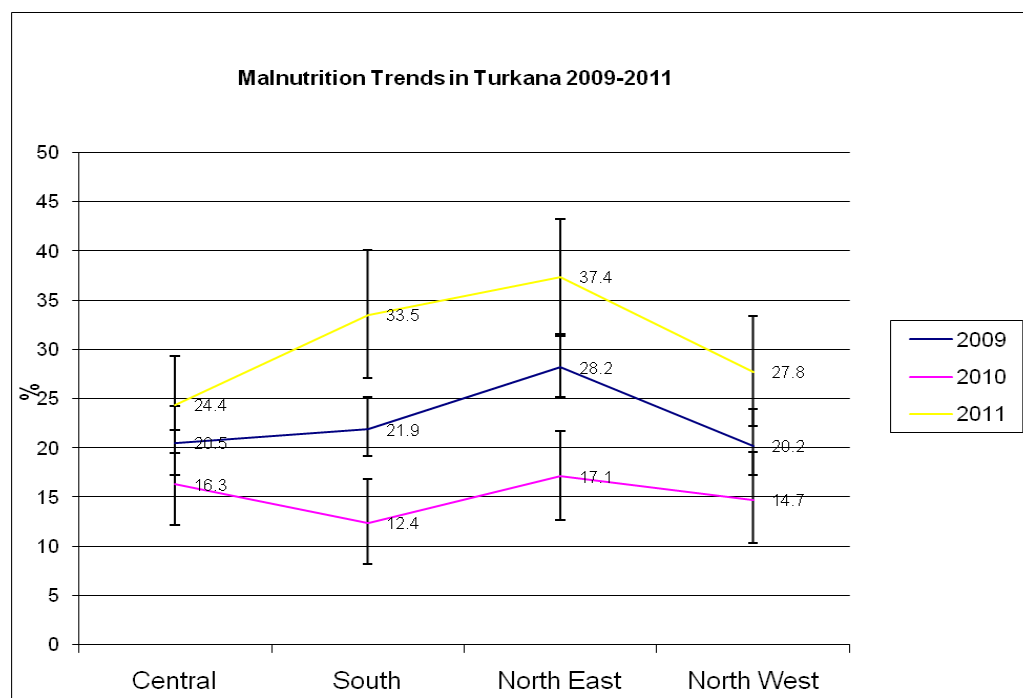
Figure 21: Trends in Malnutrition in Turkana (2009-2011)

The community reported during the FGDs that the nutrition situation of the children had deteriorated to lower levels in 2011 than seen in recent years.

The probable reasons for the significant deterioration in the nutritional situation from 2010 to 2011 based on the discussions with the MOH and its implementing partners working in Turkana and review of the 2010 nutrition survey, ALRMP and KFSSG reports included the following:

1. Increased food insecurity
    Chronic food insecurity has been reported to be the major cause of malnutrition making Turkana to be targeted under the EMOP with the rest of the ASAL districts in Kenya. In 2011, the food insecurity of households increased because of:

    Inadequate General Food Distribution. The food pipeline was weak, erratic and unpredictable with effect from February 2011 because of insufficient stocks. It was reported that procuring of cereals especially maize was a challenge. In February the distribution was incomplete as parts of Central and North Turkana did not get their supplies. Again in March, there were partial dispatches to the South and none to the North. In April there was no distribution for about two weeks because the transporters went on strike demanding an increase in payment. Consequently, many households particularly those in North East stayed for 2 months without food aid. In May, at the time of the survey, it was reported that the food basket would not contain a staple because of the shortage of maize in the region. It was planned that CSB in amounts enough to provide the equivalent kilocalories as the cereal (maize or sorghum) was to be distributed as a substitute. In addition, distribution of food aid in Central was, also, disrupted because there was no leading agency to distribute the food forcing WFP to do this for some time.

    The distribution of the food aid by the government which targets fewer households was also affected for sometime by lack of transportation.

    The findings of this survey also revealed significantly lower percentages of households that reported having received food aid in the three months prior to the survey compared to 2010. Furthermore, over 80% of the households with the exception of North West reported having received the food once instead of the three times as is expected since the food is meant to be distributed monthly. These findings were also corroborated with those of the FGDs. During the FGDs, the community members stated that sharing of food aid between households was much higher than any other time because of the increased number of households needing such assistance. Furthermore, food aid was sold to get income to meet other needs because of the lowered economic power of the households as a result of decreased livestock.

    Drought: Reports from the ALRMP and discussions with officials from the organization indicated that the short rains in 2010 were not sufficient in most parts of Turkana. The rainfall was not well distributed and there was hardly time for it to impact on the vegetation. People flocked with their animals to the few places that had received rainfall. Within no time the browse was depleted and the condition of the animals started to deteriorate again. This was evidenced by the decreased livestock prices and increased food prices. On the other hand, the long rains for 2011 failed. During the FGDs, the community members reported drought as the major cause of food insecurity in 2011. The food insecurity situation was exacerbated by the decreased economic power of households to purchase food. The majority of the households (about 80% and above) reported having lost their animals (the main livelihood) to drought.

    Blanket Supplementary Feeding Programme (BSFP): In the year 2010, BSFP for all children underfive years of age, pregnant women and lactating women for 6 months had been in place in Turkana for a period of 6 months. The programme ended in May, just a week or two before the commencement of the survey. This was despite the fact that the rains were better in 2010. At the time of the survey the research team observed sorghum almost ready for harvest in some parts of Turkana which was not observed in 2011.

