MATERNAL INFANT AND YOUNG CHILD NUTRITION (MIYCN) KNOWLEDGE, ATTITUDES, BELIEFS AND PRACTICES (KABP) SURVEY REPORT

SAMBURU COUNTY

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TABLE OF CONTENTS

ACKNOWLEDGEMENT ii
TABLE OF CONTENTS iii
ACRONYMS AND ABREVIATIONS vii
EXECUTIVE SUMMARY ix
RECOMMENDATIONS xiii
1. INTRODUCTION 1
1.1 Background Information 1
1.2 Justification to conduct the survey 2
1.3 Survey objectives 2
1.4 Significance of the survey 2
2. METHODOLOGY 2
2.1 Survey Design 2
2.2. The Target Population 3
2.3 Sample Size Determination 3
2.3.1 Sample Size Determination for IYCN indicators 3
2.3.2 Calculation of number of clusters 3
2.3.3 Sample size for focus group discussions (FGDs) 4
2.4 Sampling Procedure 4
2.5 Data collection tools 4
2.6. Implementation of the Survey 5
2.6.1 Survey Team 5
2.6.2 Training of survey team members 5
2.6.3 Pre-testing 6
2.7 Data collection and quality control 6
2.8 Data management and analysis 6
2.9 Definition of key MIYCN indicators 7
3. RESULTS 9
3.1 Household characteristics 9
3.2 Child characteristics 9
3.3 Maternal Characteristics 10
3.4 Infant and young child feeding practices 11
3.4.1 Breastfeeding practices for children 0-23 months old 11
3.4.2 Bottle feeding practices 13
3.5 Complementary feeding practices 13

3.5.1 Types of foods eaten 13
3.5.2 Introduction to and consumption of solid, semi-solid or soft foods 14
3.6 Factors influencing infant and young child (IYCN) feeding practices 15
3.6.1 Factors enhancing infant and young child feeding practices 15
3.6.2 Barriers to Infant and Young Child Feeding Practices 17
3.5.3 Suggestions for improvement of the IYCN practices by participants in the FGDs 17
3.6 Responsive feeding of children 6-23 months old 17
3.6 Feeding during illness 18
3.7 Knowledge and consumption of micronutrient powders for children 6-23 months old 19
3.7.2 Consumption of foods and lipids to which MNPs have been added 20
3.7.3 Preparation and Consumption of Micronutrient Powders (MNPs) 21
3.8 Maternal knowledge on infant and young child feeding practices 22
3.8.1 Knowledge on breastfeeding practices 22
3.8.2 Knowledge on complementary feeding practices 24
3.9 Maternal attitudes on infant and young child feeding practices 24
3.10 Perceptions on infant feeding practices 25
3.11 Factors influencing Infant and Young Child (IYCN) Feeding Practices 26
3.11.1 Factors enhancing Infant and Young Child Feeding Practices 26
3.11.2 Barriers to Infant and Young Child Feeding Practices 28
3.12 Ante Natal Care (ANC) for pregnant women 28
3.12.1 ANC attendance and provision of services 28
3.12.2 Iron and folic acid supplementation (IFAS) for pregnant women 29
3.12.3 Provision and consumption of IFAS by pregnant women 30
3.13 Ante-natal care for mothers with children 0-23 months old 31
3.13.1 Frequency and timing of ANC attendance 31
3.13.2 Reasons for not attending ANC 32
3.13.3 Services offered at ANC clinic 32
3.13.4 Factors influencing ANC attendance 34
3.14 Iron and folic acid supplementation (IFAS) for mothers with children 0-23 months old 34
3.14.1 Maternal knowledge on IFAS 34
3.14.2 Maternal provision and consumption of IFAS by mothers 0-23 months old 35
3.14.3 Factors influencing the consumption of IFAS 37
3.15 Post-natal care services for mothers with children 0-23 months of age 38
3.15.1 Factors influencing the uptake of PNC services 38
3.16: Dietary intake by women of reproductive age (15-49 years) 38
3.16.1 Foods eaten the previous day by women of reproductive age 39

13.6.2 Maternal dietary diversity 39
13.6.3 Factors influencing maternal dietary intake 40
3.17 Use of fortified foods by households 40
3.18 Maternal and child nutritional status based on MUAC measurement 41
3.19 Access to health and nutrition information via media channels 42
4: DISCUSSION 43
4.1 Infant and young child feeding practices 43
4.1.1 Breastfeeding practices 43
4.1.3 Complementary feeding practices 44
4.2 Maternal knowledge, attitudes and perceptions on IYCN 45
4.3 Responsive feeding practices 45
4.4 Feeding of children during illness 45
4.5 Access, preparation and consumption micronutrient powders (MNPs) 46
4.6 ANC attendance by pregnant women 46
4.7 Maternal knowledge on IFAS, provision and consumption by pregnant women 46
4.8 Dietary intake of women of reproductive age 47
4.9 Access to health and nutrition information via media 47
5. CONCLUSIONS 47
6. RECOMMENDATIONS 49
6.1 Programme recommendations 49
6.2 Recommendations for future surveys 50
7. REFERENCES 51
8. APPENDICES 52

LIST OF TABLES

Table 1: Child characteristics 9
Table 2: Maternal and caregivers' characteristics 10
Table 3: Pre-lacteal feeding of infants 12
Table 4: Types of foods eaten the day prior to the survey by the children 6-23 months old 14
Table 5: Prevalence of key complementary feeding practices 15
Table 6: Responsive feeding of children 18
Table 7: Feeding during illness 19
Table 8: Maternal knowledge on MNPs and sources of MNPs for children 20
Table 9: Preparation and consumption of micronutrient powders (MNPs) 22
Table 10: Maternal knowledge on breastfeeding practices 23
Table 11: Maternal knowledge on breastfeeding practices cont. 23
Table 12: Maternal attitudes on infant and young child feeding practices 25
Table 13: Maternal perceptions on infant feeding practices 26
Table 14: Ante-natal care for pregnant women 29

Table 15: Pregnant women's knowledge of IFAS 30
Table 16: Provision and consumption of IFAS for pregnant women 31
Table 17: Maternal knowledge on IFAS for women with children 0-23 months old 33
Table 18: Maternal knowledge on IFAS for women with children 0-23 months old 35
Table 19: Provision of IFAS 36
Table 20: Consumption of IFAS 37
Table 21: Post-natal care services for mothers with children 0-23 months old 38
Table 22: Foods eaten by women of reproductive age the day before the survey 39
Table 23: Use of fortified foods by households 41
Table 24: Maternal and child nutritional status based on MUAC measurement 42
Table 25: Access to different radio channels 42
Table 26: Comparison of the prevalence of the key breastfeeding indicators (national and Samburu County) 44
Table 27: Comparison of complementary feeding practices at national and Samburu County levels 45
Table 28: Recommendations 49

LIST OF FIGURES

Figure 1: Map of Samburu County showing livelihood zones 1
Figure 2: Prevalence (%) of key breastfeeding indicators 11
Figure 3: Exclusive breastfeeding rates disaggregated by age of child 11
Figure 4: Practical support offered to mothers to start breastfeeding 12
Figure 5: Feeding of children using various containers 13
Figure 6: Consumption of foods to which MNPs have been added 21
Figure 7: ANC attendance by mothers of children 0-23 month old 32
Figure 8: Minimum dietary diversity for women of reproductive age 40

ACRONYMS AND ABREVIATIONS

ANC	Ante-natal care
CF	Complementary Feeding
CHMT	County Health Management Team
CHVs	Community Health Volunteers
CNC	County Nutrition Coordinator
EBF	Exclusive breastfeeding
ENA for SMART	Emergency Nutrition Assessment (ENA) for Standardized Monitoring and Assessment of Relief and Transitions
FAO	Food and Agriculture Organization
FGD	Focus Group Discussions
FGDs	Focus Group Discussions
IFAS	Iron, folic acid supplementation
IYCF	Infant and Young Child Feeding
IYCN	Infant and Young Child Nutrition
KABP	Knowledge, Attitudes, Beliefs and Practices
KAP	Knowledge, Attitudes and Practices
KDHS	Kenya Demographic Health Surveys
KIIs	Informed Key Interviews
MAD	Minimum Acceptable Diet
MDD	Minimum Dietary Diversity
MMD-W	Minimum Dietary Diversity for women of reproductive age
MIYCN	Maternal Infant and Young Child Nutrition
MMF	Minimum Meal Frequency
MNPs	Micronutrient Powders
MOH	Ministry of Health
MUAC	Middle Upper Arm Circumference
NGO	Non-governmental Organization
NSO	Nutrition Support Officer
NHP Plus	Nutrition and Health Program Plus

ODK	Open Data Kit
PNC	Post-natal care
SCNC	Sub-County Nutrition Coordinator
WHO	World Health Organization

EXECUTIVE SUMMARY

Introduction

This report summarizes the outcomes of a Knowledge, Attitudes, Beliefs and Practices (KABP) Maternal Infant and Young Child Nutrition (MIYCN) survey conducted in Samburu County in February 2018. This was a baseline survey conducted to provide benchmarks against which to measure programme performance in the future as well as identify the barriers to appropriate MIYCN practices in the County.

Methodology

The survey adopted a mixed design using both quantitative and qualitative data collection methods. The quantitative data was collected at household level whereas qualitative was collected through Key Informant Interviews (KIIs) with programme officers and Focus Group Discussions (FGDs) with mothers, fathers and Community Health Volunteers (CHVs).

The survey used a two-stage cluster sampling methodology based on proportion to population size to select 63 clusters of 16 households each. The clusters were selected from a comprehensive list of the smallest geographical unit (villages) for which population statistics were available. The target population was mothers/caregivers and their children aged 0-23 months. Data was collected for 1008 children of whom 272 (27.0%) were infants less than 6 months of age and 993 were mothers/caregivers. Data was also collected on Ante-natal care (ANC), Post-Natal Care (PNC) and Iron Folic Acid (IFAS). The data were entered and analyzed in SPSS version 22.0 for Windows. Qualitative data was analysed through content analysis based with the objectives of the survey.

Findings on key MIYCN indicators

Indicator	Prevalence (%)
Infant and Young Child Feeding Practices	
Breastfed in demand	92.7
Exclusively breastfed	77.6
Continued breastfeeding at 2 years	41.1
Continued breastfeeding at 1 year	86.0
Given pre-lacteal feeds	10.9
Given colostrum	95.2
Initiation of breastfeeding within 1 hour	83.7
Bottle feeding with nipple/teat	26.8
Complementary feeding practices	
Proportion of infants 6-8 months old who received solid, semi-solid or soft foods the previous day	47.9
Minimum Dietary Diversity (MDD) % 6-23 months old who received foods from ≥ 4 food groups % 6-23 months who received foods from ≥ 4 food groups by breastfeeding status: • Not breastfed • Breastfed	 59.6 67.7 57.5
Minimum Meal Frequency (MMF) % of both breastfed and non-breastfed 6-23 months of age who received foods the minimum times or more Breastfed: • 6-8 months old [2 times] • 9-23 months old [3 times] Non-breastfed: 6-23 months old [4 times]	 35.9 39.1 37.2 11.0

Minimum Acceptable Diet (MAD) % of children 6-23 months of age who receive a minimum acceptable diet	25.7
Consumption of iron-rich foods	21.1
Feeding during illness	
Offered less breastmilk to child than usual	75.8
Offered less non-breastmilk to child than usual	77.1
Offered less food to child than usual	16.4
Knowledge on breastfeeding and complementary feeding practices	
Breastfeeding should be initiated within 1 hour of birth	93.2
Baby should be given colostrum	97.4
Pre-lacteals should not be given	91.3
Duration of exclusive breastfeeding	84.7
Solid, semi-solid and soft foods should be introduced at 6 months	72.7
Attitudes on breastfeeding and complementary feeding practices	
A baby should be breastfed immediately after they are born	93.5
Would you feed your baby colostrum?	98.9
It is important for a baby to breast fed for 6 months without being introduced to anything else including water	85.9
Perceptions to infant feeding practices	
Do not believe that certain foods are taboo and should not be fed to pregnant women	69.5
Do not believe that a new born baby should be given liquids other than breastmilk	89.2
Do not believe that colostrum is dirty and should not be fed to new born babies	95.1
Do not believe that a baby cannot survive on exclusive breastfeeding for 6 months	87.5
Do not believe that certain foods are taboo and should not be fed to a child	82.1
do not believe that a young child should not be breastfed up to 2 years	85.6
Ante-Natal Care for mothers with children 0-23 months of age	
Attended ANC at least once	84.8
First ANC visit during the first trimester	25.8
Made at least 4 visits during pregnancy	50.2
IFAS for mothers when pregnant with children 0-23 months old	
Heard of IFAS	81.2
First source of information on IFAS: • Health staff from health facility • Community Health Volunteers (CHVs)	 96.9 17.5
Know benefits of IFAS	71.0
Number of days for which combined iron/folic acid tablets were given**:** Combined iron/folic acid tablets: < 60 days 60-89 days ≥90 days	 77.6 10.1 12.3
Number of days for which combined iron/folic acid tablets were consumed**:** < 60 days 60-89 days ≥90 days Consumption of IFAS	 78.6 10.3 11.1
Dietary Diversity for women of reproductive age (MMD-W): Attained Minimum Dietary Diversity (ate foods from at least 5 food groups)	 47.5

Breastfeeding practices: Overall the practices were optimal except for: provision of pre-lacteal feeds; continued breastfeeding at 2 years; practical support given to mothers to help start breastfeeding; and bottle feeding with teat/nipple. Efforts should continue to be made to ensure further improvement in breastfeeding practices and also to ensure that the gains made are not lost. Despite the fact that EBF has improved significantly, the rate should be improved further to reach 90%, the minimum recommended by WHO to have impact on and reduce mortality by 13% among the underfives. In any case, exclusive breastfeeding was stopped at 3 months for the

majority of the children and there is need therefore to encourage mothers to continue the practice until 6 months.

Complementary feeding practices: Overall, the CF practices were sub-optimal implying that a majority of the children are not getting adequate diet; a diet that provides adequate nutrients in terms of quantity and variety for healthy development. Given that knowledge and cultural practices were not the major hindrances to appropriate complementary feeding practices, there is need for innovative and nutrition-sensitive interventions to address food insecurity which is the major hindrance to appropriate feeding practices.

Knowledge on MIYCN practices was high and the attitudes and perceptions positive. Promotion of appropriate MIYCN messages should be up-scaled. Messages to promote appropriate MIYCN practices should continue to be disseminated with particular emphasis on the remote, hard to reach areas where knowledge was reported to be low. There is need to explore the use of various channels in the promotion of these messages such as the Serian FM. and the mobile phones especially through text messages.

In terms of ANC attendance, the majority of the pregnant women make at least one visit to a skilled health provider. The challenge is with the frequency of ANC attendance as well with timing of the first visit to the ANC. It is therefore important to establish the reasons why mothers do not start attending ANC in a timely manner and at the recommended frequency. This information would be useful in addressing the development of messages on the health benefits of attending ANC and also useful in addressing the barriers to pregnant women attending ANC as recommended.

The coverage for the provision and consumption of IFA supplements to pregnant women is low. The majority of the pregnant women received and consumed IFAS for less than 60 days and yet it was reported that the county had not experienced any stock outs of the combined IFAS. There is need to train the CHVs on IFAS so that they promote the consumption and address the mothers' challenges in the use of the supplements at the household level. It was reported that this training has yet to be conducted. May be frequent follow-up at the household level by the CHVs may encourage pregnant women and also remind them to take IFAS. One of the reasons given for not taking IFAS on a regular basis was forgetfulness.

Responsive feeding: Overall, positive as the majority of the mothers talked to children and encouraged them to eat and self-feed. There is need to discourage the practice of ordering and threatening children to eat as was reported by about one-quarter of the mothers.

Feeding during illness: Overall, poor feeding practices and should therefore be appropriately addressed in the behaviour change communication messages.

Maternal dietary intake: Maternal dietary intake needs improvement given that less than half of the mothers attained a minimum dietary diversity. The major hindrance to adequate dietary intake is food insecurity and poverty. So addressing food security issues would improve mothers' dietary intake.

Factors influencing MIYCN practices

Factors influencing MIYCN positively

- **High level of knowledge on breastfeeding and complementary feeding practices** the mothers and the community as a whole. This together with the positive attitudes and perceptions to IYCF practices may have contributed to the appropriate breastfeeding feeding practices. The knowledge and positive attitudes and perceptions towards on complementary feeding did not necessarily translate to improved practices.
- It was also reported during the FGDs **that cultural beliefs** are no longer a barrier to IYCN practices for the majority of the people.
- **High level of maternal knowledge** on the health benefits of ANC attendance and consumption of IFAS during pregnancy influences mothers to seek these services. Despite this, many mothers did not seek these services on regularly.
- The services provided at the ANC such as; growth monitoring of the foetus, checking of anaemia and provision of supplementary foods encouraged mothers to attend ANC encouraged mothers to attend ANC clinics.

