BREASTFEEDING OF CHILDREN 0-24 MONTHS IN BUSIA DISTRICT: PATTERNS AND BARRIERS

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UNIVERSITY OF NAIROBI

DECLARATION

I declare that this dissertation is my original work and has not been presented to any other university for the award of an academic degree.

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DEDICATION

To my lovely family: husband Nashon Juma Adero and daughters Faith, Charity and Peace.

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ACRONYMS AND ABBREVIATIONS

ANC	Antenatal Clinic
CHVs	Community Health Volunteers
CHWs	Community Health workers
ERC	Ethical Review Committee
FANC	Focused Antenatal Care
FGD	Focus Group Discussion
IYCF	Infant and Young Child Feeding
KNH	Kenyatta National Hospital
NACC	National Aids Control Council
PPH	Post -partum Haemorrhage
SDGs	Sustainable Development Goals
STATA	Data Analysis and Statistical Software
UNAIDS	United Nations Programme on HIV/AIDS
UNICEF	United Nations Children's Fund
UoN	University of Nairobi
USAID	United States Agency for International Development
WHO	World Health Organization

DEFINITION OF TERMS

Barriers: An obstacle that hinders or prevents an action.

Bottle Feeding: If a child has received liquid or semisolid food from a bottle with nipple or teat. Infants receiving breast milk from a bottle are also included. It has been known to interfere with optimal breastfeeding. It is also known to be associated with increased diarrhoeal disease, morbidity and mortality.

Breastfeeding: Process of feeding the infant on the mother's milk, either directly from breast or by giving expressed breast milk.

Colostrum: Thin yellowish fluid that oozes from the breasts from as early as 20 weeks' gestation to the first few days after birth. It is rich in white cells, antibodies and proteins.

Complementary feeding: The child receives both breastmilk and solid (semisolid or soft) foods.

Exclusive Breastfeeding: The infant receives only breastmilk (including expressed breast milk or from a wet nurse) and nothing else except

Oral Rehydration Solution, vitamins, minerals and medicines. This is recommended for the first six months of life.

Prelacteal feeds: Any food apart from mother's milk provided to a newborn before initiating breastfeeding.

ABSTRACT

INTRODUCTION**:** Breastfeeding provides infants and young children with nutrients for healthy growth and development. Virtually every mother can breastfeed with the right information and support. Assessment of the local breastfeeding situation is an essential step in developing district specific strategies and programmes to promote breastfeeding and improve child health.

OBJECTIVES**:** To describe patterns of breastfeeding in children 0-24 months in Busia District. The secondary objectives were to identify barriers to breastfeeding and measures to reduce prelacteal feeding.

METHODOLOGY**:** This was cross sectional community survey of children 0-24 months and their mothers in Busia District. 385 mother-infant pairs were recruited into the study.An interviewer administered questionnaire was used to obtain data on patterns of breastfeeding (including prelacteal feeding, timely initiation of breastfeeding, exclusive breastfeeding , bottle feeding and continued breastfeeding at one year). A Focus Group Discussion (FGD) comprising 5 mothers, 2 nurses, 2 grandmothers, 2 community health workers/volunteers and 1 community women leader was held to obtain information on barriers to optimal breastfeeding (exclusive breastfeeding, timely initiation of breastfeeding and prelacteal feeding) and on measures to reduce prelacteal feeding. The households visited were mapped using a hand-held GPS device.

DATA ANALYSIS: Data entry, cleaning and validation were executed using MS Office Excel™. Data analysis was conducted using STATA™ version 12. Means and medians were calculated for the variables as well as their frequencies and percentages. Association between the breastfeeding patterns and maternal characteristics were explored using Chi Square tests. Data from the FGD was analysed using a deductive thematic approach.

RESULTS**:** The mean age of the children was 10.6 months (SD 6.7) and 201 (52.2%) were males. 218 (56.6%) of the mothers were between 15 and 24 years. 228 (59.2%) of the mothers were unemployed while 120 (31.2%) were self-employed. About 94% of the mothers attended ANC at least once during pregnancy. The prevalences of the assessed breastfeeding practices were as follows: 85 (78.7%) for exclusive breastfeeding; 189 (51.3%) for timely initiated to breastfeeding ;48 (12.6%) had prelacteal feeds; 67(18.3%) were bottle fed and 42 (84%) continued breastfeeding for at last 1 year. Lack of ANC clinic attendance and lack of breastfeeding information during ANC were associated with increased prelacteal feeding (ten times and four times respectively). The self-employed were twice as likely to exclusively breastfeed OR 2.56 (1.07-6.13) as their salaried counterparts.

Home delivery, non-attendance of ANC clinic, failure to receive information on breastfeeding during ANC visits, maternal engagement outside the home and cultural beliefs were some of the barriers to optimal breastfeeding. Strategies to emphasize ANC clinic attendance, breastfeeding counseling during ANC visits and hospital delivery were cited as some of the measures to reduce prelacteal feeding.

CONCLUSION**:** The breastfeeding rate in the district was generally high. Even though most children in the district continued to breastfeed for at least one year, there were significant divisional variations. There was a direct relationship between ANC attendance and counseling on breastfeeding during ANC with the practice of optimal breastfeeding. The practice of optimal breastfeeding experienced several barriers including influence by family members, maternal engagement outside the home and myths that surround breastfeeding.

RECOMMENDATION**:** Breastfeeding messages should emphasise the importance of ANC attendance and breastfeeding counselling during ANC. Programmes to promote

breastfeeding should include significant others like grandmothers and be sensitive to local needs.

CHAPTER 1: INTRODUCTION AND LITERATURE REVIEW

1.1 Introduction

Breastfeeding provides all the energy and nutrients that the infant needs for the first six months of life, and it continues to provide up to half or more of a child's nutritional needs during the second half of the first year, and up to one-third during the second year of life. Exclusive breastfeeding and proper complementary feeding after six months have been shown to be the most effective ways of ensuring child survival and preventing early childhood malnutrition. Continued frequent breastfeeding is associated with greater linear growth and improves child health by delaying maternal return to fertility hence reducing the risk of morbidity and mortality. It may also prevent dehydration in infants recovering from infections **(1,2).**

WHO and UNICEF recommend that infants should be breastfed within the first one hour after birth and thereafter exclusively breastfed for the first six months of life to achieve optimal growth, development and health. To meet their evolving nutritional requirements, infants should then receive nutritionally adequate and safe complementary foods, while continuing to breastfeed for up to two years or beyond. **(2)** Despite high rates of initiation of breastfeeding, many mothers find it difficult to meet personal goals and to adhere to the expert recommendations for timely initiation, exclusive and continued breastfeeding**. (3)**

1.2 Literature Review

Numerous studies have shown that breastfeeding has a lot of benefits to the baby, the mother and the society at large .A study done by Maria et al in the United Kingdom in 2006 found that Breastfeeding, particularly when exclusive and prolonged, reduces hospitalizations from diarrhea and lower respiratory tract infections **(4) .**A WHO public health review revealed that approximately 44% of infection-related neonatal

deaths/DALYs (including those due to acute lower respiratory infections) and 20% of postnatal acute respiratory infections deaths/DALYs lost were attributed to suboptimal breastfeeding **(5)**

A review by Agency for Healthcare and Research Quality (AHRQ) found that breastfeeding reduced the risk of acute otitis media, non-specific gastroenteritis, severe lower respiratory tract infections, atopic dermatitis, asthma (young children), obesity, type 1 and 2 diabetes, childhood leukemia, sudden infant death syndrome (SIDS), and necrotizing enterocolitis .**(6)** Extensive research on the relationship between cognitive achievement (IQ scores, grades in school) and breastfeeding has shown the greatest gains for those children breastfed for longer durations. **(7,8)**

Breastfeeding has the following benefits to the community :it saves money as it does not require importing formula and utensils, healthy babies make a healthy nation, breastfeeding leads to a decrease in the number of childhood illnesses hence decreased national expenditure on treatment, improves child survival (reduces child morbidity and mortality) ,and lastly if breastfeeding is practised widely it conserves the environment in that trees are not used for firewood to boil water, milk and utensils as breast milk is a natural renewable resource.**(2)**

Breastfeeding brings a feeling of fulfillment and joy to the mother emanating from the physical and emotional communion they experience with their child while nursing. This is known to increase a mother's chances of breastfeeding subsequent children **(9)**

On the global platform, improving the rates of breastfeeding will help in achieving some of the global nutrition targets 2025 namely: 40% reduction in stunting rates among children under five, no increase in childhood overweight, increasing exclusive breastfeeding rates by 50% in children under 6 months and reducing and maintaining childhood wasting at less than 5% **(10).**

Optimised breastfeeding will have a direct positive effect on the second target of third Sustainable Development Goals (SDGs) 2030. The target aims to end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under 5 mortality to at least as low as 25 per 1,000 live births by 2030 **(11).** The global strategy for infant and young child feeding provides the roadmap towards achieving optimal child feeding practices **(2)**. The Kenyan government has adopted this strategy, and breastfeeding is among 11 prioritized high-impact nutrition interventions for child survival and development **(12).**

1.2.1 Various Breastfeeding Practices

Prelacteal Feeding:

The practice of giving newborns food or drink other than breast milk delays initiation of breastfeeding and is a barrier to exclusive breastfeeding**.** The feeds interfere with breastfeeding by decreasing frequency or effectiveness of suckling hence decreasing amount of milk. A study carried out in Zimbabwe in 2014 indicated that majority of children under six months were not being exclusively breastfed because the mothers gave the infants certain feeds for protection from or treatment of a perceived illness associated with early infancy (protection feedings). **(13)**

Initiation of breastfeeding within the first one hour after delivery:

This allows the baby to get colostrum protecting the neonate from infections and reduces neonatal mortality. It facilitates emotional bonding of mother and baby and stimulates milk production. Early initiation of breastfeeding reduces post-partum hemorrhage (PPH) in the mother because of increased secretion of oxytocin which exerts uterine tonic effects. (**2,14,15,16,)**

Exclusive breastfeeding for the first six months of life:

The nutrient needs of the infant can be met by breast milk alone for the first 6 months. Complementary feeding before 6 months tends to displace breast milk and has no additional nutritional benefit. In the context of Human Immunodeficiency Virus (HIV), exclusive breastfeeding for six months increases infants' chances of HIV-free survival and reduces chances of HIV transmission through breast milk. Exclusive breastfeeding also delays return to fertility. **(2,14,15,16)**

Continued breastfeeding up to two years and beyond:

Breast milk continues to provide important nutritional contribution beyond infancy. A longer duration of breast feeding has also been linked to reduced incidence of chronic childhood illnesses and obesity and improved cognitive outcomes (2). Optimal breastfeeding of infants under two years of age has the potential to prevent over 13% of all deaths in children under five in the developing world. A further 6% under-five mortality can be prevented by continued breastfeeding. **(17)** A study by Murage et al in an informal urban settlement in Kenya showed that about 85% of infants were still breastfeeding by the end of the 11th month **(18).** In Kenya, 51% of babies are still being breastfed by their second birthday.

Bottle Feeding:

Golen and Venturato described the extent to which mothers engage in distracting activities during infant bottle feeding. They were reported to engage in other activities during 52% of the feedings with television watching being the most prevalent activity reported **(19).** A study by Hye –Young Kim et al in 2011 suggested that prolonged bedtime bottle feeding might be one of the causes of chronic respiratory symptoms in infants. **(20)**

1.2.2 Barriers to Breastfeeding

Unfavourable Work / School Demands

This is one of the most frequently experienced barriers to initiation and continuation of breastfeeding. Women who have not returned to work after delivery had greater odds of initiating breastfeeding, predominantly breastfeeding for more than three months and continuing to breastfeed beyond six months. If new mothers delay their time of return to work, then duration of breastfeeding among the mothers may lengthen. **(21)**

Cultural Barriers:

In some communities, the breast is viewed as a sexual object and so men are not supportive of their wives breastfeeding. They are concerned that breastfeeding will change the appearance of the breasts and have negative perception of breastfeeding in public. Some believe that transition from the breast to the bottle may harm the baby so they do not breast feed at all. Some cultures consider colostrum as dirty, poisonous and contaminated and is likened to 'birth blood 'milk. **(22,23)**

Breastfeeding problems:

Breastfeeding problems are barriers both to initiation and continuation of breastfeeding according to a 2014 study. Examples are painful nipples due to engorgement, cracked nipples among others. ***(22*)**

Lack of Social Support:

Modernisation and rural urban migration has meant people live away from their extended families. This translates to little support with childcare and exclusive breastfeeding **(18).** The key to best breastfeeding practices is continued day to-day support for the breastfeeding mother within her home and community", a statement made during the World Breastfeeding week. (**24).**

Inadequate antenatal visits:

Apart from offering regular checkups to detect and treat potential problems in the pregnant woman, antenatal care also provides information that prepares her for child birth including information on breastfeeding. **(25)**

Lack of breastfeeding advice during antenatal and postnatal visits:

A study showed that women who have attended antenatal classes were half as likely to bottle feed and recommend better information on breastfeeding than non-attendees. Women who attend antenatal clinic are also linked to maternity services and networks in the community that support breastfeeding. Antenatal visits also give mothers the opportunity to ask questions and be able to overcome myths associated with breastfeeding. (**22)**

Inadequate Breast Milk:

A study carried out in 2009, showed that 14.3% of mothers did not exclusively breastfeed for six months because of insufficient breast milk production while 64.4% reported that breast milk was insufficient for the infant. (**26)**

Use of Prelacteal Feeds:

Prelacteal feeds interfere with breastfeeding by decreasing frequency or effectiveness of suckling, decreasing amount of milk removed from breasts and delaying milk production or reducing milk supply. Prelacteal feeding is associated with insufficient breast milk production **(13)**. The use of pre-lacteal feeding was significant predictor for early cessation of full breastfeeding at 6, 10, 14 and 19 weeks. **(27)**

1.2.3 Breastfeeding Trends in Kenya

Table 1.1: Breastfeeding trends in Kenya (28,29)

PRACTICES	KDHS 1998	KDHS 2003	KDHS 2008/2009	KDHS 2014
INITIATION OF BREASTFEEDING	54.5%	48.7%	54.9%	60%
EXCLUSIVE BREASTFEEDING	16.6%	14.6%	32%	61%
DURATION OF BREASTFEEDING	21 months	20 months	21 months	21 months
BOTTLE-FEEDING	22.3%	22.4%	19.7%	-
PRELACTEAL FEEDING	-	65%	42%	16%
EVER BREASTFED RATE	98%	97%	97%	99%

Breastfeeding profiles in Western Kenya indicate that 98.9% of children are ever breastfed, 52.8% (second lowest in Kenya) were breastfed within the first one hour, 82% were breastfed within the first one day while 25% (highest in Kenya) received prelacteal feeds **(28,29).** Separately**,** a child survival report by Bennet et al indicated that only 25% of mothers initiated breastfeeding within the first one hour after delivery and 22% exclusively breastfed their infants under six months of age in Samia and Busia Districts. **(30)**

1.3 Study Justification and Utility

Western Province, where Busia is found, had the lowest rates of initiation of breastfeeding within the first one hour recording 34% against national average of 58%.