2. Low coverage of selective programmes

The coverage of both SFP and OTP was poor and much lower than that recorded in 2010. In 2010, the SFP coverage rates in all the survey sites with the exception of North West were above the minimum Sphere Standards (>50%) and the OTP coverage rates were 100% in all survey sites. The lower coverage rates in 2011 were attributed to decreased community outreach due to the following:

- Withdrawal of implementing partners' activities. Samaritan's Purse that was doing OTP in North West phased out in September 2010 and no organization took over from them. Because of poor exit strategy, the areas where the agency operated were thus left without any organization covering them and therefore the community outreaches were abandoned.
- WVK changed their strategy from running a parallel SFP and OTP programme to the MOH in September 2010 due to the cessation of donor funding and also to increase sustainability of the programme by transferring the responsibility to MOH. From January 2011, World Vision had been working with MOH at the health facilities. The change in programme strategy paralyzed operations especially in the South creating a gap in implementation from September 2010 to January 2011. The operations slowed down especially during the transition period resulting in lower coverage. Most of the SCs in the South closed down and therefore all the referrals were taken to Lodwar. WVK came back into full operation in February 2011.
- The drought was also reported to cause a lot of movement especially to insecure areas in search of pasture for the livestock, for example, to Kibish and Lapur divisions in North East. Because of insecurity, there are no NGOs covering such areas and consequently no outreaches. These movements resulted in increased defaulter rates.
- Infrequent supply of CSB also resulted in longer stay in the programme, fewer discharges and admissions and increased defaulter rates.
- The new approach of implementation of health services (Facility-Based Integration of Health and Nutrition activities) whereby the MOH rather than the agencies take the lead in the implementation of the programmes at the health facility level was introduced in October 2010. The rationale for this strategy was to facilitate sustainability of the nutrition programmes when the NGOs left. Under this approach, the agencies provide capacity for the MOH staff through *on the job training* (OJT). Additionally, the agencies provide support to MOH in the form of logistics for the outreach activities and other resources such as registers for the selective feeding programmes. The agencies are also expected to undertake parallel outreach programmes particularly in the hard-to-reach areas. The OJT strategy was reported to have resulted in decreased coverage of the selective feeding programmes because of:

  - High turnover of health staff necessitating continuous training and limited availability of the staff to implement the programme;
  - Delayed reporting during transition time affected requisition of supplies resulting in delayed supplies. This was however reported to be on course at the time of the survey;
  - Shortage of health staff at the health facilities. Many of the health facilities were manned by skeleton staff; one qualified health worker and a CHW with some being manned by CWHs only. The shortage of staff limited the number of and quality of activities undertaken. Outreaches were many times not undertaken because of the heavy workload for the health staff.

The community members expressed the same sentiments (decreased coverage of selective feeding programmes) compared to 2010.They indicated that the feeding programmes were not adequate to cater for the increased number of malnourished children in the year 2011.

3. Increased child morbidity. The proportion of children suffering from diarrhoea, fevers and ARIs was higher than those suffering from the same conditions in 2010. These diseases conditions have profound effect on the nutritional status of the child because of the synergism between malnutrition and infections; and

4. There was deterioration in the IYCF practices indicators with the exception of exclusive breastfeeding. The duration of breastfeeding decreased and complementary feeding rate, minimum dietary diversity, and frequency of feeding of children reduced probably as a result of the increased household food insecurity.

5.2 Coverage of Selective Feeding Programmes

There was a significant drop in SFP and OTP coverage rates in all the survey sites compared to 2010. All the sites did not achieve the Sphere Standards 2004 (>50%) based on MUAC and Z scores. The interpretation of the coverage rates especially for OTP should be done cautiously given the limitations in the formula used to calculate these rates. This formula 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

On the whole, immunization coverage rates for all the vaccines were more or less the same in all the survey sites as in 2010. Vitamin A supplementation for children 6-59 months old showed a marked improvement from 2010. Nonetheless, the frequency of administration was poor. Less than 50% of children 12-59 months of age received the supplementation twice within a 12-month period as per the WHO protocol. On the whole, de-worming coverage was low despite having shown a marked improvement from 2010. This finding is worrying considering the poor water availability and accessibility as well as poor sanitation in Turkana that predisposes the children to helminthes infestation, making de-worming a crucial exercise.

5.4 Child Morbidity and Maternal Health Seeking Behaviour

The majority of the mothers/caregivers sought assistance for their sick children from public health facilities. Of concern was the relatively high percentage of caregivers who 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 that 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 Turkana, health services are not easily accessible because of the poor infrastructure and the few health facilities which are, in many cases, poorly staffed.

5.5 Infant and Young Child Feeding Practices (IYCF)

Breastfeeding Practices
Breastfeeding practices were adequate in terms of: initiation of breastfeeding which was universal as breastfeeding is the cultural norm and giving of colostrum. Colostrum provides antibodies thus conferring immunity to the baby. In contrast, optimal breastfeeding practices in terms of: duration of breastfeeding; timely initiation of breastfeeding (within 1 hour of birth as per the WHO recommendations); not giving of pre-lacteal feeds, and exclusive breastfeeding for 6 months were inadequate. It should be noted however, that exclusive breastfeeding rates in all the survey sites were much higher than the national rate at 32%[18]. As a whole, breastfeeding rates were lower in 2011 compared to 2010.

Complementary Feeding Practices
As a whole, the complementary feeding practices in all the survey sites were inadequate. This means that many children were not getting adequate nutrients because of delayed introduction of complementary feeding. It is

---

[18] Kenya Demographic and Health Survey, 2008-09

important that complementary feeding be introduced at 6 months because breastmilk is not sufficient to provide all the required nutrients for the child's optimal growth and development from this age onwards.

Dietary diversity was limited for those children receiving complementary feeding. The minimum dietary diversity (consumption of foods from ≥4 groups from a total of 7) was achieved by less than 15% of the children from all the survey sites. The frequency of feeding was below the WHO recommendations for over three-quarters of the children. The children were therefore most likely not getting a variety of nutrients in amounts to meet their requirements. The findings on complementary feeding practices concur with those of in-depth assessments conducted in Turkana in the recent past[19],[20].

As a whole, complementary feeding were less adequate in 2011 compared to 2010.