Barriers to appropriate MIYCN practices

- **Household food insecurity** resulting into inadequate dietary intake affecting milk production among breastfeeding mothers. Similarly, food insecurity was a major factor contributing to inappropriate complementary feeding practices because of unavailability and inaccessibility of a variety of foods. Poverty and loss of livestock were reported to major constraints to household food security. Poor household food security was also a major factors constraining maternal adequate dietary intake;
- **Family conflicts and violence** causing stress to the mother and therefore not able to produce adequate breastmilk and also take care adequate care of children;
- **High maternal workload** affecting time mother is available to provide quality care to the child and also to breastfeed and prepare appropriate complementary foods for the baby;
- **Alcoholism among the mothers** interfering with quality of care given to children including appropriate feeding practices;
- **Inadequate knowledge on complementary feeding practices** particularly on how to prepare foods for the children was reported to be a constraint to appropriate feeding practices.
- **The women who did not attend ANC regularly** were discouraged by: the high maternal workload; long distance to health facilities; were not comfortable to be attended by male health workers; mandatory HIV testing and some were discouraged by their husbands from attending.
- **The women who did not take IFAS on a regular basis** were discouraged by the side effects (nausea and vomiting) while some forgot to take them.

RECOMMENDATIONS

Programme recommendations

Recommendations	Persons responsible	By when
Optimize utilization of Social and Behavior Change Communication Strategy to promote adoption of appropriate MIYCN practices	CHMT – CNC- Partners	Continuous
Enhance collaboration of Health/Nutrition Sector and other nutrition sensitive actors through Samburu County Nutrition Multi Stakeholder Platform to promote a holistic way of addressing nutrition issues	Departments of Health, Agriculture, Child Protection Services, Water, and Education	Continuous
Promote operationalization of Complementary Feeding Action Plans	CHMT	Continuous
Scale up Baby Friendly Community Initiatives in all Community Units	CHMT	April 2019
Training of CHVs on Nutrition modules	CHMT/Partners	December 2018
Training of health workers on MIYCN/BFCI Modules	CHMT	December 2018
Dissemination of VAS, IFAS, and MIYCN Policies	MoH/CHMT	December 2018
Promote customization of local diets and Food demonstrations	Ministry of Agriculture	Continuous
Develop and operationalize County Common Results Framework	Samburu County Multi- Stakeholders Platform	By May 2018
Recruitment of more nutritionists	County Government	2019
Advocacy for more investment in nutrition	CHMT/Partners	Continuous

Recommendations for future surveys

- Conduct in-depth MIYCN KAPB qualitative surveys to provide detailed sub-county level information to allow for appropriate programming taking into account any differences in the sub-counties.
- The questionnaire should be shortened and made to focus on the key MIYCN indicators. Questions with a high possibility of recall bias e.g. IFAS for mothers with children 0-23 months old- the target population should be changed to mothers with younger children to minimize recall bias.
- Data analysis: It is recommended that qualitative data be analysed using data analysis software for improved efficiency. It is also recommended that basic inferential statistics be included in the analysis to provide information for more targeted MICYN messages.
- The ToR should include maternal nutrition and other-related indicators e.g. IFAS and ANC based on the WHO and MOH guidelines.

1. INTRODUCTION

1.1 Background Information

Samburu is located in the Northern part of Kenya bordering Marsabit, Turkana, Isiolo, Laikipia and Baringo Counties. It is administratively subdivided into three sub-counties; Central, East and North. Samburu County covers a total area of 20,826 Km2 with a population of 224, 000. The major livelihood is nomadic pastoralism practiced by 99% of the people and a relatively smaller percentage of the population practice agro-pastoralism (https://www.google.can/search? q=Samburu County + maps& - accessed on 29th March 2018) as shown in Figure 1.

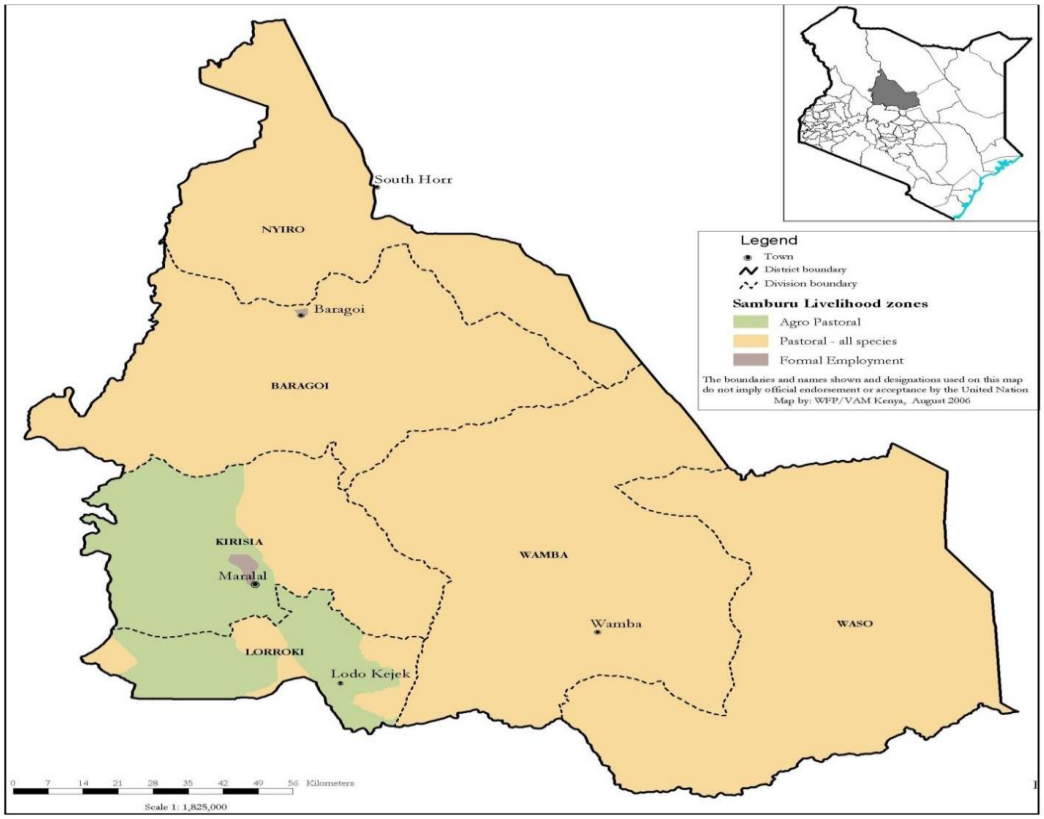

Figure 1: Map of Samburu County showing livelihood zones

The nutritional status of children underfive years of age continues to be poor and the rates of malnutrition are above the minimum acceptable levels and are also higher than the national rates. The stunting rate in Samburu according to the most recent Kenya Demographic Health Survey (KDHS) 2014 is 30.1% compared to the national rate of 26.1%; wasting rate is 13.6% compared to 4.0% national rate and underweight is 28.9% whereas the national rate is 11.0%.

Stunting is as a result of extended periods of inadequate food intake, poor dietary quality, increased morbidity, poverty, low maternal education or a combination of these factors. Stunting and poor nutritional status eventually result to mortality among children. Nutrition interventions have been demonstrated to the most effective preventive actions for reducing mortality among children under the age of five years. Of these actions, exclusive breastfeeding ranks first; being estimated as having the potential to prevent 13 percent of all deaths in this age group while appropriate complementary feeding, water, sanitation and hygiene would reduce 6 percent and 3 percent respectively (Lancet, 2003).

1.2 Justification to conduct the survey

According to KDHS 2014, data on exclusive breast feeding and complementary feeding practices is available at national level but not county level. At the national level, Kenya has made progress on exclusive breast feeding from 32% in 2008/09 to 61% in 2014. In Kenya, about two in ten (21 percent) children age 6-23 months consume an Minimum Acceptable Diet (MAD). The Nutrition Program Review (2016) has shown that current data on exclusive breastfeeding and complementary feeding practices is lacking in target Counties such as Samburu. The 2016 Communication For Development Secondary Data Analysis and Literature identified information gaps such as lack of sub-national level evidence on knowledge, attitudes, beliefs and practices in relation to appropriate feeding practices and lack of analysis on reasons for low exclusive breastfeeding in selected counties such as Samburu. It was therefore important to gather evidence (quantitative and qualitative) that will guide nutrition program in terms of measuring progress and guiding programmatic strategies and activities based on WHO 2010 and Kenya MOH guidelines (MOH, 2016) and data collection tools (MOH, June 2015).

1.3 Survey objectives

Overall, the main objective of this survey was to collect baseline information on knowledge, attitudes, beliefs and practices among mothers/caregivers in Samburu County (Appendix 3 for TOR).

1.4 Significance of the survey

In particular, the findings of this survey will be used to support MOH, NHPplus and UNICEF's work in nutrition, specifically by:

- Improving the understanding of the core IYCN indicators in Samburu County
- Measuring progress and informing programme design and implementation through application of these findings.

2. METHODOLOGY

2.1 Survey Design

The survey adopted a mixed methods using both quantitative and qualitative data collection methods. The quantitative data was collected through household surveys to obtain information on maternal knowledge, attitudes, practices, beliefs and practices on MIYCN. Qualitative data collection involved Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs). KIIs were conducted with various stakeholders (Programme Officers from partner organizations), Country Nutrition Coordinators (CNCs), Sub-County Nutrition Coordinators (SCNCs). The KIIs solicited information on MIYCN practices in the County, the factors enhancing appropriate practices and the barriers to appropriate practices in the County. Focus Group Discussions (FGDs) were conducted with mothers, fathers and Community Health Volunteers (CHVs) to solicit their perceptions on the MIYCN practices in the County as well as the barriers to such practices, if, any and how they think these can be minimized. The qualitative information collected from the KIIs and FGDs was used to complement the quantitative data from the household survey and also to provide an in-depth understanding of the community's MIYCN practices and perceptions.

The survey was conducted in a participatory manner that involved consultations with Ministry of Health (MOH) Officials, NGO partners, UN agencies and beneficiaries.

2.2. The Target Population

The target population was mothers/caregivers and their children 0-23 months of age in Samburu County. Children 0-23 months old were targeted because this is the window period for implementing appropriate infant and young child feeding otherwise the adverse consequences of inappropriate feeding may be irreversible after this period. The survey was conducted in the all the three sub-counties in Samburu County; Samburu East, Samburu North and Samburu Central.

2.3 Sample Size Determination

2.3.1 Sample Size Determination for IYCN indicators

The sample size for the IYCN indicators was calculated based the Care International Step by Step Guide (2010). Based on this guide, the sample size for each of the **eight** IYCN core indicators was calculated and computed based on various parameters: the most recent estimate (prevalence/rate); level of precision; and design effect as shown in Table 1. The estimates used in the sample size calculation was from the findings of a KABP survey conducted in Samburu County in 2014.

Table 1: Calculation of sample size

Indicator	Estimate* (%)	Precision	Design Effect	Sample Size
Timely Initiation of breastfeeding	89.6	8.0	1.5	91
Exclusive Breastfeeding Rate	69.4	8.0	1.5	208
Continued breastfeeding at 1 year	90.4	8.0	1.5	85
Minimum Dietary Diversity	25.0	7.0	1.5	240
Minimum Meal Frequency	69.8	8.0	1.5	207
Minimum Acceptable Diet	**47.0**	**8.0**	**1.5**	**244**
Consumption or iron-rich or iron-fortified foods	3.5	7.0	1.5	43
Bottle feeding	13.7	7.0	1.5	151

*From KABP 2014 Survey

The Care International Step-By-Step Guide (2010) recommends a precision of between 5% and 10%; in this survey, a precision of 8% was used for prevalence rates above 25% and 7% for those below 25% (Table 1). A design effect of 1.5 was used for the eight indicators. This was based on the assumption that there is some level of heterogeneity in the IYCN practices within the County. A 95% Confidence Interval was used in the calculation of the sample size. The indicator Minimum Acceptable Diet (MAD) was used to calculate the final sample size because it yielded the largest sample size (244) at this stage sample size calculation. This sample size (244) was multiplied by 4 to yield a total sample size of 976 children 0 to 23 months of age. As recommended by the Care International Step-by-step Guide (2010); the sample size is multiplied by 4 to allow for large enough samples for disaggregation into 4 age categories for children 0-23 months (0 – 5, 6 – 11, 12 – 17 and 18 – 23.9) during data analysis. This sample size (976) was then adjusted upward by a non-response rate of 2% to give **996** as the final sample size of children aged between 0 and 23 months.

2.3.2 Calculation of number of clusters

The total number of clusters/villages for the survey was **63**. This was obtained by dividing the calculated final sample size **(996)** by **16** (total number of households to be visited per cluster per day). The number of households to be visited per cluster per day was based on experience from previous KABP surveys that used the same MIYCN KABP tool as used in this survey and conducted in Homa-Bay, West Pokot, and Turkana.

2.3.3 Sample size for focus group discussions (FGDs)

In total 20 FGDs were conducted in all the three sub-counties in Samburu County. The FGDs were conducted in 20 villages across the villages/clusters sampled for the household survey. Half (10) FGDs were allocated to the mothers since they are the main stakeholders of IYCF issues, 6 FGDs for CHVs and 4 FGDs for men.

2.4 Sampling Procedure

A two-stage sampling methodology was used to select the target population (mothers/care givers) of children 0-23 months old.

Sampling Stage 1

The first stage of sampling involved selection of villages (clusters) which was the sampling unit. The village is the smallest geographical unit for which population statistics were available. All the villages in each of the three sub-locations in Samburu County constituted the sampling frame with the exception of villages where there was insecurity. The population statistics used for sampling of the villages were from the National Census (2009) projections. Emergency Nutrition Assessment (ENA) for Standardized Monitoring and Assessment of Relief and Transitions (SMART) version November 2012 was used to randomly select the villages/clusters.

Each of the villages was listed together with its total population. The cumulative population was then calculated and used in the computation of a population proportional to size (PPS) sampling design to identify the specific villages to be covered by the survey. After computing the cumulative population, the sampling interval was determined by dividing the total cumulative population by the number of clusters required, i.e. 63. A random number (equal to or less than the sampling interval) was then selected from a Table of Random Numbers and the village where the random number fell was the first cluster to be selected for the survey. Subsequent villages were selected by adding the sampling interval to the number first selected. Through this process, the locations of the sampled villages/clusters were identified. This process was conducted using the ENA for SMART software.

Sampling Stage 2

The second stage involved selection of 16 households per cluster/village. A list of all households with children 0-23 months per village was obtained from the Community Health Volunteers (CHVs) and 16 households selected through simple random sampling using Table of Random Numbers. Once a house was selected, the survey team visited the household and inquired if the target respondent (mother/caregiver) of children 0-23 months of age lived that household. If the target population lived there and was willing to participate in the survey, then the relevant data was collected from the respondent. The same procedure was used in each of the selected 16 sampled households. Sampled households were revisited later during the day if, on first visit, the mother/caregiver was not present. If the target population did not live the sampled households then the same sampling procedure was followed to select another household.

If there was more than one child 0-23 months old in a household then the youngest one was included in the sample.

2.5 Data collection tools

The Kenya Ministry of Health (MoH) KAP questionnaire on Maternal, Infant and Young Child Nutrition (June 2015) shown in Appendix 1 was used to collect the quantitative data at the household

level. The questionnaire was in English language. During the training, the key terms were translated into and described in Kiswahili (Kenyan national language) or/and the local languages spoken in Samburu County and back translated into English to ensure accurate translation. The translation (from English to local language and back translation to English) was agreed upon through general consensus during the training.

FGD and KII guides were used to collect quantitative data from various groups of community members and Key Informants (MoH officials and programme officers) respectively (Appendix 2). These guides were developed by the consultant to solicit information related to the objectives of the KABP survey. The guides were developed in English language and key terms and ideas were translated into Kiswahili and local languages in Samburu County and back translated into English to ensure accurate translation during the training of the FGD team.

The questionnaires were pre-tested during the training for accuracy and validity. Minor corrections were incorporated after pre-testing. The questionnaires had provision for respondents to indicate their verbal informed consent before participating in the survey.

2.6. Implementation of the Survey

2.6.1 Survey Team

The survey team was composed of various groups of people:

- The coordination and supervisory teams composed of the consultant and two technical assistants; CNC, NSO, officer from NHPplus-FTO, CNC and SCNCs.

- An ODK expert in charge of uploading questionnaire on to the ODK platform and ensuring their accuracy, managing data quality at the server and sharing the data with the relevant persons on a daily basis.

- The household survey team: Composed of 12 teams each comprising of 3 members making a total of 36 data collectors. Each team had 2 enumerators, and a team leader from the MoH and/or the partners.

- The FGD teams: Three FGD teams each composed of a facilitator/moderator, a recorder, an observer and a transcriber, making a total of 12 people.

The household survey team members had at least Kenya Certificate of Secondary Education (KCSE) with the majority having prior experience in surveys.
Note: The survey team members were mainly staff from the MoH (nurses, nutritionists, public health officers, and a Medical Officer) and partners.

2.6.2 Training of survey team members

Four-day training for the household survey was conducted by the consultant and two technical assistants in collaboration with the Nutrition Support Officer (NSO) Samburu, Country Nutrition Coordinator (CNC) Samburu and an Officer from the partner NHP plus –FTO. The training took place from 15th to 18th February, 2018. The training focused on the objectives of the survey, uses of KABP surveys, cluster and household selection, interviewing techniques, accurate recording of responses and the use of mobile technology in data collection. Lectures, Question and Answer and demonstrations were used to train the participants. Role-plays on how to administer the questionnaire

and record responses were also conducted. Participants were exposed to practical hands on experience on the use of mobile technology in data collection.