The province was also reported to record the highest rates of prelacteal feeding: 67% against the national level of 42%. (**28**)

Childhood malnutrition in Kenya is still high with 26% 11% and 4% of children under 5 years being stunted, underweight and wasted respectively. (**29)** Nungo and Okoth in 2012 showed that the rates of stunting in one of the divisions of Busia District was 26.6% and 13.9% were underweight **(31).**

So far, there exists no data that describes the breastfeeding patterns in the wider Busia District and the factors that have contributed to high use of prelacteal feeds in this region as well as low rates of timely initiation of breastfeeding. It is hoped that this assessment of the local breastfeeding situation will help in developing district-specific strategies and programmes to promote breastfeeding and improve child health. This will be valuable in achieving the second target of third SDG 2030, which aims to end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under 5 mortality to at least as low as 25 per 1,000 live births by 2030**. (32)**

A spatial mapping component was included for completeness and scalability in the following ways:

a) It gives a more complete picture by adding location components to the descriptive statistics collected from the field, so that the spread of the data collection exercise can be visualised and interrogated for geographical equity.

b) It ensures that the data collected is amenable to GIS analysis, hence easy to integrate with other geographically referenced data for more advanced and complex analyses.

1.4 Study Questions

1. What is the breastfeeding pattern of children 0-24 months in Busia District?
2. What are the barriers to breastfeeding of children 0-24 months in Busia District?
3. How can the prelacteal feeding in Busia District be reduced?

1.5 Study Objectives

1. To establish the pattern of breastfeeding of children 0-24 months in Busia district (initiation of breastfeeding, exclusive breastfeeding, and continued breastfeeding at 2 years, bottle feeding and prelacteal feeding).
2. To identify the barriers to optimal breastfeeding of children 0-24 months in Busia District (exclusive breastfeeding, timely initiation of breastfeeding and use of prelacteal feeds).
3. To identify ways to reduce use of prelacteal feeding in Busia District.

CHAPTER 2: METHODOLOGY

2.1 .Study Design

This study was a cross-sectional community survey that utilised both quantitative and qualitative methods of data collection.

2.2 Study Site

The study was conducted in Busia District, located in the western part of Kenya. Busia District measures 1,628 km^2 with a predominantly North-South elongation. It borders Uganda to the west, Bungoma County to the north, Kakamega County to the east, and Siaya County to the South. It is approximately 430 km west of Kenya's capital city, Nairobi, by road. Busia District is made up of six divisions and had a population of 743,946 according to the 2014 demographic survey. The map of Busia District is shown in Figure 2.1.

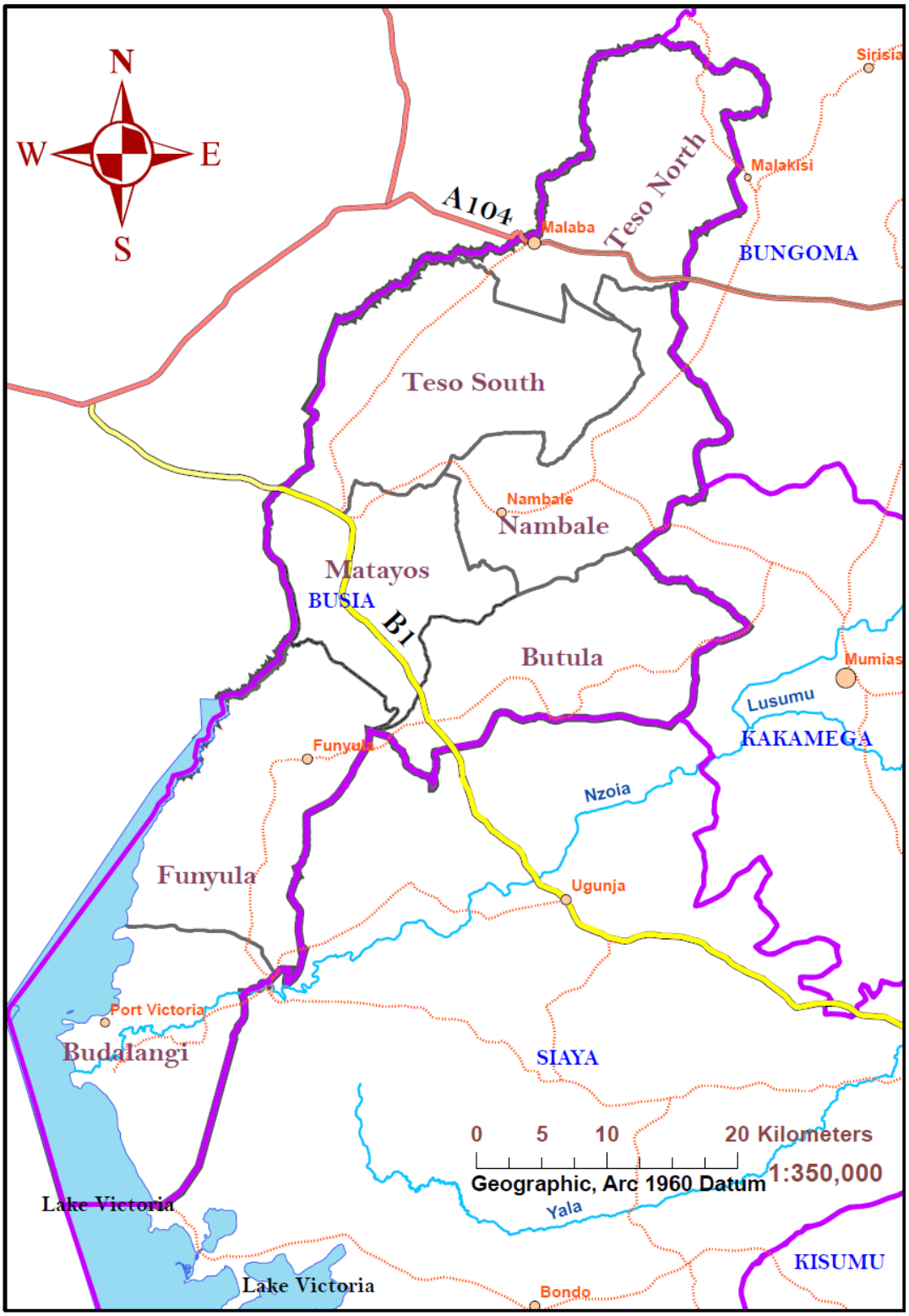

Figure 2.1: Map of study area according to Divisions in Busia District

2.3 Study Population

Mothers with their children aged 0-24 months residing in Busia District.

2.4 Study Period

The study was carried out over a period of one month, from 1st December 2015 to 30th December 2015.

2.5 Inclusion Criteria

1. Mothers with their children 0-24 months
2. Mother given informed written consent for study participation

2.6 Exclusion Criteria

1. Children whose mothers were absent from home during the data collection visit.
2. Children whose parent could not remember exact date of birth and with no valid data on date of birth.
3. Mother-child pairs found within households in the study area but who were not residents of Busia.

2.7 Sample Size Determination

The sample size was determined using Fischer's Formula for determining sample size in prevalence studies:

$N=Z^2*P(1-P)/ D^2$

N is the desired sample size

Z is the value representing 95% confidence interval

D is the precision with which to measure prevalence of the study ± 5%

P is the estimated prevalence

The prevalence of 50% covers the range of possible values for all the five outcomes of interest (initiation of breastfeeding, exclusive breastfeeding, and continued breastfeeding at 1 year, bottle feeding and prelacteal feeding) and ensures adequate numbers to estimate each outcome with the desired precision (± 5%)

$n = (1.96)^2 \times 0.5(0.5) / (0.05)^2$

$n = 384$

2.8 Sampling Method and Study Progress

Each of the six divisions in Busia District were sampled and an approximate sample size determined based on the population distribution as per the last Population and Housing Census. Four villages were then randomly selected from each of the 5 divisions except for Busia Township where five villages were selected due to high population. The desired sample size from each village was determined by dividing the estimated divisional sample by the number of the villages selected from that division. Community Health Workers acted as guides helping the data collectors to navigate the villages. From a starting point at the perceived centre of the village, a direction was randomly chosen by tossing a coin. The first household with a child 0-24 months nearest to the centre in the chosen direction was picked. Subsequent households were based on the nearest households to the initial household which had children within the target age group. This was done consecutively till the edge of the village in that direction. If the sample size was not attained, then a new direction was randomly chosen by tossing a coin.

The mothers initially gave verbal then informed written consent, on a pre-designed consent form. The consent form was provided in Kiswahili, English and the local Luhya

language. Each mother then filled a pretested interviewer-administered questionnaire. The questionnaire was used to obtain data on demographic and socioeconomic characteristics of the study subjects, breastfeeding practices and breastfeeding problems. A total of 385 mother–child pairs were included into the study. Information obtained was only accessible to the principal investigator and was kept confidential.

A hand-held GPS receiver (Garmin eTrex 10) was used to accurately capture the locations of the respondents across Busia District. To be equitably representative of the changing geography of stakeholder views and experiences, the samples were distributed according to the relative abundance of the expected respondents, going by the administrative units in Busia District. Divisions were used as the basic administrative units for geographical sampling.

The GPS units were configured to match the standard time and geographical parameters suitable for mapping in Kenya. A geographic coordinate system based on Arc 1960 datum was selected to define the mapping framework. Arc 1960 datum based on Clarke 1880 ellipsoid is recommended by the National Mapping Agency, Survey of Kenya, for referencing coordinates within the country. To adequately show Busia and her neigbouring counties, the suitable scale of mapping was 1:350,000. Care was therefore taken to ensure the recording of GPS locations was always within a tolerance of 10 meters, which is 10% of the resolvable detail at the scale of 1:350,000.

One Focus Group Discussion was conducted comprising twelve participants. The participants included 5 mothers, 2 nurses, 2 grandmothers, 2 community health workers/volunteers and 1 community women leader. To be eligible for inclusion in the focus group discussion participants had to be: residing or working in Busia District, aged eighteen years and above, taking/taken care of children 0-24 months and give verbal consent. During the focus group discussion, information on barriers to breastfeeding and measures to reduce prelacteal feeding was obtained.

The data collectors comprised five high school graduates, one primary school teacher and one high school teacher. The data collectors were taken through two days of training by the principal investigator on how to obtain consent and administer the questionnaire. The Focus Group Discussion was facilitated by principal investigator assisted by one primary school teacher (note taker) and one high school teacher (voice recording).

2.9 Calculation of Breastfeeding Indicators Assessed

Two core indicators (early initiation of breastfeeding and exclusive breastfeeding) and three optional indicators (prelacteal feeding, bottle feeding and continued breastfeeding at 1 year) were assessed. This is according to WHO recommendations for assessing Infant and Young Child Feeding Practices. The indicators were calculated as percentages using the following numerators and denominators:

1. PRELACTEAL FEEDING

$$\frac{\text{Children 0-23 Months fed on prelacteal feed X 100}}{\text{All Children 0–23 months of age}}$$

2. TIMELY INITIATION OF BREASTFEEDING

$$\frac{\text{Children age 0- 24 months put to the breast within 1 hour of birth X 100}}{\text{Total number of children age 0- 24 months}}$$

3. EXCLUSIVE BREASTFEEDING

Number of children 0-5 months on exclusive breastfeeding X 100

Total number of children 0-5 months

4. CONTINUED BREASTFEEDING AT TWO YEARS

   Children 20-23 months who received breast milk in the previous day X 100

   Children 20-23 months

5. BOTTLE FEEDING

Children 0–23 months of age who were fed with a bottle the previous day X 100

Children 0–23 months of age

6. CONTINUE BREASTFEEDING AT 1 YEAR

   Children 12-15 months who were breastfed in the previous day X 100

   Children 12-15 months

2.10 Data Management

The questionnaires were safely kept by the principal investigator during the period of data collection. The questionnaires were then kept under lock and key in the statistician's office during data entry and analysis. Each of the questionnaires had no direct identifying information but had code numbers instead. Data entry was done using a password protected excel sheet and data base was created. Data was verified by comparing the information in the database with that on the questionnaires. Data management was closely supervised at all stages.

2.11 Data Analysis

Analysis of the quantitative data was done using STATA version 12. Means (standard deviations) and medians (ranges) were calculated for continuous variables and frequencies and percentages calculated for categorical variables. Breast feeding patterns were described using percentages calculated for prelacteal feeding, timely initiation of breastfeeding, exclusive breastfeeding, bottle feeding and breastfeeding at 1 year. Association between these patterns and maternal characteristics were explored using chi square tests. Chi Square test was used to determine factors associated with each outcome and logistic regression used in multivariable regression model to identify independent predictors of breast feeding patterns. Multivariable logistic regression analysis was used to identify independent associations using a p-value < 0.05.