5.6 Availability and Utilization of mosquito bed nets

Bed net ownership was low in all the districts with only half or less of the households reported owning bed nets. Most of the bed nets were provided by MOPHS and partner agencies with fewer households reporting having purchased them. This is a commendable effort by MOPHS and partners which should be up scaled so that more households get bed nets. The utilization of the bed nets was by the most vulnerable groups; children underfive years of age and pregnant women and mothers. This is a positive finding that should be encouraged because Turkana is malaria endemic. Nonetheless, ownership of bed-nets reduced in 2011 from 2010. Of concern was the relatively high proportion of households who owned bed-nets but did not utilize them.

5.7 Water and Sanitation and Hygiene Practices

Water is inaccessible to most households in Turkana in terms of distances to water sources and safe water. It would appear that households used the source of water that was most accessible to them because of the scarcity of water in the region. Even though the safety of the water was not established, it can be assumed, that on the whole, the households drank unsafe water as the majority, never boiled drinking water. The amount of water used by a household per day was low, thus limiting adequate hygiene practices. The mean amount of water available per person per day in all the survey sites was much lower than the recommended Sphere Standards of ≥20 litres per person per day[21].The limited amount of water used by households may be explained by the long distances to water points. The minimum time taken to the water point and back was on average over 40 minutes in the survey sites with the exception of the South at 30 minutes.

Access to latrines was very low with less than 20.0% of the households in all the districts having latrine facilities. The majority of the households without latrine facilities disposed of adult and children's faeces in the bush. The practice of washing hands after visiting the toilet was very low, by less than 20.0% of the respondents. This practice could be constrained in part, by the scarcity of water. The use of soap in hand washing was very low. The survey did not establish why soap was hardly used for washing hands. The poor availability of safe water coupled with poor accessibility to latrines and poor personal hygiene practices, could probably explain the high prevalence of diarrhoeal diseases among children in Turkana.

5.8 Household Food Security

The food security status of the households deteriorated significantly in 2011 compared to 2010. There was a severe drought in 2011. The short rains in 2010 were successful in some parts of Turkana but the long rains (April to June) 2011 failed. During the FGDs, the community members expressed strong sentiments about drought being the main cause of food insecurity. They reported that they had lost large numbers of livestock to

---

[19] World Vision Kenya, Assessment of Infant and Young Child Feeding Practices in Turkana District, Kenya; 2006
[20] MOH/UNICEF, Qualitative Assessment of the Infant and Young Child Feeding Practices in UNICEF-Kenya Focus Districts, 2007.

[21] Sphere Standards 2004

drought. This was in agreement with the findings from household interviews which showed a significant drop in the proportion of households that owned livestock in 2011 compared to 2010.

The deterioration in household food security was further confirmed through a number of proxy indicators used in the survey. Food aid was received by less than one-third of the households in the last three months before the survey. The majority of the households received food aid only once in the three months before the survey and not three times as is the standard practice. There was increased sharing of the food aid between the households than during other times as reported by the community members during the FGDs.

Analysis of the types of foods consumed at the household level revealed dependence on food aid. The most consumed foods, with the exception of sugars, were those provided in the food basket; cereals, pulses and oils. The consumption of milk and meat was relatively low despite the fact that the main livelihood of Turkana people is livestock keeping. Food aid was mentioned second to purchase, as the most common source of food. It should be noted that all the food items in the food basket were shared by many households thus further exacerbating the food insecurity situation. The practice of sharing or selling food aid has the overall effect of diluting the food basket, in that the food consumed does not provide the 75.0% of the 2100 kilocalories per person per day as intended by WFP[22]. Furthermore, selling of food aid to purchase non-equivalent nutritional food commodities such as sugar, a food that offers *empty calories* further dilutes the food basket.

Another evidence of household food insecurity was the limited number of meals eaten per day. The majority of the households ate either one or two meals per day. The proportion of households that ate one meal the day preceding the survey was more than double the proportion that normally eats one meal. There was a significant decrease in the number of households that ate two meals the day before the survey compared to those who normally eat two meals. The same was observed for those who ate three meals the day preceding the survey compared to those who usually ate the same number of meals. This finding is corroborated by the fact that the coping strategy for the majority of the households was skipping meals.

The household dietary diversity score was limited signifying low household economic capacity to consume foods that provide an adequate variety of nutrients. On the whole, the 24-hour dietary diversity scores for all the survey sites were lower than those recorded during the 2010 nutrition survey. The limited dietary diversity is explained in part by the high level of poverty in Turkana and the unavailability and inaccessibility of a variety of foods. The same sentiments were expressed during the FGDs as community members stated that many of them have lost their livestock to drought, disease and raids.

5.9 Factors associated with malnutrition in Turkana

In discussing the probable causes/factors associated with the acute malnutrition in Turkana, it should be borne in mind that the results were generated from a cross-sectional survey and as such only reflects a "snap-shot" in time. The conceptual framework by UNICEF explaining the causality of malnutrition has been adapted, in discussing the probable causes of malnutrition in Turkana. The qualitative data from the FGDs have also been incorporated appropriately.

5.9.1   Immediate Causes

Dietary Intake
The findings of this survey revealed inadequate dietary intake by the households. Many households ate 1 or 2 meals per day instead of 3. The household dietary diversity was limited with the majority of households eating food from less than one-quarter of 15 food groups.

Disease
A large proportion of children 20.5% to 28.4% from all the survey sites had diarrhoea. Up to one-fifth of the children suffered from ARIs and up to 27.7% from fever. These diseases have a profound negative effect on the nutritional status of children.

---

[22] WFP, Personal Communication Head of Sub-Office Lodwar

5.9.2   Underlying causes of malnutrition

Inadequate Household Food Security
The drought impacted negatively on the household food security status. The irregular distribution of food aid which was a major source of food for many households, also contributed to food insecurity.