The FGD team was trained separately from the household survey team over a 3-day period from 16th to 18th February 2018 although they participated in the training for the household survey during the first day of the training (15th February). This was to enable them understand the survey purpose and objectives as this would assist them to better understand the kind of information they were required to collect through the FGDs. The training focused on the objectives of the FGDs, understanding the kind of information to be solicited through the FGDs, how to conduct FGDs, translation of the questions into the local language etc. Very important was how to record the discussions and deliberations. The transcribers were also trained on the transcription process.

2.6.3 Pre-testing

A one-day pre-testing of the questionnaires was conducted on the last day of training. This was to test for accuracy, clarity and validity and modified accordingly. Each team conducted 3 interviews and recorded responses on the tablets/mobile phones. The survey teams also tested the survey procedures; sampling, interviewing techniques, and the duration taken to sample and interview one household. The consultant and the supervision team members accompanied and observed the teams during the pre-testing in order to identify the weaknesses and strengths of the teams. All the filled in questionnaires were checked by the consultant, her assistants and the rest of the supervisory team (MOH and partners). Pre-test data was uploaded by the enumerators to the server and checked for data quality and accuracy by the consultant.

The FGD teams each conducted an FGD during the pre-testing; one team conducted an FGD for mothers, another for men and the third one for CHVs.

2.7 Data collection and quality control

The data was collected over a 6-day period, from 19th to 24th February 2018. Data was collected using face to face interviews at respondents' home. Data was collected by trained enumerators under the supervision of the consultant and the technical assistants, MOH officials, NSO, CNC and NHPplus officer. Data was collected using android phones/tablets and the Open Data Kit (ODK software). Data entry process was conducted simultaneously with data collection. Validation and verification through comparisons of the data sets was done using Open Data Kit aggregate to obtain the final data. The enumerators were comprehensively trained in order to standardise the data collection method. The enumerators uploaded the data on the ODK server daily once the data had been checked by the team leaders. Data was also validated on a model installed into the phones through skip patterns to ensure that what was submitted was correct and accurate.

2.8 Data management and analysis

Quantitative data

The external ODK expert sent data uploaded to the server by the enumerators to the consultant on a daily basis and if there was need for corrections, the consultant passed this information to the expert who would then make the necessary changes to the data set. At the end of the survey, the expert sent the data set to the consultant in excel format. The consultant exported the data to SPSS version 22 and analysed the data based mainly on the WHO (2010) and MoH MIYCN indicators.

Qualitative data

The data from both focus group discussions and key informant in-depth interviews were transcribed and content analysis conducted. Content analysis involves the detailed exploration for common themes and assigning of labels to variable categories. The categories or themes were identified in advance, in line with the objectives and scope of the survey. The coding consisted of searching for the common themes which could be established as categories into which later information could be inserted. The themes were clustered into a patterned order so as to identify variables that predict general concepts and isolate repetitions. Inferences were made from particular data under each theme and conclusions drawn from the findings. The qualitative data was been used for triangulation of the findings; and to complement the quantitative data obtained from reported household interview information. The qualitative data has also been used to report findings on community's knowledge, attitudes, beliefs and practices of MIYCN as well as to identify the factors enhancing and barriers to appropriate MICYN practices.

2.9 Definition of key MIYCN indicators

A. **Household:** A group of persons who eat from the **same cooking pot.**

B. **Minimum Dietary Diversity for women of reproductive age [15 to 49 years of age] (MDD-W)** is a dichotomous indicator defined as: The proportion of women 15-49 years of age who consumed food items from at least five out of 10 food groups (FA0, 2016)[1]. The ten food groups are as follows:

1. Grains, white roots and tubers, and plantains
2. Pulses (beans, peas and lentils)
3. Nuts and seeds
4. Dairy
5. Meat, poultry and fish
6. Eggs
7. Dark green leafy vegetables
8. Other vitamin A-rich fruits and vegetables
9. Other vegetables
10. Other fruits

C. Definitions of IYCF indicators:

1. **Early imitation of breastfeeding:** Proportion of children born in the last 24 months who were put to the breast within one hour of birth (WHO, 2010).

2. **Exclusive breastfeeding under 6 months:** Proportion of infants 0-5 months of age who are fed exclusively with breastmilk (WHO, 2010).

3. **Continued breastfeeding at 1 year:** Proportion of children 12-15 months of age who are fed milk (WHO, 2010).

4. **Introduction of solid, semi-solid or soft foods:** Proportion of infants 6-8 months of age who receive solid, semi-solid or soft foods (WHO, 2010).

[1] FAO (2016), Minimum Dietary Diversity for Women. A Guide to Measurement. Published by the FAO of the United Nations and USAID'S Food and Nutrition Technical Assistance Project III (FANTA), managed by FHI 360 Rome.

5. **Minimum Dietary Diversity:** Proportion of children 6-23 months of age who receive foods from 4 or more food groups (WHO, 2010). The seven food groups are also as follows:

    11. Grains, roots and tubers
    12. Legumes and nuts
    13. Dairy products (milk, yoghurt, cheese)
    14. Flesh foods (meat, fish, poultry and liver/organ meats)
    15. Eggs
    16. Vitamin A-rich fruits and vegetables
    17. Other fruits and vegetables

6. **Minimum Meal Frequency:** Proportion of children 6-23 months of age who receive solid, semi-solid, or soft foods (including milk feeds for non-breastfed) the minimum number of times or more calculated as follows (WHO, 2010).:

    - **Breastfed children 6-23 months old who receive** solid, semi-solid, or soft foods the minimum number of times or more during the previous day **and non-breastfed children 6-23 months old who receive** solid, semi-solid, or soft foods the minimum number of times or more during the previous day**.**

      Note: **For breastfed children,** the minimum number of times varies with age (2 times for children 6-8 months old and 3 times is 9-23 months old).

      For non-breastfed children, the minimum number of times does not vary with age (4 times for all children).

7. **Minimum acceptable diet:** Proportion of children 6-23 months of age who receive a minimum acceptable diet (apart from breastmilk) calculated as follows (WHO, 2010).

    - **Proportion of breastfed children 6-23 months of age** who had at least the minimum dietary diversity and the minimum meal frequency during the previous day and **non-breastfed children 6-23 months of age** who had at least the minimum dietary diversity and the minimum meal frequency during the previous day.

8. **Consumption of iron-rich or iron-fortified foods:** Proportion of children 6-23 months of age who receive an iron-rich food or iron-fortified food that is specially designed for infants young and children during the previous day (WHO, 2010).

3. RESULTS

3.1 Household characteristics

The majority (84.7%) of the households were male-headed with only 15.3% being female-headed. The mean household size was 5.9±2.0.

3.2 Child characteristics

The total sample size for children for children 0-23 months of age was 1008, larger than the planned 996 children. Children 0-5 months of age were 272 forming 27% of the total sample which was higher than the calculated sample size of 244. Children 6-23 months old comprised of 73% of the total sample. Disaggregated further by age, children 6-11 months old comprised 26.4%, those 12-17 months 23.7% and those 18-23 months old 22.9%. The mean age of the children was 11.0 ±6.9 months (Table 2). Age was verified for a majority of the children (80.6%) by Maternal and Child Health Booklets. The sex distribution of the children was almost equal; 50.4% females and 49.6% males. The majority of the children (57.2%) were born in midwife's homes and 34% in hospitals (Table 2). The percentage of children born at home was larger than what is the usual practice and this was reported to be contributed to the doctors' and nurses' strike that took place in for long periods in 2016 and 2017 interfering with services offered at the health facilities.

Table 2: Child characteristics

	N=1008	
	n	%
Children 0-23 months old	1008	100
Children 0-5 months old	272	27.0
Children 6-23 months old	736	73.0
Children 6-11 months old	266	26.4
Children 12-17 months old	239	23.7
Children 18-23 months old	231	22.9
Age (mean +SD)	11.0 ±6.9	
Age verified:		
Maternal and Child Health Booklet	812	80.6
Birth certificate	11	1.1
Seasonal calendar of events	79	7.8
Others	106	10.5
Sex of child:		
Male	500	49.6
Female	508	50.4
Place of delivery:		
Hospital	343	34.0
Dispensary	13	1.3
Health centre/ private clinic	34	3.4
Home	38	3.8
Midwife's home	577	57.2
Others	3	0.3

3.3 Maternal Characteristics

The majority of the mothers/caregivers were relatively young with a mean age of 26.6 ±6.4 years and a mean parity of 3.4 ±2.0 children. The majority of mothers/caregivers (84.9%) were married with smaller percentages either separated/divorced (2.9%) or living together (1.5%) (Table 3). The majority (85.0%) of the mothers/caregivers were lactating, 5.5% were pregnant and no woman reported being pregnant and lactating whereas those not pregnant and not lactating was 9.5%. The mothers/caregivers' level of education was low; with only 35.2% having gone to school and 12.8 % having less than primary education respectively. Over one-third (39.7%) of the mothers/caregivers were housewives and only 1.9% in formal employment while others were involved in casual labour (11.9%) and petty trading 4.8% (Table 3).

Table 3: Maternal and caregivers' characteristics

Characteristics	N=993	
	n	%
Age (mean ±SD)	26.6 ± 6.4	
Marital status:		
Currently Married	843	84.9
Currently living together	15	1.5
Separated/divorced	29	2.9
Widowed	35	3.5
Single/Never married	71	7.2
Religion:		
Christian	916	92.2
Muslim	5	0.5
Traditional	67	6.7
Hindu	1	0.1
Others	4	0.4
Physiological status:		
Pregnant	55	5.5
Lactating	844	85.0
Pregnant and lactating	0	0
Not pregnant/Not lactating	94	9.5
Have you ever been to school (N=350)	350	35.2
Education level attained (n=1008)		
Less than primary school	129	12.8
Primary school	124	12.3
Secondary school	70	6.9
College/University	27	2.7
Main occupation:		
Formal employment	19	1.9
Informal employment	5	0.5
Casual labour	118	11.9
Own business	89	9.0
Petty trading	48	4.8
Farming	45	4.5
Dependent	14	25.6
Housewife	394	1.4
Others	7	
Parity (mean±)	3.4± 2.0	

3.4 Infant and young child feeding practices

Infant feeding and complementary feeding practices were determined based on a 24-hour recall as recommended by WHO (2010) and the Kenya Ministry of Health (MoH) guidelines. The key indicators are also based on the same guidelines (refer to section 2.9 Case Definitions).

3.4.1 Breastfeeding practices for children 0-23 months old

Breastfeeding was universal with almost all the children (99.5%) having ever breastfed. The majority (83.7%) of the children were initiated to breastfeeding timely (within one hour of birth) as per the WHO recommendations (WHO 2010). A majority of the children (95.2%) were fed colostrum, 85.0% of the one year old children were still breastfeeding and 41.1% of those who were two years old were still breastfeeding. The majority (92.7%) of the children were fed on demand. The exclusive breastfeeding practice was 77.6% (Figure 2). These findings demonstrate that breastfeeding practices are on the whole were optimal.

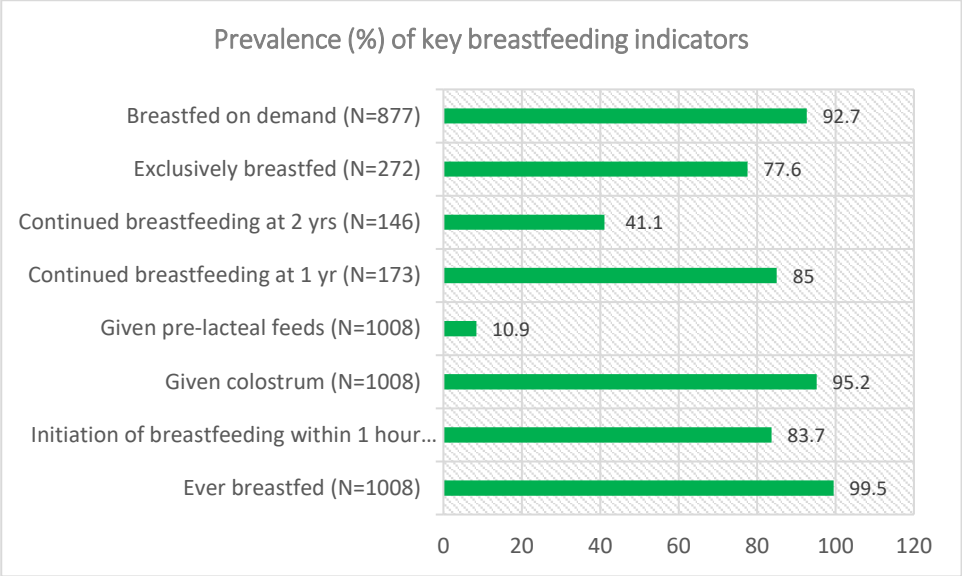

Figure 2: Prevalence (%) of key breastfeeding indicators

Disaggregated by age, exclusive breastfeeding rate was highest among infants 0-1 month old (89.7%) followed by those 0-3 months old at 84.2% and the lowest rate was for infants 4-5 months old at 62.2% (Figure 3) showing a decline in the practice as the child become older.

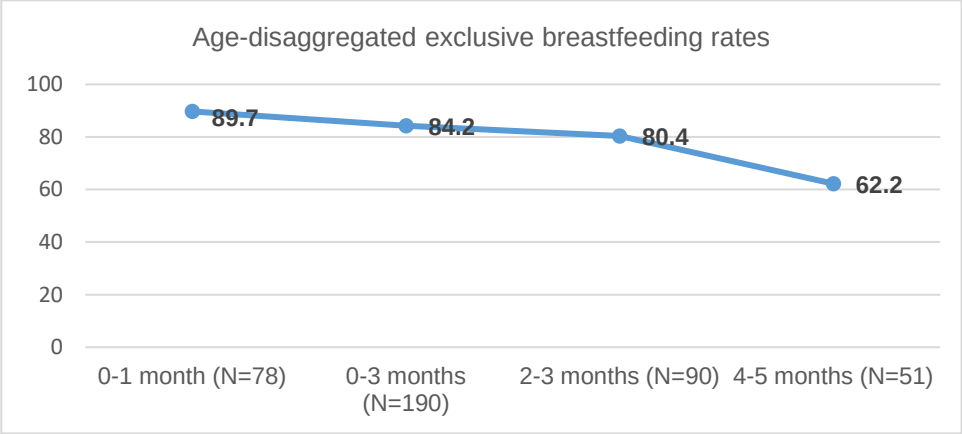

Figure 3: Exclusive breastfeeding rates disaggregated by age of child

Pre-lacteal feeds were given to 10.9 % of the children (Table 4), a practice that should be discouraged because it interferes with the establishment of lactation. Of the children given pre-lacteal feeds; the most common pre-lacteal feed was sugar/glucose given to 57.3%, followed by plain water given to 32.9% of the children and other milks to 24.4%. The main reason for giving pre-lacteal feeds was that the mother does not or have little breastmilk stated by 63.4% and baby cries too much by 20.7% of the mothers who gave pre-lacteal feeds respectively (Table 4).

Table 4: Pre-lacteal feeding of infants

Giving of pre-lacteal feeds	N=1008	
	n	%
Given pre-lacteal feeds	110	10.9
Pre-lacteal feeds given (N=82)*:		
Other milks	20	24.4
Plain water	27	32.9
Sugar/glucose water	47	57.3
Sugar/salt solution	14	17.1
Fruit juice	1	1.2
Infant formula	2	2.4
Animal fat	7	8.6
Local herbs	2	2.4
Other	12	14.6
Reasons for giving pre-lacteals (N=82)*:		
No/little breastmilk	52	63.4
Baby cries too much	17	20.7
Cultural reasons	20	24.4
Work-related obligations	1	1.2
Weather too hot	4	4.9
First milk no good for babies	1	1.2
Other	25	30.5

*Multiple responses

Support offered to mothers to help in start of breastfeeding

In terms of practical breastfeeding support given to mothers to start breastfeeding; 44.3% received such support whereas 55.2 %, a relatively large proportion did not receive this vital support (Figure 4).

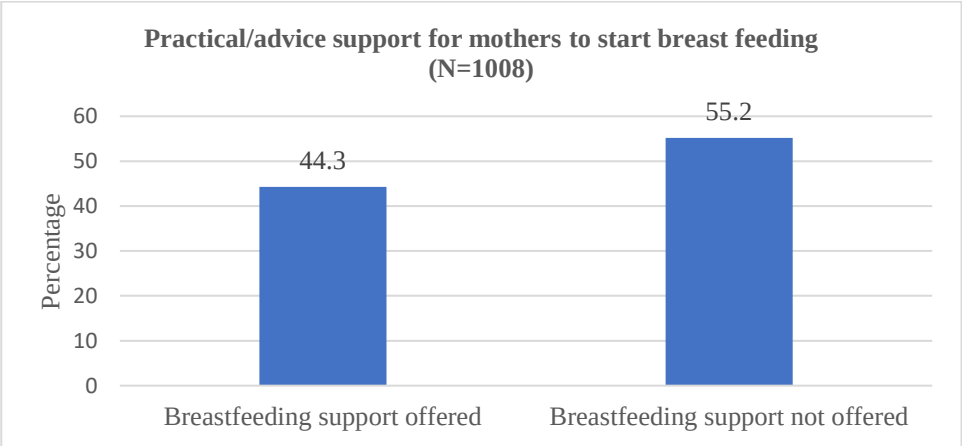

Figure 4: Practical support offered to mothers to start breastfeeding

3.4.2 Bottle feeding practices

Over one-quarter (26.8%) of the children were fed using a bottle with a nipple/teat the day before the survey, a practice that is not recommended because of hygienic reasons since it is difficult to keep the teat clean especially for mothers with poor hygiene practices and inadequate supply of clean water. About one-quarter of the children (24.7%) who were fed from a container were correctly fed using a cup only as is the recommended practice (Figure 5).