The qualitative data from the FGD was transcribed and coded. The analysis was then done manually using deductive thematic approach based on the WHO framework for breastfeeding recommendations to identify perceived barriers to breast feeding and measures to reduce prelacteal feeding.

Using ArcGIS 10.3, the GPS points representing the surveyed locations were imported as a shape file. The points were then plotted and integrated into the base maps of administrative units, heath facilities, key roads, main rivers, Lake Victoria, and other counties in the immediate vicinity of Busia District. This process yielded a digital map showing the locations of the interviewed households within the spatial context of the wider region of this study.

2.12 Ethical Consideration

Permission was first sought from the County Director of Health. The County Public Health Officer assisted with community entry via the Sub-county Public Health Officers. The mothers were informed of the objectives of the study and how it would be beneficial to the community. Their verbal approval was obtained before they gave an informed

written consent. An interviewer administered questionnaire was then administered. Ethical approval was obtained from Kenyatta National Hospital and University of Nairobi (KNH/UON) Ethical Review Committee (ERC) before the study. The study was carried out based on the ethical standards set out in the ERC guidelines.

The participants were informed that their participation was voluntary and all the information obtained was confidential. The questionnaires had no identifiers and instead each questionnaire had a unique code. Those who participated in the Focus Group Discussion also gave an informed verbal consent before being recruited. It is anticipated that the information obtained from this study will be given as feedback to the district through the Busia County Director of Health.

CHAPTER 3: RESULTS

3.1 Sampled Households

The surveyed points were mapped, as shown in Figure 3.1. The locations of interviewed households are shown in small red circles.

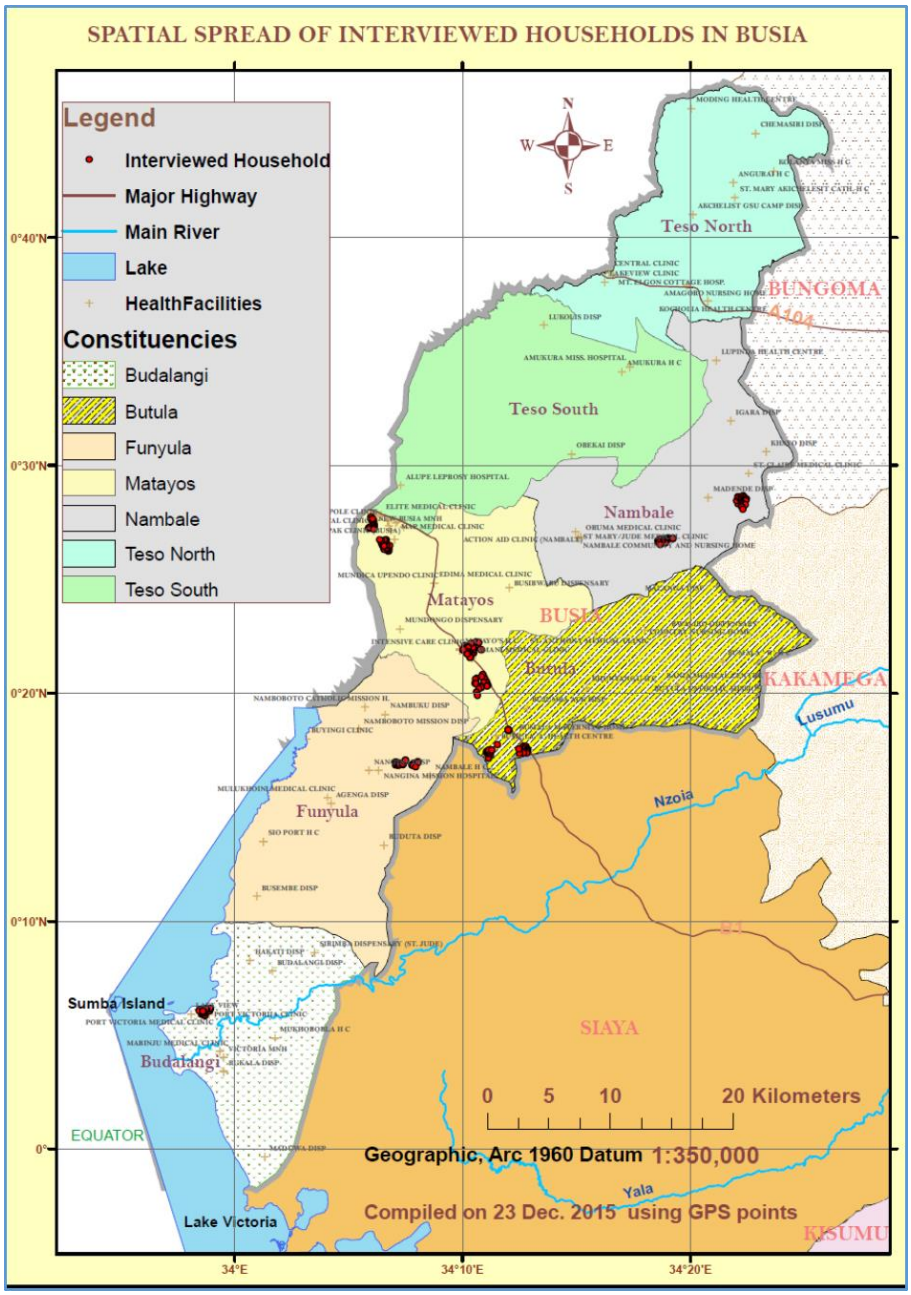

Figure 3.1: Map of sampled households

3.2 Socio-demographic Characteristics of Mothers

Maternal demographic characteristics are presented in Table 3.1. The mean age of the mothers was 24.6 years (SD 5.5) and the age range was between 15 to 47 years.

Table 3.1: Socio–demographic characteristics of mothers in Busia District

	Frequency	***Percent***
Maternal age (in completed yrs)		
15-19 years	60	15.5
20-24 years	158	41.0
25-29 years	106	27.5
30-34 years	41	10.6
35 years and above	20	5.1
Marital status		
Married	313	81.3
Single	68	17.7
Separated/ widowed	4	1.0
Number of children		
1 child	140	36.3
2 children	91	23.6
3 children	61	15.8
More than 3 children	93	24.1
Education level		
Tertiary	32	8.3
Secondary complete	51	13.2
Secondary incomplete	72	18.7
Primary complete	94	24.4
Primary incomplete	131	34.0
None	5	1.3

3.3 Socio-economic Characteristics of Mothers

There were 209 (54.3%) households reporting that they lived in their own houses and 150 (39%) households were residing in single roomed houses. Approximately one-third 123 (32%) houses were connected to electricity and most houses 205 (53.2%) had cemented floors. A total of 161(41.8%) households reported their monthly rent payment

with 73.1% paying less than Kshs 3,000 per month. One hundred and twenty (31.2%) mothers were self-employed and 37 (9.6%) were in salaried employment.

3.4 Characteristics of the Children

The mean age of the children was 10.6 months (SD 6.7).

Table 3.2: Characteristics of the children

	Frequency	***Percent***
Child age		
0-5 months	101	26.3
6-11 months	115	29.9
12-17 months	100	25.9
18-24 months	69	17.9
Child sex		
Male	201	52.2
Female	184	47.8

3.5 Summary of Pattern Breastfeeding Practices in Busia District

Exclusive breastfeeding, timely initiation to breastfeeding, prelacteal feeding, bottle feeding and continued breastfeeding at 1 year were 78.7%, 51.3%, 12.6%, 18.3% and 84% respectively in Busia District. The prevalence of each of the breastfeeding practices in the six divisions were as shown in Table 3.3 below.

Table 3.3: Summary of breastfeeding practices in Busia District

	District 385	***Matayos 68***	***Funyula 39***	***Bumula 41***	***Budalangi 62***	***Busia T.116***	***Nambale 59***

Prelacteal feeding (0-23 mo) n=379	**N=379**						
Yes	48(12.6)	19(28.4)	3(7.9)	3(7.3)	1(1.6)	8(7.0)	14(24.1)
No	331(86.9)	47(70.1)	35(92.1)	38(92.7)	61(98.4)	106(92.2	44(75.9)
Breastfeeding initiation ***n =376***	**N=376**						
Within 1hr	189(50.3)	24(37.5)	21(55.3)	24(58.5)	21 (33.9)	52(46.0)	47(81.0)
1-6hrs	159(42.3)	33(51.6)	16(42.1)	16(39.0)	27(43.5)	56(49.6)	11(19.0)
6-12hrs	14(3.7)	3(4.7)	1(2.6)	1(2.4)	6(9.7)	3(2.7)	0(0.0)
> 12hrs	14(3.7)	4(6.3)	0(0.0)	0(0.0)	8(12.9)	2(1.8)	0(0.0)
EBF (0-5 mo) ***n=108***							
YES	85(78.7)	9(56.2)	9(90)	14(77.8)	14(77.8)	31(88.6)	8(72.7)
NO	23(21.3)	7 (43.8)	1(10.0)	4(22.2)	4 (22.2)	4(11.4)	3 (27.3)
Bottlefed (0-23 months) ***N=379***							
Yes	67(18.3)	15(22.7)	11(28.9)	5(12.5)	11(19)	20(18.2)	5(9.1)
No	367(81.7)	51(77.3)	27(71.1)	35(87.5)	47(81)	90(81.8)	50(90.9)
Breastfeeding at 1 year (12-15 months) ***N=50***							
Yes	42(84)	8(80.0)	6(100.0)	2(50.0)	4(100.0)	16(84.2)	6(85.7)
No	8(16)	2(20.0)	0(0.0)	2(50.0)	0(0.0)	3(15.8)	1(14.3)

3.6 Antenatal Clinic Attendance and Breastfeeding Information at ANC according to Divisions

Table 3.4: **ANC attendance and breastfeeding information at ANC**

	District	Matayos	Funyula	Bumula	Budalangi	Busia	Nambale

						Town	
ANC attendance							
Yes	367(96.8)	60(89.6)	39(100.0)	39(95.1)	61(100.0)	112(98.2)	56(98.2)
No	12(3.2)	7(10.4)	0(0.0)	2(4.9)	0(0.0)	2(1.8)	1(1.8)
Information about breastfeeding provided during ANC							
Yes	325(85.5)	45(67.2)	35(89.7)	33(80.5)	51(82.3)	104(92.0)	57(98.3)
No	55(14.5)	22(32.8)	4(10.3)	8(19.5)	11(17.7)	9(8.0)	1(1.7)

3.7 Types of Prelacteal Feeds

The types of prelacteal feeds given to children in Busia District are as shown in Figure 3.2.

