PREDICTORS OF EXCLUSIVE BREAST FEEDING AMONG HIV-POSITIVE MOTHERS IN NORTH RIFT REGION OF WESTERN KENYA.

BY

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DEDICATION

To my dear wife Emily and our children, daughter Judith Sidney Chepkorir and sons, Mathew Kiprop and Allan Komen who encouraged me in this endeavor.

ABSTRACT

Exclusive breastfeeding (EBF) for the first six months of infants' lives is a cost effective intervention which can avert 13-15% of the 9 million deaths of children under 5 years old in resource poor settings. In areas where HIV prevalence is high, especially in sub-Saharan Africa, EBF has the added advantage of reducing the risk of mother-to-child transmission (MTCT) of HIV. However, EBF rates have been shown to be lower in resource poor settings, than the World Health Organization recommended 90% in spite of PMTCT counseling that is expected to increase prevalence of EBF. This low prevalence is a public health problem, especially in developing countries; hence, understanding predictors of EBF is essential for development of relevant intervention strategies. The North Rift is home to the most established comprehensive care clinics (CCCs) in Kenya, yet the overall prevalence of exclusive breastfeeding in the Rift Valley which encompasses the North Rift is 35%, with no specific data for the North Rift. Predictors of EBF vary widely between and within countries, necessitating the need to collect context-specific data. A cross-sectional study was conducted in the North Rift, Kenya to determine predictors of EBF among HIV-positive mothers attending five CCCs including: Kitale District hospital (DH), Turbo Health Centre (HC), Moi Teaching and Referral Hospital, Kabarnet DH and Mosoriot HC were included. Objectives were to determine prevalence of EBF; socio-demographic, cultural and economic predictors of EBF; and from these determine the main predictors of EBF. HIV-positive mothers (n=297) attending the CCCs, selected by random sampling, were included. Socio-demographic, cultural and economic information was collected from the mothers using open and closed ended questions. Qualitative data was collected in Focus group discussions (FGDs) conducted among the mothers until saturation, and key informant interviews conducted among purposively selected health workers, to corroborate data generated from the questionnaire. Socio-demographic, cultural and economic predictors of EBF were identified using bivariate and multivariate regression analysis. Main predictors of EBF were then identified using multiple logistic regression analysis. Prevalence of EBF was 63% confirming disparity with the recommended 90% prevalence. The main predictors of EBF were: OR (95% CI): education level 17.67(0.906, 2.512); knowledge 17.85(3.806, 8.372); stigma 0.19(0.092, 0.394); traditional beliefs 0.03(0.007, 0.154). Improving education of these women, enhancing their knowledge on breastfeeding, exploring interventions to address stigma and traditional beliefs can contribute to enhancing the prevalence of EBF in the North Rift as a step towards achieving the WHO target. Lessons on best practices from Mosoriot and Turbo should be explored as a starting point.

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ABBREVIATIONS

AFASS	Acceptable**,** Feasible**,** Affordable**,** Sustainable and Safe
AIDS	Acquired Immune Deficiency Syndrome
AMPATH	Academic Model providing access to health care
CCC	Comprehensive Care Clinic
DMOH	District Medical Officer of Health
EBF	Exclusive Breastfeeding
FGD	Focus Group Discussion
HIV	Human Immunodeficiency Virus
KAIS	Kenya AIDS Indicator Survey
KDHS	Kenya Demographic and Health Survey
KNBS	Kenya National Bureau of Statistics
MTCT	Mother-to-Child Transmission
MTRH	Moi Teaching and Referral Hospital
NACC	National AIDS Control Council
NASCOP	National AIDS and STI Control Programme
PMTCT	Prevention of Mother-to-Child Transmission
UNAIDS	United Nations Programme on HIV/AIDS
UNFPA	United Nations Population Fund
UNICEF	United Nations International Children Emergency Fund
WHO	World Health Organization

DEFINITION OF TERMS

Exclusive breastfeeding means an infant receives no other food or drink, not even water, other than breast milk (which can include expressed breast milk), with the exception of drops or syrups consisting of vitamins, mineral supplement or medicines.

Human Immunodeficiency Virus (HIV) refers to HIV-1 in this study.

Infant refers to a child from birth to 12 months of age.

Mixed feeding refers to breastfeeding with the addition of fluids, solid foods and/or non human milk such as formula.

Mother-to-child transmission (MTCT) indicates instances of transmission of HIV to a child from HIV-infected woman during pregnancy, delivery or breastfeeding. The term is used in this study because the immediate source of the child's HIV infection is the mother.

North Rift refers to the northern part of former Rift Valley province comprising of seven counties

Knowledge: Refers to defining exclusive breastfeeding as giving infant breast milk alone without introduction other fluids or foods until the infant is six months after birth.

Income: Refers to family average monthly earning in Kenya Shillings

Perception: refers to the way someone thinks about or understands something

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CHAPTER ONE: INTRODUCTION

1.1. Background

Globally, more than 10 million children under the age of five years die each year, 41% of these deaths occur in sub-Saharan Africa (SSA) and 34% in south Asia (Walker *et al*., 2004). Sub-Saharan Africa continues to shoulder the greatest burden where the under-five deaths are 15 times higher than deaths in an average high income country (UNICEF, 2014). Of the 10 million under-five deaths globally, approximately 4 million are newborns with the majority from developing countries (Lawn *et al*., 2005). Major causes of the deaths are inadequate breastfeeding practice in combination with high levels of disease (Walker *et al*., 2004). To reduce the burden of morbidity and mortality of infants and young children, the World Health Organization (WHO) recommends the practice of exclusive breastfeeding (EBF) for infants in the first 6 months of life as one of the evidence-based leading preventive interventions for child survival (WHO/UNICEF, 2003; Black *et al*., 2013; Nkala and Msuya, 2011; WHO, 2007a), as it has a protective effect against child morbidity and mortality (Vafaee *et al*., 2010).

Exclusive breastfeeding (EBF), is defined as giving an infant only breast milk (including milk expressed or from a wet nurse) from birth up to 6 months of age, without giving other liquids or solids, not even water, with the exception of Oral Rehydration Solution (ORS), or drops/syrups of vitamins, minerals or medicines (WHO, 2007a). Breast milk has just the right amount of fat, sugar, water, and protein that is needed for a young baby's growth and development, and promotion of EBF practice has significant impact on child survival and mortality (Bahl *et al*., 2005; Mullany *et al*., 2008). EBF has been considered beneficial to the health and wellbeing of both infants and mothers (Kramer, 2010). Nutrition in early childhood is essential not only for the immediate health of the child but also for the long term benefits. Breast milk as a source of nutrition is critical to protect newborns and infants against many illnesses and infectious diseases, including reducing the risk of diarrhea (Arifeen *et al*., 2001; Dewey *et al*., 2001; Bahl *et al*., 2005), lowering risk of gastrointestinal infections and respiratory infections such as pneumonia (Victoria, 1996), meningitis (Victoria, 1996), neonatal sepsis (Victoria, 1996; Bhutta and Yusuf, 1997; Ashraf *et al*., 1993; Edmond *et al*., 2006), otitis media and allergies

(Lumbiganon *et al*., 2011; Woldie *et al*., 2014), better visual acuity, speech and cognitive development (Lumbiganon *et al*., 2011; Woldie *et al*., 2014). EBF can also protect the child from atopic eczema (Kramer *et al*., 2002; Ip *et al*., 2009), the risk of allergy and asthma (Pettitt *et al*., 1997), leukaemia (Jones *et al*., 1998) and decreases the risk of chronic diseases later in life such as obesity and type II diabetes (Pettitt *et al*., 1997; Lanting *et al*., 1994; Kramer, 2010).

In areas where HIV prevalence is high, especially in sub-Saharan Africa, EBF has been shown to have an added advantage of reducing the risk of mother-to-child transmission of HIV (MTCT) (Illiff *et al*., 2005; Desmond *et al*., 2008). Exclusive breastfeeding ordinarily protects the integrity of the intestinal mucosa, which thereby presents a more effective barrier to HIV (Coovadia *et al*., 2007). This is a vital advantage in Africa where the prevalence of HIV infection is high and replacement feeding that is acceptable, feasible, affordable, sustainable and safe (AFASS) is unavailable for many HIV positive women (Coutsoudis *et al*., 2000; WHO, 2001; Onyearugha and Onyire, 2008). Mixed feeding (*i.e*., breastfeeding in addition to solids or milk from formula) disrupts the integrity of the gut endothelium, facilitating HIV entry via the gastrointestinal tract (Keith, 2007).

It has been estimated that optimal breastfeeding for children has the potential to prevent 1.4 million under five deaths in the developing world annually (Lancet, 2008). Maternal benefits of EBF include: reducing the risk of breast and ovarian cancer, reducing bleeding, preventing anemia by helping the uterus to return to its normal size and decreasing risks of new pregnancies by delaying the return of fertility (WHO, 1998; Mane *et al*., 2005; Chudasama *et al*., 2008; Barria *et al*., 2008; Yohannes *et al*., 2011; UNICEF, 2009b). Exclusive breastfeeding is also associated with fewer breast health problems such as subclinical mastitis and breast abscesses, which in turn are associated with increased breast milk viral load than is mixed feeding, (Coovadia *et al*., 2007). Estimates show that, good breastfeeding practices especially EBF coverage of 90%, could prevent about 11.6 % of the 6.9 million under five deaths in developing countries (Black *et al*., 2013; WHO/UNICEF, 2013). Even in countries with high HIV prevalence,

breastfeeding could prevent 13% of deaths in children younger than 5 years; in countries with low HIV prevalence, 15% of under-5 deaths could be prevented. Exclusive breastfeeding promotes optimal neonate and infant growth as it contributes to 100 % of daily nutrition requirement of children up to 6 months of age, 50 % of children of 6–12 months and 35 % of nutritional requirement for children aged 12–24 months (Kruger and Gericke, 2002).