Inadequate child care
IYCF practices were on the whole inadequate in terms of: breastfeeding duration; exclusive breastfeeding for infants less than 6 months of age; timely initiation of breastfeeding; and not giving of pre-lacteals. Introduction of complementary feeding was delayed for many children and even for those on complementary feeding the diversity of the foods was limited and this was made worse by the low frequency of feeding of the children.

Inadequate health services and unhealthy environment
The health facilities are not easily accessible for the majority of the population and many public ones are understaffed. In some of the places, health services are offered on mobile basis. Consequently, immunization, vitamin A supplementation and de-worming coverage for children less than 5 years is below the WHO goal.

There was scarcity of water for the majority of the households and the water was also not easily accessible. Many households therefore, 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 because of the large number of respondents that did not wash their hands after defaceation. Overall, sanitation was inadequate as less than one-fifth of the households had access to latrines.

5.9.2 Basic causes of malnutrition

Turkana is marginalized with 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. The constant cattle raids and animal diseases such as PPR have also contributed, to a large extent to loss of livestock. Consequently, many people have been rendered destitute and dependent on food aid.

6   CONCLUSIONS

- The nutritional status of the children deteriorated significantly in all the four survey sites in Turkana. For the first time in many years some of the survey sites recorded GAM rates of over 30% signifying an emergency situation. This deterioration may be attributed to the worsened food security situation. The prevalence of diarrhea, ARIs and fever increased in all the survey sites in 2011. Additionally, there was lower coverage of selective feeding programmes;
- The SFP and OTP coverage decreased drastically in 2011 compared to 2010. The coverage rates were not within acceptable Sphere Standards 2004;
- On the whole, IYCF practices deteriorated in 2011 compared to 2010. Breastfeeding practices were inadequate in terms of the duration of breastfeeding, exclusive breastfeeding and timely initiation. Complementary feeding practices were inadequate in terms of timely introduction, dietary diversity and the frequency of feeding of complementary foods;
- There was an increase in the morbidity burden for children in 2011 compared to 2010. The most common illnesses/disease symptoms were fevers, ARIs and diarrhoea;
- The immunization coverage for all the antigens was more or less the same as in 2010;
- The coverage of Vitamin A supplementation was far below the WHO acceptable levels especially in terms of the frequency of supplementation;
- Access to clean safe water and adequate sanitation was limited and probably constrained proper hygiene practices;
- Mosquito bed net ownership was low but utilization by the most vulnerable groups of people was high; and

- The crude mortality levels were not acceptable in North East and North West but acceptable for Central and South based on Sphere Standards. The underfive mortality rates for all the survey sites were within the Sphere Standards acceptable levels.

7   RECOMMENDATIONS

Short-term interventions
- Provide protection ration linking households with children admitted to SFP and OTP to GFD. This will decrease sharing of the food meant for the malnourished children at household level;
- Introduce blanket supplementary feeding programme (BSFP) for children underfive years of age pregnant and lactating women up to 6 months to act as a stop gap measure and prevent moderately malnourished children becoming severely malnourished;
- Increase the number of SCs in Turkana especially in the North to deal with the large number of severe cases of malnutrition;
- Increase the number of households receiving GFD from WFP. The number of households receiving food aid from the government should also be increased;
- Upscale community outreach sites especially in hard-to-reach areas to improve coverage of SFP and OTP. This should be done by the MOH and partner agencies;
- Increase the number of mobile clinics to improve on immunization, vitamin A and de-worming coverage;
- Strengthen the monitoring and evaluation of programmes so that gaps in implementation may be identified and appropriate interventions taken timely to curb malnutrition before it reaches emergency levels;
- Documentation of vaccination needs to improve. A significant proportion of the children did not have health cards and vaccination status was based on recall. Documentation of vaccination on cards is important to prevent unnecessary re-vaccination and monitoring of coverage. All vaccinations given during campaigns should be documented. Lost cards should be replaced as soon as possible;
- There is need for continued and more intensive health and nutrition education focusing on: the value of timely health seeking behaviour and the dangers of self-diagnosis and self prescription of medicine; importance of proper sanitation and hygiene especially using latrines, washing of hands after visiting the toilet; appropriate IYCF feeding practices with special focus on the value and duration of exclusive breastfeeding and the importance of timely introduction of complementary feeding, dietary diversity and appropriate frequency of feeding;
- It is recommended that all available channels such as SFP and OTP distribution points, MCH, ANC, SC and mobile clinics be used to provide health and nutrition education for wider coverage and reinforcement of the information; and
- Upscale the distribution of bed nets to help prevent malaria which is endemic in Turkana.

Medium and long-term Interventions

- An integrated approach, tackling both the immediate and underlying causes of malnutrition should be put into place and/or scaled up. Such approach is necessary because of the range of factors that interact with each other to contribute to malnutrition. Most of the interventions in the region are humanitarian in nature, dealing with the immediate causes of malnutrition. Whereas these relief services are critical, they need to go hand in hand with developmental activities so as to provide sustainable solutions to the problem of malnutrition. For example, the GAM rates reduced considerably in 2010 partly due to improved food security and BSFP that was implemented for 6 months. This impact was not sustained a year later when drought set in and food insecurity levels increased. There is need for example, to develop and/or to scale up projects which will make food more available at the household level;
- The government's efforts in drought mitigation and the provision of health services and alternative means of livelihood in Turkana are acknowledged. There is an urgent need however, to accelerate or re-strategize these efforts. Greater efforts should be made towards the improvement of: the road network; provision of safe water; and availability of health facilities as well as improvement in staffing levels and availability of drugs. The government and the NGOs working in Turkana should also be more actively involved in the diversification of livelihoods and the mitigation of the insecurity in the region. Without the underlying and basic causes of malnutrition being addressed on a large scale, efforts by the humanitarian agencies will

continue to address malnutrition on a short-term basis, thus rendering malnutrition chronic in the region. It is needless to mention that the activities of the humanitarian agencies are greatly constrained by the lack of infrastructure and insecurity in the area; and

- It is recommended that the interventions by the government and the agencies working in Turkana be based on a coordinated, integrated and holistic approach. Integration of humanitarian services and developmental activities should tackle both the immediate and underlying causes of malnutrition. This approach will increase impact because of the synergy created between the two. Agencies providing different services should strive to do so in the same locality for greater impact. Developmental activities provide a safety-net to household food insecurity by providing alternative means of livelihood. It is however, acknowledged that various agencies are already adopting this approach. Such activities are few and scattered with some being in the pilot or inception stage. The impact of most of these activities in improving the household food security status and consequently improving the nutrition situation is yet to be determined. There is need therefore to evaluate the impact of these activities with the view to up scaling those with the greatest impact on the food security situation in Turkana.