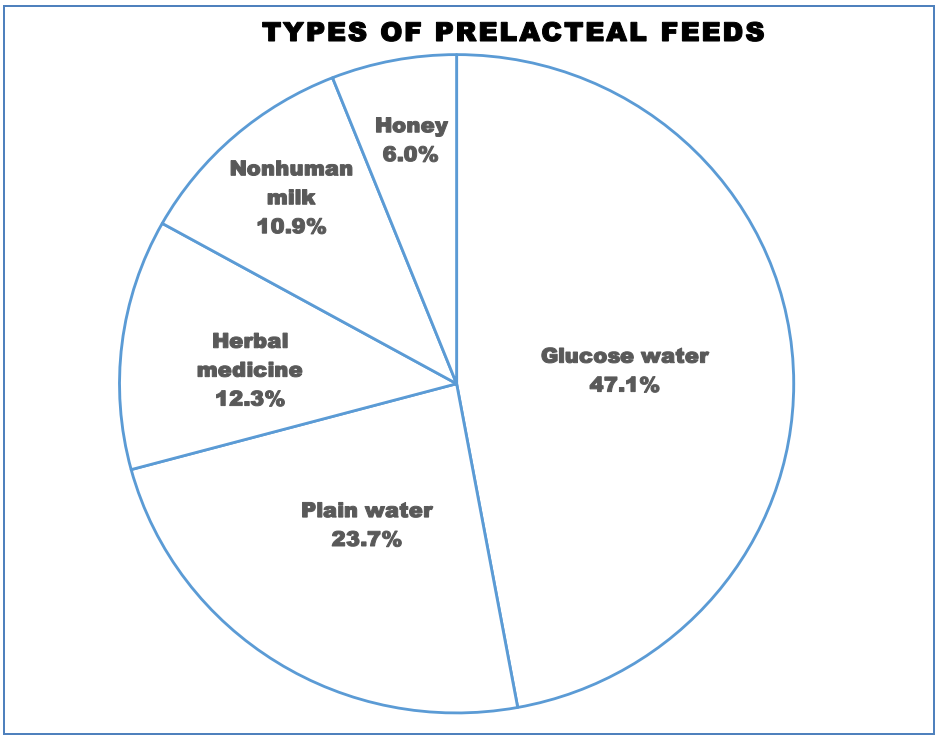

Figure 3.2: Types of prelacteal feeds administered to newborns in Busia District

3.8 Individuals Who Recommend Prelacteal Feeds

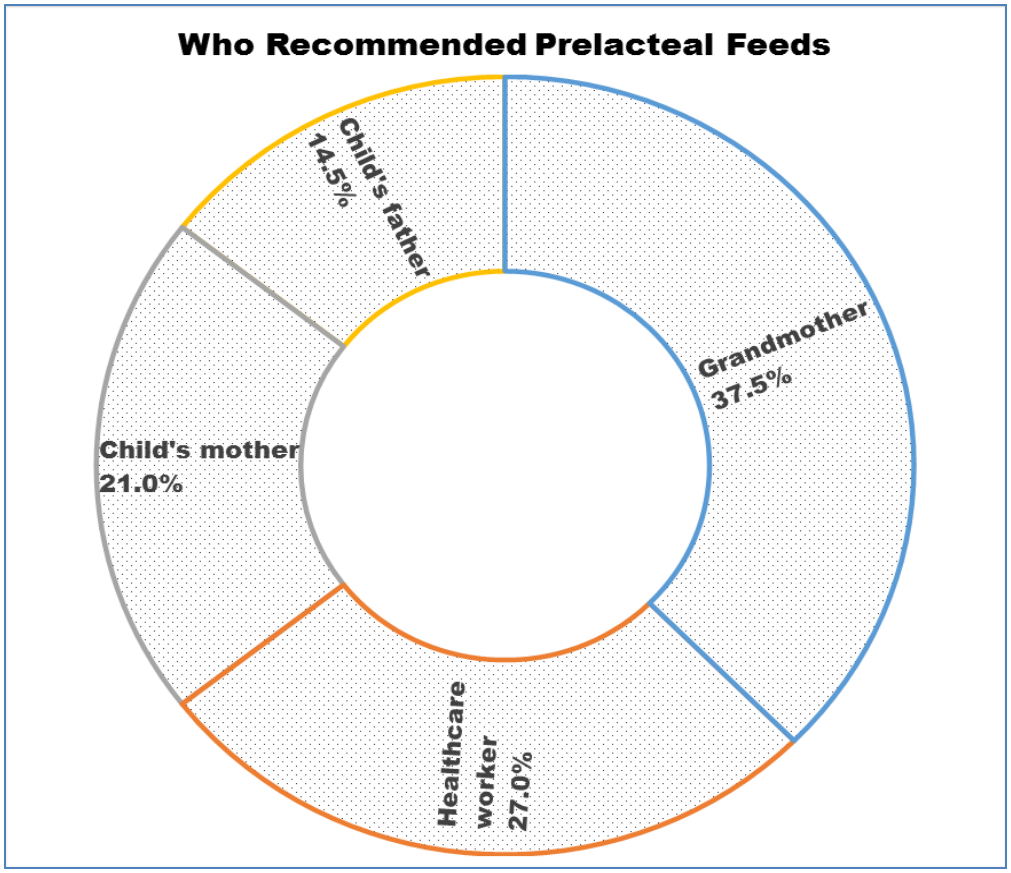

Figure 3.3: Individuals who recommend prelacteal feeds

3.9 Initiation of Breastfeeding

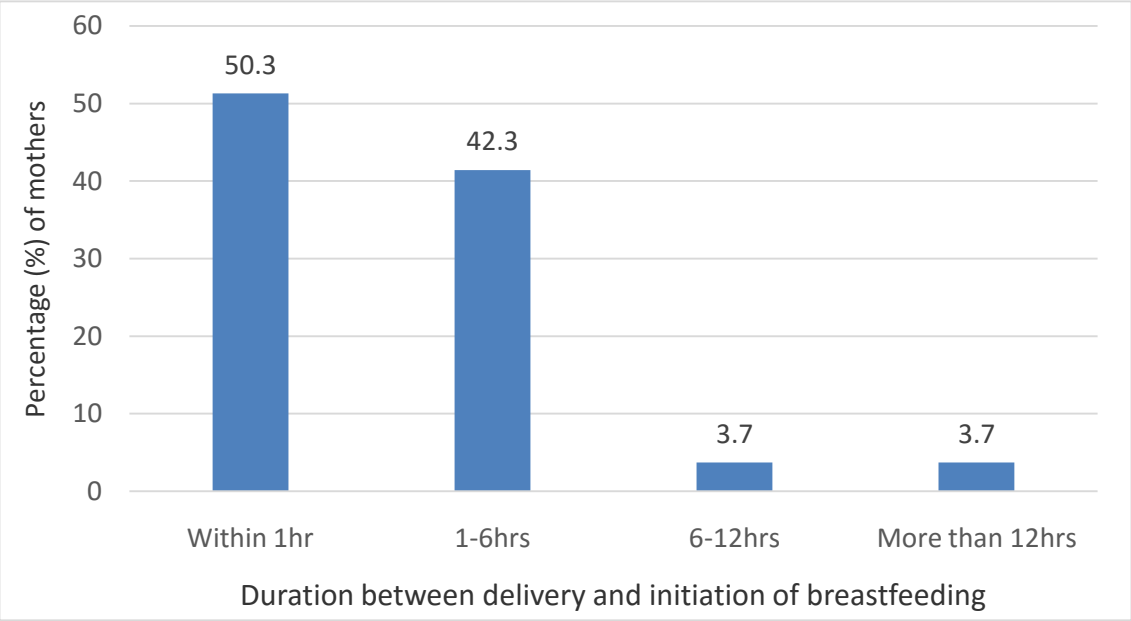

Figure 3.4: Interval between delivery and initiation of breastfeeding

3.10 Breastfeeding Problems

The respective breastfeeding problems experienced by mothers in Busia District are shown in Figure 3.5.

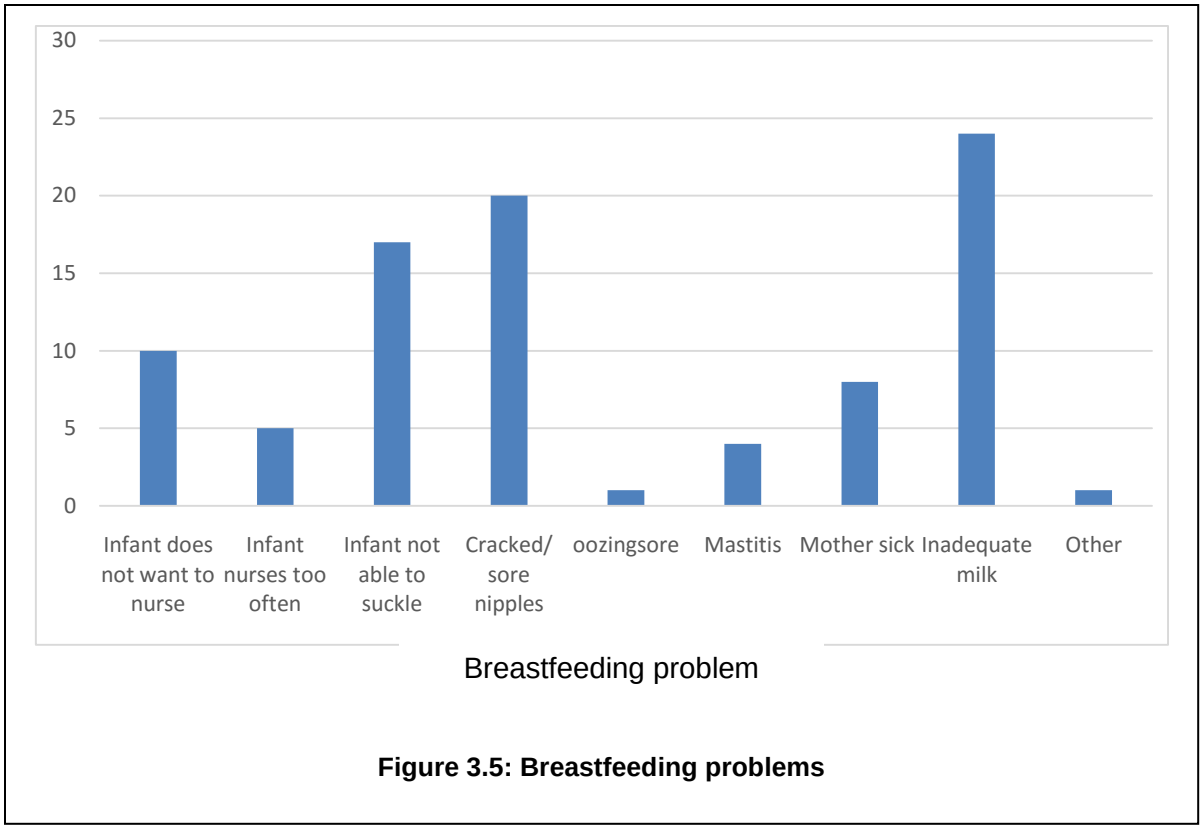

Figure 3.5: Breastfeeding problems

3.11. Associations between breastfeeding practices and characteristics of respondents

There was significant association between prelacteal feeding and failure to attend antenatal clinic ($p < 0.001$) as well as failure to receive breastfeeding information during antenatal clinic ($p < 0.001$).The risk of prelacteal feeding was ten times higher among mothers who did not attend antenatal clinic compared to mothers who attended antenatal clinic (OR = 10.77, 95% CI 3.27-35.46).Similarly, the risk of prelacteal feeding increased four-fold among mothers who reported not having received any breastfeeding information during antenatal clinic compared to their counterparts (OR = 4.07, 95% CI 2.06-0.02).

Maternal demographic factors including marital status, education, employment status and age were all not associated with prelacteal feeding (all p values > 0.05).

Table 3.5: Associations between maternal characteristics and prelacteal feeding

	Prelacteal feeds			
	Yes	**No**	**OR (95% CI)**	**P**
Maternal marital status				
Married	35(72.9)	268(81.0)	1.0	
Single	11(22.9)	57(17.2)	1.40(0.67-2.90)	0.369
Separated	1(2.1)	3(0.9)	2.41(0.24-23.82)	0.45
Attended ANC				
Yes	40(83.3)	323(97.6)	1.0	
No	7(14.6)	5(1.5)	10.77(3.27-35.46)	<0.001
Received information about breastfeeding from ANC				
Yes	30(62.5)	291(87.9)	1.0	
No	17(35.4)	38(11.5)	4.07(2.06-8.02)	<0.001
Level of education				
Tertiary	1(2.1)	29(8.8)	1.0	
Secondary complete	4(8.3)	47(14.2)	1.23(0.21-7.17)	0.815
Secondary incomplete	7(14.6)	65(19.6)	1.56(0.31-7.98)	0.592
Primary complete	10(20.8)	83(25.1)	1.92(0.40-9.19)	0.413
Primary incomplete	23(47.9)	105(31.7)	3.18(0.71-14.27)	0.132
None	3(6.3)	2(0.6)	21.75(2.20-215.26)	0.008

Timely initiation of breastfeeding was significantly associated with antenatal clinic attendance (p = 0.034), receipt of breastfeeding information during antenatal visits (p = 0.012) and number of children in household. Mothers who did not attend antenatal clinic were less likely to initiate breastfeeding within one hour of delivery OR = 0.19 (0.04-0.89) as well as mothers who did not receive information on breastfeeding during antenatal visits 0.47(0.26-0.85). Mothers with more than one child within the household

were twice as likely to initiate breastfeeding within an hour compared to mothers with a single child in their household. Mothers with two children [OR = 1.93(1.12-3.33) and OR = 2.01(1.07-3.76) for mothers with three children both compared to a single child within household.

Table 3.6: **Maternal characteristics and initiation of breastfeeding within one hour after delivery**

	Initiated Breastfeeding within 1 hr			
	Yes	**No**	**OR (95% CI)**	**P**
Maternal marital status				
Married	154(81.5)	147(78.6)	1.0	
Single	30(15.9)	37(19.8)	0.77(0.45-1.32)	0.345
Separated	3(1.6)	1(0.5)	2.86(0.29-27.84)	0.365
Maternal age				
15-19 years	21(11.1)	38(20.3)	1.0	
20-24 years	88(46.6)	65(34.8)	2.45(1.32-4.56)	0.005
25-29 years	47(24.9)	56(29.9)	1.52(0.79-2.94)	0.214
30-34 years	21(11.1)	20(10.7)	1.90(0.84-4.28)	0.121
35 years and above	12(6.3)	8(4.3)	2.71(0.96-7.69)	0.06
Number of children in household				
1 child	62(32.8)	74(39.6)	1.0	
2 children	55(29.1)	34(18.2)	1.93(1.12-3.33)	0.018
3 children	37(19.6)	22(11.8)	2.01(1.07-3.76)	0.029
4 or more children	35(18.5)	57(30.5)	0.73(0.43-1.26)	0.259
Number of rooms in house				
One	73(38.6)	73(39.0)	1.0	
Two	41(21.7)	55(29.4)	0.75(0.44-1.25)	0.267
Three	46(24.3)	41(21.9)	1.12(0.66-1.91)	0.671
>Three	29(15.3)	18(9.6)	1.61(0.82-3.15)	0.164
Attended ANC				
Yes	184(97.4)	176(94.1)	1.0	
No	2(1.1)	10(5.3)	0.19(0.04-0.89)	0.034
Received information about breastfeeding from ANC				
Yes	169(89.4)	149(79.7)	1.0	
No	19(10.1)	36(19.3)	0.47(0.26-0.85)	0.012

Exclusive breastfeeding rates were significantly lower among mothers who did not attend ANC (p = 0.002) or did not receive information about breastfeeding during

pregnancy ($p < 0.001$). The odds of exclusive breastfeeding in mothers who did not attend ANC were 88% lower compared than the mothers who attended ANC (OR = 0.12, 95% CI 0.003-0.45). The rates of exclusive breastfeeding among mothers who did not receive breastfeeding information during ANC were 78% lower than their counterparts.

Self-employed mothers were twice as likely to exclusively breastfeed their infants compared to mothers who reported that they were in salaried employment (OR = 2.56, 1.07-6.13, $p = 0.034$). There were no statistically significant associations between exclusive breastfeeding rates and maternal characteristics like maternal age and education. (P values > 0.05).