Despite its demonstrated benefits, EBF prevalence and duration in many countries are lower than the international recommendation for the first six months of life which is 90 % (Sonko and Worku, 2015). Global average prevalence stood at 39% in the year 2008 (WHO, 2009) and was estimated to be 36% in low income countries (UNICEF, 2007; WHO, 2009). In sub-Saharan Africa, only 33% of children under the age of 6 months were exclusively breast-fed in 2008 (UNICEF, 2009a). In Kenya, according to the latest national statistics, only 32% of infants under six months of age are exclusively breastfed, while 59.9% receive other foods in addition to breastfeeding. In the former Rift Valley province, the rate of exclusive breastfeeding is 35% (KNBS, 2010). In the North Rift, records on the proportion of exclusively breastfeeding mothers are not available hence there is no indication of the prevalence of exclusive breastfeeding among HIV-positive mothers in this region.

A study in South Africa by Kruger and Gericke (2002), on infant and young child feeding practices, showed that low maternal knowledge negatively influence the practice of EBF in infants aged under six months. Adequate knowledge on exclusive breastfeeding as a method of prevention of mother-to-child transmission of HIV has been found to positively influence the practice of exclusive breastfeeding among HIV-positive mothers while poor knowledge is a hindrance to the practice (Matovu *et al.,* 2008; Kakute *et al.,* 2005). This implies that knowledge of HIV-positive mothers on exclusive breastfeeding may determine whether a mother practices exclusive breastfeeding or not. Therefore, knowledge of mothers in the North Rift on exclusive breastfeeding should be established to determine whether it influences the practice of exclusive breastfeeding.

Although correct perceptions have been found to promote the practice of exclusive breastfeeding among HIV-positive mothers while incorrect perceptions were found to negatively influence it, common perceptions were dependent on the context (Ukegbu *et al.*, 2011). Perceptions are varied and may determine whether a mother exclusively breastfeeds or not (Guil and Pollard, 2009). It is therefore necessary that when assessing factors that influence exclusive breastfeeding in a given context, the perception of mothers in that context is taken into account, hence should be identified.

In sub-Saharan Africa, there are also concerns about satisfying infants' nutritional needs, encouragement by other family members as a cultural norm and fear that feeding the baby only with breast milk could raise suspicion in the community about their HIV status. These are among reasons given by women infected with HIV for not exclusively breastfeeding their infants (Chasela *et al.*, 2008). Supplemental feeding is traditionally common in many regions of the developing world, making it easy for women to practice mixed feeding (Keith, 2007). Mothers who were HIV-positive introduced other foods in addition to breastfeeding to avoid stigmatization by their families and communities, making it difficult for them to practice exclusive breastfeeding (Buskens *et al.*, 2007). In Kenya, women deviate from the counselling received in the PMTCT clinic on exclusive breastfeeding for up to six months during which many infants are at great risk of MTCT of HIV through breastfeeding (NACC, 2009). Based on literature, varied socio-demographic, cultural and economic factors influence whether or not a mother will exclusively breastfeed as well as duration of breastfeeding. This suggests that socio-demographic, cultural and economic factors that influence exclusive breastfeeding are context dependent and therefore should be explored in each given situation. Clear determination of these factors in the North Rift is therefore necessary as they should be documented since they are not static.

Cognizant of the high prevalence of inappropriate child feeding practices and the importance of exclusive breastfeeding, several strategies have been initiated by UNICEF and WHO in order to promote optimal breastfeeding practices *i.e.*, start breastfeeding within 1 hour of birth, EBF for first 6 months of infant life and after 6 months

introduction of appropriate weaning foods while continuing to breastfeed for 2 years (WHO/UNICEF, 2003; Black *et al*., 2013; WHO/UNICEF, 2013). The Kenya government has endorsed these global commitments to improve EBF practices and has incorporated them into the primary health care system in line with the community health strategy (MoH, 2005). These strategies are Baby Friendly Hospital initiative (BFHI), Infant Young Child Feeding policy (IYCF) and breastfeeding recommendation in prevention of mother to child transmission of HIV (PMTCT) (WHO/UNICEF, 2003; UNICEF, 2005; UNICEF/WHO, 2006). However, a large portion of infants are not exclusively breastfed according to the infant feeding recommendations because delivery by the majority of women in Kenya and other less developed nations are home based and often attended to by trained or untrained birth attendants (Parkhurst *et al*., 2006; Cotter *et al*., 2006; Adegoke and van den Broek, 2009), thus, the BFHI strategy alone may not have a positive effect on EBF rates. While the Kenya Demographic and Health Surveys (KDHS) collect data on national prevalence of EBF, it does not generate regional prevalence, nor does it provide detailed information on predictors of EBF in specific groups such as HIV-infected women. Identifying factors associated with good breastfeeding practices in different contexts is assumed to facilitate better advocacy and wider coverage of exclusive breastfeeding in the country.

1.2. Statement of the Problem

The World Health Organization (WHO), United Nations Children's Fund (UNICEF) and other organizations promote exclusive breastfeeding as one of the key effective low-cost interventions to enhance child survival. Numerous awareness campaigns have been launched by national governments, multilateral organizations, and non-governmental and private sector organizations across the globe to educate mothers and families about the benefits of exclusive breastfeeding and with aim to encourage the practice. Mixed feeding of infants before 6 months of age by HIV- positive mothers increases the risk of MCTCT of HIV through breastfeeding. It is not clear why despite high uptake of PMTCT services in Kenya, the practice of exclusive breastfeeding still remains unacceptably low reflecting high prevalence of mixed feeding among HIV-positive women. The AMPATH programme in the North Rift has long standing CCCs in support of government policy on

PMTCT of HIV; providing a context where HIV-positive mothers have been exposed to such services for a relatively long time. This renders the North Rift as a suitable region to assess why despite long standing access to PMTCT services, exclusive breastfeeding as indirectly reflected Rift Valley region (35%) remains lower than the 90% coverage recommended by WHO.

Socio-demographic, economic and cultural factors have been found to be context specific and may enhance or hinder the practice of exclusive breastfeeding among HIV-positive mothers. Adequate information on these factors in the North Rift is not available, hence need for identification of factors that determine the practice of exclusive breastfeeding in this area inform relevant intervention strategies.

1.3 Objectives

1.3.1 Broad Objective

To investigate the predictors of exclusive breastfeeding among HIV-positive mothers attending CCCs in North Rift region of Kenya

1.3.2 Specific Objectives

i. To determine the prevalence of exclusive breastfeeding among HIV-positive mothers in North Rift.
ii. To identify the socio-demographic predictors of exclusive breastfeeding among HIV- positive mothers in the North Rift.
iii. To establish the cultural predictors of exclusive breastfeeding among HIV-positive mothers in the North Rift.
iv. To establish economic predictors of exclusive breastfeeding among HIV-positive mothers in the North Rift.
v. To establish the main predictors of exclusive breastfeeding among HIV-positive mothers in the North Rift.

1.4 Research Questions

i. What is the proportion of HIV-positive mothers who practice exclusive breastfeeding in the North Rift?
ii. What are socio-demographic predictors of exclusive breastfeeding among the study participants?
iii. What cultural predictors of exclusive breastfeeding among the study participants?
iv. What economic predictors of exclusive breastfeeding among the study participants?
v. What are the main predictors of exclusive breastfeeding HIV-positive among study participants?

1.5 Significance of the Study

An understanding of main predictors of exclusive breastfeeding among HIV-infected mothers as well as ways in which breastfeeding practices may be improved, are necessary for effective application of the WHO/UNICEF guidelines on breastfeeding and HIV in resource-strained settings. Preventing HIV transmission to infants through EBF is essential to meeting the Sustainable Development Goal (SDG) 3 of ensuring healthy lives and promoting well-being for all at all ages. Information from this study will be useful to policy makers in developing effective intervention strategies to improve the rates of EBF and thus reduce infant mortality in the context of HIV-positive mothers in the study area. This study will provide information on predictors of exclusive breastfeeding in the North Rift. This will inform interventions that are relevant for effective scale-up of the practice of exclusive breastfeeding in the North Rift and similar contexts. This would in turn contribute to efforts in reducing infant morbidity and mortality.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature based on the study objectives. It covers socio-demographic, cultural and economic characteristics of respondents in relation to exclusive breastfeeding and identifies any gaps.

Breastfeeding is a well established and recommended intervention for the improvement of child nutrition. Studies have demonstrated that it reduces deaths in infants and young children (Black *et al*., 2008; Jones *et al*., 2003). It is one of the most important factors for growth and development of infants and is globally endorsed as being the best for any neonate (Pramer *et al*., 2000). The World Health Organization (WHO) recommends the practice of exclusive breastfeeding (EBF) of infants for the first six months of life after birth (WHO, 2003). EBF means that the infant receives only breast milk. No other liquids or solids are given, not even water, with the exception of oral rehydration salt solution, or drops/syrups of vitamins, minerals or medicines (WHO, 2009). Infant feeding is complex in the context of HIV because of the major influence that feeding practices has on child survival. It is a dilemma to balance the risk of infants acquiring HIV through breast milk with the higher risk of death from causes other than HIV, in particular malnutrition and serious illnesses such as diarrhoea, among non-breastfed infants (Bahl *et al*., 2005; WHO, 2000).

In areas where HIV prevalence is high, especially in sub-Saharan Africa, exclusive breastfeeding (EBF) has been shown to have an added advantage of reducing the rates of mother-to-child transmission (MTCT) of HIV (Peter *et al*., 2005; Tewodros and Dereje, 2009). Observational data from a randomized trial of the effect of antenatal vitamin A supplementation on perinatal transmission (Coutsoudis *et al*., 1999), suggested that the risk of postnatal HIV transmission was lower with exclusive breastfeeding than with mixed breastfeeding. Another trial of a vitamin A intervention showed that HIV postnatal transmission risk and mortality were higher in mixed breastfed infants than in those who were exclusively breastfed (Illiff *et al*., 2005).