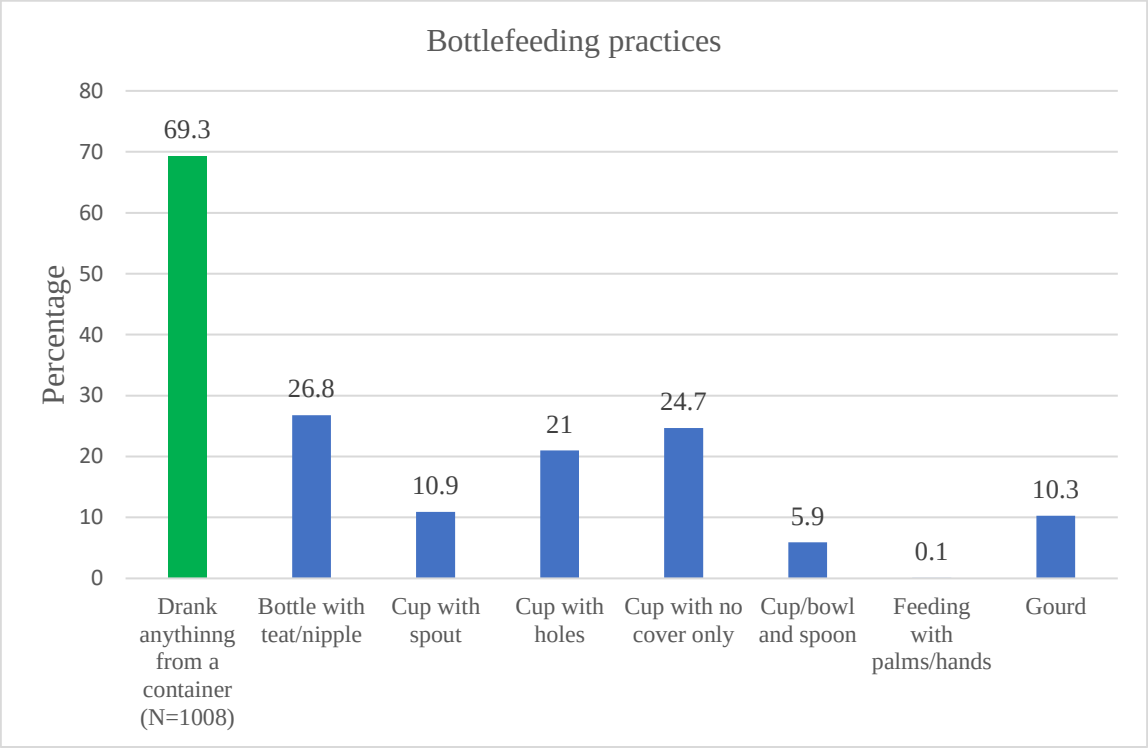

Figure 5: Feeding of children using various containers

3.5 Complementary feeding practices

The main decision maker on what the child eats was reported to be the mother by 96.3% of the respondents and only 0.9% of the fathers were reported as the main decision makers. Baby's grandmothers (2.0%) were also involved in decision making on the foods the child should eat.

3.5.1 Types of foods eaten

The most consumed foods was milk and milk products by 88.3% of the children followed closely by cereals at 83.6%. Roots and tubers were consumed by 54.1% of the children, beans and lentils by 55.8% of the children. The least consumed foods were fresh and dried fish by 1.6% (Table 5).

Table 5: Types of foods eaten the day prior to the survey by the children 6-23 months old

Foods eaten the previous day	N=736	
	n	%
Fortified food like cerelac	80	10.9
Cereals (maize, rice, wheat, porridge, sorghum, bread, or other foods grains	615	83.6
Pumpkin, carrots, squash, or sweet potatoes that are yellow or orange inside	190	25.8
White potatoes, white yams, cassava or any other foods made from roots	398	54.1
Dark green vegetables	306	41.6
Ripe mangoes, papayas, pawpaw, guava (yellow or orange on the inside of the fruit	297	40.4
Any other fruits or vegetables	218	29.6
Liver, kidney, heart or other organ meats	271	36.8
Meat such as beef, pork, lamb, goat, chicken, or duck	306	41.6
Eggs	262	35.6
Fresh or dried fish	12	1.6
Bean, lentils, or nuts	411	55.8
Cheese and other foods made from milk	650	88.3
Any other solid foods	411	55.8

3.5.2 Introduction to and consumption of solid, semi-solid or soft foods

About half of the children 6-23 months of age (47.9 %) were introduced to solid, semi-solid or soft foods at the appropriate age (6 months) that is children 6-8 months old introduced to these foods in the 24 hours preceding the survey. Over half of the children (59.6 %) of both breastfed and non-breastfed children attained the Minimum Dietary Diversity (MDD), that is ate foods from **four** or more out of **seven** food groups (WHO, 2010) (see section 2.9 of the report for the definition of this indicator) (Table 6). Disaggregated by breastfeeding status, 67.7% of non-breastfed children and 57.5% attained MDD respectively.

The percentage of both breastfed and non-breastfed children who attained the Minimum Meal Frequency (MMF) was 35.9% (Table 6). Disaggregated by age, younger children tended to attain the Minimum Meal Frequency than older children; 39.1% of children 6-11 months old attained the MMF compared to 30.7% of children 18-23 months old. Disaggregated by age and breastfeeding status 38.7% of breastfed children 6-8 months old attained the MMF and 43.7% of breastfed children 9-23 months old attained the MMF. In contrast, a lower percentage (11.0%) of non-breastfed children 6-23 months old attained the MMF (Table 6).

The percentage of children 6-23 months old who received a Minimum Acceptable Diet (MAD) was low at 25.7% (Table 6) implying that about three-quarters of the children were not receiving diverse diets and also the meals were not as frequent as they should be. The children are therefore not getting adequate diet in terms of diversity and quantity.

Consumption of iron-rich foods was low as only 21.1% of the children consumed such foods during the previous 24 hours prior to the survey (Table 6).

Table 6: Prevalence of key complementary feeding practices

Feeding practices	**N=736**	
	n	%
Proportion of infants 6-8 months old who received solid, semi-solid or soft foods the previous day: (N=144)	69	47.9
Minimum Dietary Diversity (MDD)		
Proportion of children 6-23 months old who received foods from ≥ 4 food groups the previous day: (N=736)	439	59.6
Proportion of children 6-23 months who received foods from ≥ 4 food groups the previous day disaggregated by breastfeeding status:		
• Not breastfed (N=155)	105	67.7
• Breastfed (N=581)	334	57.5
Minimum Meal Frequency (MMF)		
Proportion of both breastfed and non-breastfed 6-23 months of age who received foods the minimum times or more the previous day (N=736)	264	35.9
Proportion of both breastfed and non-breastfed children who received foods the minimum times or more the previous day disaggregated by age as follows:		
• 6-11 months [2 times] (N=266)	104	39.1
• 12-17 months old [3 times] (N=239)	89	37.2
• 18-23 months old [3 times] (N=231)	71	30.7
Proportion of breastfed children who received foods the minimum times or more the previous day by breastfeeding status and age:		
Breastfed:		
• 6-8 months old [2 times] (N=142)	55	38.7
• 9-23 months old [3 times] (N=439)	192	43.7
Non-breastfed:		
• 6-23 months old [4 times] (N=155)	17	11.0
Minimum Acceptable Diet (MAD)		
Proportion of children 6-23 months of age who receive a minimum acceptable diet: (N=736)	189	25.7
Consumption of iron-rich foods (N=1008)	213	21.1

3.6 Factors influencing infant and young child (IYCN) feeding practices

Information on the possible factors influencing IYCN practices was collected majorly through FGDs and KIIs and to a smaller extent through quantitative information collected through the household survey.

3.6.1 Factors enhancing infant and young child feeding practices

Overall, the findings indicated high levels of knowledge among the mothers/caregivers, the fathers and the community members. The attitudes and perceptions on IYCN practices were also very positive and may have contributed to influencing breastfeeding practices positively. As a whole, culture was not reported as a major constraint to appropriate IYCN practices except in a few areas.

Breastfeeding practices

Overall, the practice of exclusive breastfeeding (EBF) was reported to be improving at the community level but with variability from one area to another. One of the factors that is probably contributing to improved breastfeeding practices and in particular EBF rates is high level of knowledge in the community about breastfeeding practices. The quantitative findings showed the majority of the respondents to be knowledgeable about the critical aspects of breastfeeding such as duration and importance of EBF, timely initiation of breastfeeding, the health benefits of colostrum to the baby and that pre-lacteal feeds should not be given to the baby. These findings were corroborated by those from the FGDs. The community members including the men demonstrated high level of knowledge on breastfeeding practices. In some of the FGDs, it was reported that husbands were encouraging their wives to practice EBF. The following sentiments expressed in an FGD in Lshaalai village in Central Samburu demonstrates this finding:

"The community members are knowledgeable about appropriate breastfeeding practices. Even the husbands now have the knowledge because of intensified health and nutrition education by the CHVs. The community members know that EBF makes the babies put on weight quickly and protects them from diseases such as diarrhea", reported a woman in an FGD.

Another statement expressed in an FGD with men in Samburu Central; *"EBF is good because the child does not become sick. Giving a child ng'orno (ghee) makes them sick".* This statement implies that the cultural beliefs like giving of *ng'orno* is wearing off.

In an FGD in Lorubae in Samburu East Sub-County, it was reported that EBF is being practiced by many women in the village for the following reasons:

- *The trained CHVs are intensively passing on messages on appropriate breastfeeding practices.*
- *The mothers/caregivers also receive messages on appropriate breastfeeding practices at the health facilities but not as intensive as given by the CHVs.*
- *Children who are exclusively breastfed are healthy, grow well and are clever.*
- *EBF makes a mother stress-free because the child is healthy and therefore no more frequent health visits.*

There was however, variability in the practice of EBF from one area to another. In an FGD in Nkutoto village in Samburu East Sub-County it was reported that very few women practice EBF despite the high level of knowledge. In this village, cultural issues influenced breastfeeding practices; the practice of giving children pre-lacteal feeds such as water to which sugar has been added and giving of *ng'orno* is common.

Complementary feeding practices

There was high knowledge demonstrated by mothers and other community members on appropriate complementary feeding practices. The knowledge did not always translate into appropriate practices. During the FGDs, it was reported that many children were introduced to complementary feeding before 6 months and many were not given a variety of foods as recommended. This finding was in agreement with the quantitative data which showed high level of knowledge on and inappropriate feeding practices based on most of the key indicators of complementary feeding. Many mothers were not able to translate the knowledge on complementary feeding to feeding practices because of factors beyond their control such as unavailability and inaccessibility of foods. In Lmisigiyoi village in Samburu Central, the following sentiment expressed by a participant in an FGD exemplifies this view:

"Many mothers cannot give a variety of foods to the baby because of unavailability of the foods. Foods such vegetables and fruits are not easily available. One would have to travel to Maralal town

to purchase such foods and yet because of poverty we do not have money for transport", stated a man in an FGD.

3.6.2 Barriers to Infant and Young Child Feeding Practices

During the FGDs, many barriers were reported to be interfering with appropriate infant feeding practices as indicated below:

- Inadequate food affecting milk production among breastfeeding mothers;
- Family conflicts and violence causing stress to the mother and therefore not able to produce adequate breastmilk;
- EBF in particular is not practical when mother is sick;
- High maternal workload affecting time mother is available to breastfeed and prepare appropriate complementary foods for the baby;
- Alcoholism among the mothers interfering with quality of care given to children;
- Another pregnancy before the child is 2 years and this means the mother has to stop breastfeeding prematurely;
- Inadequate knowledge on complementary feeding practices particularly on how to prepare foods for the children was reported to be a constraint to appropriate feeding practices:
- Unavailability of foods to provide appropriate complementary feeding to the children; and
- Poverty making food inaccessible to the majority of the households.

3.5.3 Suggestions for improvement of the IYCN practices by participants in the FGDs

During the FGDs, the participants were asked for suggestions on what could be done to improve IYCF practices at the community. The following suggestions were made:

- Strengthen health and nutrition activities in the community by creating awareness and sensitization on the importance of appropriate IYCF practices. This could be done through various channels including the use of community dialogue and IEC materials such as print media.
- Other interventions suggested by the community members included: starting IGAs for women to enable them purchase food for their children and assist educate the mothers to start kitchen gardens to provide vegetables and fruits to diversity the diets of children and mothers.

3.6 Responsive feeding of children 6-23 months old

Most of the children 6-23 months old (91.2%) were fed by their mothers/caregivers the day before the survey. Majority of the children (61.4%) ate all the food served to them at the main meal (Table 7). Most of the mothers/caregivers (71.7%) encouraged the children to eat during meals and 90.6% did so verbally. The majority of the mothers/caregivers (72.4%) who talked to the children praised them to encourage them to eat. One-quarter (25.0%) of the mothers who talked to the children ordered them to eat. Majority (59.1%) of the children self-fed during the main meal with one-third (33.6%) having self-fed during all the time during the meal (Table 7).

Table 7: Responsive feeding of children

	n	%
Mother/caregiver fed the child the previous day (N=736)		
YES	671	91.2
NO	65	6.4
Child ate all the food at the main meal (N=671)		
YES	412	61.4
NO	189	28.2
DNK	70	10.4
Did you do anything yesterday during the main meal to encourage the child to eat? (N=671)		
YES	481	71.7
NO	190	28.3
How child was encouraged to eat: (N=481)		
Offered another food or liquid	83	17.2
Encouraged verbally	436	90.6
Modeled eating (with or without toy)	30	6.2
Ordered strongly or forced the child to eat	42	8.7
Another helped feed the child	20	4.2
Another person encouraged the child	15	3.1
Talked to the child during the main meal: (N=671)		
YES	537	80.0
NO	129	19.2
DNK	5	0.7
If YES, What did you say? (N=537)*		
Ordered child to eat	134	25.0
Praised the child	389	72.4
Asked the child questions	35	6.5
Talked about the food	101	19.0
Threatened the child	10	1.9
Told the child that she liked the food	47	8.8
Talked about other things	28	5.2
Did the child feed self-feed any moment during the main mean yesterday (N=736)		
YES	295	59.1
NO	435	40.1
DNK	6	0.8
Did the child self-feed all the time during the main meal? (N=295)		
All the time	99	33.6
Half the time	84	28.5
Little bit of the time	109	36.9
DK	3	1.0

*Multiple responses

3.6 Feeding during illness

The majority of the children (75.8%) were offered less breast milk during the last time the child was ill. The same was true for the amount of non-breast milk liquids with 77.1% of the sick children offered less amounts than usual. Similarly, the majority of the sick children (67.8%) were fed less food during illness than normal times. The reasons for this was that the children did not want the food or the liquids because of lack of appetite (Table 8). About half of the children (51.8%) were offered

the same amount of food during recovery period as during normal times with only 25.3% being offered more food during this time (Table 8).

Table 8: Feeding during illness

	n	%
Has child ever been sick? (N=1008)		
YES	689	68.4
NO	319	31.6
The amount breast milk the child was offered during the last time illness (N=689)		
Less, because the child did not want it	522	75.8
Less because mother decided to give less	9	1.3
More	10	1.5
The same	126	18.3
Child never breastfed or child not breastfeeding before illness	10	1.5
Does not know	12	1.7
The amount of non-breast milk liquids offered to the child during illness: (N=689)		
Less, because the child did not want it	531	77.1
Less because of mother's decision	14	2.0
More	6	0.9
The same	72	10.4
Child never fed on non-breastfed liquids	59	8.6
Does not know	7	1.0
The amount of food offered to the child during illness: (N=689)		
Less, because the child did not want it	468	67.8
Less because of mother's decision	19	2.8
More	4	0.6
The same	111	16.1
Child never fed foods	73	10.6
Does not know	14	2.0
The amount of food offered to the child after illness ended: (N=689)		
Less, because the child did not want it	113	16.4
Less because of mother's decision	9	1.3
More	174	25.3
The same	357	51.8
Does not know	36	5.2

3.7 Knowledge and consumption of micronutrient powders for children 6-23 months old

3.7.1 Knowledge of micronutrient powders (MNPs)

When asked about awareness of MNPs, 40.7% of the mothers/caregivers indicated that they had seen or heard of them. About one-third of all the respondents (34.0%) had first seen or heard of MNPs from the health facility and only 3.3% from CHVs (Table 9). Only 7.0% of the children received the commodity in the last 6 months with 6.3% of them having received the commodity free from the health facility and 0.5% from CHVs and a similar percentage from bought them from the health facility (Table 9). The major reasons given for children not receiving MNPs was that the majority of mothers (53.1%) did not know about the commodity and 24.1% reported that they were not given MNPs at the health facility (Table 9).