Table 3.7: Maternal characteristics and exclusive breastfeeding

	Exclusive Breastfeeding			
	Yes	**No**	**OR (95% CI)**	**P**
Maternal marital status				
Married	226(81.3)	83(77.6)	1.0	
Single	44(15.8)	24(22.4)	0.67(0.39-1.18)	0.164
Separated	4(1.4)	0(0.0)	1.0	
Maternal age				
15-19 years	40(14.4)	20(18.7)	1.0	
20-24 years	116(41.7)	42(39.3)	1.38(0.73-2.63)	0.325
25-29 years	74(26.6)	32(29.9)	1.16(0.59-2.28)	0.675
30-34 years	32(11.5)	9(8.4)	1.78(0.71-4.43)	0.217
More than 35 years	16(5.8)	4(3.7)	2.00(0.59-6.77)	0.265
No. of children in household				
1 child	98(35.3)	42(39.3)	1.0	
2 children	72(25.9)	19(17.8)	1.62(0.87-3.02)	0.126
3 children	44(15.8)	17(15.9)	1.11(0.57-2.16)	0.76
More than 4	64(23.0)	29(27.1)	0.95(0.54-1.67)	0.848
No. of rooms in house				
One	107(38.5)	43(40.2)	1.0	
Two	65(23.4)	31(29.0)	0.84(0.48-1.47)	0.546
Three	70(25.2)	19(17.8)	1.48(0.80-2.75)	0.214
More than Three	36(12.9)	14(13.1)	1.03(0.51-2.11)	0.928
Attended ANC				
Yes	271(97.5)	96(89.7)	1.0	
No	3(1.1)	9(8.4)	0.12(0.03-0.45)	0.002
Received information about breastfeeding from ANC				
Yes	248(89.2)	77(72.0)	1.0	
No	26(9.4)	29(27.1)	0.28(0.15-0.50)	<0.001
Employment status				
Salaried employment	26(9.4)	11(10.3)	1.0	
Self-employment	103(37.1)	17(15.9)	2.56(1.07-6.13)	0.034
None	149(53.6)	79(73.8)	0.80(0.37-1.70)	0.558

There was no statistically significant association between bottle feeding and maternal demographic characteristics (p > 0.05).

Table 3.8: Maternal characteristics and bottle feeding

	Bottle feeding			
	Yes	**No**	**OR (95% CI)**	**P**
Maternal marital status				
Married	54(80.6)	241(80.3)	1.0	
Single	12(17.9)	52(17.3)	1.03(0.51-2.06)	0.934
Separated	1(1.5)	3(1.0)	1.49(0.15-14.58)	0.733
Maternal age				
15-19 years	14(20.9)	43(14.3)	1.0	
20-24 years	30(44.8)	120(40.0)	0.77(0.37-1.58)	0.474
25-29 years	18(26.9)	85(28.3)	0.65(0.30-1.43)	0.285
30-34 years	3(4.5)	34(11.3)	0.27(0.07-1.02)	0.054
35 years and above	2(3.0)	18(6.0)	0.34(0.07-1.66)	0.182
Number of children in household				
1 child	27(40.3)	106(35.3)	1.0	
2 children	21(31.3)	67(22.3)	1.23(0.64-2.35)	0.53
3 children	7(10.4)	51(17.0)	0.54(0.22-1.32)	0.176
4 or more children	12(17.9)	76(25.3)	0.62(0.30-1.30)	0.206
Number of rooms in house				
One	24(35.8)	120(40.0)	1.0	
Two	20(29.9)	71(23.7)	1.41(0.73-2.73)	0.311
Three	12(17.9)	73(24.3)	0.82(0.39-1.74)	0.609
>Three	11(16.4)	36(12.0)	1.53(0.68-3.42)	0.302

Attended ANC				
Yes	63(94.0)	289(96.3)	1.0	
No	3(4.5)	8(2.7)	1.72(0.44-6.67)	0.433
Received information about breastfeeding from ANC				
Yes	55(82.1)	256(85.3)	1.0	
No	11(16.4)	42(14.0)	1.22(0.59-2.52)	0.592
Level of education				
Tertiary	6(9.0)	25(8.3)	1.0	
Secondary complete	8(11.9)	40(13.3)	0.83(0.26-2.69)	0.76
Secondary incomplete	5(7.5)	66(22.0)	0.32(0.09-1.13)	0.076
Primary complete	21(31.3)	67(22.3)	1.31(0.47-3.61)	0.607
Primary incomplete	25(37.3)	99(33.0)	1.05(0.39-2.84)	0.92
None	2(3.0)	3(1.0)	2.78(0.38-20.50)	0.316
Employment status				
Salaried employment	7(10.4)	27(9.0)	1.0	
Self-employment	22(32.8)	93(31.0)	0.91(0.35-2.36)	0.85
None	38(56.7)	180(60.0)	0.81(0.33-2.01)	0.655

There was no statistically significant association between maternal characteristics and continued breastfeeding at 1 year.

3 .12 Focus Group Discussion

The following barriers to optimal breastfeeding were identified as perceived by 5 mothers 2 nurses 2 grandmothers, 2 community health workers/volunteers and 1 women leader.

3.12.1 Barriers to early initiation of breastfeeding and facilitators of prelacteal feeding

The views expressed by participants in the focus group discussion conformed to the findings in the quantitative analysis that many babies were not initiated to breastfeeding within the first one hour of life. It was apparent from the analysis of these qualitative data that mothers had to overcome various barriers to early initiation of breastfeeding. The barriers were categorized into three thematic groups: maternal and newborn baby's physical condition, setting of the delivery, practicality of immediate initiation of breastfeeding.

Maternal and newborn baby's physical condition

The main barrier to immediate initiation of breastfeeding was the development of complications during labour which had an impact on the physical condition of both mother and baby such that initiation of breastfeeding was not possible. The reasons included separation of mother and baby after delivery, exhaustion or other physical states that hampered initiation of breastfeeding. Caesarean section whether elective or emergency was mentioned as an important barrier to early initiation of breastfeeding.

"When a mother starts to breastfeed depends on the mode of delivery, there is caesarian section and normal delivery, by the time a mother who delivers through caesarian section wakes up and she is settled it will be long after one hour" (Community Health Worker)

Despite the perceived barriers related to mode of delivery, respondents noted that caesarian section conducted under spinal anesthesia had significantly less effect of delaying initiation of breastfeeding.

Setting of the delivery and its influence

It was felt that the hospital environment was more supportive of timely initiation of breastfeeding because there was adequate help and advice on breastfeeding and the environment is also prohibitive of alternative feeding modes. Home deliveries provided an opportunity for relatives and peers to influence baby's feeding.

> *"If a mother delivers in hospital her in-laws or peers have no opportunity to influence her to give any other feed to the baby before breastfeeding and the nurse will also help her to put the newborn to the breast..." (mother)*

Certain myths held by certain groups of women hinder initiation of breastfeeding and some even practice total replacement feeding.

> *"There is a group of women who have decided never to breastfeed because they do not want their breasts to sag" (woman leader)*

Certain communities have cultural practices that were said to prevent early initiation of breastfeeding because babies had to undergo customary rites conducted outside the hospital before breastfeeding was initiated. This included administration of certain herbs some of which that are perceived to be protective from colic, curse or evil eye.

Practicality of immediate initiation of breastfeeding

There is perception among mothers that it was not practical to initiate breastfeeding immediately after birth mainly because of hygienic reasons. For certain participants in the FGD the priority after birth was cleaning the baby, a practice that contradicts the essential newborn care recommendations, and for the mothers to take a bath.

"It is very funny to talk about starting to breastfeed immediately after birth and it makes me laugh because after birth mother and baby are very dirty and they must bathe first" (mother)

3.12.2 Barriers to sustained breastfeeding

Maternal factors

Maternal roles and responsibilities are a barrier to continued breastfeeding once a mother initiates breastfeeding. Among the roles identified as hampering breastfeeding were demanding jobs, and student roles that required prolonged periods of maternal absence from home.

"My daughter delivered recently and had to stop breastfeeding at five months because she had to go back to school" (grandmother)

It was clear from the discussion that the participants were generally aware of the benefits of exclusive breastfeeding but had to cope with cultural beliefs and stigma which earlier associated exclusive breastfeeding with prevention of mother to child transmission of HIV

Poor milk production was reported by some mothers. When this occurred mothers felt the need to supplement breast milk with solid foods. Some participants in the FGDs linked the poor milk production to maternal nutrition while others attributed it to psychological stressors. Others still blamed poor milk production on use of family planning methods.

3.12.3 How to discourage prelacteal feeding

Most of the participants suggested that if all pregnant women attended antenatal clinic and deliver in hospital, prelacteal feeding can be reduced to zero. Every mother should be provided with information and counseling on the benefits of early initiation of breastfeeding and exclusive breastfeeding during ANC visits.

CHAPTER 4: DISCUSSION

Some socio-demographic characteristics like marital status, maternal education level, gender of the child, number of rooms and type of floor did not have any significant association with the practice of breastfeeding. The mean age of the mothers included in the study was 24.6 years while that of the children was 10.6 months. The male to female ratio among the children was about 1:1. Prelacteal feeding rate of 12.6% in the district was lower than the country average of 16%. This is an improvement from the findings of KDHS 2008/2009 that showed that Western Province recorded the highest prelacteal feeding rates. The mothers who did not attend antenatal clinic were ten times more likely to give prelacteal feeds than their counterparts (OR 10.77; 3.27-35.5, P < 0.001**)**. Those who did not receive any breastfeeding information during ANC visits were four times more likely to give prelacteal feeds (0R 4.07; 2.06-8.02 p< 0.001**).**

The rates of prelacteal feeding were lower than those from an Ethiopia study that found prelacteal feeding rate was 38.8% (95% CI: 35.00%, 43.00%).This difference in the levels of prelacteal feeding may have been accounted for by the high rate of antenatal clinic attendance in Busia District hence mothers may have had more knowledge on recommended breastfeeding (96.8%). However, the reasons given for prelacteal feeding were similar**.** The Ethiopian study showed that mothers who were not aware of the risks associated with prelacteal feeding were nearly four times more likely to practice prelacteal feeding as compared to knowledgeable mothers (AOR: 3.70; 95% CI: 2.44, 5.53).The Ethiopian study also showed that home delivery was a risk factor for practising prelacteal feeding and those mothers who gave birth at home were seven times more likely to practice prelacteal feeding as compared to mothers who delivered at health institutions (Adjusted Odds Ratio (AOR):7.10; 95% CI: 3.91, 12.98).This was similar to the findings of the FGD in the Busia study that showed that prelacteal feeding was commoner among mothers who delivered at home. Some prelacteal feeds were administered as protection for perceived illnesses of the newborn like colic **(33)**

Glucose solution (47.1%), plain water (23.7%), herbal medicine (12.3%) and non-human milk (10.9%) were the most common types of prelacteal feeds administered in Busia District. Most prelacteal feeds were recommended by the child's grandmother (37.5%) followed by the healthcare worker (27%), child's mother (21 %) and child's father (14.5%).These results were similar with the findings of a study by Kegode among neonates delivered at Naivasha District Hospital that revealed that glucose (26.6%) was the predominant prelacteal feed and the feeds were mostly recommended by the child's grandmother (42.2%), .The others who recommended prelacteal feeds in Kegode's study were healthcare workers (31%) and child's father (27**%) (34)**

Timely initiation of breastfeeding in Busia District (50.3%) was lower than the national average as per KDHS 2014 (60%).This was also lower than the study by Kegode at Naivasha district hospital that showed a rate of 71%.The findings imply that both the mothers and babies in Busia District miss out on the benefits of timely initiation of breastfeeding including bonding, and the protective and nutritional benefits of early initiation of breastfeeding .The major barriers to timely initiation of breastfeeding were among others the perception that the birth setting is unhygienic hence a mother must take a bath before breastfeeding . Administration of prelacteal feeds was cited as a barrier to timely initiation of breastfeeding. This was in agreement with the study conducted by Awi and Alikor in 2006 in Niger which showed that one of the barriers to timely initiation of breastfeeding was routine labour ward practices like cleaning of the newborn**. (34,35)**

In Busia, those who attended ANC and those who received breastfeeding information at ANC were more likely to initiate breastfeeding within the first one hour after delivery .The findings were in contrast to the findings by Awi and Alikor in 2006 which found that ANC attendance and receipt of information on breastfeeding had no statistical association with time of initiation of breastfeeding. The possible explanation is that all the mothers in the Niger study delivered in hospital and so there may have not been any

significant difference in the level of breastfeeding information. The babies were all healthy term babies who would naturally want to start breastfeeding irrespective of maternal knowledge. The Busia study did not explore the place of delivery and included all babies irrespective of what their clinical status or gestation at delivery were **. (35)**

The rate of exclusive breastfeeding in children under six months (78.7%) was higher than the national level (61%) with Matayos Division (56.2%) recording the lowest rate. Exclusive breastfeeding was significantly associated with both ANC attendance ($p = 0.002$) and receiving breastfeeding information during ANC ($p < 0.001$). This was supported by the fact that Matayos also recorded the lowest ANC attendance (89.6%) and proportion of mothers receiving breastfeeding information during ANC (67.2%). The odds of exclusive breastfeeding reduced by 88% in mothers who did not attend ANC compared to those who attended ANC (OR = 0.12, 95% CI 0.03 – 0.45). The mothers who did not receive breastfeeding information during ANC had a 72% reduction in the odds of exclusively breastfeeding compared to their counterparts (OR = 0.28, 95% CI 0.15 – 0.5). Self-employed mothers were twice as likely to breastfeed exclusively as their salaried employment (OR = 2.56, 95% CI 1.07 – 6.13). This may have been due to greater flexibility in work schedule and ability to work from home by the self-employed mothers. The major barriers to exclusive breastfeeding were maternal engagements outside the home. There was perception that the longer a baby breastfeeds exclusively, the more difficult it would be to accept other feeds later and hence exclusive breastfeeding would increase chances of future malnutrition.