ANNEXES

TERMS OF REFERENCE FOR TURKANA NUTRITION SURVEY

MAY 2011 CONSULTANCY

Contact Person: Milka Choge IRC - KENYA

Contact Info: milka.choge@rescue.org

Background Information

The greater Turkana region lies in Rift Valley province of Kenya and is situated in the arid north western region of the country. The region borders Uganda, Sudan and Ethiopia to the East, North East and North West respectively. It has area coverage of about 77,000 square kilometers. Until recently, Turkana has been the largest district in Kenya. It has since been sub-divided into six districts namely; Turkana North, Central, West, East, South and Loima. Turkana is classified among the Arid and Semi-Arid Lands (ASALs). The region has been repeatedly classified as a humanitarian emergency (level 4) under the Integrated Food Security Humanitarian Phase Classification (IPC).

Being an ASAL district, Turkana is a drought prone area that experiences frequent, successive and prolonged drought and cattle rustling which leads to heavy losses of lives and livestock. Turkana has two rainy seasons (April-June & October-December) but rains are often scarce and erratic with frequent total failures.

Turkana County is the second poorest district in Kenya with poverty levels of approximately 20% above the national average. Turkana is constrained by the harsh environment, remoteness coupled with the poor infrastructure and low access to essential services in addition to other underlying causes of poverty that are experienced elsewhere in Kenya. It is classified among the arid and semi arid lands (ASAL).
According to arid land resource management project (ALRMP), the district has four main livelihood zones. Nearly 60% of the population is considered pastoral, 20% agro pastoral, 12% fisher folks and 8% are in the urban/peri-urban formal and informal employments.

Due to failure of rainfall including the just ended short rains season, access to potable water is greatly reduced. This has negatively impacted on availability of pasture and in turn resulted in weakened animal body conditions thus affecting availability of milk at the household level. On the other hand, poverty, illiteracy and unfavourable government policies have ensured that access to essential services has remained minimal to the majority of the district inhabitants. Poverty, illiteracy and unfavorable government policies have ensured that access to essential services has remained minimal to the majority of the district inhabitants. Inadequate food and poor sanitary conditions at the household and community level as a result of cyclic drought conditions coupled with long-term degradation of livelihoods and traditional coping strategies have further weakened the Turkana community. The combined effect of the above factors has resulted in chronic levels of acute malnutrition indicating the enormity of both underlying and basic causes of malnutrition.[23]Following annual nutrition assessments that have been conducted in the district, various interventions based on the recommendations have been conducted in the district to address the high prevalence of malnutrition. However, despite the numerous interventions, the rates of malnutrition have still remained high. Though A survey conducted in May 2010 indicated a GAM prevalence of <15% in three survey zones except for turkana north east whose prevalence was above the recommended WHO thresholds.

Based on the above rates, partners have been implementing different nutrition response interventions in the areas. The assessment will aim at strengthening the on-going interventions in addition to new recommendations and determining the current, malnutrition rates in light of the just improved rain seasons and prevalence of cholera outbreak in the region.

Main Objective of the Consultancy
The main aim of the consultancy is to support the MOH and implementing partners in conducting 4 nutrition surveys in Turkana North (East and West), Turkana south and Turkana central.

---

[23] Conceptual framework of malnutrition: UNICEF 2000

The main purpose is to estimate the level of acute malnutrition and nutritional oedema among children aged 6-59 months of age and to determine the main causes of Malnutrition in Turkana County.

Specific objectives of the Nutrition survey

Using the Kenya nutritional assessment guidelines, the following objectives will guide the implementation of the survey:

Determine the prevalence of acute malnutrition among under five year olds children, pregnant and lactating women

Estimate coverage of the current nutrition interventions in the district

Determine the Infant and Young Child Feeding Practices (IYCF) among children 0-23 months of age

Investigate household food security and food consumption practices.

To estimate crude and under-five mortality rates.

Estimate morbidly rates of children below five years

Determine the proportion of households with access to safe water and sanitation

Survey design and methodology
The Kenya national guidelines on nutrition and mortality assessments and the MOH/UNICEF health and nutrition assessment tool will be used for data collection during the survey. The Nutrition survey will be conducted in accordance with the National Guidelines for Nutrition and Mortality assessments in Kenya and will employ ENA for SMART methodology to determine the sample size and the clusters at the village level.

The survey will use a cross-sectional study design with both quantitative and qualitative components. In addition to household interviews, which will provide quantitative information, focus group discussions (FGDs) will also be conducted with different groups at the community level.

Target population
Four independent surveys will be conducted in Central Turkana district, South Turkana district, North East and North West Turkana to assess the nutritional status of children 6-59 months of age. In addition, the survey will seek to establish infant and young child feeding practices among children 0 to 23 months as well the nutritional status of women in the reproduction age (15-49 years).

Design and Scope of Work

This consultant is to perform the major technical duties surrounding the nutrition survey:

The *key tasks* for this consultancy will be:

Review the MOH questionnaires to make sure the minimum indicators and all other information required is captured in the questionnaires.