Table 9: Maternal knowledge on MNPs and sources of MNPs for children

	n	%
Seen or heard of micronutrient powders (N=1008):		
YES	410	40.7
NO	493	48.9
DNK	105	10.4
Where first seem or heard of micronutrient powders (N=1008)		
Health facility	343	34.0
CHVs	33	3.3
Community members (barazas/church/neighbor/friend)	6	0.6
Other family member	25	2.5
Other	3	0.3
Did child receive micronutrient powders in the last six months: (N=1008)		
YES	71	7.0
NO	937	93.0
Where the micronutrient powders was sourced from: (N=1008)		
Free from health facility	64	6.3
Bought from health facility	5	0.5
Free from CHVs	2	0.2
Reasons why child did not receive micronutrient powder: (N=937)		
Do not know about micronutrient powder	535	53.1
Discouraged from what I heard from others	36	3.6
The child has not fallen ill, so have not gone to health facility	56	5.6
Health facility or outreach is far	24	2.4
Child receiving therapeutic/supplementary foods	5	0.5
I was not offered micronutrient powder at the health facility	243	24.1
Others	122	12.1

3.7.2 Consumption of foods and lipids to which MNPs have been added

The respondents were asked to state whether their children 6-23 months of age had consumed foods and lipids to which sprinkle powder was added. The consumption of such foods by the children was very low at 6.7%. The consumption of lipid based nutrient supplements such as plumpy nuts was equally low at 6.0% (Figure 6).

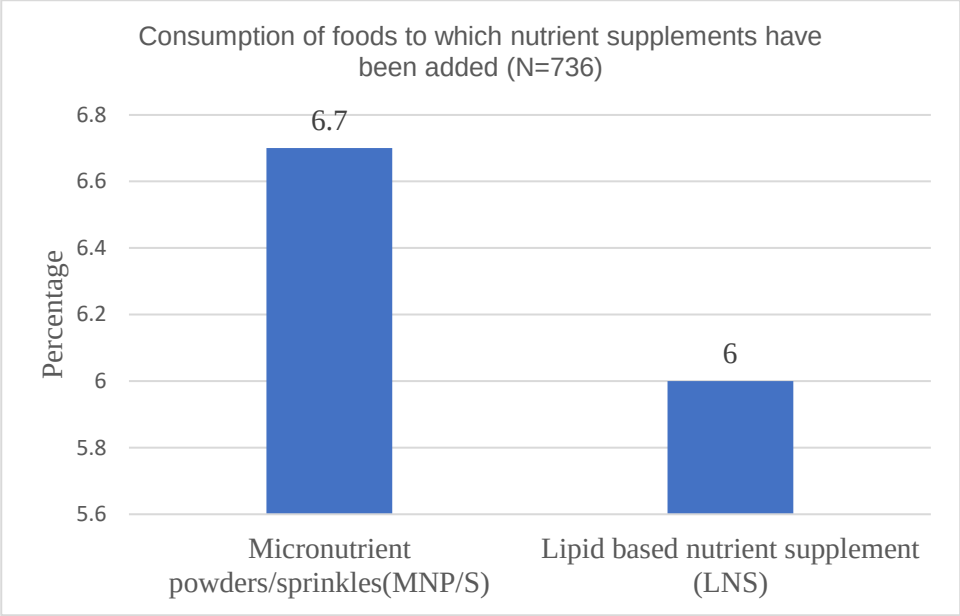

Figure 6: Consumption of foods to which MNPs have been added

3.7.3 Preparation and Consumption of Micronutrient Powders (MNPs)

The majority of the mothers/caregivers (59.5%) indicated that they were never away/were away for 0-1 day per week from the children for more than half a day (Table 9). This is an indication that they took care of the children including feeding them by themselves most of the time. A large percentage of the children ate all the food served to them since 52.7% left food a few times and 14.2% never left any food on the plate. In terms of what is done to the food that remained on the plate, 46.5% of the mothers reported that they threw the food away whereas 30.8% gave the food to other children. Almost one-fifth (16.3%) of the mothers reported that the leftover food was put elsewhere for baby to feed later (Table 10).

In terms of consumption of MNPs only 3.9% of the children were given the commodity at the appropriate frequency – every third day. Only 1.8% of the children were given MNPs daily and 0.8% every other day (Table 10). As for food preparation, only 6.7% of the mothers mixed MNPs with cooked solid or semi-solid food that is warm and ready to eat which is the recommended practice. Again, only 0.6% of the mothers mixed MNPs with the amount of food which the child could eat at once as is recommended.

Table 10: Preparation and consumption of micronutrient powders (MNPs)

	n	%
How often are you/mother away from the baby for most of the day (more than half a day)? (N=1008)		
Always (6 days/week)	107	10.6
Often (4-5 days/week)	75	7.4
Sometimes (2-3 days/week)	222	22.0
Never/few days (0-1 day/week)	604	59.9
How often the child's food remains on the plate: (N=730)		
Most of the times/always	104	14.2
Often/several times	137	18.8
Few times/once in a while	385	52.7
Never	104	14.2
What is done to the food that remains on the plate: (N=626)		
Put in a cupboard to feed baby later	33	5.3
Put elsewhere to feed baby later	102	16.3
Thrown away	291	46.5
Given to other children	193	30.8
Others	7	1.1
How frequent do you give your child micronutrient powders (N=1008)		
Every day	18	1.8
Every other day	8	0.8
Every third day	39	3.9
2 days per week at any day	3	0.3
At any day when I remember	1	0.1
Cannot remember/Do not know	2	0.2
Preparation of food with micronutrient powders: (N=1008)	2	0.2
Cook with child's food	68	6.7
Mix with cooked solid or semi-solid food that is warm and ready to it	1	0.1
Mix with water		
Quantity of food mixed with the micronutrient powder (N=1008)		
All the amount of food prepared for the child	6	0.6
Quantity that a child can eat once	65	6.4

3.8 Maternal knowledge on infant and young child feeding practices

3.8.1 Knowledge on breastfeeding practices

Overall, the mothers/caregivers were knowledgeable on breastfeeding practices. The majority of the mothers (93.2%) knew the right time to initiate breastfeeding; within one hour of birth. Majority (97.3%) stated that a baby should be given colostrum and also knew the health benefits of colostrum to the child. Many mothers (55.0%) stated that colostrum was nutritious and 12.8% reported that colostrum prevents diseases and infections in the child. Similarly, most of the mothers (91.3%) stated that babies should not be given pre-lacteals (Table 11). About one-tenth of the mothers/caregivers (8.2%) reported that babies should be given pre-lacteal feeds. Of these mothers/caregivers, the majority 43.4% stated that babies should be given sugar/glucose water whereas 33.7% stated plain water and 21.7% milk other than breastmilk (Table 11).

Table 11: Maternal knowledge on breastfeeding practices

	N=1008	
Breastfeeding practices	n	%
How long after birth should a baby be put to the breast?		
Less than one hour	939	93.2
More than one hour	44	4.4
More than 24 hours	3	0.3
DNK	22	2.2
Should a baby be given colostrum?		
YES	982	97.4
NO	16	1.6
DNK	10	1.0
What are the benefits of feeding the baby colostrum?*		
Nutritious to the baby	666	66.1
Prevents diseases/infections	354	35.1
Cleans baby's stomach	251	24.9
Nothing specific	26	2.6
Others	36	3.6
Don't know	207	20.5
Within the first three days after delivery, should a baby be given anything to drink/eat other than breast milk?		
YES	83	8.2
NO	920	91.3
DNK	5	0.5
If YES, What should be given? (N=83)		
Milk other than breastmilk	18	21.7
Plain water	28	33.7
Sugar/glucose water	36	43.4
Gripe water	1	1.2
Fruit juice	12	14.5
Other	6	7.2

*****Multiple responses

Maternal knowledge on the duration of exclusive breastfeeding was high with 84.7% reporting that babies should be exclusively breastfed for 6 months. About one-quarter of the mothers (26.2%) reported that babies should be fed liquids with a bottle with nipple/teat indicating a practice that is not recommended (Table 12).

Table 12: Maternal knowledge on breastfeeding practices cont.

	N=1008	
For how long (in months) should a child be fed on breast milk without being given anything else even water?		
Less than 6 months	79	7.8
6 months	854	84.7
7-12 months	37	3.7
>12 months	33	3.3
What should be used to feed liquids to a baby? (N=1008)		
Bottle with nipple/teat	264	26.2
Cup with spout	104	10.3
Cup with holes	179	17.8
Cup only	307	30.5
Cup/bowl and spoon	39	3.9
Gourd	87	8.6

3.8.2 Knowledge on complementary feeding practices

In terms of having received information on complementary feeding practices, less than half (48.4%) of the mothers/caregivers reported that they had received the information. The source of information for the majority of the mothers/caregivers was the CHV (33.7%) followed by print media at 16.5% and then mother/mother in laws at 10.7%. The health worker was mentioned by only 0.3% of the mothers/caregivers (Table 13). Majority of the mothers 72.7% knew that solid, semi-solid or soft foods should be introduced to the child at 6 months of age.

Table 13: Maternal knowledge on complementary feeding practices

	N=1008	
Received information about feeding:		
YES	488	48.4
NO	507	50.3
DNK	13	1.3
Source of information on feeding:		
Mother/mother in law	108	10.7
Father/father in law	3	0.3
Other relative	48	4.8
Neighbor/friend	32	3.2
Siblings	1	0.1
Health worker	3	0.3
Community Health volunteer (CHV)	340	33.7
Print media	166	16.5
Electronic media	5	0.5
Other	5	0.5
Age at which solid, semi-solid and soft foods should be introduced to a child:		
Less than 6 months		
6 months	43	4.3
7 to 12 months	733	72.7
More than 12 months	231	22.9
	1	0.1

3.9 Maternal attitudes on infant and young child feeding practices

On the whole, maternal attitudes on infant and young child feeding practices were positive. The majority of the mothers (93.5%) were of the opinion that babies should be put to the breast immediately after birth (Table 14). A large majority (98.9%) of the mothers also stated that they would feed their babies colostrum and 85.9% reported that it is important to exclusively breastfeed the baby without giving anything else or drink including water for 6 months.

Table 14: Maternal attitudes on infant and young child feeding practices

	N=1008	
	n	%
In your opinion should a baby be put to the breast immediately they are born		
YES	942	93.5
NO	36	3.6
DNK	30	3.0
Would you feed your baby colostrum?		
YES	997	98.9
NO	9	0.9
DNK	2	0.2
Why would you not feed your baby colostrum?		
Dirty milk	7	0.7
Cultural practices	1	0.1
Others	1	0.1
In your opinion is it important for a baby to be breast fed on for 6 months without being introduced to anything else or drink including water?		
YES	866	85.9
NO	77	7.6
DNK	65	6.4

3.10 Perceptions on infant feeding practices

Overall, the maternal perceptions towards infant feeding practices were positive. The majority of the mothers (69.5%) disagreed with the idea that certain foods are taboo and should not be fed to pregnant women (Table 15). A large majority (89.2%) of the mothers also disagreed with the idea that a new-born baby should be given liquids or semi-liquids and 95.1% disagreed with the idea that a baby cannot survive on breastmilk alone for 6 months. In terms of cultural practices, 82.1% of the mothers disagreed with the perception that certain foods are taboo and should not be fed to a child. Similarly, 85.6% of the mothers disagreed with the belief that young children should not be breastfed up to two years of age (Table 15).

Table 15: Maternal perceptions on infant feeding practices

	N=1008	
	n	**%**
Some people believe that certain foods are taboo and should not be fed to pregnant women		
Disagree	248	24.6
Not sure/neutral	59	5.9
Disagree	701	69.5
Some people believe that a new-born baby should be given other liquids/semi-liquids		
Agree	58	5.8
Not sure/neutral	51	5.1
Disagree	899	89.2
Some people believe that colostrum is dirty and should not be fed to new born babies		
Agree	28	2.8
Not sure/neutral	21	2.1
Disagree	959	95.1
Some people believe that a baby cannot survive on exclusive breastfeeding for six months?		
Agree	61	6.1
Not sure/neutral	65	6.4
Disagree	882	87.5
Some people believe that certain foods are taboo and should not be fed to a child.		
Agree	92	9.1
Not sure/neutral	88	8.7
Disagree	828	82.1
Some people believe that a young child should not be breastfed up to 2 years.		
Agree	62	6.2
Not sure/neutral	88	8.2
Disagree	863	85.6

3.11 Factors influencing Infant and Young Child (IYCN) Feeding Practices

Information on the possible factors influencing IYCN practices was collected majorly through FGDs and KIIs and to a smaller extent through quantitative information collected through the household survey.

3.11.1 Factors enhancing Infant and Young Child Feeding Practices

Overall, the findings indicated high levels of knowledge on IYCN among the mothers/caregivers, the fathers, CHVs and the community members as a whole. The attitudes and perceptions on IYCN practices were also positive. Generally, culture was reported not to be a major constraint to appropriate IYCN practices with the exception of a few areas. As a whole, there was general agreement between the quantitative findings from the household survey and those from the FGDs.

Breastfeeding practices

Overall, the practice of exclusive breastfeeding (EBF) was reported to be improving at the community level but with variability from one area to another. One of the factors that is probably contributing to improved breastfeeding practices particular EBF is the high level of knowledge in the community about breastfeeding practices. The quantitative findings showed the majority of the respondents to be knowledgeable about the crucial aspects of breastfeeding such as: time of initiation of breastfeeding; duration and importance of EBF; health benefits of colostrum; and dangers of giving pre-lacteal feeds. These findings were corroborated by the findings from the FGDs. The community members including

the men demonstrated high level of knowledge on breastfeeding practices. In some of the FGDs, it was reported that husbands were encouraging their wives to practice EBF. The following sentiments expressed in an FGD in Lshaalai village in Central Samburu Sub-County demonstrates this finding:

"The community members are knowledgeable about appropriate breastfeeding practices. Even the husbands now have the knowledge because of intensified health and nutrition education by the CHVs. The community members know that EBF *makes the babies put on weight quickly and protects them from diseases such as diarrhea", reported a woman in an FGD.*

Another statement expressed in an FGD with men in Samburu Central; *"EBF is good because the child does not become sick. Giving a child ng'orno (ghee) makes them sick".* This statement implies that cultural beliefs and practices are wearing off.

In an FGD in Lorubae in Samburu East Sub-County, it was reported that EBF is being practiced by many women in the village for the following reasons:

- *The trained CHVs are intensively passing on messages on appropriate breastfeeding practices.*
- *The mothers/caregivers also receive messages on appropriate breastfeeding practices at the health facilities but not as intensive as given by the CHVs.*
- *Children who are exclusively breastfed are healthy, grow well and are clever.*
- *EBF makes a mother stress-free because the child is healthy and therefore no frequent health visits.*

There was however, variability in the practice of EBF from one area to another. In an FGD in Nkutoto village in Samburu East Sub-County it was reported that very few women practice EBF despite the high level of knowledge. In this village, cultural issues influenced breastfeeding practices; the practice of giving pre-lacteal feeds, water to which sugar has been added and *ng'orno* were common.

<u>Complementary feeding practices</u>

There was high knowledge demonstrated by mothers and other community members on appropriate complementary feeding practices. The attitudes and perceptions to complementary feeding practices from the household quantitative data and the FGDs were positive. Nonetheless, the knowledge, attitudes and perceptions did not necessarily translate into appropriate practices. During the FGDs, it was reported that many children were introduced to complementary feeding before 6 months and many were not given a variety of foods as recommended. This finding was in agreement with the quantitative household survey data. In Lmisigiyoi village in Samburu Central, the following sentiment expressed by a participant in an FGD exemplifies this view:

"Many mothers cannot give a variety of foods to the baby because of unavailability of the foods", stated a man in an FGD.

It was also reported that mothers did not have adequate knowledge on the appropriate preparation of complementary foods. In an FGD with men in Nkutoto village in Samburu East Sub-County, a men made the following statement:

"Many women here do not know how to prepare complementary foods for the children. This is especially true of the foods that were not traditionally given to children. They need demonstrations on appropriate preparation of these foods", stated a participant in the FGD.

3.11.2 Barriers to Infant and Young Child Feeding Practices

During the FGDs, many barriers were reported to be interfering with appropriate infant feeding practices as indicated below:

- Inadequate food for mothers affecting milk production among breastfeeding mothers;
- Family conflicts and violence causing stress to the mother and therefore not able to produce adequate breastmilk;
- EBF in particular is not practical when mother is sick;
- High maternal workload affecting time mother is available to breastfeed and prepare appropriate complementary foods for the baby;
- Alcoholism among the mothers interfering with quality of care given to children;
- Another pregnancy before the child is 2 years and this means the mother has to stop breastfeeding prematurely;
- Inadequate knowledge on complementary feeding practices particularly on how to prepare foods for the children was reported to be a constraint to appropriate feeding practices:
- Unavailability of foods to provide appropriate complementary feeding to the children; and
- Poverty making food inaccessible to the majority of the households.