The above findings were in keeping with a study conducted in Eldoret, Kenya which reported the barriers to exclusive breastfeeding to include early introduction of complementary feeds to improve nutritional status of the infant (n=18, 7.4%), for the infant to learn to feed on other foods (n=19, 7.7%) and in order for mothers to resume work (n=15, 6.1%) among others**. (26)**

Bottle Feeding rates of 18.3% were slightly lower than the Kenya national average of 19.7% in the previous demographic survey but were especially commoner in the

divisions of Matayos (22.7%) and Funyula (28.9%) .This means that these children were still being exposed to the risks associated with bottle feeding: wheezing/asthma (adjusted OR: 1.05, 95% CI 1.00–1.09), allergic rhinitis (adjusted OR: 1.04, 95% CI 1.00–1.08), and eczema (adjusted OR: 1.07, 95% CI 1.01–1.2**)** as indicated by a study conducted in 2012 in Taiwan by Nai Yun Hsu. Other known risks associated with bottle feeding are otitis media and dental caries. **(36)**

84% of the babies were still being breastfed by their first birthday a level which was comparable to findings in the latest Kenyan demographic survey. However only 14.8% of the children were still being breastfed by their second birthday, a rate lower than the national level of 51%. Breast milk continues to provide nutritional and immunologic benefits to the child, source of profound comfort and security, laying the groundwork for a confident, happy, and healthy future. Duration of breastfeeding had no statistically significant association with maternal demographic or socioeconomic characteristics.

The healthcare workers were consistently identified by participants in the focus group discussion as the main source of information and guidance on breastfeeding**.** Other information sources mentioned were the media, women support groups and community activities like World Breastfeeding Week. Most participants knew what the recommended practice of breastfeeding was but did not have knowledge of the specific benefits of these recommendations. The discrepancy between knowledge and the actual practice was partly explained by various barriers and difficulties mentioned.

One of the reasons given for failure to initiate breastfeeding was desire to return to school for the young adolescent mothers. There were also reports that certain groups of mothers did not initiate breastfeeding to prevent sagging of the breasts. There was a misconception that babies who exclusively breastfed for six months would have difficulty accepting solid foods later.

In the study the presence of breastfeeding problems had no significant effect on the breastfeeding practices. This is in contrast to the studies by Besore et al and Chirop et al that showed that mothers who experienced breastfeeding problems were more likely to practice suboptimal breastfeeding. This disparity can be explained by the higher probability of the mother with a problem to seek counsel from healthcare practitioners and peers hence still keep on track in terms of breastfeeding. ***(*****22,26)**

In our study about 11% of the mothers who attended ANC did not receive any information on breastfeeding. Inadequate or lack of education on breastfeeding techniques and nutrition practices during ANC follow up may have been due to little training in lactation and lactation support by healthcare workers. There is need to create forums to regularly update the knowledge of the healthcare workers. This would improve knowledge of both the mothers and the healthcare workers hence putting an end to the negative effects of the practice of suboptimal breastfeeding. (**37)**

4.1 Strength of the Study

The desired sample size was achieved. The study objectives were met. The sample population was representative as it was drawn from the six divisions of Busia District.

Validity of collected data was ensured especially in regards to the interpretation of the infant breastfeeding practices. The Principal Investigator assessed the responses given to the questionnaires administered on a regular basis and helped to supervise data entry to ensure.

4.2 Limitations of the Study

Recall bias due to the long time interval between the actual breastfeeding and the interview. This may have led to overestimation of age at complementary feeding and duration of breastfeeding especially by those who breastfed for a shorter time.

Social desirability bias due to social pressure to breastfeed may have caused mothers to overestimate durations of breastfeeding and fail to report engaging in any non-recommended practices like prelacteal feeding

CHAPTER 5: CONCLUSION AND RECOMMENDATION

5.1 Conclusion

Majority of babies in Busia District are breastfed (97.7%). 12.6% of babies are given prelacteal feeds. Only half of the children are put to the breast within the first one hour of life. More than three quarters of children 0-5 months are exclusively breastfed and most of them are still breastfeeding by their first birthday (84%). Only a small proportion of the children are bottle fed (18.3%). The patterns of breastfeeding vary significantly across the six divisions of Busia District.

The main barriers to optimal breastfeeding are engagement of the mothers outside of the home, home delivery, lack of antenatal clinic attendance and cultural belief that breast milk if inadequate that in early infancy. Some mothers still associate exclusive breastfeeding with prevention of mother to child transmission of HIV and so fear of stigma.

5.2 Recommendation

Activities and interventions to promote child health should emphasize the importance of antenatal follow up and continuous education of the mothers on recommended breastfeeding during antenatal visits.

All the stakeholders should be involved in designing messages to encourage breastfeeding. This includes fathers, grandmothers, healthcare workers and mothers.

Cultural beliefs that affect breastfeeding should be explored and addressed during breastfeeding promotion campaigns and infant feeding counseling.

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CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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Study Timeline

ACTIVITY	START	END	DURATION
Concept development	Sep 2014	Oct 2014	2 months
Concept presentation to Prime K for funding	Oct 2014		1 month
Concept presentation to faculty	End of Nov 2014	Jan 2015	2 months
Proposal to ERC	Feb 2015	June 2015	4 months
Recruitment and training of RAs	October 2015	November 2015	1 month
Data collection	December 2015		1 month
Data entry	January 2016		1 month
Data analysis	February 2015		1 month
Posters to faculty	March 2016		1 month
Handing in books for marking	End of March 2016	April 2016	1 Month
First internal marking	April 2016		
Student corrections	1st 2 weeks of May 2016		
2nd internal marking	Last 2 weeks of May 2016		
Final internal corrections and handing in final draft	1st week of June 2016		
Books sent to external examiner	Mid June 2016		

Study Budget

BUSIA			
BUDGET FOR DECENTRALISED RESEARCH			
ITEM	**QUANTITY**	**UNIT PRICE**	**TOTAL (KSH)**
SUPPLIES			
Biro Pens	8	20.00	160.00
Pencils	8	10.00	80.00
Box file	5	150.00	750.00
Spring files	4	100.00	400.00
Pencils sharpener	1	50.00	50.00
White out pen	4	150.00	600.00
Folder	6	50.00	300.00
Staple	1	500.00	500.00
Paper Punch	1	600.00	600.00
Staple Romover	1	250.00	250.00
Dicta phone	1	15,000.00	15,000.00
Note book	8	100.00	800.00
TOTAL SUPPLIES			**19,490.00**

OTHERS			
Printing	15	10.00	150.00
Photocpying	8250	2.00	16,500.00
Final proposal booklet	12	1,500.00	18,000.00
Ethic comm, Bk	1	2,000.00	2,000.00
Aposter	4	3,000.00	12,000.00
TOTAL OTHER			**48,650.00**
Transport	**1**	40,000.00	40,000.00
Communication	**1**	5,000.00	5,000.00
Data Statistitian	**1**	15,000.00	15,000.00
Research Assistant & other related Expenses			
Cost of training for Research Assistants (2 days training)	12	800.00	9,600.00
Focus group discussion cost (6 groups)	6	1,500.00	9,000.00
Transport rembursement for mothers	60	300.00	18,000.00
Payment to research Assistants	500	150.00	75,000.00
Dissemination cost	6	5,000.00	30,000.00

Communities field facilitators (15 villages per division)	90	200.00	18,000.00
TOTAL PERSONNEL			**219,600.00**
TOTAL EXPENSES			**287,740.00**

APPENDICES

Appendix 1: Parent Information Sheet

Mother-Infant Pair No……

My name is Dr. Jecinter Achieng Modi from the University of Nairobi; Department of Pediatrics and Child Health. I am conducting a study to describe the patterns of and barriers to breastfeeding among children 0-24 months in Busia District. The study will also identify ways to reduce the use of feeds other than breast milk before a baby starts breastfeeding. You are being asked to participate in the study because both you and your baby meet the conditions required to participate in the study.

This will require that I administer to you a questionnaire at the beginning on the day of the study. You may later be required to attend a focus group discussion. Your participation in the study is voluntary and you are free to withdraw from the study even after recruitment without consequences. There are no monetary gains from this study.

The information obtained from the study will be important in educating mothers about breast milk and the importance of breastfeeding and will help policy makers.

No harmful procedures shall be done to you during the study.

All information will be kept confidential.

If you have any ethical issues related to this study, you can get in touch with the ethics and research committee chair person at KNH, Tel 726300 –ext44355.

Principal Investigator: Dr.Jecinter Modi(0726022742)----------sign----------

Supervisors: Prof. Ezekiel Wafula----------sign----------

Prof Dalton Wamalwa ----------sign----------

University of Nairobi, Department of Pediatrics and Child Health

Appendix 2: Parent Information Sheet (Luhya)

Mama- Omwana no:----------

Erira riange ni Dr. Jacinta Modi wa university ya Nairobi ; Department ya obulwaye nende obulamu bwa bana badoro. Ndi ohuhola amasomo kohumanya obulayi nende obubi bwa ohununia abana ba miosi 0-24 mu county ya BUSIA. Mulangwa huitsa hube halala hubera omwana nende ewe omwibusi olafaidika.

Kano kalenya mbu ngalusie amarebo kenywe huchaka inyanga ya mekesio.

Lunyuma lwa masomo kano olalangwa huitsa halala nende abasio ili mukatsule kamusomisibwe.

Basaya mbu mundehere inamba ya isimu nende ya iposta ili hubalange mumukutano baadaye.

Amasomo kano ni kesihaya, ni onyala hureha ebiha biosibiosi. Solalipwa dawe(tawe).Werusie nomwoyo kwao kwosi.

Amasomo kahulanyola kalaba malayi hubera kalahonya husomisia bamama hulondahana nende hununia omwana nende huhonya betsa hukasiamekesio malayi (policy).

Olaba nende wasiwasi dawe(tawe) .Hubera mahua kosi kolasunga kalaba isiri.

Nori nende rihua riosiriosi rihunyasia hulondahana nende amasomo kano

onyala hureba hu:

Ethics and research committee chairman wa sibutali sia kenyatta; isimu;726300-ext.44355

Onyala hureba bano:

Dr. Jecinter Modi-0726022742

Prof.Ezekiel Wafula nende Prof.Dalton Wamalwa

University ya Nairobi Department ya obulwaye nende obulamu bwa bana.

Appendix 3: Consent Form

Mother- Infant Pair code No----------

CONSENT FORM

I, Mr./Mrs./Ms ----------, the parent of

(baby's name) ----------.

Agree to the above and give consent for me and my child to be included in this study

As explained to me by----------

I understand the purpose of the study and conditions of participation.

Sign---------- Date----------

Witness---------- Sign---------- Date----------

Appendix 4: Idhini ya Mzazi wa Mtoto (Kiswahili)

Nambari ya mama na mtoto ----------

Mimi----------ni mzazi

wa----------Nimekubali kushiriki katika utafiti huu kama nilivyo elezewa na Daktari----------

Sahihi ---------- Tarehe----------

Shahidi ---------- Tarehe ----------

Appendix 5: Efukiriro (Luhya)

Inamba ya mama -nomwana.....

Ese,..... Omwibusi/Omulesi wo omwana.....

Fukirira omwana wange asaangirane mukhukhwikhoneserwa khumeeko kano nga mbolerwe no omulesi.....

Manyire kosi kenyikhana nende kanekholekha khandi fukirire.

Esaini ya mwibusi---------- Ludalo----------

Muloli---------- ---------- Ludalo----------

Appendix 6 : Initial Questionnaire

BREASTFEEDING OF CHILDREN 0-24 MONTHS IN BUSIA DISTRICT: PATTERNS AND BARRIERS

Date ----------

Mother-infant pair code number ☐

1. Age of the mother in completed years----------
2. Date of birth of the baby_____
3. What is the gender of your child? ----------
4. How many children do you have? ----------
5. Is this your last child ?
6. Marital status

Married ☐

Single ☐

Divorced ☐

Separated ☐

Widowed ☐

6. Residence _____

7. How many rooms? One ☐

Two ☐

Three ☐

☐

>Three

8. Amount of house rent per month in Kenya shillings

Less than 3 thousand ☐

3-5 thousand ☐

☐

5-10thousand ☐

>10 thousand

9. Do you live in your own house ? Yes No

10. Do you have electricity Yes No

11. Flooring material

☐

☐

Earthen

Cement

Wood

12. Level of education

Tertiary ☐

☐

Secondary complete ☐

☐

Secondary incomplete ☐

☐

Primary complete Primary

incomplete

None

13. Employment status? Employed Not employed

14. If employed

Professional

/technical

Skilled manual

Unskilled manual

Domestic services

Agriculture

Small-scale business

15. Did you attend ANC during pregnancy? Yes

No

16. How many children do you have?.....

17. Did you receive information about breastfeeding during ANC?

Yes No.

Appendix 7: Breastfeeding Questionnaire

Mother child pair code no……..

Maternal age (in years): ……

(Unknown = 99)

A **.**FEEDING HISTORY

1. Breast-feeding Initiation and Frequency

•***Breast-feeding initiation***

1.0 Did you ever breast-feed your child? 1 = yes 2 = no

(if no, end of the questionnaire)

2.0 How soon after delivery was your child first put to the breast?

Days |___|___| Hours |___|___| Minutes |___|___|

3.0 Did you give the first milk that comes from your breast to your child?

1 = yes 2 = no

4.0 Did your child receive anything to eat/drink *before* your milk came in (breasts full of milk)?

1 = yes, 2 = no, 9 = don't know *(if no, go to question 5)*

7.3 What did he receive? If item quoted yes, specify what the child received and who recommended giving it to infant *(If no, go to next item)*

Codes of what is Given

01. Plain water _____
02. Sugar or glucose water_____
03. Honey _____
04. Herbal preparation _____
05. Non-human milk _____
06. Semi-solid food _____
07. Vitamins, mineral drops _____
08. Liquid medicine _____
09. Other _____
10. Other _____

Codes who recommended

1. Infant's mother herself
2. Husband
3. Infant's grand-mother
4. Health worker
5. Somebody else
6. Don't know

5.0 At what age did you give your child any solids or semi solid foods ?

Months …… weeks ……

Days …….