2.2 Prevalence of Exclusive Breastfeeding

As a mode of transmission, MTCT accounts for more than 10% of all new HIV infections globally. In the absence of interventions, the risk of MTCT is 20-45%, with the highest rates in populations with prolonged breastfeeding. Without effective interventions, HIV-infected women will pass the virus to their infants during pregnancy or delivery in about 15-25% of cases; and an additional 5-20% of infants may become infected postnatally during breastfeeding (De Cock *et al.*, 2002). Throughout the world, in developed and developing countries alike, inappropriate feeding of infants leading to their poor nutrition is a significant problem affecting socioeconomic progress in general (Akri, 1989). Suboptimum breastfeeding was responsible for 11.6% of all child deaths in 2011 (Black *et al*., 2013). Universal (90%) coverage of breastfeeding is estimated to prevent around 13% of all deaths among children under five years of age in low and middle income countries (Jones *et al*., 2003). However, globally only half of infants under 1 month of age and 30% of infants aged 1–5 months are exclusively breastfed (Black *et al*., 2013).

In 2014, an estimated 3.2 million children (aged 0-14 years) were living with HIV worldwide. Of these an estimated 91% are from sub-Saharan Africa (UNAIDS, 2014). According to UNAIDS, (2014), more than 370 000 children globally were newly infected with HIV, mostly through MTCT causing 260 000 deaths in the same year. \, (2009) estimates 22 259 children were newly infected through MTCT in Kenya during the same year. Despite the known and proven benefits, the prevalence of exclusive breastfeeding of children under 6 months of age remains disconcertingly low with a global average rate of 35% (WHO, 2009). UNICEF (2009a), reported global exclusive breastfeeding average coverage rate per continent as follows; South Asia 44%, East Asia and Pacific (excluding China) reported 32%, Middle East and North Africa, Europe and America reported 25%, 20% and 13% respectively while in sub-Saharan Africa, only 33% of children under the age of 6 months were exclusively breast-fed. In Kenya, only 32% infants under six months of age are exclusively breastfed and 59.9% receive other foods in addition to breastfeeding before 6 months (KNBLS, 2010). EBF prevalence in Kenya, as in several countries as depicted, falls short of the WHO target of 90%

coverage, yet MTCT is the most significant source of HIV infection in young children (WHO, 2010b).

Recent reports have identified gaps in the delivery of nutrition and HIV/AIDS-related services in Kenya (MMS, 2008; Chopra *et al*., 2009). In an effort to reduce mother-to-child transmission rates, the government of Kenya and its partners provide antiretrovirals to reduce mother-to-child transmission rates (MoH, 2006; MMS, 2008). Additionally, the Kenyan government has defined national guidelines that promote timely and EBF for non-infected mothers and for HIV-infected mothers who choose to breastfeed (MoH, 2006). These estimates suggest that MTCT is a significant cause of HIV infection in children meaning there are still many children at risk HIV infection through breastfeeding. Therefore the most appropriate interventions to prevent MTCT need to be understood in order to reverse the infection trends. Prevalence of EBF in the greater Rift Valley as proxy for the North Rift is un acceptably low (35%) as indicated in KNBS, (2010). Presence of CCCs in the North Rift for a long period through AMPATH programme would be a suitable context to identify predictors of EBF. Records on proportion of HIV-positive mothers living in the North Rift who exclusively breastfeed their infants are not available. It is important therefore to establish the prevalence of exclusively breastfed children up to the age of 6 months in the study area (North Rift region) and its predictors in order to devise strategies to promote this.

2.3 Predictors of Exclusive Breastfeeding

2.3.1 Socio-demographic predictors of Exclusive Breastfeeding

Socio-demographic factors such as age, parity, marital status, education level, occupation and religion have been found by various studies to influence the practice of exclusive breastfeeding either positively or negatively depending on the context (Asfaw *et al.*, 2015; Tan, 2011). In a cross-section study, Ajibade *et al.*, (2011) reported that mothers below the age of 25 years and first time mothers were less likely to breastfeed their babies than those aged above 25 years and having had more than one child. The study further reported that married mothers were more likely to practice exclusive breastfeeding compared to single, divorced or widowed women. Parity has been shown to

be a significant predictor of providing EBF (Khanal *et al*., 2013). Mothers with three or more children were more likely to breastfeed than those with one child. It has been shown that mothers who have had previous child birth are more likely to practice EBF compared to the first time mothers because multiparous mothers have already had experience in breastfeeding and maybe better able to manage EBF with their other household tasks (Okanda *et al*., 2014; Tan, 2011; Dewey *et al*., 2003). This finding also suggests that even though breast-feeding is a natural act, it is also a learned behaviour (MOH, 2004). In addition, EBF is less expensive than mixed feeding, and cost may be a concern in larger families (Okanda *et al*., 2014). Similar findings were also reported earlier by Doherty *et al.,* (2007) who found that older mothers were more likely to practice exclusively breastfeeding compared to young mothers. Regarding difference between old and young mothers and EBF, it has been suggested that younger age mothers do have a better job opportunity and lack the time to EBF their infant compared to older age mothers (Asfaw *et al*., 2015).

Other studies have reported that mothers with secondary or higher education levels were more likely to practice exclusive breastfeeding than those with lower level or no formal education. Maternal education is related to knowledge of good child care practice and a proxy to household wealth. Female education has severally been described as one of the strongest determinants of the practice of EBF (Dubois and Girard, 2003). Children from mothers who attended formal school are more likely to practice exclusive breast feeding when compared to those mothers who had not attended formal education. This can be explained by the fact that a mother who attended formal school has the opportunities to expose herself to information related to exclusive breast feeding through different kinds of media channel likes posters, family health cards and other electronic information and education materials that might influence exclusive breast feeding practice (Kingsley and Justice, 2011; Alice, 2002; Elizabeth *et al*., 2011).

Occupation and religion background were found to influence positively exclusive breastfeeding (Chudasama *et al.,* 2009, Fadnes, 2009; Otoo, 2009). Being a housewife has been associated with high prevalence of EBF, as these women are presumed to have

enough time to be with their infants and have more opportunity to practice EBF (Oche and Umar, 2008), than those who do not have chance to stay at home due to work or other reasons (Ulak *et al*., 2012; Asfaw *et al*., 2015). In contrast Khanal *et al.*, (2011) reported mothers with higher education level and those employed to be less likely to breastfeed their infants than those with lower than secondary education and/or those with no employment. This could be due to the fact that educated mothers have better job opportunities than illiterate mothers, so they don't have enough time to maintain EBF practice (Asfaw *et al*., 2015). Employed mothers have been found not to fully practice EBF compared to unemployed mothers (Haroun *et al*., 2008; Tan, 2011, Taveras *et al*., 2003; Chudasama *et al*., 2009), and this has been attributed to less maternity leave (two months after delivery in most contexts) (Setegn *et al*., 2012), which makes employed mothers have less opportunity to stay at home, compromising exclusive breastfeeding. Mothers also may have to leave their babies to search for a job.

Although age, parity, education and occupation have been shown to influence EBF, this may not be applicable to all contexts. Agu and Agu, (2011) in a cross-section study in Nigeria found no influence of maternal age, parity, education or occupation on the practice of exclusive breastfeeding. This implies that in some settings socio-demographic factors influence the practice of exclusive breastfeeding and those factors may differ across contexts. Whether or not the same socio-demographic factors may influence the practice of exclusive breastfeeding among HIV-positive mothers in the North Rift study area; is not known. Therefore, there is need to explore these factors in order identify those relevant to EBF practice, to inform effective control strategies.

Knowledge of mothers on EBF has been shown by studies from Nepal (Ulak *et al*., 2012), Tunisia (Bouanene *et al*., 20129) and Tanzania (Nkala and Msuya, 2011) to influence the practice of EBF. These studies reported that mothers who had adequate knowledge about breastfeeding were more likely to exclusively breastfeed their infants than those who didn't have adequate knowledge about breastfeeding. This impact could be partly explained by mothers improved knowledge of the benefits of breastfeeding for themselves and their infants, as well as the risks of not breastfeeding, improving the

likelihood that mothers will breastfeed their infants even if alternatives are available (Mekuria and Edris, 2015). Studies also show that better knowledge about breastfeeding is the most important factors for giving colostrum and exclusively breastfeed up to 6 months (Kruger and Gericke, 2002).

Low maternal knowledge on infant and young child feeding (IYCF) practices predicted the practice of non EBF in infants aged less than six months. Children of mothers who scored below the mean cut-off point upon responding to IYCF knowledge questions were 3.4 times more likely not to be exclusively breastfed compared with their counterparts (Egata *et al*., 2013). One of the key characteristics of women who achieved success in exclusive breastfeeding was good knowledge on MTCT of HIV risks and mixed feeding (Kaliwile and Michelo, 2010). The same authors further found that, MTCT key messages are important as they give mothers information that they use to explain their behavior to family members, giving them a greater understanding of the reasons for exclusive breastfeeding. According to a study by Lunney and others (2008), one factor that has been shown to facilitate early breastfeeding cessation is mothers' poor knowledge about HIV transmission from mother to child. The study further reported that HIV-positive mothers in developing countries including Kenya may be so motivated to protect their children from HIV infection that they stop breastfeeding early even when they cannot provide adequate replacement diet due to poor knowledge on MTCT. Matovu *et al*., (2008), in a cross sectional study on factors influencing adherence to exclusive breastfeeding among HIV positive mothers in Uganda, established that knowledge on exclusive breastfeeding as a method of preventing MTCT influenced the practice of exclusive breastfeeding positively. These findings imply that among other factors, mothers need to have adequate knowledge on MTCT to be able to practice exclusive breastfeeding (EBF). However, information on knowledge of exclusive breastfeeding as well as its influence on exclusive breastfeeding among HIV-positive mothers in the North Rift is not known to provide evidence-based health promotion strategies.