3.12 Ante Natal Care (ANC) for pregnant women

3.12.1 ANC attendance and provision of services

Women who were currently pregnant during the survey were asked questions about ante-natal care during the current pregnancy. About half (52.7%) of the women had received ANC services (Table 16). The mean age of gestation at which the first ANC visit was made was 5.8±1.7 months. In terms of frequency of ANC attendance, the mean was 3.6±1.5 times. The majority of the women received services from public health facility (96.6%) and 3.4% at home. Most of the women received the essential services which should be offered at ANC clinics, with over 65.0% having received the essential services at least once during the current pregnancy (Table 14). The least offered services at least once during the pregnancy was provision of information on infant feeding practices given to only 55.2% of the pregnant women. Urine samples were collected for testing for only 51.7% of the women. Other services that were offered to small percentages of women was provision of anti-malarial drugs (3.4%), de-worming tablets (10.3%) and mosquito bed-nets (10.3%). Samburu County is not malaria endemic and therefore provision of anti-malaria and bed nets is not a standard practice in the ANC clinics but de-worming tablets is supposed to be offered to all women attending ANC. (Table 16).

Table 16: Ante-natal care for pregnant women

	N=55	
	n	%
Seen anyone for ANC during this pregnancy		
YES	29	52.7
NO	26	47.3
Mean gestation age when first receive Ante-natal care(N=29)	5.8± 1.7	
Mean number of times received ante-natal care (N=29)	3.6 ± 1.5	
Where ANC services were received: (N=29)		
Public Hospital	28	96.6
Home	1	3.4
Services offered at ANC at least once (N=29)*		
Weight measurement	26	89.7
BP measurement	24	82.8
Iron folic acid supplementation	28	96.6
Anti-malaria drugs	1	3.4
Blood sample/HB	21	72.4
Urine sample	15	51.7
Tetanus vaccine	25	86.2
De-worming tables	3	10.3
HIV test	23	79.3
Mosquito net provided	3	10.3
MUAC measurement	20	69.0
Information or counseling that you have received during this pregnancy on the following: (N=29)*		
Test during pregnancy	27	93.1
Birth planning	19	65.5
Place of delivery	25	86.2
Own health & hygiene	19	65.5
Own nutrition	19	65.5
HIV/AIDS	23	79.3
Breastfeeding	19	65.5
Infant feeding	16	55.2
Iron folate supplementation	26	89.7
Growth monitoring	18	62.1
The source of information given: (N=29) *		
Doctor	1	3.4
Nurse	25	86.2
CHW	7	24.1
NGO/CBO	1	3.4
Others	1	3.4

*Multiple responses

3.12.2 Iron and folic acid supplementation (IFAS) for pregnant women

Pregnant women were asked questions to establish their knowledge on IFAS. A majority of the women (69.1%) had heard about IFAS and the majority (97.4%) first heard of IFAS at the health facility (Table 17). A high percentage of the women (88.7%) reported that they knew the benefits of IFAS. The women were highly knowledgeable on the health benefits of IFAS during pregnancy; with 78.8% reporting that IFAS increased blood; prevents anaemia (27.3%) and prevents dizziness as reported by 30.3% among other correct responses (Table 17).

Table 17: Pregnant women's knowledge of IFAS

	N=55	
	n	%
Heard information on IFAS for pregnant women: N=55		
YES	38	69.1
NO	17	30.9
Where first heard information on IFAS: N=37		
Health staff of health facility	37	97.4
CHVs	5	13.2
Other family member	1	2.6
Know benefits of taking IFAS during pregnancy (N=55)		
YES	33	60
NO	22	40
The benefits of taking IFAS tablets during pregnancy: (N=33)*		
Prevents anemia among pregnant women	9	27.3
Prevents dizziness	10	30.3
Increases blood	26	78.8
Helps development of the foetus	4	12.1
Improves immunity	2	6.1
Increases energy	1	3.0
Improves concentration	2	6.1
Others	1	3.0
Do not know	2	6.1

*Multiple responses

3.12.3 Provision and consumption of IFAS by pregnant women

Pregnant women were asked to state whether they had received IFAS or not. Over two thirds (63.6%) of them reported that they had received the supplements. Of those women who received the supplements, the majority (71.4%) received the combined iron/folic acid tablets, 34.3% received iron tablets and 8.6% received folic acid tablets (Table 18). The pregnant women received iron only tablets for a mean number of 20.8±12.2 days; folic acid tablet 25.0±8.6 and combined iron and folic acid for 33.1±16.0 days.

In terms of consumption, those women who consumed iron tablets did so for a mean of 20.3±12.7 days, folic acid tablets for 25.0±8.6 days and combined iron/folic acid for 26.8±19.0 days. For the combined iron/folic acid tablets, there was a discrepancy in the number of the supplements given and the number consumed with the number given being higher than that consumed implying that the pregnant women did not consume the supplements on a daily basis (Table 18). The women reported that there were some days they had the supplements at home but did not consume them, reported by 23.6% of the mothers. The most commonly reported reason for not consuming the tablets was that forgetting, stated by 61.5% of the mothers; side effects by 23.1% and the same percentage of the mothers indicated that they did not know the benefits of taking the supplements. These findings should be interpreted cautiously because of the small sample size of mothers (N=13]) as shown in Table 18.

The mothers were also asked if they were currently taking food supplements fortified with micronutrients or taking soil/mineral stones. About half (26 out of 55) took these substances. Soil/mineral stones was consumed by the highest percentage (21.8%), fortified blended flours (e.g. CSB, UNIMIX) were consumed by 12.7% of the mothers and herbal supplements by 10.9% mothers (Table 18). These findings imply that the mothers' diet is likely to be deficient in micronutrients required for prevention of anaemia since the consumption of IFAS is also inadequate.

Table 18: Provision and consumption of IFAS for pregnant women

Provision of IFAS	N=55	
Received any of the following IFAS: (N=55)		
YES	35	63.6
NO	20	36.4
Type of IFAS received:		
Iron tablets/syrup (N=35)	12	34.3
Folic acid tablets (N=35)	3	8.6
Combined iron/folic acid (N=35)	25	71.4
Number of days for which the supplements have been given: (mean and SD)		
Iron tablets/syrup(N=12)	20.8±12.6	
Folic acid tablets(N=3)	25.0±8.6	
Combined iron/folic acid (N=25)	33.1±16.0	
Consumption of IFAS		
Number of days the supplements have been consumed **(**mean and SD**)**		
Iron tablets/syrup (N=12)	20.3± 12.7	
Folic acid tablets (N=3)	25.0± 8.6	
Combined iron/folic acid (N=25)	26.8±19.	
Days you have heard IFAS at home but did not take them (N=55)		
YES	13	23.6
NO	42	76.4
Reasons for not taking them (N=13)		
Forgot	8	61.5
Side effects	3	23.1
Did not know how long to take the tablets	1	7.7
Did not know benefits of taking	3	23.1
Currently taking any of the following: (N=55)		
Fortified blended flours(e.g. CSB, Unimix)	7	12.7
RUSFs	1	1.8
Herbal supplements	6	10.9
Soil/mineral stones	12	21.8

3.13 Ante-natal care for mothers with children 0-23 months old

3.13.1 Frequency and timing of ANC attendance

Mothers of children 0-23 months old were asked questions about their ANC attendance when pregnant with the youngest child. A large percentage (84.8%) of the mothers attended ANC at least once whereas 15.2% did not attend (Figure 7). Only 1.8% of the mothers made a first ANC visit during the first month of pregnancy. Most of the mothers (59.1%) made their first visit during the second trimester followed by 25.8% during the first trimester and 15.1% during the third trimester. A half of the mothers (50.2%) made four or more ANC visits during the entire pregnancy period (Figure 7). The mean gestation age of first ANC attendance was 4.6±1.7. The mean number of times that the mothers attended ANC was 4.3±1.7.

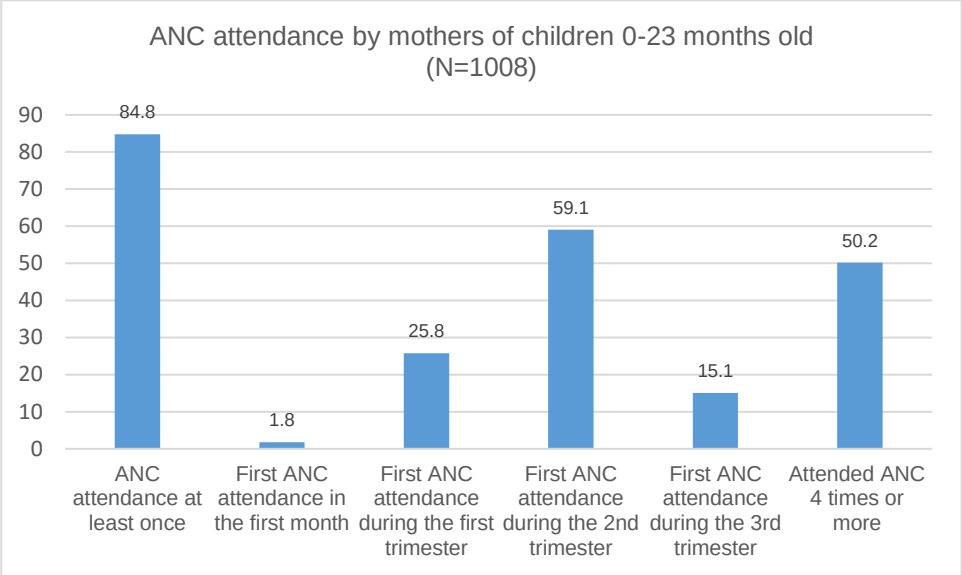

Figure 7: ANC attendance by mothers of children 0-23 month old

3.13.2 Reasons for not attending ANC

The reasons given by the few mothers who did not attend ANC at all was that the health facility was too far by 38.6% and that they were not aware of the importance or existence of ANC services by 26.8% of the mothers. Other reasons given for not attending ANC clinic by relatively smaller percentages of the mothers were that the services offered by TBA was adequate (2.6%), cultural barriers 3.3% and unfriendly health workers by 1.3% of the mothers (Table 19).

3.13.3 Services offered at ANC clinic

Mothers were asked to state the information or counselling offered or services offered during the ANC clinic visits. Most of the essential services supposed to be offered during ANC clinics were offered as reported by a majority of the mothers, over 70% with the exception information of infant feeding practices at 69.1% (Table 19).

When asked what services were offered at least once during the ANC visits, most of the services had been offered to large majority of mothers: weight measurement to 96.3%; BP measurement to 95.1% and IFAS supplementation to 86.1%. The least offered services were provision of anti-malaria drugs (19.2%), de-worming tablets at 29.8% and provision of mosquito bed-nets at 9.0% (Table 19). It should be noted that Samburu is not malaria endemic so provision of anti-malaria drugs and mosquito bed-nets is not a requirement.

Table 19: Maternal knowledge on IFAS for women with children 0-23 months old

	N=1008	
	n	%
Attended ANC during this pregnancy (N=1008)		
YES	855	84.8
NO	153	15.2
Gestation age when first attended ANC services (N=855)		
First attendance during the first month	18	1.8
First visit during first trimester	221	25.8
First attendance second trimester	505	59.1
First attendance third trimester	129	15.1
Mean age when first attended Ante-natal care = 4.6±1.7		
How many times attended Ante-natal care (N=855)		
Less than 4 times	419	49.0
4 times or more	429	50.2
DNK	7	0.8
Mean number of times attended ante-natal care = 4.3±8.6		
Information or counseling that you have received during this pregnancy on the following: (N=855)*		
Test during pregnancy	774	90.5
Birth planning	602	70.4
Place of delivery	766	89.6
Own health & hygiene	682	79.8
Own nutrition	660	77.2
HIV/AIDS	749	87.6
Breastfeeding	687	80.4
Infant feeding	591	69.1
Iron folate supplementation	756	88.4
Growth monitoring	599	70.1
Services offered at ANC at least once (N=855)*		
Weight measurement	823	96.3
BP measurement	813	95.1
Iron folic acid supplementation	736	86.1
Anti-malaria drugs	164	19.2
Blood sample/HB	786	91.9
Urine sample	706	82.6
Tetanus vaccine	785	91.8
De-worming tables	255	29.8
HIV test	789	92.3
Mosquito net provided	77	9.0
MUAC measurement	636	74.4
Reasons for not attending ANC*: (N=43)		
Not aware of the existence/importance of ANC	41	26.8
Health facility too far	59	38.6
Unfriendly health workers	2	1.3
TBA services adequate	4	2.6
Cultural barriers (staff too young, male staff etc.)	5	3.3
Other	51	33.3

*Multiple responses

3.13.4 Factors influencing ANC attendance

During the FGDs it was reported that ANC attendance among the pregnant women was low. It was reported that the majority of the women were encouraged by the CHVs and health workers at the health facilities to attend ANC. Those women who attended ANC reported that they did so because of the services provided such as monitoring of the growth of the foetus, checking on anaemia and the provision of supplementary foods. The FGD participants also reported that some of the husbands encouraged their wives to attend the clinics.

There were also factors that discouraged ANC attendance as such:

- The high maternal workload which included attending to livestock and fetching for water and firewood left the women with limited time to attend ANC clinics;
- The women were discouraged from attending ANC clinics because they were not comfortable to be attended to by male health workers. *"It is considered taboo for women to expose their nakedness to men",* reported a woman in an FGD*;*
- The mandatory HIV testing also discouraged some women from attending ANC;
- The availability of TBAs who were familiar to them also discouraged women from attending ANC; as they preferred the services of the TBAs; and
- While it was reported that some husbands encouraged their wives to attend ANC, others refused their wives to attend the clinic.

3.14 Iron and folic acid supplementation (IFAS) for mothers with children 0-23 months old

3.14.1 Maternal knowledge on IFAS

Mothers were asked questions to establish their knowledge on various aspects of IFAS. The majority of the mothers (81.2%) had heard of IFAS and the main source of information where mothers first heard of IFAS was the health facility by 79.5%. The next common source of information was the CHVs for 14.4% of the mothers (Table 20). The majority of the women (71.0%) knew the benefits of taking IFAS during pregnancy. The most commonly known benefit of IFAS was that it increased blood (85.5%) and that it prevents anaemia by 32.8%, helps in the development of the foetus by 22.2% and 15.6% knew that it prevents dizziness. Other health benefits mentioned by relatively smaller percentages of the mothers included improving immunity to the baby to be born and improves concentration (Table 20).

Table 20: Maternal knowledge on IFAS for women with children 0-23 months old

	N=1008	
	n	%
Heard information on IFAS for pregnant women: (N=1008)		
YES	818	81.2
NO	190	18.8
Where first heard of information on IFAS: (N=818)*		
Health staff of health facility	801	79.5
CHVs	145	14.4
Community members (*baraza*/church/neigbour)	3	0.3
Friend/support group	18	1.8
Husband/male partner	3	0.3
Other family member	20	2.4
IEC Material	1	0.1
Mass media	3	0.4
Other	2	0.2
Know benefits of taking IFAS during pregnancy (N=1008)		
YES	716	71.0
NO	292	29.0
The benefits of taking IFAS tablets during pregnancy: (N=716)*		
Prevents aneamia among pregnant women	235	32.8
Prevents dizziness	112	15.6
Increases blood	612	85.5
Helps development of the foetus	159	22.2
Improves immunity	45	6.3
Increases energy	52	7.3
Improved concentration	5	0.7
Other	14	2.0
Do not know	39	5.4

*Multiple responses

3.14.2 Maternal provision and consumption of IFAS by mothers 0-23 months old

Mothers were asked about the number of IFAS tablets they received during the pregnancy of their youngest child aged 0-23 months old. The majority (79.0%) reported that they had received IFAS during the pregnancy (Table 21). The majority of those who had received IFAS tablets (91.1%) received iron tablets to last less than 60 days. The same trend was observed for the other types of IFAS; 83.3% of the mothers received folic acid to last less than 60 days and 77.6% received combined iron/folic acid to last for the same period of time. Those who received the supplements for 90 days or more were relatively few; 6.7% for iron tablets, 0.0% for folic acid tablets and 12.3% for combined iron folic acid tablets (Table 21).

Table 21: Provision of IFAS

	n	%
Received any IFAS when pregnant with child: (N=1008)		
YES	796	79.0
NO	212	21.0
Received Iron tablets/syrup (N=796)	45	5.7
Received Folic acid tablets (N=796)	24	3.0
Received Combined iron/folic acid (N=796)	742	93.2
Number of days for which the supplements were given:		
Iron tablets/syrup: (N=45)		
< 60 days	41	91.1
≥ 60 to 89 days	1	2.2
≥ 90 days	3	6.7
Folic acid tablets: (N=24)		
< 60 days	20	83.3
≥ 60 to 89 days	4	16.7
≥ 90 days	0	0.0
Combined iron/folic acid: (N=742)		
<60 days	576	77.6
60-89 days	75	10.1
≥ 90 days	91	12.3

In terms of the number of days the mothers consumed IFAS during the entire pregnancy period, the majority consumed the supplements for less than 60 days; 91.1% (iron tablets), 83.3% folic acid supplements and 78.6% combined iron and folic acid supplements (Table 22). Those who consumed the three types of supplements for ≥ 90 days were less than 15.0% for each of the three types.