Meet with the Ministry of Health and implementing partners in Nairobi and Turkana.

Facilitate training for the survey staff including the focus group discussions.

Ensure all questionnaires, survey tools and equipment are ready for data collection.

Supervise data collection for the 4 surveys

Arrange for data entry and supervise data entry in Lodwar.

Carry out data cleaning and data analysis. Quantitative data will be analyzed using Excel, SPSS and ENA for smart software while qualitative data will be analyzed manually.

Present preliminary findings to the MOH and implementing partners two days after the data collection in Lodwar.

Present first draft of report to implementing partners for comments 2 weeks after data collection

Submit final report (one week later) to Implementing partner as stated in the consultancy contract.

Key Deliverables

Assessment supervisors and enumerators adequately trained to conduct the survey within the proposed timeframe.

A comprehensive food security and nutrition survey report in accordance with the approved TOR detailing:

Methodology used for data collection and analysis

Nutritional status of the targeted population

Coverage of nutrition interventions

Infant and Young Child Feeding Practices (IYCF) among children 0-23 months of age

Household food security and food consumption practices.

Crude and under-five mortality rates.

Morbidity rates of children below five years

Proportion of households with access to safe water and sanitation

Suggested recommendations that will inform future and current programming

The consultant will also be required to submit:

Four (4) bound hard copies of the survey report

Soft copy of the report in a CD

Soft copies of all data sets both quantitative and qualitative (Cleaned data in both ENA for SMART)

Copy of training package and materials used

A table of data quality check duly filled

All filled quantitative data collection tools and qualitative data recording materials.

Any other non-consumable documents/items that will be used in the course of the planned consultancy

Duration of the Consultancy

The consultancy is expected to be for 30 days. The successful bidder must commit to accomplish and deliver the consultancy services and deliverables before or on 30th June 2010 by close of business.

Tentative schedule

Date	Activity	Location
May 2011	Questionnaires review and finalization	Nairobi
May	2 Trainings of survey staff	Lodwar/Kakuma
May 2011	Photocopying of questionnaires Distribution of questionnaires to survey teams	Lodwar
May 2011	Supervision of data collection in 4 districts of Turkana	Larger Turkana
June 2011	Data entry and cleaning	
June 2011	Initial analysis for Nutrition status Presentation of preliminary results to MOH and partners	Lodwar
June 2011	Data analysis	Nairobi
June 2011	Report writing Draft report Final report	Nairobi
July 2011	Presentation of final findings to MOH, UNICEF and other partners	Nairobi

Contractual Responsibilities

Required qualifications/ Complications

To successfully undertake this assignment, the Consultant should meet the following minimum requirements

Education: A professional with a post-graduate degree in Nutrition or public health.

Experience:

Documented experience in conducting Nutrition surveys

Experience in using a range of qualitative and quantitative data collection and analysis methods

Clearly proven strong quantitative skills and expertise in the use of standard data management software, statistical analysis and Nutritional data analysis packages

Skills:

Strong analytical and report writing skills

Proficiency in use of computers, especially latest Word Processing Packages and a MUST in the use of SPSS

Cost: The cost of the provision of services should be reasonable and feasible.

Independence: the consultant(s) should not have been directly involved in the design and execution of any of the ongoing Nutrition programs, and should not be a current employee of any of the implementing agencies.

Expression of interest

A consultant/Firm that meets the above requirements and is available within the time period indicated above should submit the following:

A capability statement of the firm and the specific consultant who will undertake this assignment, including a commitment to be available to undertake the entire assignment within the stated timelines. If two consultants are proposed, it should be clearly demonstrated on how their individual competencies shall complement each other in the context of this assignment and Budget

An elaborate methodology and detailed budgeted work plan indicating number of days per tasks and costs (in Kenya Shillings) per main task.

Detailed Curriculum vitae indicating their relevant qualifications, skills and experience should be clearly spelt out.

Full contact details for the person selected. The details should include current telephone contact, e-mail address, title of assignment undertaken by the consultant, dates when the assignment was undertaken and name of the contracting organization

ANNEX 2: SAMPLED CLUSTERS

Central		South		North East		North West	
Cluster name	Cluster No	Cluster name	Cluster No	Cluster name	Cluster No	Cluster name	Cluster No
Napetet	1, 2, 3, 4	Lokichar	RC, 1, 2, 3	Lotanit	1, 2, 3, 4, 5, 6	Katalemot	RC, 1
Kanamkemer	5, 6	Loperot	4, 5, 6	Nalita	7, 8	Oropoi	10
Naiwotorong	7, 8, 9	Kalapaata	7, 8	Lokolio	9	Tarach	11, 12
Kerio	10	Nakalalei	9,10,11	Milima tatu	RC	Nadapal	13, RC, 14, 15, 16, 17, 18, 19
Nakuro	11	Longwaangamatak	12, 13, 14, 15	Kalem	10, 11, 12	Namorungole	20, 21, 22
Nakaret	14, 15	Lokori	16, 17, 18, 19, 20, 21	Loruth/Esekon	14	Lokore	23, 24
Lorengulup	RC	Lotubae	RC, 22, 23, 24, 25, 26, 27	Kanarudio	RC, 15, 16, 17	Nakalale	25, 26
Locharekuyen	16, 17	Elelea	28	Kaeris	18	Lokichoggio	27, 28
Lochar Edema	18	Lochakula	29	Nadunga	19	Lokariwon	29
Puch	RC, 19	Lokwamusing	RC, 29, 30, 31, 32, 33	Nabulukok	20	Songot	30
Nameruputh	20	Kalamungorok	34, 35, 36, 37	Lewan	21	Lokudule	31
Nakurio	21	Kanaodeon	38	Naipekar	22	Lokangae	32
Lochar lomala	22, 23, 24	Kainuk	39	Kokuro	RC, 23, 24, RC, 25	Mogila	35, 36, 37, 38, 39
Kapua	25	Naipan	40, 41	Lowerangak	26, 27, 28, 29, 30	Nanam	40, 41

Central		South		North East		North West	
				Kanamukuny	31		
				Kataboi	32, 33, 34, 35		
				Katiko	36, 37		
				Lokomarinyang	RC, 38, 39, 40		
				Karah 1	41		

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
						___/___/____		

| *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		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=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)) 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)……………..