Perceptions have been shown to play an important role in determining the behavior of individuals regarding exclusive breastfeeding, hence may determine whether or not

mothers will exclusively breastfeed their infants (Guil and Pollard, 2009). Other studies have shown that HIV-positive mothers in different settings have varied perceptions on exclusive breastfeeding. While some hold to the incorrect perception that breast milk alone is not enough for the baby up to 6 months of age, others correctly perceive that exclusively breastfeeding up to 6 months is sufficient and could prevent mother to child transmission of HIV (Kaliwile & Michelo, 2010; Matovu *et al*., 2008). Although correct perceptions have been found to promote the practice of exclusive breastfeeding among HIV-positive mothers while incorrect perceptions were found to negatively influence it, perceptions were found to be dependent on context (Ukegbu *et al.,* 2011). Perceptions range from mothers considering colostrum as being impure to introduction of other fluids including herbs with misconceptions that; breast milk alone was insufficient for the baby or baby needed protection from illness which have led to mixed feeding of babies exposing them to the risk of MTCT of HIV (Oche *et al*., 2011; Bentley *et al*., 2008; Nankunda *et al.*, 2006; Shirima *et al*., 2000; Ssenyonga *et al*., 2004) . Perceptions are context-specific and may change with time (Kirkwood, 2008). It is therefore necessary that when assessing factors that influence exclusive breastfeeding in a given context, the perception of mothers is taken into account. In the North Rift, perceptions on exclusive breastfeeding among HIV-positive mothers are not known. Therefore, there is need to identify perceptions of HIV-positive mothers on exclusive breastfeeding in the area and determine how these perceptions influence their practice towards exclusive breastfeeding

2.3.2 Cultural predictors of Exclusive Breastfeeding

Cultural beliefs are usually found to be region specific. Studies in Ghana have found that in some areas of Ghana, mothers or relatives usually give water and other concoctions to infants as a perceived way of quenching their thirst or as a sign of welcoming them into the world (Davies-Adetugbo, 1997; Otoo *et al*., 2009; Iddrisu, 2013; Tampah-Naah and Kumi-Kyereme, 2013). Some infants are given soil to signify that they have arrived in the world or given sugar and vinegar for them to understand that the world has a mixture of sweet and bitter things/experience (Maonga *et al*., 2015). The practice of breastfeeding plus giving water or other concoctions amounts to mixed feeding

increasing the risk MTCT of HIV thus may increase mortality rates among young children in most developing countries. (VanDerslice *et al.*, 1994). External pressure from elders or family members especially spouses and traditional beliefs have led to mothers mixed feed their babies (Keith, 2007; Chasela *et al.*, 2008). HIV-positive Mothers from communities where introduced other foods in addition to breastfeeding is a tradition it is difficult for them to practice exclusive breastfeeding as recommended by WHO if they do so would be stigmatized by their families and communities(Buskens *et al.*, 2007).

Women in some communities who stop breastfeeding before six months do so because of the onset of a new pregnancy (Oche *et al*., 2011). In this study of Oche and colleagues, the widely held cultural belief in their study participants was that the new pregnancy produces milk that is contaminated and thus harmful to the child hence the need to put the child off the breast. In Nepal, infants are introduced to nuts, especially dates (*chokda*) and nutmegs (*jaiphal*) that are mashed and given to infants. According to local belief it will sooth the baby and helps with normal sleep (Ulak *et al*., 2012). Usually it is given in small amounts so it will not contribute with much energy. In some communities in the same country, local herbal drops (*janamghuti*) were found to be a common tradition, and infants usually started around one month of age. According to the local belief, these drops should be given to clean the stomach of infants and will remove unnecessary contents by inducing vomiting (Ulak *et al*., 2012). Studies from Tanzania and Nigeria also showed that mothers gave pre-lacteal feeds due to their belief that they prevent against disease (Shirima *et al*., 2001; Steve, 2006). Traditional malpractices like pre-lacteal feeding and early introduction of complementary food is common barriers to optimal breastfeeding practices. Pre-lacteal feeding inhibits giving colostrum as mothers give pre-lacteal feeds to replace the colostrum they discard. Studies show that mothers who discard colostrum perceiving it to be water and causing disease are more likely to non-exclusively breastfeed than those who gave colostrums for their children ((Semega-Janneh *et al*., 2001; Ergenekon-Ozelci *et al*., 2006; Tamiru *et al*., 2012). This implies that traditional practices on infant feeding vary across countries and regions with adverse effects on exclusive breastfeeding as it amounts to mixed feeding, a risk factor to MTCT. In the

given context, such factors should be identified and assessed to determine those that may have a bearing on practice of exclusive breastfeeding in North Rift study area.

2.3.3 Influence of Economic factors on Exclusive Breastfeeding

Economic status of a mother has been shown to be a major factor in determining whether she exclusively breastfeeds or not (Khanal *et al.,* 2013). Joshi and others (2014) in a study in Bangladesh found that the mothers from households belonging to a richer wealth quintile were more likely to exclusively breastfeed their infants than those belonging to the poorest wealth quintile. It was suggested these mothers may have better education level, easier access to media and health services which may have increased their awareness and made them relatively more conscious about EBF. In contrast, Blas and Kurup (2010) in their cross-sectional study, reported prevalence of exclusive breastfeeding to be higher among children belonging to the poorest wealth quintile. It can be argued from this finding that mothers who are poor are more likely to EBF as they do not have other option such as infant formula (Xu *et al*., 2007; Agho *et al*., 2011). In addition, it may be that infant formula and cow milk are not affordable unless the family have higher income. Another possible explanation for this finding is that women with higher income are less likely to stay at home during day time and that may compromise the practice of exclusive breastfeeding (Shifraw *et al*., 2015). From these studies, income could either hinder or enhance exclusive breastfeeding among HIV-positive mothers depending on the context and the direction in North Rift is not clear. It calls for assessing the influence of economic factors asa potential predictors of exclusive breastfeeding among HIV positive women in the context of the North Rift study area.

2.4 Conceptual Framework for the Study

This conceptual framework used in this study is based on the idea that socio-demographic, cultural and economic factors as reviewed above are thought to be predictors of whether a mother exclusively breastfeed her baby or not. The influences of these factors were assessed to identify the predictors of exclusive breastfeeding among HIV-positive mothers attending CCCs in the North Rift (**Figure 2.1)**.

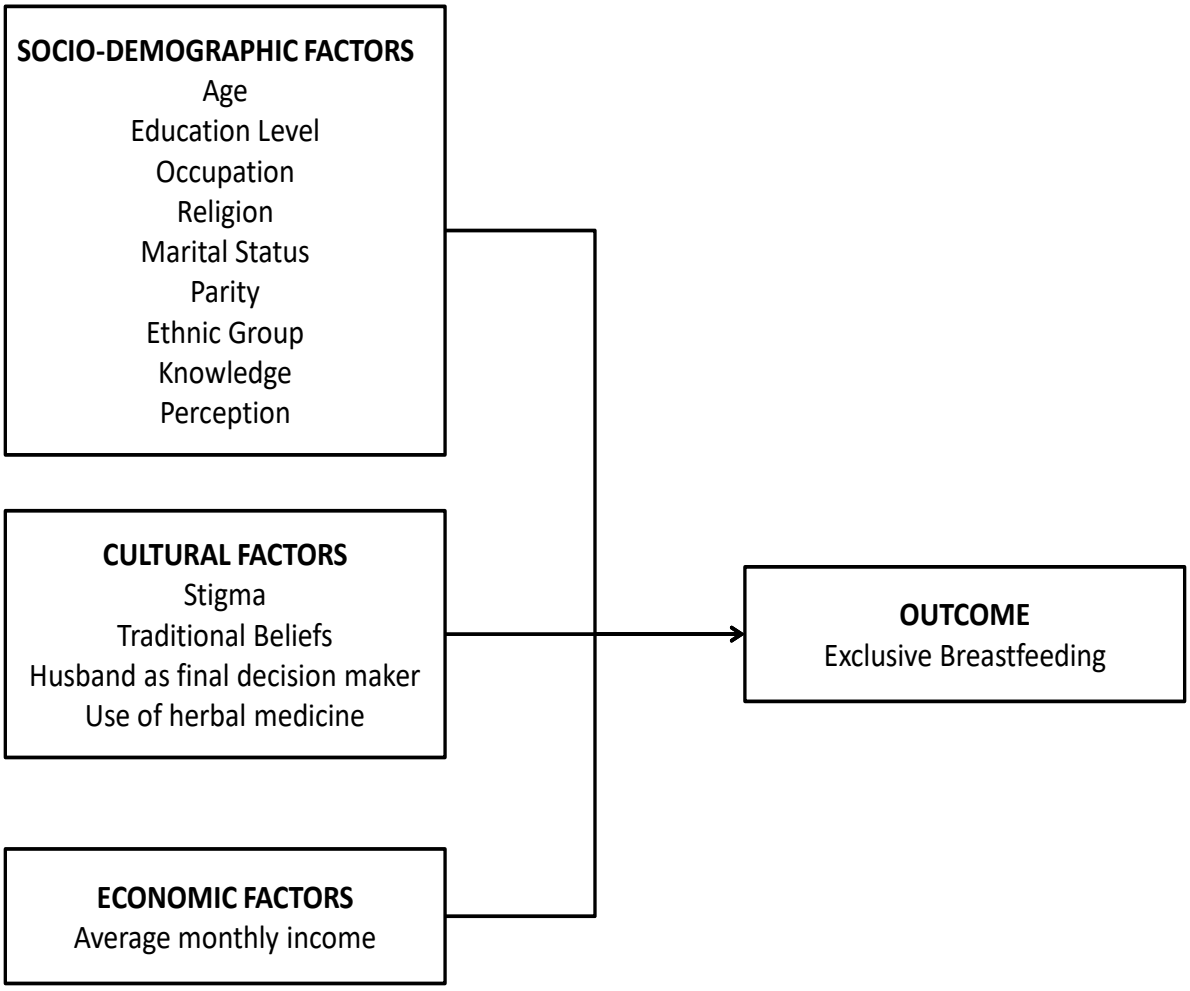

Figure 2.1: Conceptual Framework on Factors associated with Exclusive Breastfeeding Practices (based on literature review).