About one-third of the mothers (30.9%) reported that there were days that they had the supplements at home but did not take them (Table 22). The main reasons given by those who did not take the supplements despite having them at home were forgetting to take the supplements mentioned by 64.6% of the mothers, side effects such as nausea reported by 39.2% and 6.3% indicated that they felt better and therefore did not see the need to continue taking the supplements.

Mothers were asked if they were currently taking any other supplements. Less than one-tenth (7.7%) of the mothers reported that they were taking either CSB, Advantage PLUS or UNIMIX; 7.7% herbal supplements and 2.4% were currently taking ready to use supplements. Some of the mothers (6.5%) ate soil or mineral stones (Table 22).

Table 22: Consumption of IFAS

	n	%
Number of days the supplements were consumed throughout pregnancy:		
Iron tablets/syrup: (N=45)		
< 60 days	41	91.1
60-89 days	3	6.7
≥ 90 days	1	2.2
Folic acid tablets: (N=24)		
< 60 days	20	83.3
60-89 days	2	8.3
≥ 90 days	2	8.3
Combined iron and folic acid: (N=742)		
< 60 days	583	78.6
60-89 days	77	10.3
≥ 90 days	83	11.1
Days you had IFAS at home but did not take them (N=776)		
YES	240	30.9
NO	536	69.1
Reasons for not taking them (N=240)*		
Forgot	155	64.6
Side effects	94	39.2
Felt better and did not think I needed them anymore	15	6.3
Did not know for how long I should take the tablets	4	1.7
Did not know the benefits of taking IFAS	8	3.3
Other	9	3.8
Currently taking any of the following: (N=1008)		
Fortified blended flours (CSB, Advantage PLUS, UNIMIX)	78	7.7
Ready to use supplementary feed	24	2.4
Herbal supplements	78	7.7
Soil/mineral stones	66	6.5

3.14.3 Factors influencing the consumption of IFAS

During the FGDs it was reported that not many pregnant women consumed IFAS on a regular basis despite the majority being knowledgeable on the health benefits of the commodity. The level of knowledge varied from one area to another. The main reasons reported for non-adherence to taking IFAS were the side effects. A woman expressed the following sentiments in a FDG; "*IFAS causes vomiting because it has a bad smell. These side effects lead to non-adherence to taking the supplements".*

This finding was in agreement with the quantitative data which indicated that there were days the pregnant women had the IFAS at home but did not take them.

Other reasons reported for poor adherence of IFAS included:

- Long distance to health facilities;
- Negative attitude of health workers towards clients;
- Soil eating which discourage the women to take IFAS; and
- Some health workers dispense IFAS to the pregnant women without explaining their benefits.

3.15 Post-natal care services for mothers with children 0-23 months of age

Mothers of children 0-23 months old were asked questions about post-natal services they received after the delivery of their youngest child. Almost half of the mothers (46.4%) delivered at home assisted by TBAs and 39.9% at hospital whereas 9.9% delivered at home without assistance (Table 21). Of those mothers who did not deliver in a health facility, 17.1% took the child to the clinic within 2 weeks of birth, 32.8% after two weeks, 29.9% after one month and 7.4% did not take the child to the clinic (Table 23).

The majority of those mothers who did not deliver in a health facility received postnatal care from a health care worker ranging as follows: from 48 hours by 10.5%, one week by 14.9%, two weeks 27.6% to within one month 36.2% (Table 23). The percentage of mothers who did not receive post-natal care from a qualified health worker was 6.3%.

Table 23: Post-natal care services for mothers with children 0-23 months old

	n	%
Place of delivery of child (N=984)		
At home by TBA	457	46.4
At home by nurse	17	1.7
At home without assistance	97	9.9
Hospital	393	39.9
Other	20	2.0
If not at health facility, how long did it take before you took child to clinic for the first time? (N=591)		
Immediately (within 24 hours)	101	17.1
Within the first 2 weeks	194	32.8
Between 2 weeks to 1 month	72	12.2
After 1 month	177	29.9
Child not taken	44	7.4
Does not intend to take child to clinic	3	0.5
If you did not deliver at health facility, how long after delivery were you seen by a health care worker? (N=591)		
Immediately (within first 48 hours)	62	10.5
Within one week	88	14.9
Within two weeks	163	27.6
After one month	214	36.2
Not seen	64	6.3

3.15.1 Factors influencing the uptake of PNC services

The uptake of PNC services was reported to be low during the FGDs, a finding that concurs with that from quantitative data. The factors reported to encourage PNC attendance included; the provision of food supplements and immunization given to the children. The main barriers to the uptake of PNC services was reported to be restriction by some husbands to attend the clinics and that there was no need to attend the clinic if the mother did not have any complications during or after delivery.

3.16: Dietary intake by women of reproductive age (15-49 years)

Information was collected to establish the quality of dietary intake by mothers. The twenty-four hour (24 hour-recall) method was used to collect information on dietary intake so as to establish the types of foods eaten and the dietary diversity.

3.16.1 Foods eaten the previous day by women of reproductive age

Mothers/caregivers were asked to state the foods they ate the previous day. The foods consumed were categorized into foods groups as shown in Table 22. The majority of the mothers/caregivers (98.5%) ate oils and fats which were majorly used in cooking of foods. Cereals were consumed by a large majority of the respondents (95.7%) as would be expected since they form the staple foods. Sweets mainly in the form of sugar in tea was consumed by 83.5% of the mothers and 80.3% consumed milk and milk products mainly in tea. Oils and spices and condiments (mostly used for cooking food) was consumed by 79.5%. The least consumed foods were nuts and seeds by 5.0% of the women, eggs by 27.8% and vitamin A-rich vegetables and fruits by 35.8%, (Table 24).

Table 24: Foods eaten by women of reproductive age the day before the survey

Food groups	N=993	
	n	%
Cereals (maize, rice, wheat, sorghum, millet or any other grains or foods made from these foods)	950	95.7
White roots and tubers (white potatoes, white yam, white cassava and other foods)	475	47.8
Dark green leafy vegetables	519	52.2
Other vegetables (tomato, onion, eggplant etc.)	625	62.9
Other Vitamin A-rich vegetables and fruits	355	35.8
Other fruits (inclusive of wild fruits)	261	26.3
Meat, poultry, fish	438	44.1
Eggs	280	27.8
Pulses (beans, peas and lentils)	598	60.2
Nuts and seeds	50	5.0
Milk and milk products	797	80.3
Oils and fats	978	98.5
Sweets (sugar, honey, sweetened soda, sweetened juices, sugary foods such as chocolates, candies, cookies and cakes)	829	83.5
Spices and condiments	789	79.5
Did you eat anything (meal or snack) outside of the home yesterday?	156	15.7

13.6.2 Maternal dietary diversity

Consumption of a minimum of foods from at least 5 out of 10 food groups based on FAO guidelines (FAO, 2016) [see section 2.9 under methodology for details of food groups] was considered an attainment of minimum dietary diversity (MDD) for the women of reproductive age (MDD-W). The percentage of women who attained the MDD was 47.5% (Figure 8) implying that over half of the women were consuming diets limited in a variety of nutrients. The mean MDD-W was (4.8±2.6).

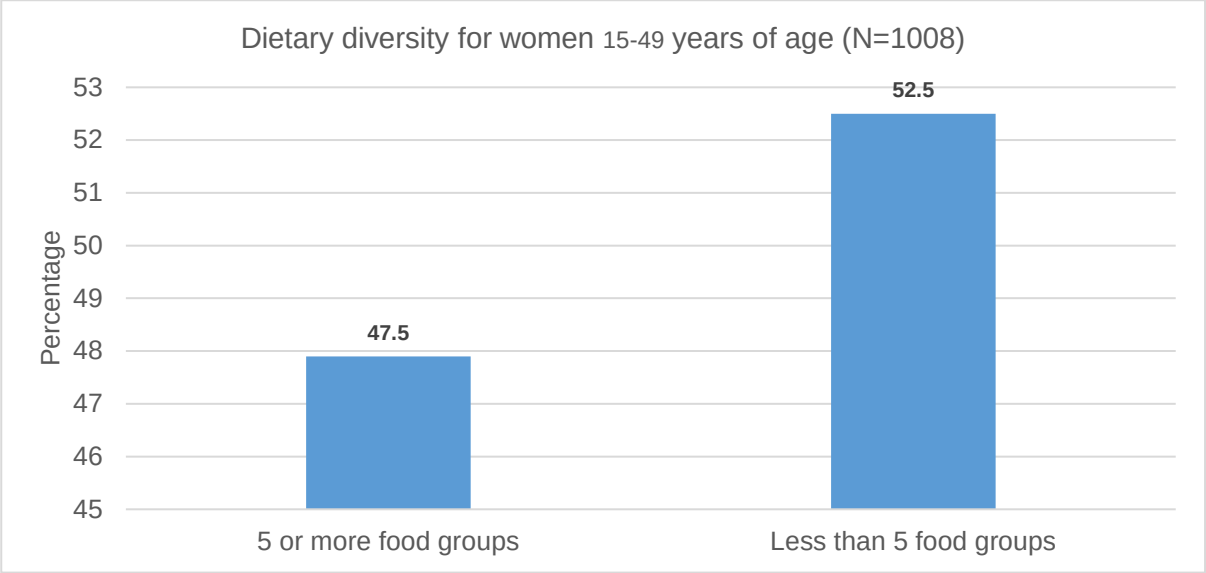

Figure 8: Minimum dietary diversity for women of reproductive age

13.6.3 Factors influencing maternal dietary intake

It was reported during the FGDs that maternal dietary intake (for both pregnant and lactating women) was not adequate for the majority of the women. The major factors reported to negatively influence dietary intake were:

- Food unavailability and long distance to markets to purchase foods;
- Low purchasing power of most families due to poverty and limited availability of livestock;
- Women not allowed to sell livestock and therefore acquisition of money from sale of this depends on the husband's decision;
- Likes and dislikes of pregnant women- some women preferred to eat certain foods during pregnancy and not others; and
- **Cultural beliefs** for example, pregnant women were not allowed to eat eggs because this would make the unborn baby to grow too big resulting in difficult delivery. Similarly, pregnant women were to drink diluted milk *(Nkarer)* as it was believed that undiluted milk is too strong and would make the unborn baby grow too big. It was recommended for pregnant women to eat animal fat as this would relieve heart burn experienced by a majority of the women.

The foods traditionally recommended for lactating women included soup from animal meat as this was believed to increase milk production. Raw blood was also recommended to replace the blood lost during delivery.

All women were restricted from eating certain parts of the animal except for the intestines and consumption of eggs and chicken was also a taboo for all women.

The traditional practices on the dietary intake of pregnant and lactating women stated here were however reported to be wearing out and only practiced by few women in a few of the areas such as Samburu East Sub-County.

3.17 Use of fortified foods by households

Mothers/caregivers of children 0-23 months old were asked questions about the use of fortified foods in their households. The majority of the mothers/caregivers (77.2%) reported that they used foods

and food products enrichened with vitamins and minerals (Table 25). When asked the specific fortified foods they consumed, majority of the households (93.7%) reported that they consumed fortified salt, and 79.3% consumed fortified cooking fats and oils. These were followed by the consumption of fortified maize flour at 68.3%, wheat flour at 62.8% and 25.7% consumed fortified sugar. Margarine was consumed by a small proportion of households (2.2%) (Table 23). The main oil/fat consumed by the households was vegetable fats by 77.4% of the households followed by oil by 21.9% of the households (Table 25).

The mothers/caregivers were also asked about the benefits of feeding children with flours fortified oils with vitamins and minerals. Over one-third of the mothers/caregivers (39.0%) reported that the fortified foods improve the body's ability to fight diseases and 38.1% that the fortified foods makes the child healthy, strong and active (Table 25). Many of the respondents (34.0%) did not know the benefits of feeding children with these foods.

Table 25: Use of fortified foods by households

	n	%
Use of foods and food products enrichened with vitamins and minerals (N=993)		
YES	767	77.2
NO	226	22.8
Type of fortified foods used: (N=767)		
Maize flour	524	68.3
Wheat flour	482	62.8
Margarine	76	9.9
Cooking fats and oils	608	79.3
Salt	719	93.7
Sugar	197	25.7
Other	17	2.2
What is the main oil/fat consumed by your household? (N=767)		
Vegetable fat	594	77.4
Animal fat	5	0.7
Oil	168	21.9
In your opinion, what are the benefits of feeding children flours and oils fortified with vitamins and minerals* (N=1008)		
Improve body's ability to fight diseases	396	39.0
Improves child's appetite	168	16.7
Improve child's ability to learn and develop	178	17.7
Makes children healthy, strong and active	384	38.1
Prevent vitamins and minerals deficiency	117	11.6
Others	8	0.8
DNK	343	34.0

3.18 Maternal and child nutritional status based on MUAC measurement

Maternal nutritional status based on MUAC measurement showed that 2.8% of the women were wasted (Table 24). This finding may be an indication that the women were probably getting adequate macronutrients but inadequate micronutrients as less than half of them consumed a diet the recommended minimum dietary diversity. The rate of wasting among the children (MUAC < 125mm) was high 7.2% with 1.2% being severely wasted (Table 26).

Table 26: Maternal and child nutritional status based on MUAC measurement

	n	%
Maternal Nutritional Status (N=1005)		
Normal ≥210 mm	977	97.2
Wasted <210 mm	28	2.8
Child nutritional status (N=736)		
Severely wasted <115 mm	9	1.2
Moderately wasted >115 mm to <125mm	37	5.0
At risk 125 to <135 mm	220	29.9
Normal ≥135 mm	470	63.9

3.19 Access to health and nutrition information via media channels

Mothers/caregivers were asked questions about access to health and nutrition information via radio channels. The most frequently listened to radio channel was reported to be Serian FM; 48.2% of the respondents had listened to the radio in the last twelve months compared to 0.8% that listened to KASS FM in the same period of time. When asked whether they had listened to the radio channels in the last one week; 36.8% of the respondents reported that they had listened to Serian FM and only 0.8% had listened to KASS FM (Table 27). The respondents were further asked if they had listened to the programme 'MIENDAP BORTO' on KASS FM, only 1.4% reported having listened to the programme and 0.9% listened to it in the last 7 days (Table 27).

Table 27: Access to different radio channels

	N=1008	
	n	%
Have you listened to Serian FM in the last 12 months		
YES	486	48.2
NO	511	50.7
DNK	11	1.1
Have you listened to KASS FM in the last twelve months		
YES	8	0.8
NO	943	93.6
DNK	57	1.1
Have you listened to Serian FM in the last one week		
YES	371	36.8
NO	114	11.3
DNK	1	0.9
Have you ever listened to programmes on KASS FM called 'MIENDAP BORTO'		
YES	14	1.4
NO	937	93.5
DNK	57	5.7
When did you last listen to this programmes		
Within last 7 days	9	0.9
Within last two weeks	4	0.4
Within last months	1	0.1
How often do you listen to this programme		
7 months	10	1.0
Can't remember	4	0.4

4: DISCUSSION

This discussion focuses on the key indicators of MIYCN. An attempt is made to discuss the plausible reasons for the observed rates in these indicators based on both the quantitative and qualitative findings. Qualitative data from this survey was used wherever appropriate to triangulate, or provide in-depth information, to the quantitative findings. Discrepancies between quantitative and qualitative findings, if any, are highlighted. The findings of this survey will provide baseline information useful for setting benchmarks and measuring progress of MYICN interventions in Samburu County since this is the first County level KABP survey to be conducted. Previously KABP surveys have been conducted at Sub-county level (KAP, 2013) and therefore the findings of these surveys are not directly comparable to those of this survey.

4.1 Infant and young child feeding practices

Appropriate infant and young child feeding practices play a major role in the healthy growth and development of children. The impact of undernutrition during the "window of opportunity" from minus 9 to 24 months (i.e. from pregnancy to two years old) has irreversible long-term effects on health and on cognitive and physical development.

4.1.1 Breastfeeding practices

Overall, the breastfeeding practices were optimal except for the following indicators: giving of pre-lacteal feeds; continued breastfeeding at 2 years; practical support given to mothers to help start breastfeeding and bottle feeding with teat/nipple. The optimal breastfeeding practices may have been contributed to by the high level of knowledge among mothers, fathers and other community members.

The attitudes and perceptions towards breastfeeding practices were positive and again there was agreement in the findings from the household survey and those from the FGDs. Also, there was limited cultural barriers to the adoption of scientifically appropriate feeding practices. Nonetheless, despite the relatively high exclusive breastfeeding rate recorded in this survey, effort is still needed to improve the rate to at least 90%, the minimum recommended by WHO to have impact on and reduce mortality by 13% among the underfives (Lancet, 2003). It was also observed that most children receive exclusive breastfeeding for 3 months and therefore there is need for efforts to encourage mothers to continue the practice up to 6 months.

Compared to the most current national rates, Samburu County had higher or improved rates for some indicators (initiation of breastfeeding, EBF and giving of pre-lacteal feeds) and lower/worse rates for others (continued breastfeeding at one year and 2 years, and bottle feeding) as shown in Table 26. It should however, be noted that the national rates are inclusive of rates from environments that are not similar with Samburu County. Samburu being an ASAL region and therefore vulnerable, has many partners implementing programmes in the County to improve the poor nutritional and health status of the mothers and children. This could partly explain the better rates of some of the breastfeeding indicators.