1.2 (Start with the youngest to the oldest member of the household Insert the names of the persons and ensure that numbering is continuous (For the head of the household, indicate M for mother, F for father, C for child headed HH and, GF for grandfather and GM for grandmother)

Age group	ID	NAME	Date of birth dd/mm/yyyy	Months			
Under 5 years							

62

	ID	NAME		AGE		SEX	OCCUPATION
over 5 years	ID	NAME		AGE		SEX	OCCUPATION

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 (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														

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)_____						
2			Yes ☐ No☐	☐ Watery diarrhea ☐ Bloody diarrhea ☐ Cough with difficult breathing ☐ Fever ☐ Fever with chills ☐ Other (specify)_____						

| 3 | | | Yes ☐ No☐ | ☐ Watery diarrhea
☐ Bloody diarrhea
☐ Cough with difficult breathing
☐ Fever
☐ Fever with chills
☐ Other (specify)_____ | |
| 4 | | | Yes ☐ No☐ | ☐ Watery diarrhea
☐ Bloody diarrhea
☐ Cough with difficult breathing
☐ Fever
☐ Fever with chills
☐ 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
						___/___/_____		

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. Kindly probe the mother for responses and record the codes/responses as the mother names the fluids and liquids in their appropriate category

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 (Mamex, Nan) 1. Yes 2. No 3. DNK	Other milks: animal milk, - reconstituted powdered milk, (Hilwa, Milki, Nido, Safari land, Hayat, Coast) - Sour milk. 1. Yes 2. No 3. DNK	Sweetened flavored juices (Quencher, Juice for you, Zeitun, Altuza, Mushakil, vimto, afia, juice cola, Savannah, for you, Delmonte, pliot) Soda 1. Yes 2. No 3. DNK	ORS 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
						____/____/_____		

Now, I will ask you about what solid/ semi solid foods [Name] ate YESTERDAY during the day and the night. YESTERDAY during the day and the night, what food items did [Name] receive? (Ask the mother /caregiver to mention all foods given to the child and record as mentioned in the appropriate category)

Note: Please wait for the mothers response after asking the questions other than reading out the various foods

ChNo	Child Name	4.19	4.20	4.21	4.22	4.23	4.24	4.25	4.26	4.27	4.28
		Eggs 1. Yes 2. No 3. DNK	Porridge made from CSB/ Unimix/ millet/ sorghum/ maize flour Use the correct code. Only one answer. 1. Yes 2. No 3. DNK	Flesh Meats (Chicken, beef, Goat,Kidney,Liver, Mutton, Camel, Donkey, Fish, blood, wild meat) 1. Yes 2. No 3. DNK	Legumes and Nuts (Beans, Groundnuts, Cowpeas, Lentils, Green Grams, Edapal, Eedung, eleero) 1. Yes 2. No 3. DNK	Dairy Products (Milk, cheese, Ghee, fermented milk) 1. Yes 2. No 3. DNK	Grains, Roots &Tubers (Pasta, rice, bread, potatoes, biscuits, mandazi, chapatti, anjera, ugali, cassava, sorghum, millet) 1. Yes 2. No 3. DNK	Vitamin A Rich fruits & Vegetables (pawpaw, melon, Sukuma wiki, carrots, cowpea leaves, spinach, Avocado, lokiliton, loara kimak, akoropait) 1. Yes 2. No 3. DNK	Other Fruits and Vegetables (onions, tomatoes, cabbage, Oranges, bananas Okra, wild fruits) 1. Yes 2. No 3. DNK	Oil (Salad oil), fats, Zeitzun, simsim, (camel fat, goat's fat) 1= Yes 2= No 3= DNK	Yesterday (During the day and at night), how many times did you feed [Name] solid and semi-solid foods? No. of times child was given food to make it full.

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
						____/____/_____		

HOUSEHOLD WATER CONSUMPTION

| 5.1. What is your main current water source for household use? *(Probe for the Main source)*

1=River   7=Public pan
2=Lake   8=Tanker
3=Water tap   9=Dam
4=Borehole   10=Laga
5=Unprotected well   11=Springs
   12=Other
6=Protected well _____ | 5.2 How long does it take to go to the main source of water and come back (in minutes) (In case you approximate in hours kindly note (Hrs)

PLEASE INDICATE THE ACTUAL NUMBER OF MINUTES TAKEN | 5.3 On average, how many LITRES (20 litre jerricans) of water does the household use per day?

PLEASE INDICATE THE AMOUNT OF WATER IN LITRES

_____ | 5.4. How much do you pay for a 20lt jerrican (enter zero if water is free). Enter in Kenya shillings | 5.5. What is your main source of drinking water? *(Probe for the Main source of drinking water)*

1=River   6=Protected well
2=Lake
3=Water tap   7=Public pan
4=Borehole   8=Tanker
5=Unprotected well   9=Dam
   10=Laga
   11=Springs
   12= Oasis
   13=Other
  _____ | 5.6. Do you do anything to the water before drinking it?
1=Boiling
2=Use traditional herbs
3=Use chemicals
4=Filters/Sieves
5=Decant
6=Nothing |
| | | | 1.Per 20lt jerrycan _____
2.Per month_____(FOR ONLY THOSE WHO PAY ON A MONTHLY BASIS)
3. Free_____ | | |

70

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
						____/____/_____		

6. I owe a lot SANITATION (CIRCLE RESPONSES)

| 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 100 meters distance from houses.