6.0 Did your child have any solid food yesterday, day or night?

Yes No don't know

- ***Breast-feeding Frequency***

6.0 Are you breast-feeding your child now? 1 = yes 2 = no

|__
_|

7.0 How many times did you breast-feed (put child to the breast) yesterday during the daylight hours? *specify*|___| |___| |___|

Code 99 if can't specify----------

8.0 Was the child breast-fed on demand during the daylight hours? …….___|

|___|

1 = yes, 2 = no

9.0 Was the child breast-fed on demand during night-time hours? …….|___| |___|

1 = yes, 2 = no

10.0 How many times did you breast-feed yesterday during the night-time? *Code '99': can't specify* |___ |___| ___|

- **Cessation of Breastfeeding**

11.0 Have you stopped breast-feeding your child every day and night?

1 = yes 2 = no

12.0 How old was your child when you stopped breast-feeding him every day and night? *(Code 00' days for never breast-feed, and code 99' days for don't know)*

Months |___|___| Weeks |___|___| Days |___|___|

13.0 If known, specify date (day/month/year): …….

- **Bottle Feeding**

14.0 Did your child drink anything from a bottle with a nipple yesterday during day or night ?

Yes No don't know

B**.BREAST-FEEDING RELATED PROBLEMS**

15.0 Have you experienced any problems breast-feeding your child? ……..

1 = yes, 2 = no *(if no, go to23.0)*

15.1What problems have you experienced?

Infant's aged----------

Event occurred?----------

01 breasts engorged ……..|___| |___|___|/|___|___|___|

02 pain during feeding ……..|___| |___|___|/|___|___|___|

03 infant does not want to nurse…….. |___||___|___|

04 infant nurses too often…….|___| |___|___|/|___|___|___|

05 infant not able to suckle……..|___| |___|___|/|___|___|___|

06 not enough milk……....|___| |___|___|/|___|___|___|

07 cracked nipples, sore nipples ……..|___| |___|___||___|

08 breast or areola abscesses/oozing sore….. |___||___|___||

09 mastitis or breast inflammation ……..|___| |___|___||___|

10 nipple exudate/rash/itching ……..|___| |___|___||___|

12 mother sick ……..|___| |___|___||___|___|___|

if yes, specify: _____

13 other ……
……

Appendix 8: Focus Group Discussion

Focus Group Discussion Checklist

Start time_____ End time _____

Focus Group Introduction

Welcome

Thanks for agreeing to be part of the focus group. We appreciate your willingness to participate.

Introductions

Moderator; Assistant moderator; participants

Purpose of Focus Groups

I am conducting this focus group discussion as part of my research to be presented in fulfillment of the degree of Master of Medicine in Paediatrics and Child Health at the University of Nairobi. The purpose of these focus groups is to get an in-depth understanding of barriers to the practice of optimal breastfeeding in children 0-24 months and find ways to minimize the practice of prelacteal feeding in Busia District. The information collected will be used in designing future programs to improve health and nutrition in the first two years of life in Busia District and other areas.

We need your input and would like to urge you to share your honest and open thoughts with us.

Ground Rules

1. You will do the talking, we will do the listening.

- We would like everyone to participate.
- I may call on you if I haven't heard from you in a while.

2. There are no right or wrong answers.

- Every person's experiences and opinions are important.
- Speak up whether you agree or disagree.
- We want to hear a wide range of opinions.

3. What is said in this room stays here.

- We want everyone to feel comfortable sharing when sensitive issues come up.

4. We shall record the proceedings of the group.

- We want to capture everything you have to say.
- We will not identify anyone by name in our report. You will remain anonymous.

Insert Ice breaker here (to increase comfort and level playing field)

1.What is your source of information on breastfeeding?

- You mother in law
- Media
- Medical staff,
- Friends

2.What do you understand by:

- Timely initiation of breastfeeding
- Exclusive breastfeeding

- Recommended duration of breastfeeding?

3. What are the reasons why:

- Breastfeeding is initiated more than one hour after delivery?
- Prelacteal feeds were administered?
- Complementary feeds are initiated before six months?

4.Sample Reasons (details to be explored during the discussion)

- Infant was crying
- Infant was hungry
- Infant was thirsty
- Infant had colic/gas/abdominal pain
- Infant had diarrhoea
- Infant was not well
- Infant refused to breast-feed
- Mother was tired
- Mother was sick
- Mother had breasts problems
- Mother had no milk
- Mother died
- Traditional belief
- Other reason
- No reasons offered

5.Why is breastfeeding stopped before two years of age ? (Details to be explored during the discussion)

- Separation from infant due to work

- Separation from infant for other reasons
- Mother too sick to breast-feed
- Infant too sick to breast-feed
- Infant not growing well
- Other reason

6. In what ways do you think we can successfully minimize and finally eliminate the practice of prelacteal feeding?

7. Way forward? (Any suggestions on how to improve the practice of breastfeeding i.e exclusive breastfeeding, initiation of breastfeeding ,prelacteal feeding and total duration of breastfeeding)

Conclusion: Thank you so much for spending time with us and agreeing to share your insights on this important topic.

END

Thank you.

Appendix 9 : KNH/ UON Approval Letter

Appendix 10 Additional Tables of Results

Table 1: Socio-economic characteristics of mothers

	Frequency	***Percent***
Living in own house		
Yes	209	54.3
No	176	45.7
Number of rooms in current house		
One	150	39.0
Two	96	24.9
Three	89	23.1
More than three	50	13.0
House rent (per month) n = 161		
Less than 3000/-	119	73.9
3000-5000/-	38	23.6
5000-10000/-	4	2.5
Electricity connection		
Yes	123	32.0
No	262	68.0
Floor material		
Earth	180	46.8
Cement	205	53.2
Employment status		
Salaried employment	37	9.6
Self employment	120	31.2
None	228	59.2
Type of salaried employment		
Professional/technical	19	12.8
Skilled manual	25	16.8

Unskilled manual	13	8.7
Agriculture	19	12.8
Small scale business	71	47.7
Others	2	1.3

Table 2: Associations between maternal characteristics and prelacteal feeding

	Prelacteal feeds			
	Yes	**No**	**OR (95% CI)**	**P**
Is this your youngest child?				
Yes	45(93.8)	322(97.3)	1.0	
No	3(6.3)	9(2.7)	2.28(0.60-8.74)	0.228
Maternal marital status				
Married	35(72.9)	268(81.0)	1.0	
Single	11(22.9)	57(17.2)	1.40(0.67-2.90)	0.369
Separated	1(2.1)	3(0.9)	2.41(0.24-23.82)	0.45
Maternal age				
15-19 years	12(25.0)	48(14.5)	1.0	
20-24 years	17(35.4)	139(42.0)	0.49(0.22-1.10)	0.083
25-29 years	15(31.3)	87(26.3)	0.78(0.34-1.77)	0.555
30-34 years	3(6.3)	38(11.5)	0.32(0.08-1.20)	0.091
35 years and above	1(2.1)	19(5.7)	0.21(0.03-1.73)	0.147
Number of children in household				
1 child	24(50.0)	114(34.4)	1.0	
2 children	7(14.6)	83(25.1)	0.46(0.20-1.07)	0.071
3 children	7(14.6)	53(16.0)	0.63(0.25-1.55)	0.311
4 or more children	10(20.8)	81(24.5)	0.65(0.30-1.39)	0.263
Number of rooms in house				
One	21(43.8)	127(38.4)	1.0	

Two	14(29.2)	82(24.8)	1.03(0.50-2.14)	0.932
Three	6(12.5)	81(24.5)	0.52(0.21-1.29)	0.157
>Three	7(14.6)	41(12.4)	1.18(0.49-2.87)	0.715
Attended ANC				
Yes	40(83.3)	323(97.6)	1.0	
No	7(14.6)	5(1.5)	10.77(3.27-35.46)	<0.001
Received information about breastfeeding from ANC				
Yes	30(62.5)	291(87.9)	1.0	
No	17(35.4)	38(11.5)	4.07(2.06-8.02)	<0.001
Level of education				
Tertiary	1(2.1)	29(8.8)	1.0	
Secondary complete	4(8.3)	47(14.2)	1.23(0.21-7.17)	0.815
Secondary incomplete	7(14.6)	65(19.6)	1.56(0.31-7.98)	0.592
Primary complete	10(20.8)	83(25.1)	1.92(0.40-9.19)	0.413
Primary incomplete	23(47.9)	105(31.7)	3.18(0.71-14.27)	0.132
None	3(6.3)	2(0.6)	21.75(2.20-215.26)	0.008
Employment status				
Salaried employment	4(8.3)	32(9.7)	1.0	
Self employment	10(20.8)	108(32.6)	0.81(0.24-2.73)	0.74
None	34(70.8)	191(57.7)	1.47(0.49-4.40)	0.496