The current KABP survey is the first to be conducted in Samburu County; other surveys have been conducted at the sub-county level and therefore the findings are not directly comparable with these surveys because of the heterogeneity within the sub-counties. This may explain to a certain extent, the large differences in the rates of some of the indicators (Table 28). The findings of this survey will however be used as a baseline upon which progress of interventions at County level will be measured.

Table 28: Comparison of the prevalence of the key breastfeeding indicators (national and Samburu County)

Breastfeeding Indicators	KDHS 2014 %	Samburu North and East sub-counties %	Samburu County Survey, 2018 %
Early initiation of breastfeeding (within 1 hour)	62.2	89.3	83.7
Continued breastfeeding at 1 year (12-25 months of age)	90.0	90.4	85.0
Continued breastfeeding at 2 years (20-23 months of age)	53.0		41.1
Exclusive breastfeeding	61.0	69.4	77
Giving of pre-lacteal feeds	15.5		10.9
Bottle feeding	22.0	13.7	26.8

4.1.3 Complementary feeding practices

Overall, the complementary feeding practices are sub-optimal despite the high knowledge and positive attitudes and perceptions. Cultural beliefs and practices were also reported to be no longer a major barrier to adoption of appropriate IYCN practices. The majority of the children were receiving foods with limited dietary diversity and less than recommended frequency of meals, implying that they were not getting enough of a variety of nutrients for healthy growth and development. The children were therefore most likely deficient in micronutrients. This was compounded by the fact that consumption of MNPs among the children was very limited.

A comparison of the national and county rates of the key complementary feeding indicators showed a mixed picture. Less than half the children were introduced to complementary feeding at the correct time compared to 81.0% at the national level. Minimum Meal Frequency (MMF) was achieved by a much lower proportion of children in Samburu County compared to the national level. Minimum Dietary Diversity (MDD) and Minimum Acceptable Diet (MAD) was achieved by higher percentages of children in Samburu County than at the national level (Table 29). Again, as already pointed out, these findings have to be interpreted cautiously they are not directly comparable.

A comparison of the Samburu County and Samburu North and East sub-counties also show differences in the rates of the indicators most probably because of the heterogeneity in the sub-counties (Table 29). Nevertheless, as already mentioned these findings have to be interpreted cautiously because they are not directly comparable.

The major barriers to adoption of appropriate feeding practices were reported to be unavailability and inaccessibility to foods. It was reported by the county personnel that there was a prolonged drought just before the survey and therefore this exacerbated the food insecurity situation probably contributing to the poor indicators of complementary feeding practices. Another barrier to adoption of appropriate feeding practices was the lack of knowledge on how to prepare complementary dishes particularly using the foods that were not traditionally used for this purpose. This was reported to be a hindrance to women in some areas of the county particularly the remote ones.

Concerted efforts should be put into place to improve complementary feeding practices in the County. Knowledge alone will not improve the practices. There is need for innovative strategies to address the causes of inadequate complementary feeding practices. These strategies should include nutrition sensitive interventions to address food security issues which is the major cause of poor complementary feeding practices.

Table 29: Comparison of complementary feeding practices at national and Samburu County levels

Indicators of Complementary Feeding Practices	KDHS 2014 %	Samburu North and East sub-counties %	Samburu County Survey, 2018 %
Timely introduction of solid, semi-solid and soft foods (children 6-8 months old)	81.0	90.3	47.9
Minimum Dietary Diversity (MDD)	38.3	25.0	59.6
Minimum Meal Frequency (MFF)	49.6	69.8	35.9
Minimum Acceptable Diet (MAD)	22.6	47.0	25.7
Consumption of iron-rich and iron-fortified foods	33.3	3.5	21.1

4.2 Maternal knowledge, attitudes and perceptions on IYCN

Knowledge on IYCN practices was high and attitudes and perceptions were positive. The high level of knowledge among mothers and caregivers was demonstrated by the findings from the household surveys and corroborated by the findings from the FGDs. The knowledge levels were on the whole higher for breastfeeding indicators than complementary feeding practices. A smaller proportion of mothers/caregivers had received information on complementary feeding practices compared to those who had received information on breastfeeding practices. Could this probably imply that more emphasis was placed on breastfeeding at the expense of complementary feeding practices?

The high level of knowledge on breastfeeding was attributed to the intensive promotion of IYCN messages at the household level by the CHVs and also by health workers at the health facility reported by the FGD participants. The main source of information on complementary feeding practices were the CHVs with fewer mothers having received this information at the health facilities. The media was another channel of IYCF information particularly talks shows on Radio Serian FM although the coverage for this was limited mainly to Samburu Central.

There should be more emphasis on the promotion of complementary feeding practices at the health facilities and there is need to include demonstrations on the preparation of complementary feeding foods as it was reported that this was a barrier to some women practising appropriate feeding practices.

4.3 Responsive feeding practices

Overall the findings on responsive feeding practices were positive as the majority of the mothers talked to the children and verbally encouraged them to eat. Most of the mothers encouraged the children to self-feed which was a positive practice. Nonetheless, there is need to discourage mothers not to order children. One-quarter of the mothers did so. This practice could have detrimental effects on eating habits as the child may associate meals with unpleasant times or may develop negative perceptions about meals.

4.4 Feeding of children during illness

Appropriate feeding during illness is important to provide immunity to the child and also to prevent the child getting from getting malnourished. Feeding of children during illness was poor. The majority of the children received less food, less liquids and less breastmilk during illness mainly because the child did not want the food because of low appetite. This may imply that the children whose diets are not adequate based on the findings of this survey face a higher risk of malnutrition when sick. During illness the body requires more nutrients to fight the infection and boost the immunity system. During recovery, a higher proportion of children were given more or the same amount of food as they usually

eat when they are not ill – but the percentage who received more food was low. Feeding during illness therefore needs more emphasis in the messages on appropriate feeding of children.

4.5 Access, preparation and consumption micronutrient powders (MNPs)

On the whole, the coverage for the key indicators of MNPs were low. The knowledge on MNPs was limited as less than half (40.7%) of the mothers had heard of MNPs. Access to MNPs was a challenge as less than one-quarter of the children received MNPs in the last 6 months. The limited access may be partly explained by the fact that the majority of the mothers had not heard of MNPs and therefore they would not have gone to the health facilities to access the commodity. It should be noted that the County did not have supply of MNPs and therefore these findings should be integrated against this background. It was reported that plans were underway to supply the County with MNPs. It is therefore recommended that once the commodity is available, awareness creation should be conducted for all stakeholders. Appropriate messages on the health benefits of MNPs, preparation and frequency of consumption should be developed and disseminated to all stakeholders.

4.6 ANC attendance by pregnant women

The major objective of antenatal care during pregnancy is to identify and treat problems such as anaemia and infections. Screening for complications take place during ANC visits and advice is given on a range of issues, including place of delivery and referral of mothers needing further medical attention. The WHO recommendations, adopted by the MOH in Kenya stipulates that pregnant women should visit ANC at least 4 times during pregnancy and that the first visit should take place during the first trimester.

Overall, the majority of the pregnant women attended ANC at least once, most of them making their first visit during the second trimester instead of the recommended first trimester. This first visit, if started at the right time offers good opportunity for women to be reached with the full ANC service package including assessment, counselling on key IFAS messages etc. Less than half the women made the recommended 4 ANC visits. The majority of the mothers received the essential services that should be offered at the ANC clinics at least once during the entire pregnancy period. The overall implication of these findings is that the women are not getting critical services including check-ups on a frequent basis as per the recommendations because they do not visit ANC clinics regularly neither do they make timely first visit.

The interventions geared towards improving ANC attendance should address the factors hindering attendance for most women including: distance to health facilities, high maternal workload.

4.7 Maternal knowledge on IFAS, provision and consumption by pregnant women

Maternal knowledge on the health benefits of IFAS to the pregnant and unborn baby was high but this did not necessarily translate into consumption of the supplements, one per day as per the WHO and MOH recommendations. The main source of information for the majority was the health facility and less from the CHVs. In terms of provision, the majority of the mothers received the combined IFAS to last less than 60 days and the majority also consumed the IFAS for less than 60 days and yet it was reported there were no issue with the stocks of this commodity. The provision of IFAS for less than 60 days may be partly explained by the fact that the pregnant women do not attend ANC frequently and therefore they do not get adequate supply of IFAS.

The main reasons for the inadequate consumption was reported to be the side effects (nausea and vomiting) and forgetfulness. The community (all stakeholders including fathers) should be sensitized

to understand the benefits of and the frequency of taking IFAS during pregnancy. It was reported during one of the FGDs with men;

"*We fathers should also be taught the benefits of IFAS so that we can ensure our wives take them".*

4.8 Dietary intake of women of reproductive age

Dietary diversity is an indicator of diet quality; the Minimum Dietary Diversity for women of reproductive age (MDD-W) is the consumption of at least five foods from five or more of ten food groups as per FAO, 2016 guidelines (refer to section 2.9 in the methodology section). Those women who attain the MDD-W highly likely to consume at least one animal- source food and either pulses or nuts/seeds and food items from two or more of the fruit/vegetable food groups.

Maternal dietary intake was poor given that less than half of the women attained the MDD-W with a mean dietary score of 4.8±2.6. The MDD-W was low indicating low quality diet. The major reasons for poor dietary intake were food insecurity and lack of purchasing power. Cultural factors were reported not to be a major barrier to dietary practices – the majority of people are doing away with them as reported in the FGDs.

4.9 Access to health and nutrition information via media

Over one-third of the mothers listened to Serian FM Radio in the 7 days prior to the survey. During the FGDs some of the participants mentioned Serian FM Radio as on the major channels of information on IYCN. There were talk shows on IFAS and MNPs through Serian FM. The major challenge is that Serian FM is limited in coverage but plans are underway to scale up the coverage.

5. CONCLUSIONS

Breastfeeding practices: Overall the practices were optimal except for: provision of pre-lacteal feeds; continued breastfeeding at 2 years; practical support given to mothers to help start breastfeeding; and bottle feeding with teat/nipple. Efforts should continue to be made to ensure further improvement in breastfeeding practices and also to ensure that the gains made are not lost. Despite the fact that EBF has improved significantly, the rate should be improved further to reach 90%, the minimum recommended by WHO to have impact on and reduce mortality by 13% among the underfives. In any case, exclusive breastfeeding for most of the babies ends at 3 months as shown in the analysis of the EBF rates disaggregated by age. Efforts should be made to ensure that EBF is extended to 6 months for the majority of the children.

Complementary feeding practices: Overall, the CF practices were sub-optimal implying that a majority of the children are not getting adequate diet. Most of the children received diets that did not provide adequate nutrients in terms of quantity and variety for healthy development. Given that knowledge and cultural practices were not the major hindrances to appropriate complementary feeding practices, there is need for innovative and nutrition-sensitive interventions to address food insecurity which is the major hindrance to appropriate feeding practices.

Knowledge on MIYCN practices was high and the attitudes and perceptions positive. Promotion of appropriate MIYCN messages should be up-scaled. Messages to promote appropriate MIYCN practices should continue to be disseminated with particular emphasis on the remote, hard to reach areas where knowledge was reported to be low. There is need to explore the use of various channels in the promotion of these messages such as the Serian FM and the use of mobile phones through text messages.

In terms of ANC attendance, the majority of the pregnant women make at least one visit to a skilled health provider. The challenge is with the frequency of ANC attendance as only half of the pregnant women received ANC services at least 4 times by a skilled health provider as per the WHO and MOH recommendations. The other challenge is the timing of the first visit to the ANC; only one quarter of the women make first ANC visit during the first trimester. It is therefore important to establish the reasons why mothers do not start attending ANC in a timely manner and at the recommended frequency. This information would be useful in addressing the development of messages on the health benefits of attending ANC and also useful in addressing the barriers to pregnant women attending ANC as recommended.

The coverage for the provision and consumption of IFA supplements to pregnant women is low. The majority of the pregnant women received and consumed IFAS for less than 60 days and yet it was reported that the county had not experienced any stock outs of the combined IFAS. There is need to train the CHVs on IFAS so that they promote the consumption and address the mothers' challenges in the use of the supplements at the household level. It was reported that this training has not been conducted yet. May be frequent follow-up at the household level by the CHVs may encourage pregnant women and also to remind them to take IFAS. One of the reasons given for not taking IFAS on a regular basis was forgetfulness.

Responsive feeding: Overall, positive as the majority of the mothers talked to children and encouraged them to eat and self-feed. There is need to discourage the practice of ordering and threatening children to eat as was reported by about one-quarter of the mothers.

Feeding during illness: Overall, poor feeding practices and should therefore be appropriately addressed in the behaviour change communication messages.

Maternal dietary intake: Maternal dietary intake needs improvement given that less than half of the mothers attained a minimum dietary diversity. The major hindrance to adequate dietary intake is food insecurity and poverty. So addressing food security issues would improve mothers' dietary intake.

Factors influencing MIYCN practices

Factors influencing MIYCN positively

- **High level of knowledge on breastfeeding and complementary feeding practices** the mothers and the community as a whole. This together with the positive attitudes and perceptions to IYCF practices may have contributed to the appropriate breastfeeding feeding practices. The knowledge and positive attitudes and perceptions towards on complementary feeding did not necessarily translate to improved practices.
- It was also reported during the FGDs **that cultural beliefs** are no longer a barrier to IYCN practices for the majority of the people.
- **High level of maternal knowledge** on the health benefits of ANC attendance and consumption of IFAS during pregnancy influences mothers to seek these services. Despite this, many mothers did not seek these services on regularly.
- The services provided at the ANC such as; growth monitoring of the foetus, checking of anaemia and provision of supplementary foods encouraged mothers to attend ANC encouraged mothers to attend ANC clinics.

Barriers to appropriate MIYCN practices

- **Household food insecurity** resulting into inadequate dietary intake affecting milk production among breastfeeding mothers. Similarly, food insecurity was a major factor contributing to inappropriate complementary feeding practices because of unavailability and inaccessibility of a variety of foods. Poverty and loss of livestock were reported to major constraints to household food security. Poor household food security was also a major factors constraining maternal adequate dietary intake;
- **Family conflicts and violence** causing stress to the mother and therefore not able to produce adequate breastmilk and also take care adequate care of children;
- **High maternal workload** affecting time mother is available to provide quality care to the child and also to breastfeed and prepare appropriate complementary foods for the baby;
- **Alcoholism among the mothers** interfering with quality of care given to children including appropriate feeding practices;
- **Inadequate knowledge on complementary feeding practices** particularly on how to prepare foods for the children was reported to be a constraint to appropriate feeding practices.
- **The women who did not attend ANC regularly** were discouraged by: the high maternal workload; long distance to health facilities; were not comfortable to be attended by male health workers; mandatory HIV testing and some were discouraged by their husbands from attending.
- **The women who did not take IFAS on a regular basis** were discouraged by the side effects (nausea and vomiting) while some forgot to take them.
- **The major factors constraining maternal adequate dietary intake were**

6. RECOMMENDATIONS

6.1 Programme recommendations

Table 30: Recommendations

Recommendations	Persons responsible	By when
Optimize utilization of Social and Behavior Change Communication Strategy to promote adoption of appropriate MIYCN practices	CHMT – CNC- Partners	Continuous
Enhance collaboration of Health/Nutrition Sector and other nutrition sensitive actors through Samburu County Nutrition Multi Stakeholder Platform to promote a holistic way of addressing nutrition issues	Departments of Health, Agriculture, Child Protection Services, Water, and Education	Continuous
Promote operationalization of Complementary Feeding Action Plans	CHMT	Continuous
Scale up Baby Friendly Community Initiatives in all Community Units	CHMT	April 2019
Training of CHVs on Nutrition modules	CHMT/Partners	December 2018
Training of health workers on MIYCN/BFCI Modules	CHMT	December 2018
Dissemination of VAS, IFAS, and MIYCN Policies	MoH/CHMT	December 2018
Promote customization of local diets and Food demonstrations	Ministry of Agriculture	Continuous
Develop and operationalize County Common Results Framework	Samburu County Multi-Stakeholders Platform	By May 2018
Recruitment of more nutritionists	County Government	2019
Advocacy for more investment in nutrition	CHMT/Partners	Continuous

6.2 Recommendations for future surveys

- Conduct in-depth MIYCN KAPB qualitative surveys to provide detailed sub-county level information to allow for appropriate programming taking into account any differences in the sub-counties.
- The questionnaire should be shortened and made to focus on the key MIYCN indicators. Questions with a high possibility of recall bias e.g. IFAS for mothers with children 0-23 months old- the target population changed to mothers with younger children to minimize recall bias.
- Data analysis: It is recommended that qualitative data be analysed using data analysis software to for improved efficiency. It is also recommended that basic inferential statistics be included in the analysis to provide information for more targeted MICYN messages.
- The ToR should also include maternal nutrition and other indicators e.g. IFAS and ANC based on the WHO and MOH guidelines.

7. REFERENCES

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8. APPENDICES


KAP QUESTIONNAIRE 157


KABPS_2017_Samburu_Final_Dataset.csv


Samburu Final 1.sav


Training Schedule SAMBURU KABP 201


SCHEDULE FOR FGD AND KII TEAM.d


ADDITIONAL QUESTIONs for UNIC


Samburu KABP Feb 2018 report slides I


NITWG validated UNICEF KABP MIYCN