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter explains the research design, study population, sampling procedures and sample size determination and study procedures. It addresses data collection analysis, validity and reliability, as well as the ethical considerations.

3.2. Study Design

This was a health facility-based cross-sectional study conducted between November, 2010 and February, 2011; using both quantitative and qualitative study methods.

3.3 Study Area

The study was conducted in health facilities with comprehensive care clinics (CCCs) for HIV management in the North Rift region of Kenya. North Rift forms part of the former vast Rift Valley Province. This region comprises of Baringo, Elgeiyo-Marakwet, Nandi, Uasin Gishu, Trans Nzoia, West Pokot and Turkana counties (Constitution of Kenya, 2010). There are nine CCCs based in the following health facilities: Moi Teaching and Referral Hospital (MTRH)-Eldoret, which houses AMPATH; others are Kitale, Iten, Kabarnet, Kapenguria and Uasin Gishu District Hospitals; and Mosoriot, Turbo and Burnt Forest Health Centres (Appendix IX).

The North Rift was selected because it had health facilities that were well served with established CCCs which had been operational for over 10 years. These facilities are therefore considered to be well established and assumed to have adequate numbers of clientele. The facilities were purposively selected considering the catchment (geographical representation) of the North Rift Region. As a result Kitale District hospital (DH) (level 4) to the north, Turbo Health Centre (HC) (west), Moi Teaching and Referral Hospital (MTRH) (central), Kabarnet DH (east) and Mosoriot HC (south) of North Rift Region.

3.4 Study Population

The study was conducted among 902 HIV-positive mothers attending CCCs in selected health facilities in the North Rift region of western Kenya.

3.5 Sample Size Determination for Study Population

The sample size was calculated according to the formula below (Fisher *et al*., 1991). This formula was adopted because it is suitable for single proportion study

$$n = \frac{z^2\, p\, q}{d^2}$$

Where;

n = Desired sample size required if population is greater than 10,000.

z = The standard normal deviate at 95% confidence levels.

P = Proportion in target population estimated to have specific characteristics

d = The level of statistical significance set at 5% or 0.05.

q = 1-p, (1-0.5) = 0.5

A 'p' of 50% was adopted because the prevalence of HIV among mothers of reproductive age in the North Rift is not known.

$$n = \frac{1.96^2 \times 0.5 \times 0.5}{0.05^2}$$

$$= 384$$

The desired sample size = 384

Where population is less than 10,000 then the following formula applies;

$$nf = \frac{n}{1 + (n/N)}$$

Where:

nf = The desired sample size when population is less than 10,000

n = The desired sample size when the population is more than 10,000

N = The estimate of the population size

(Number of mothers registered at Comprehensive Care Clinics was 902, AMPATH, 2009)

$$nf = \frac{384}{1 + (384/902)} = 270$$

The required sample size was 270.

To cater for non-response and refusal to participate, the sample size was inflated by 10%.

10% of 270 = 10/100 * 270 = 27.

Therefore, final sample size was 270 + 27 = 297

3.5.1 Sample Distribution among Study Facilities

Proportional sampling was applied to determine the sample size for each facility (Koul, 1984)

ni/N

Where n = desired sample size i = total eligible mothers at the study site (selected facility)

N = total eligible mothers in five selected study sites

Table 3.1: Showing Distribution of Sample Per Study Site

Serial No.	Study Site/facility	Target	Sampled
1.	Kabarnet	90	40
2.	Kitale	206	93
3.	MTRH-Eldoret	192	86
4.	Mosoriot	84	38
5.	Turbo	89	40
		661	**297**

3.6 Sampling Procedure

The study participants were randomly selected using the "numbered tags" method (Lutz, 1982). A study tag (small disc with a printed number) was given to each client as they arrived at the clinic. Thus the first client got a tag numbered 1; the second got the tag numbered 2 and until the last client on a particular day. So on and so forth. Basing selection on a sampling fraction of one in three as suggestetd by Lutz (1982), clients whose tags ended in any one of three pre-selected digits ranging from 0 to 9 were included in the sample on every clinic day. Each client handed her tag to the counsellor at the counselling room. The counsellor attended to the client as usual, if the client's tag number was eligible for selection and the client satisfied the conditions of the study, she was sent for interview on exit. Informed consent was sought before interview. This process was applied in all the selected clinics.

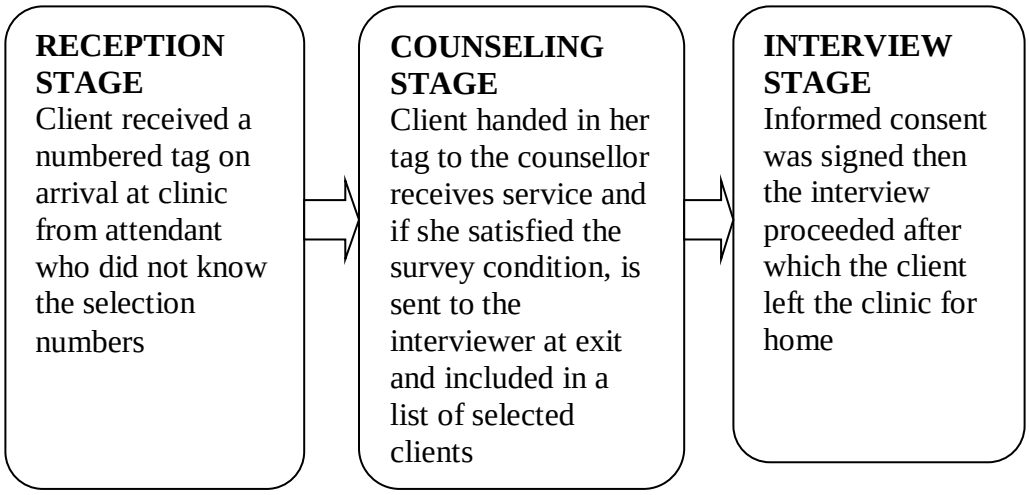

Figure 3.1: The CCC Process

At the end of the clinic session all tags were collected and arranged systematically beginning with number one, ready for the next session. Selection of numbers was changed at each session but the person handing the tags to the clients did not know what the selection numbers were, to maintain blinding hence reduce selection bias. To prevent clients being selected at a repeat visit, clients were only selected at the first time they attended the clinic during the survey period. At any subsequent visit, such clients were considered ineligible. It was therefore necessary to list all enrolled clients who got

eligible numbers each day, so that they were not selected on another day. The counsellor confirmed that a client did not appear on the list before sending them for interview.

3.7 Inclusion Criteria for HIV-Positive Mothers

HIV-positive mothers attending comprehensive care clinics at the five randomly selected clinics, diagnosed before or within six months after delivery; who had at least one child, and who gave informed consent to participate in the study were all eligible for inclusion in the study.

3.8 Exclusion Criteria

HIV-positive mothers attending comprehensive care clinics who were critically ill at the time study.

3.9 Data Collection Tools

The study utilized a questionnaire and Focus Group Discussions (FGDs) among study women and Key Informant Interviews (KIIs) among selected health workers.

3.9.1 Questionnaire

A pre-tested and standardized questionnaire (Appendix III) conducted in Kiswahili at the study clinics during clinic days was used to obtain information from women, and included: (i) socio-demographic characteristics (age, marital status, education, occupation, perception), (ii) reproductive information (parity), (iii) breastfeeding practices (use of pre lacteals, time of introduction of water, liquid and solids and EBF practice) and; (iv) knowledge on EBF and cultural factors.

3.9.2 Focus Group Discussion Guide

The FGD guide (Appendix II) consisted of three thematic areas: Theme 1 elicited information on knowledge and practice on exclusive breastfeeding; Theme 2, on socio-demographic, economic and cultural factors influencing exclusive breastfeeding; and Theme 3, the perception of HIV-positive mothers on exclusive breastfeeding. The FGDs were done until saturation.

3.9.3 Key Informant Interview Guide

The key informant interview (KII) guide (Appendix IV) was divided into two sections. In the first section, the respondents were health workers who included three PMTCT clinical officers, two nurses trained in PMTCT and two nutritionists who were working in AMPATH comprehensive care clinics at the time of interviews. The health workers were purposively selected as in-charges of their departments in the facilities and were expected to relevant information to the study. The thematic areas in this section of the interview were knowledge on exclusive breastfeeding and practice of exclusive breastfeeding. In theme 1 information on the views of the interviewee concerning HIV-positive mothers' knowledge on exclusive breastfeeding was obtained. Theme 2 elicited information on the interviewees' views concerning HIV-positive mothers practice on exclusive breastfeeding; the form of support offered by the provider to promote exclusive breastfeeding among study mothers; and providers views on what could be done to enhance better practice of exclusive breastfeeding among the participants.

3.10 Training of Research Assistants

Prior to data collection, research assistants comprising of two clinical officers, two nurses and a nutritionist conversant with CCC were engaged to conduct the interviews and administer the questionnaire. They were recruited and trained during a one day seminar on methods of data collection, conducting interviews, participant confidentiality and recording responses. Each research assistant was provided with a field manual for reference while conducting the interviews. The purpose of training research assistants was to ensure standardized data collection methods were applied at all sites, hence ensuring reliability of information collected.