Appendix 11: Additional Maps

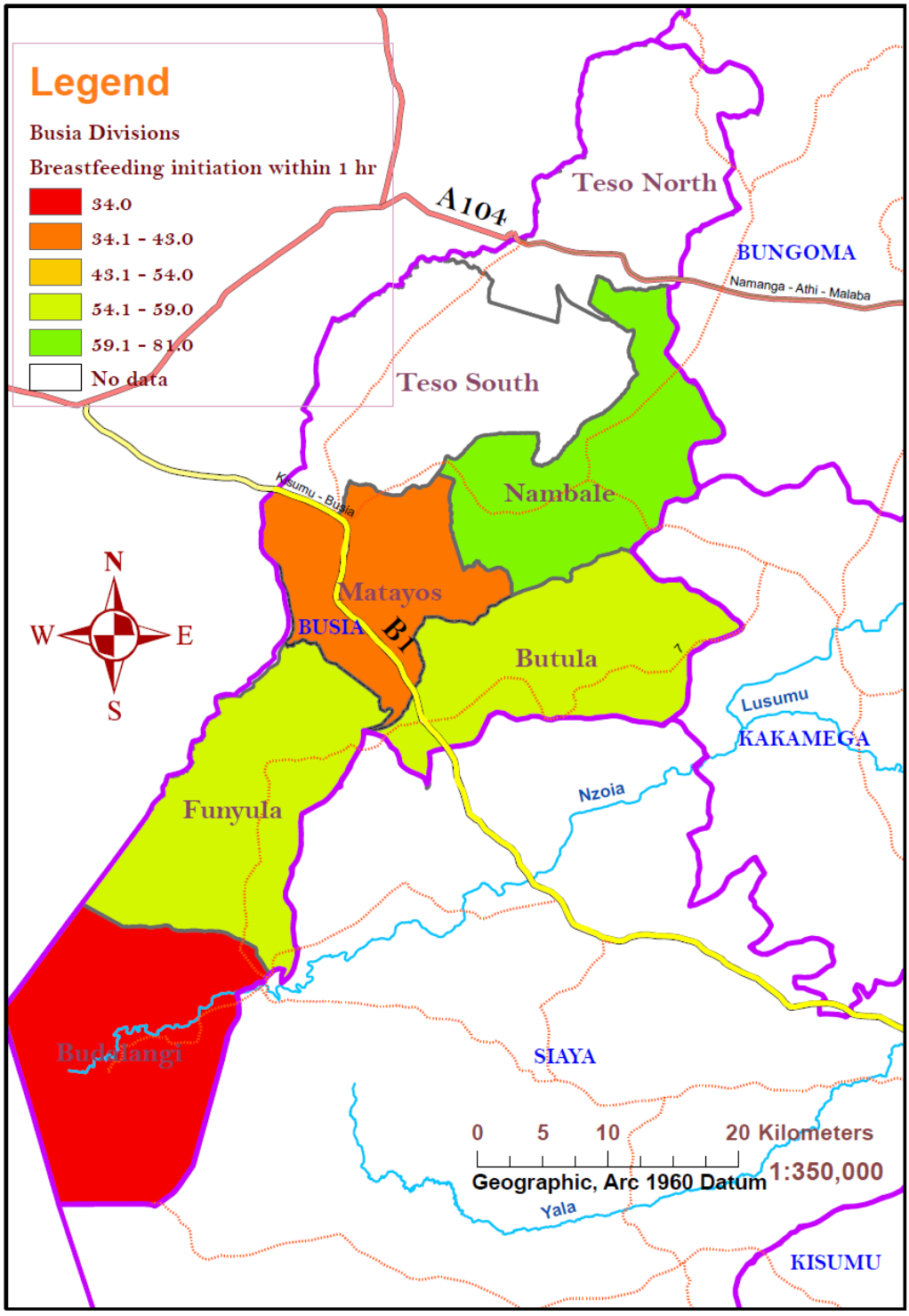

Figure 1: Map showing breastfeeding initiation within 1 hour

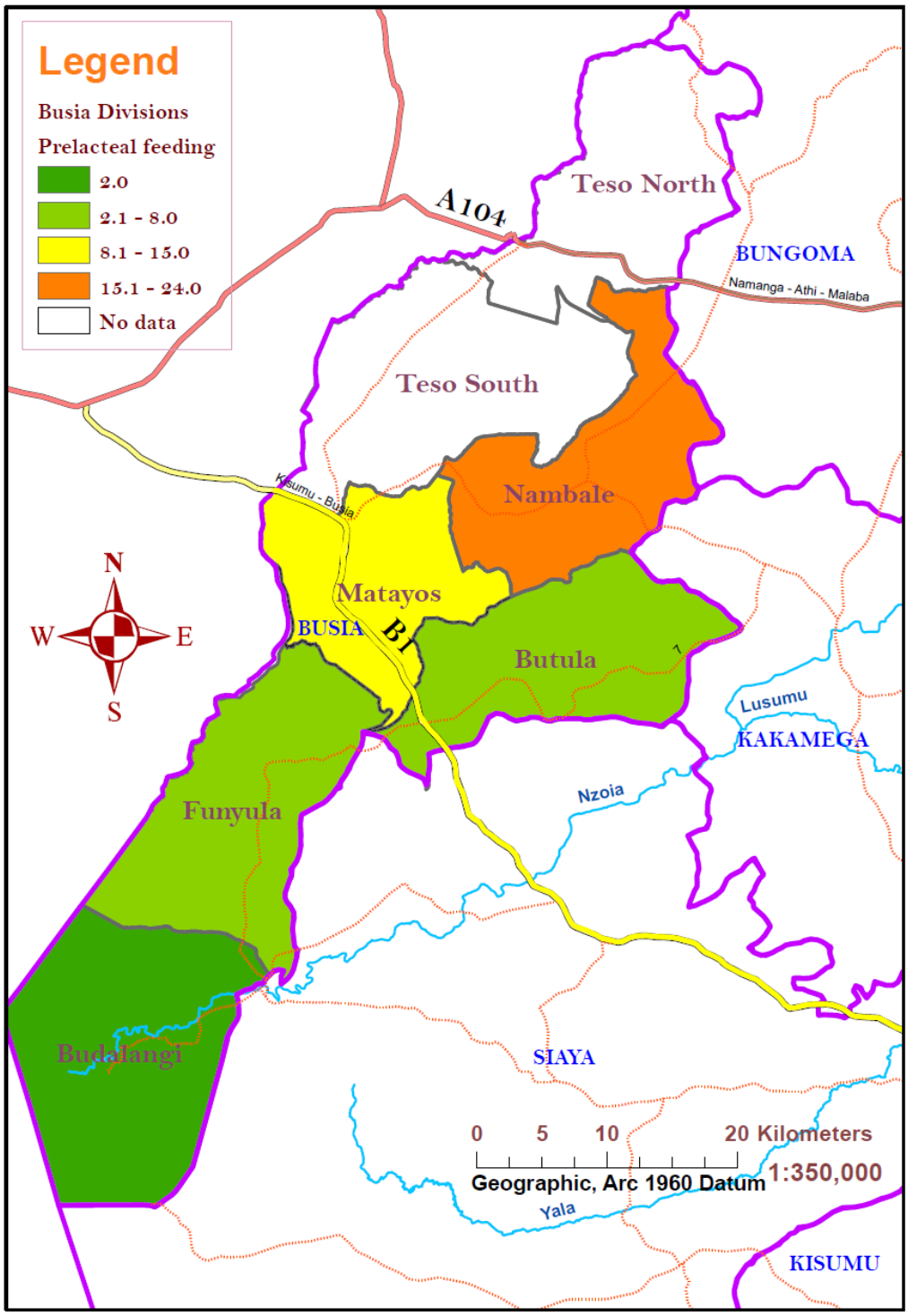

Figure 8: Map showing distribution of prelacteal feeding

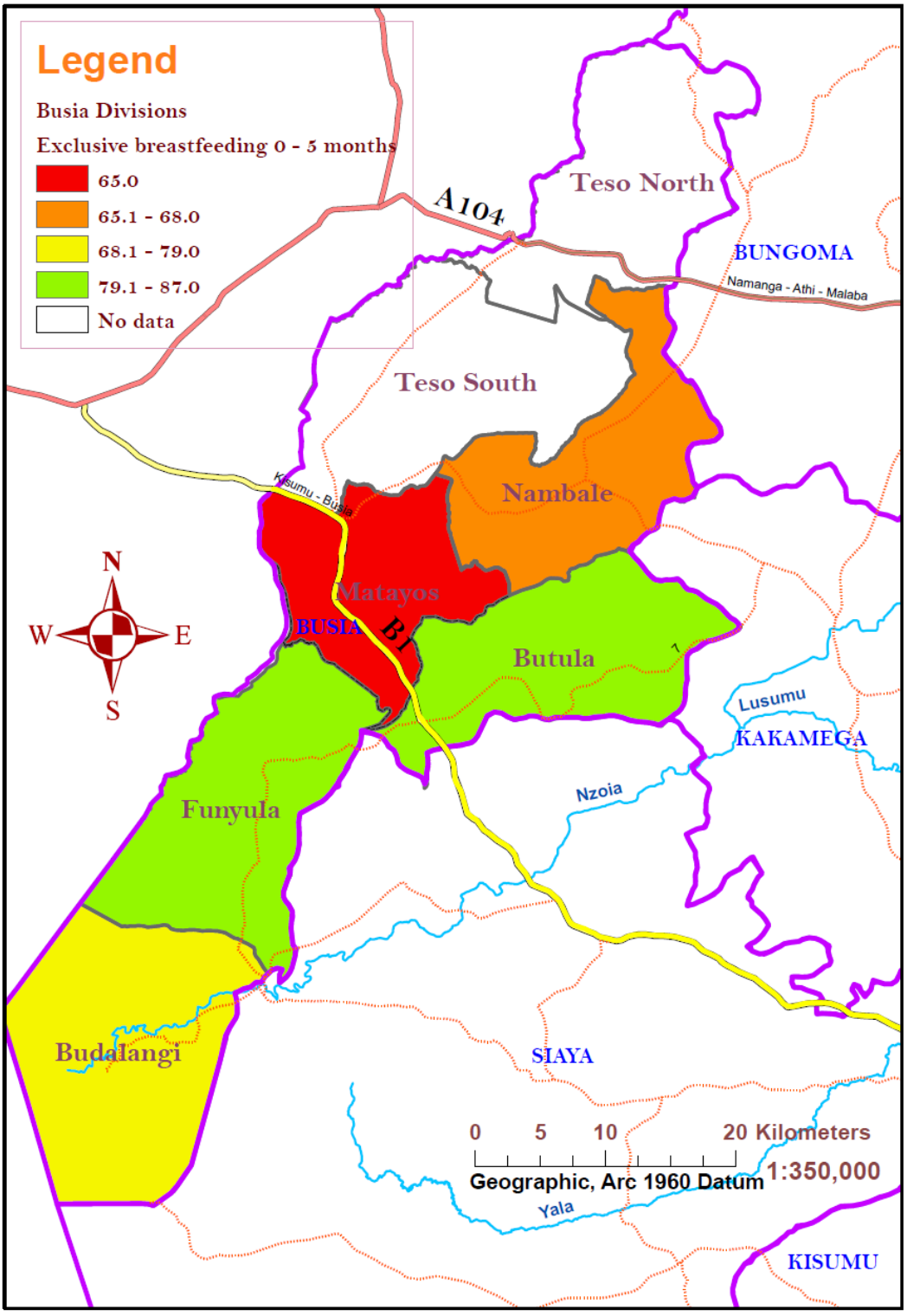

Figure 2: Map showing exclusive breastfeeding rates in children 0-5 months

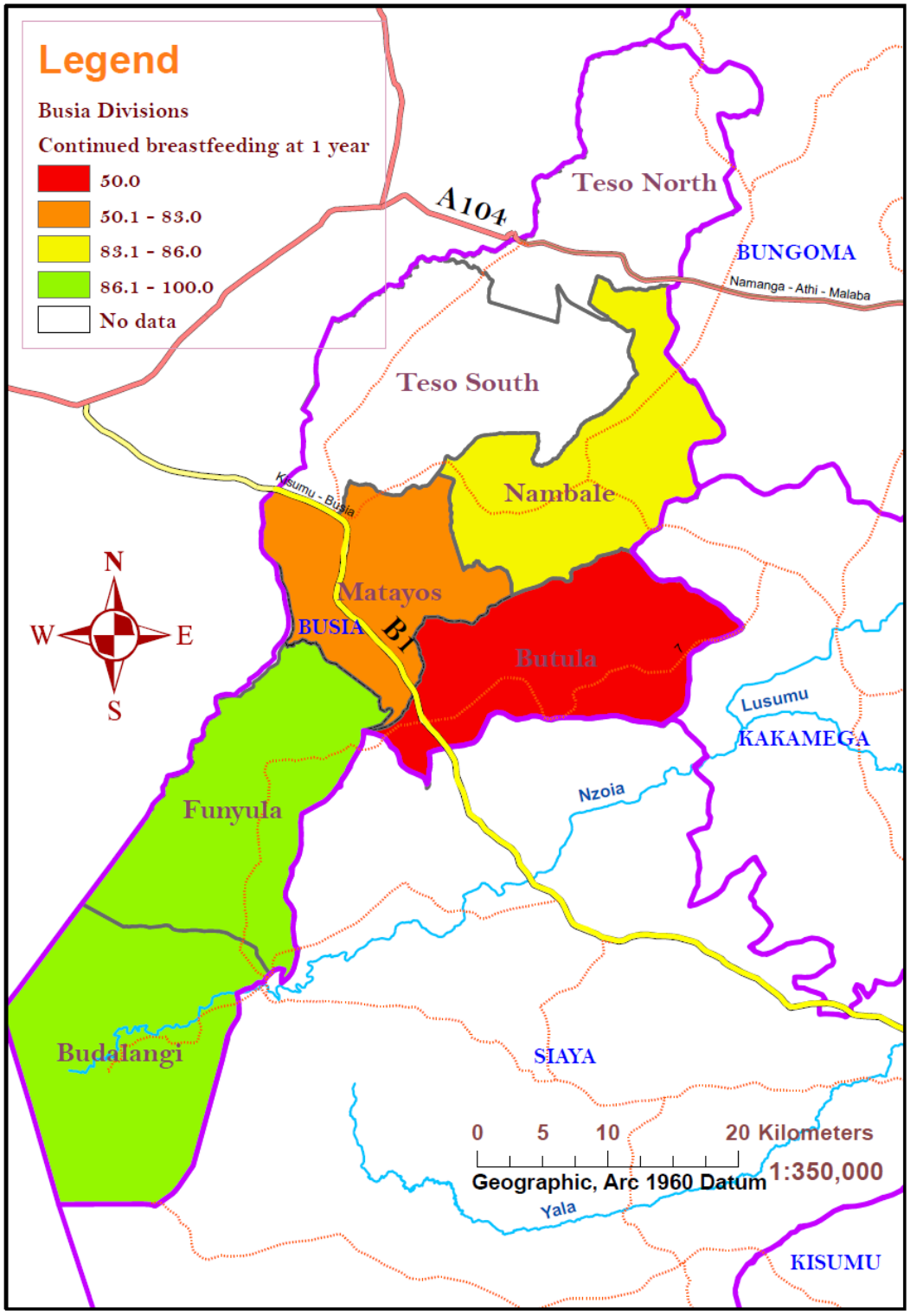

Figure 3: Map showing continued breastfeedng at 1 year

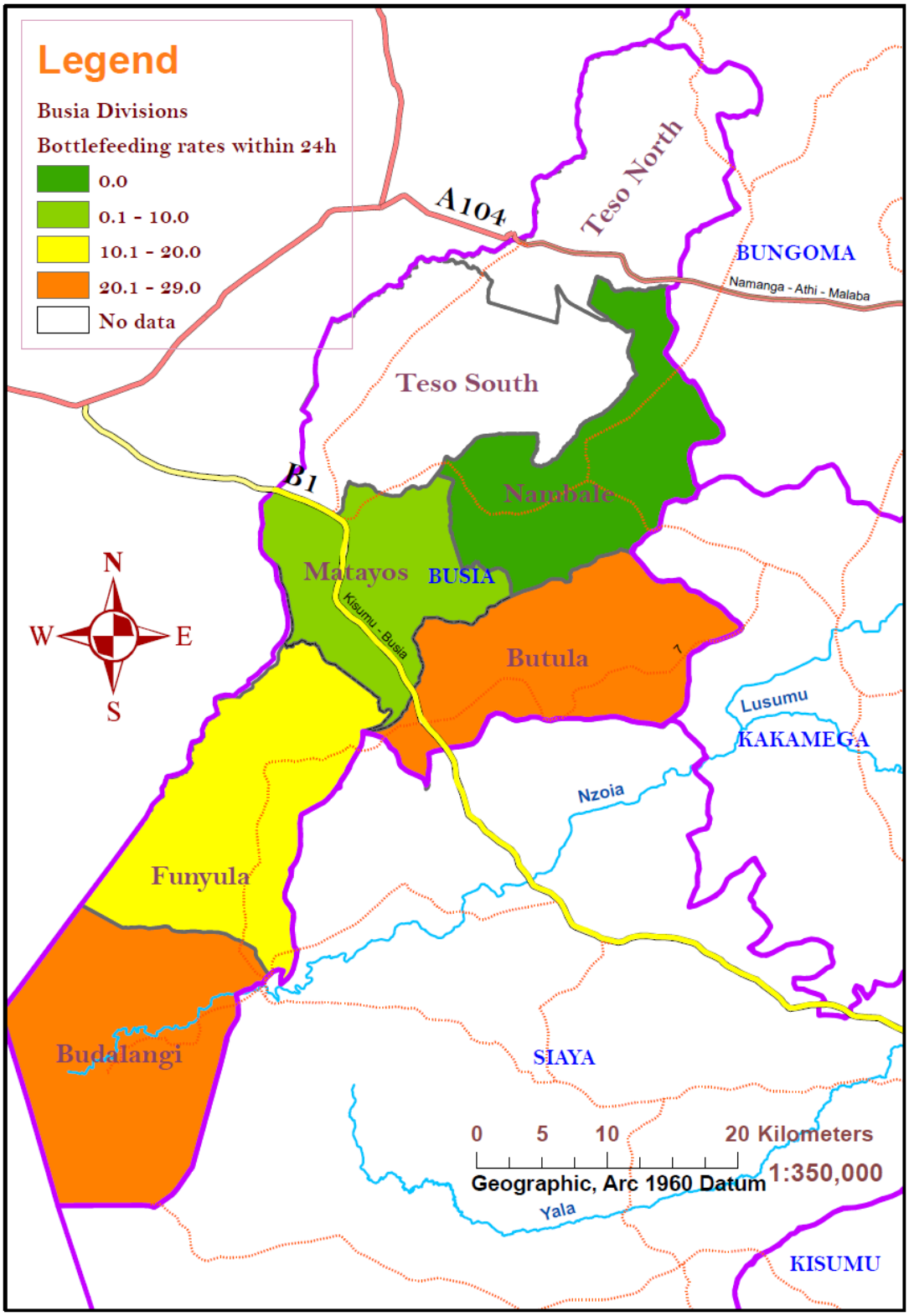

Figure 4: Maps showing rate of bottle feeding