1=Yes 2=No

6.1.2 Observe if latrine is in use.

1=Yes 2=N | 6.2. If yes, what type of toilet facility do you have? 1=Bucket 2=Traditional pit latrines 3=Ventilated improved pit latrine 4=Flush toilet 5=Other Specify _____

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 | 6.3. If No, where do you go (defecate)/use? (probe further)

1= Bush 2=Open field 3.=Near the river/Lagga 4.=Behind the house 5.=Other (specify)_____ | 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 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=Other (specify)............................ | 6.5. On what occasion (s) do you wash your hands? Record ALL that applies See codes for 6.5 below

6.5.1 Observe for presence of a hand washing facility next to the toilet/ in the compound.

1=Yes 2=No

6.5.2 Do you use soap/ash when washing hands?

1=Yes 2=No 3=Sometimes

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
						___/___/_____		

FOOD CONSUMPTION AND DIET DIVERSITY

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	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, pasta, *anjera*, rice, bulga wheat, bread)		
Vitamin A rich vegetables and tubers: Pumpkin, carrots, yellow fleshed sweet potatoes		
White tubers and roots: Ppotatoes, white yams , cassava or foods from roots, white sweet potatoes, *egilae*		
Dark green leafy vegetables: Dark green leafy vegetables including wild ones + locally available vitamin A rich leaves such as, pumpkin leaves, kunde leaves, lokilton, lorakimak, erosin akeny, sukuma wiki, spinach, *Ekamongo Eleero, akapurait, eosin-a-ikeny*		
Other vegetables (e.g. tomatoes, biringanya, onions, cabbages)		
Vitamin A rich fruits: Ripe mangoes , papayas + others locally available like watermelon, *edome, ngakalaleo, ebei, ngalam, engomo, etoikira*		
Other fruits like *esekon, engo*		
Organ meat (Iron rich): Liver, kidney, heart or other organ meats or blood based foods , spleen		
Flesh meat and offal's(matumbo): Meat, poultry, (goat, camel)		
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, *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 YESTERDAY? (*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=Other (specify)

73

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 (GENERAL FOOD DISTRIBUTION)

8.1. Have you received FOOD AID (general food distribution) 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, how many times in the last 3 months? 1= Once   2= Two times   3= Three times

Please indicate the food commodities received in the last distribution, duration each food item lasted and how it was utilized. Tick the appropriate spaces.

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

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	
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	
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/Church 3 = Ministry of Health 4= 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 Nobody uses

LIVESTOCK OWNERSHIP

11.1	Do you own livestock? (Chicken not included) 1=Yes; 2=NO	
11.2	Has the size of your livestock herd changed in the last 6 months? (1=increased, 2=reduced, 3=remained the same, DNK=4)	
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
						___/___/_____		

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			
12.1. How old are you? _____ years	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)	12.3. MUAC (cm), left arm (To the nearest 0.1 cm), do not round up _____.____cm	12.4 FOR PREGNANT WOMEN ONLY Have you received iron/folate supplementation in the last 3 months? 1=YES 2=NO 12.5 IF NO, Why NOT? 1= Do not see the need of taking them 2= Not available at the ANC 3= They make me sick 4= Have not started attending clinic 5= Any 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
						___/___/_____		

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									

LOCAL EVENTS CALENDAR-TURKANA CENTRAL 2011

		2006	mnt	2007	mnt	2008	mnt	2009	mnt	2010	mnt	2011	mnt
January (LOKWANG)		New year		New year	52	New year Post election violence, rise of IDP'S, Opening of sesame gold mine	40	New year/ Maka mpya, A woman kills a merille at kokuro	28	New year ECLIPSE OF THE SUN, MARICH BRIDGE SWEPT BY FLOOD	16	New year	4
February (LODUNGE)				Polio campaign	51	Koffi Annan signs Kenya peace accord	39		27		15	Last GFD distribution without interruption	3
March(LOMARUK)	Long rains			Polio campaign	50		38	Polio kanipen	26		14	Ordination of catholic bishop(Kimengich dominic	2
April (LOCHOTO)	Long rains	Floods in Lomil,1st Turkana to be appointed minister		PPR - disease for small livestock	49	Resurgence of Lommo(PPR)	37	Counsellor Aule's arrest; dry grass relief	25	Beginning of the registration of voters by IIEC. Todonyang raid IIEC	13	Todonyang Masacre/raid IIEC	1
May (TITIMA)	Long rains	Measles outbreak		Lokwamusing Massacre	48	Napena, yellow maize flour	36		24	The end of the registration of voters by IIEC	12	False prophecy by Haron (ending of world /judgement day)	
June (EEL EEL)			59	Registration of voters, bridge collapses in Kainuk , Wathog bites child in Kanamkemer	47	Kenya oil comes to Lodwar for extraction	35	Polio kanipen	23	The end of nutrition and food security survey for 2010	11		
July (LORARA)			58	Nominations	46	Demonstration about the district HQ in Lokori	34		22		10		

Month												
August (LOSUBAN)		Elephant swept away by R.Turkwel, Flush floods , SFP/TFP	57	Death of Ashraf	45	Napeiton massacre	33	census	21	The constitution referendum. Referendum	9	
.September (LOTIAK)			56	Power connection in Kainuk	44	Accident of Kangitit girls high school	32	CHOLERA OUTBREAK	20		8	
October (LOOPO)	Short rains		55		43		31	NADAPAL(LOKI) BORDER CONFLICT	19	The eating of dogs at Loima. Dog eating	7	
November (LOMUK)	Short rains		54		42	Obama wins the USA elections	30	COUNCELLORS DIE IN NAKURU ROAD ACCIDENT	18	The release of councilor Ebenyo from Prison	6	
December (LOLONGUK)		Christmas	53	Elections Christmas gold discovered	41	Christmas Lorengippi massacre	29	Christmas	17	Christmas	5	