3.11 Pretesting of Data Collection Tools

Research instruments were pre-tested at Iten District Hospital CCC. This hospital was chosen because it was not among the sites for the study. A sample of 30 questionnaires were administered during the pre-test which was 10% of the sample size. In order to ascertain the reliability of the questionnaire, a test-retest method was used. The questionnaire was administered twice within an interval of four weeks to the piloted

subjects. A correlation between answers obtained in the first and second administrations was computed. Spearman's Rank Correlation was used, where two sets of scores were computed by observing difference between the first and second set.

Spearman's $R = 1 - \frac{6\sum d^2}{n(n-1)}$

Whereby r= correlation d=difference between rank test and retest rank, n=number of respondents (Kothari, 2004). An overall Spearman's rank correlation coefficient value of 0.76 was obtained indicating the tool was reliable because the value is > 0.70.

3.12 Data Collection Procedures

The study involved a mixed methods data collection that included both quantitative and qualitative data collection, to explore in addition to factors influencing EBF among HIV-positive in the study facilities, it also assessed health workers views regarding breastfeeding practices in the same facilities to corroborate those of study women.

On exit, the interviewer administered a questionnaire once to each selected respondent to obtain quantitative data. The interviews were conducted in Kiswahili. Information on socio-demographic characteristics, cultural income factors and how they influence exclusive breastfeeding was collected.

The focus group discussions were conducted in Kiswahili among participants attending support group sessions at three different clinics namely, AMPATH based at the Moi Teaching and Referral Hospital (MTRH), a level six facility, Kabarnet District Hospital (a level four Health Facility) and Turbo Health Centre (a frontline level three health facility), giving a total of three FGDs In addition to differences in the level of facilities, the three are also geographically urban, peri-urban and rural facilities respectively. The first 10 mothers from the group attending monthly support sessions were selected to participate as discussants. The FGDs focused on various child-feeding issues, including decision making and family support. During each session, a moderator led the discussants through questions in all themes while a note taker took notes on details of the discussion. Saturation of information on all themes was reached when no new information could be

elicited from the discussions. Probes were executed during the FGDs until no new information was elicited (*i.e.*, saturation was attained).

Key informant interviews were also conducted in English among health workers, namely PMTCT trained clinical officers, community health nurses, nutritionists and social workers at the selected comprehensive care clinics to elicit information to corroborate data on knowledge of mothers and practice on exclusive breastfeeding in the study region. Information obtained from qualitative methods was therefore used to give additional meaning to obtained quantitative data. Key informant respondents in second section, consisted of three (3) social workers (two were from urban health facility and one was from rural health facility) working at AMPATH comprehensive care clinics. The social workers were expected to be acquainted with social and cultural norms in the study area.

3.13 Variables

This subsection describes the variables generated from the data collected.

3.13.1 Knowledge

Knowledge on exclusive breastfeeding was generated by asking respondents open ended questions to assess her knowledge on exclusive breastfeeding then categorized into two as being knowledgeable or not. Knowledge was determined by considering those respondents who were able to define exclusive breastfeeding to include giving infant breast milk only without any additional food or liquid for the first six months of the infant's life, as 1 and were considered as having good knowledge. Those who did not define it correctly or responded they didn't know were coded 0 and were considered to have poor knowledge.

3.13.2 Perception

An overall perception score was obtained by coding 1 for those who agreed to perceptions 1, 2 and, 4 and 0 for those who were neutral or disagreed. Those who agreed or were neutral to perception 3 were coded 0 while those who disagreed were coded 1.

Then, an overall perception score was obtained by summing up all the scores and dividing by four. All those respondents who scored 0.75 and above were considered to have correct perception on exclusive breastfeeding (majority was considered as 3 out of 4 given a majority value of 70%). "Correct perception" was then coded 1 and "not having a correct perception" as 0.

3.13.3 Cultural factors

Cultural factors were generated by asking the respondent to state whether the factors listed influenced their choice of infant feeding. The responses were recorded as reported. All those who reported stigma were coded as 1, all those who reported traditional beliefs, husband as the final decision maker, use of herbal medicine and none were coded as 2, 3, 4 and 5 respectively.

3.13.4 Income

Income status variable was generated by asking the respondent to state family average monthly income. Income was then divided into tertiles. A wealth index was constructed from data collected in the household questionnaire, using methods recommended by the World Bank Poverty Network and United Nations Children's Fund (Filmer and Pritchett, 2001), and was divided into three categories. The 1st tertile (group 1) all those who reported an income between Kenya shillings 0 through 4 000 represents the lowest income house, 2nd tertile (group 2) represents the next group and considered the middle-level households with a reported income of between Kenya shillings 4 001 through 12 000 and the 3rd tertile (group 3) for those who reported between Kenya shillings 12 001 through 150 000 and considered as the highest income households.

3.14 Data Management and Statistical Analysis

All forms were checked manually for completeness and consistency. Data were then entered and analyzed using Statistical Package for the Social Sciences (SPSS) software for windows version 16.0 for analysis of quantitative and thematic analysis for qualitative data. Chi-square test or Fisher's exact test (as appropriate) were calculated to identify associations between independent and the practice of exclusive breastfeeding. Explanatory variables found to be statistically significant in the bi-variate analysis were

subjected to multivariate logistic regression analysis to control for confounders. In multivariate analysis, a logistic regression model was developed to identify the key factors influencing exclusive breastfeeding. The final model thus generated adjusted odds ratios (OR) with their 95% CI. A *P* value <0.05 was considered statistically significant. Qualitative data was analyzed by summarizing and categorization of verbative response of participants and highlighting emerging themes. Quotes from respondents were presented to paraphrase opinions.

3.15 Ethical Considerations

Approval to conduct research was granted by the Maseno University School of Graduate Studies (Appendix VII) and ethical approval granted by Moi University's Institutional Research and Ethics Committee (IREC), (Appendix IX). Permission to conduct research at CCCs was obtained from the AMPATH Associate Programme Manager for research (Appendix VIII) and also from respective hospital administrators of the other study facilities. The purpose of the study was explained to eligible participants and their voluntary written consent (Appendix I) sought prior to interview. For participants who were unable to write, verbal consent and a right thumbprint was accepted as a signature. Information on study participants was recorded using personal identification numbers instead of names for anonymity and all copies of consent forms were kept under lock and key to maintain confidentiality. Respondents were not compensated for participation in the study.

3.16 Study Limitations

The measurement of Knowledge in this study is limited to the ability of respondents to define exclusive breastfeeding to include giving baby only breast milk and not other foods or fluids for a period of six months. However, this was still able to show relationship with EBF as defined in this study. Similarly, the measurement of perception in this study is limited to statements which reflect whether or not perceptions are in line with recommendations on EBF and are hence expressed as correct and incorrect perceptions. Hence results pertaining to knowledge and perceptions are limited to these interpretations.

CHAPTER FOUR: RESULTS

4.1 Introduction

297 HIV-positive mothers participated in the study. The response rate was 100%. The findings are as per the specific objectives, namely prevalence of exclusive breastfeeding (EBF) among HIV-positive mothers, socio-demographic, cultural and economic predictors of EBF.

4.1 Participants Characteristics

A total of 297 HIV- positive mothers attending five Comprehensive Care Clinics were interviewed. Their mean age in years was 31.1±5.1. More than half (61.6%) were married and 48.1% had attained primary level of education. It was observed that 53.2% of the participants had given birth 3 to 4 times and 38.4% of them were from the Kalenjin community. Most respondent (95.2%) were Christians respondents (28.3%) were casual laborers as indicated in **Table 4.1**. Majority of the respondents (83.5%) had good knowledge (having defined exclusive breastfeeding as breastfeeding infant without any food or liquid for the first 6 months) as shown in **Table 4.1**. Majority of the respondents (80.8%) had the correct perception on exclusive breastfeeding (**Table 4.1**). Most of the respondents (64.6%) reported that their choice of feeding method was not influenced by any the cultural factors. However among those who reported cultural factors as having influenced their choice of infant feeding, were mainly 21.9% who reported stigma (**Table 4.1**.). Study participants who had an average monthly income of Ksh. 4,000 or below were 35.4%.

Table 4.1: Participants Characteristics

Characteristic	*Response*	*n (%)*
Marital status	Single	40 (13.5)
	Married	183 (61.6)
	Separated/Divorced	22 (7.4)
	Widowed	51 (17.2)
	Other	1 (0.3)
Religion	Christian	283 (95.2)
	Muslim	7 (2.4)
	Others	7 (2.4)
Parity	1-2	80 (26.9)
	3-4	158 (53.2)
	≥5	59 (19.9)
Education level	None	7 (2.4)
	Primary	143 (48.1)
	Secondary	102 (34.3)
	College/University	45 (15.2)
Occupation	Business	61 (20.5)
	Farmer	36 (12.1)
	Salaried	42 (14.1)
	Casual loborer	84 (28.3)
	Housewife	74 (24.9)
Ethnic group	Kalenjin	114 (38.4)
	Luhya	101 (34)
	Kikuyu	27 (9.1)
	Luo	19 (6.4)
	Others	36 (12.1)
Knowledge on EBF	Good	248 (83.5)
	Poor	49 (16.5
Perception on EBF*	Correct	240 (80.8)
	Incorrect	57 (19.2)
Cultural	Stigma	65 (21.9)
	Traditional beliefs	24 (8.1)
	Husband as a final decision maker	9 (3.0)
	Use of herbal medicine	7 (2.4)
	None	192 (64.6)
Income	Income group 1(0-4 000)	105 (35.4)
	Income group 2 (4 001-12 000)	96 (32.3)
	Income group 3 (12 000-150 000)	96 (32.3)

Mean age (years) 31.1±5.1

*An overall perception score was obtained by summing up all the scores and dividing by four. All those respondents who scored 0.75 and above were considered to have correct perception on exclusive breastfeeding. Details on perception responses are provided in **Table 4.2**

4.1.2 Perceptions of HIV-Positive Mothers on Exclusive Breastfeeding

An assessment of participants' perception regarding EBF, indicates that most of the mothers (88.6%) perceived all babies born to HIV positive mothers to likely be infected with HIV. 78.1% were of the opinion that breastfeeding babies do not need other fluids/herbs before six months of age (**Table 4.2**)**.** Two hundred and fifty-one (84.5%) of the study mothers perceived that EBF can prevent transmission of HIV from mother to child and 78.8% believed that infants born to HIV positive mothers and are given mixed feeds are at higher risk of HIV infection than those exclusively breastfed (**Table 4.2**)**.**

Table 4.2: Perceptions of HIV Positive Mothers on Exclusive Breastfeeding

Perception	***Agree N (%)***	***Neutral n (%)***	***Disagree n (%)***
All babies born to HIV positive mothers are likely to be infected with HIV	263 (88.6)	4 (1.3)	30 (10.1)
Breastfeeding babies also need other fluids/herbs before six months of age	61 (20.5)	4 (1.3)	232 (78.1)
Exclusive breastfeeding can prevent transmission of HIV from mother to child.	251 (84.5)	13 (4.4)	33 (11.1)
Infants born to HIV positive mothers who receive mixed feeding are at higher risk of HIV infection than those exclusively breastfed	234 (78.8)	21 (7.1)	42(14.1)

4.2 Prevalence of mothers Practicing Exclusive Breastfeeding (Objective 1)

In an open-ended questionnaire in which respondents were asked to state the mode of feeding their babies during the first six months, 188 responded that they had exclusively breastfed their babies for the first six months without introducing other feeds, giving a prevalence of EBF of 63%, while 101 (34%) practiced mixed feeding (**Figure 4.1**).

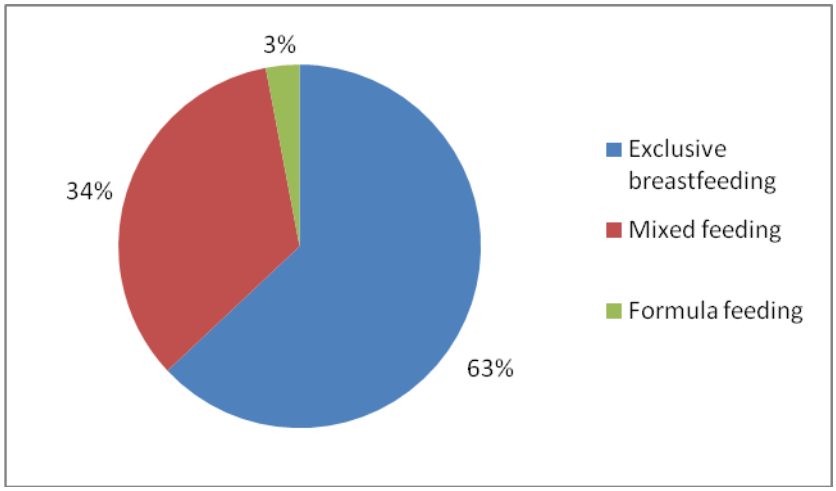

Figure 4. 1: Infant Feeding Methods Practiced by HIV-Positive Mothers Attending CCCs in the North Rift.

An assessment of breastfeeding methods by study site indicates that, the highest (72.5%) proportion of mothers attending CCC at Turbo health centre practiced exclusive breastfeeding. Among mothers attending CCC at MTRH, only 48.8% practiced exclusive breastfeeding (**Figure 4.2**).

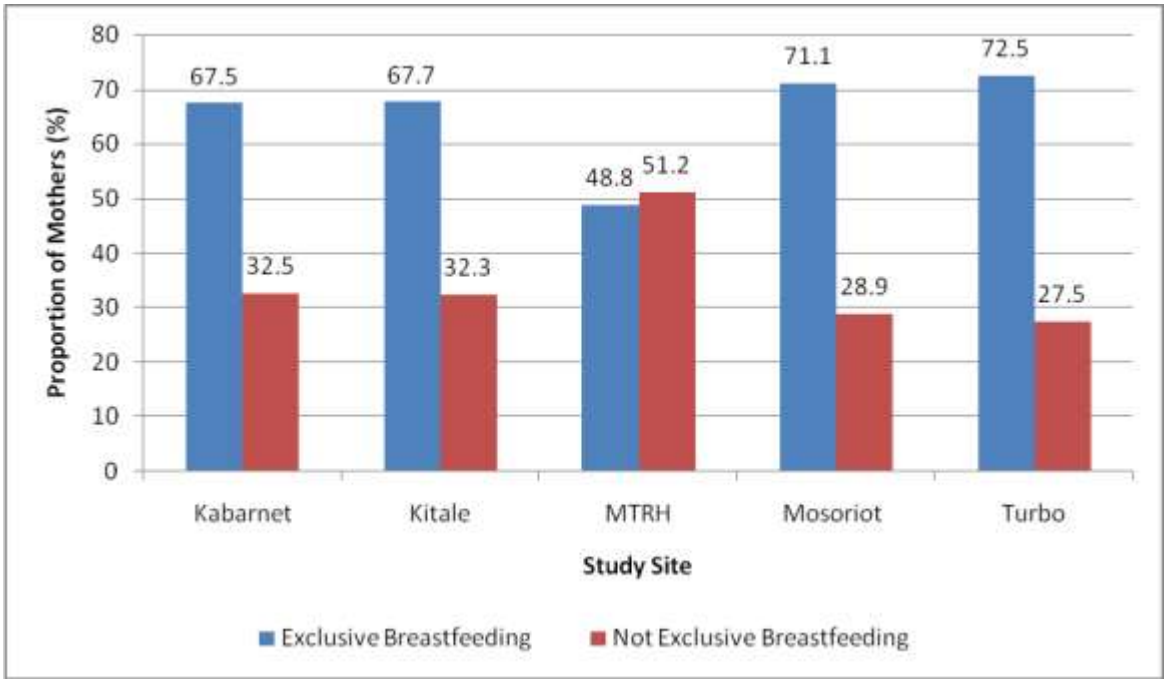

Figure 4.2: Breastfeeding Methods by Study Sites

4.3 Socio-Demographic Predictors of EBF

In this section analysis was conducted in two steps. First, a bivariate analysis was conducted to identify factors that could be included in a subsequent multivariate analysis. To identify socio-demographic factors associated with exclusive breastfeeding, bivariate analysis was carried out. Education level, occupation, religion, knowledge and perception were found to have a relationship with practice of exclusive breastfeeding. Mothers with primary or/secondary education, those who were casual labouers, house wives or farmers and those of Christian faith had a significant exclusive breastfeeding. Mothers who had good knowledge as well as those who had correct perception towards EBF had a significant relationship with EBF, $p<0.05$ (**Table 4.3).**

Table 4.3: Socio-Demographic Factors associated with the Practice of Exclusive Breastfeeding

Characteristic		Exclusive breastfeeding		χ^2	p-value
		Yes(%)	No(%)		
Education	None	1(0.3)	6(2.0)		
	Primary	75(25.3)	68(22.9)	25.231	**0.000**
	Secondary	79(26.6)	23(7.7)		
	College/University	33(11.1)	12(4.0)		
Parity	1-2	54(18.2)	26(8.8)	1.425	0.490
	3-4	100(63.3)	58(36.7)		
	≥5	34(57.6)	25(42.4)		
Occupation	Business	39(13.1)	22(7.4)		
	Farmer	29(9.8)	7(2.4)	13.516	**0.009**
	Salaried	33(11.1)	9(3.0)		
	Casual labourer	47(15.8)	37(12.5)		
	Housewife	40(13.5)	34(11.4)		
Religion	Christian	185(62.3)	98(33)	16.522	**0.002**
	Muslim	3(1.0)	4(1.4)		
	Others	0(0)	7(2.4)		
Marital status	Married	119(63.3)	64(58.7)		
	Single	23(12.2)	17(15.6)	4.850	0.333
	Widowed	34(18.1)	17(15.7)		
	Others	12(6.4)	11(10.1)		
Ethnic group	Kalenjin	72(38.3)	42(38.5)		
	Luhya	70(37.2)	31(28.4)	1.365	0.323
	Kikuyu	18(9.6)	9(8.3)		
	Luo	10(5.3)	9(8.3)		
	Others	18(9.6)			
Knowledge	Good	183(73.8)	65(26.2)	71.639	**0.000**
	Poor	5(12.2	44(89.2)		
Perception	Correct	180(75)	60(25)	50.506	**0.000**
	Incorrect	13(22.8)	44(77.2)		
Mean age (sd) in years		31.3 ± 4.7	30.8 ± 5.6	0.824‡	0.411

All values in the table are presented as proportions except where specified; and tests of differences as χ^2 except where specified.
sd (standard deviation)
‡*t*-value

Factors shown to be related to EBF were subjected to multivariate logistic regression to identify social-demographic factors that are independently associated exclusive

breastfeeding. In this analysis, among the social-demographic factors assessed, level of education, occupation knowledge, and perception were found to influence the practice exclusive breastfeeding (**Table 4.4**). Mothers who had attained secondary school and college/university level of education were more likely to practice exclusive breastfeeding than mothers without formal (**Table 4.4**). There was no statistically significant difference the practice of exclusive breastfeeding between mothers who had attained primary level of education and those with no formal education. Those mothers whose occupation was business or farming were five times more likely to practice exclusive breastfeeding compared to housewives (**Table 4.4)**. Though not statistically significant, mothers of Christian faith were more likely to practice exclusive breastfeeding than those of other faith. Mothers who had good knowledge on exclusive breastfeeding were 28 times more likely to practice exclusive breastfeeding than those with poor knowledge. Mothers who had correct perception on exclusive breastfeeding were nine times more likely to practice exclusively breastfeeding than those with incorrect perception.

Table 4.4: Influence of Social-Demographic factors on Exclusive Breastfeeding

FACTOR	OR (95% CI for OR)	P – Value
Education level (ref= None)		
Primary	5.97(1.077 3.038)	0.188
Secondary	11.21(1.854 6.781)	**0.008**
College /University	15.03(4.984 8.486)	**0.001**
Occupation (ref=Housewife)		
Business	4.78 (1.444 1.789)	**0.010**
Farmer	5.37 (1.154 2.503)	**0.032**
Salaried	5.69 (0.343 9.437)	0.225
Casual Laborer	1.49 (0.705 3.155)	0.296
Religion (ref=Other)		
Christian	8.09 (0.837 7.829)	0.071
Muslim	0.63 (0.021 1.992)	0.793
Knowledge on exclusive breastfeeding	27.77 (1.515 7.316)	**0.000**
Perception on exclusive breastfeeding	9.42(4.737 8.744)	**0.000**

When asked what factors hinder (make mothers not practice) exclusive breastfeeding, the following responses were given by discussants in the FGDs:

Mothers' Perception:

> "Babies need other fluids in addition to breast milk for good health. They cry most of the time because the breast milk alone is not enough. The child does not cry when we also give cow's milk" [FGD 3].

> "A baby can feed on breast milk alone for maximum of three months after which other foods need to be introduced" [FGD 1].

These responses reflect that mothers perceive breastmilk not to be enough to satisfy the infant and that supplementing breast milk with cow's milk and other foods is necessary (incorrect perceptions). This influences the mother's practice, reflected in the response from the key informant expressed below:

"Mothers exclusively breastfeed their babies only for about three months then initiate mixed feeding because they think that breast milk alone is not enough for the baby after some time" [KII 2].

Education:

"Women who do not have good education may not understand the information on exclusive breastfeeding that we are given at the health facility. Those who have a good education understand the messages well because they understand messages like the risk of mixed feeding" [FGD 2].

This reflects that women perceive good education as enabling understanding of reasons why they should exclusively breastfeed hence are more likely to do so. This is supported by a quote from one of the KIIs indicated below:

"Having attained secondary level of education help mothers understand the concepts of mother-to-child transmission of HIV, thus enabled them to breastfeed the babies for six months without introducing other foods" [KII 6].

Occupation:

"When a woman is employed and stays at work for long, she is not able to exclusively breastfeed" [FGD 1]

"When a woman is working, she has to leave her baby at home and so she cannot feed the baby on only breast milk"[FGD 3].

"Whenever mothers leave their babies under the care of relatives or other people, they (the other people) end up giving the baby other foods".
[FGD 2].

These responses reflect that mothers view occupation as a hindrance to exclusive breastfeeding because they are not available to feed their babies on breast milk and also that in their absence other persons feed the babies other foods.

4.4: Cultural predictors of Exclusive Breastfeeding

Logistic regression was conducted to assess the influence of cultural factors on practice of exclusive breastfeeding. In the analysis, mothers who reported to have been influenced by stigma, traditional beliefs, husband as final decision maker and use of herbal medicine were compared with mothers who reported that none of the factors influenced their choice. All factors were found to influence mothers' practice on exclusive breastfeeding (**Table 4.5**).

Table: 4.5: Influence of Cultural factors on practice of exclusive breastfeeding

FACTOR	OR (95.0 % CI)	P-Value
None*	Ref	
Stigma	0.09 (0.036 0.0231)	**0.000**
Traditional beliefs	0.04 (0.013 0.114)	**0.000**
Husband as a final decision maker	0.01 (0.001 0.043)	**0.000**
Use of herbal medicine	0.05 (0.009 0.270)	**0.000**

*Cultural factors did not influence choice to breastfeed

Triangulation of information obtained from quantitative data, FGDs and views of health workers were assessed through KIIs. The quotes below were generated when participants were asked about the cultural factors hindering the practice of exclusive breastfeeding;

Use of herbal medicine

> "In our culture [Kalenjin] we commonly use herbal medicine, to prevent illness and treat infant illness before babies attain the age of six months, and cannot give breastmilk alone when the child is ill." [FGD 3].

This reflects that herbal medicine is given in addition to breastmilk when a child is ill. These are usually in form of drinks that render a child not to have been exclusively breastfed.

Support from spouse

> "We women do not get support from our husbands to only feed our babies on breast milk especially if we have not disclosed our HIV-status. Many husbands do not understand about feeding babies on breast milk alone and want to see that cultural beliefs and norms such as giving baby cow's milk- are followed."
> [FGD 1]

This is supported by a response from one of the KIIs:

> "Male partners traditionally make key decisions on infant feeding yet may not be adequately informed on exclusive breastfeeding in prevention of HIV" [KII 3]

The husband is a key decision-maker and influences whether or not a woman will exclusively breastfeed by either enforcing cultural practices, and it is perceived by the women that lack of knowledge of their husbands on exclusive breastfeeding could be a hindrance.

Support from family members/fear of stigma; support from health workers and support groups:

> "Older women and relatives would want to see the baby fed with other foods and if we mothers resist then, they treat us with suspicion because some of them have heard that if you have HIV then you don't give the baby other food" [FGD 3].

> "When we get support from our husbands and other relatives, especially when we have disclosed our status we are able to feed our babies on breast milk only" [FGD 2]

> "Information we get when we have health education from the health workers help us to feed our babies on breast milk only. Our support groups which we hold monthly at the CCCs also help us to feed our babies on breast milk only" [FGD 2].

Mothers who exclusively breastfed their infants attributed their success as expressed in FGD 2 to "*psychosocial support group at the CCCs*", from "*health care providers, support from their spouses and/or relatives*", after disclosure of their HIV status to them.

Failure to exclusively breastfeed babies as expressed in FGD 1, 2 and 3 and KII 3 was attributed to the following: "*male traditionally making decision on infant feeding*", "*use of herbal medicine*", "*lack of disclosure of HIV status*" to either spouse or close relatives; that feeding the baby with breast milk alone could raise questions and they could *end up being stigmatized*", and lack of "*access to adequate information on facts about HIV*" and exclusive breastfeeding.

4.5. Influence of Economic factors on exclusive breastfeeding

To assess the association of economic factors with exclusive breastfeeding, economic status variable was generated based on reported family average monthly income. In the analysis, mothers who reported a family average monthly income of less than Ksh. 4 001 (1st tertile) (reference) were compared with mothers who reported an income of Ksh. 4 001 or more (*i.e.*, 2nd and 3rd tertiles). There was no difference in the practice of exclusive breastfeeding between mothers in the 1st and 2nd tertiles. Mothers whose income fell in the 3rd tertile were 5 times more likely to practice exclusive breastfeeding than mothers in the 1st tertiles. (**Table 4.6**).

Table 4.6: Influence of Economic factors on exclusive breastfeeding

INCOME TERTILES	OR (95.0 % CI)	P-Value
Income group 1 (< KShs 4001)	Ref	
Income group 2 (KShs 4001-12000)	1.71 (0.848 3.459)	0.134
Income group 3 (KShs 12001-150000)	5.14 (2.001 3.190)	**0.001**

Some quote from FGDs supporting above are as reflected in the subsequent quotes.

> "Mothers in families that can afford food that promotes good milk production can feed their children on only breastmilk because they have enough milk". [FGD 3]

> "Due to low income, mothers do not feed well hence do not produce enough breast milk so they also feed their babies with cow or formula milk." [FGD 3]

> "If a woman has good income she is able to make her own decisions so she can decide to feed her baby on breast milk alone." [FGD 2].

Income as expressed in FGD 1, 2 and FGD 3 was associated exclusive breastfeeding, with low income failing to exclusively breastfeed reason being "*non-affordability of food believed to promote breast milk production*" while those with good income exclusively breastfed their babies citing ability to "*make independent decisions in matters pertaining to feeding their babies*".

4.6 Main Predictors of Exclusive Breastfeeding

All the variables found in the preceding analyses to influence exclusive breastfeeding, were subjected to multivariate logistic regression to identify the main factors influencing exclusive breastfeeding. These variables included: education level, knowledge, perception, all cultural factors and income. Results indicated that educational level, stigma, traditional beliefs and knowledge on exclusive breastfeeding independently influenced the practice of exclusive breastfeeding among the HIV positive mothers ($p<0.05$) as shown in **Table 4.7**.

Mothers who had formal education especially those who had attained college or university education were eighteen times more likely to practice exclusive breastfeeding than those without formal education. Mothers who had good knowledge on exclusive breastfeeding were eighteen times more likely to exclusively breastfeed their infants than

mothers with poor knowledge. Mothers who reported that stigma influenced their infant feeding choice were 99.8%[1] less likely to exclusively breastfeed their infants compared to mothers who did not select stigma as having influenced their choice. Mothers who reported that traditional beliefs influenced their choice were 99.9% less likely to exclusively breastfeed their infants compared to mothers who did not select traditional beliefs as having influenced their choice. Perception, husband as a final decision maker, use of herbal medicine and income were found not to influence the practice of exclusive breastfeeding (**Table 4.7)**.

Table 4.7: Main Predictors of Exclusive Breastfeeding

FACTOR	OR (95.0 % CI for OR)	P-Value
Education level (College/University)	17.67(0.906 2.522)	**0.000**
Knowledge on exclusive breastfeeding	17.85(3.806 8.372)	**0.000**
Perception on exclusive breastfeeding	1.06(0.286 3.962)	0.927
Stigma	0.19(0.092 0.394)	**0.000**
Traditional beliefs	0.03(0.007 0.154)	**0.000**
Husband as a final decision maker	1.05(0.287 0.398)	0.928
Use of herbal medicine	1.67(0.908 2.213)	0.133
Income	1.39(0.906 2.132)	0.132

[1] For easier interpretation of Odds Ratios < 1, Odds Ratio is converted to reflect percentage difference using the formula: (OR-1) x 100 and also applies to the subsequent percentage of 99.9%.

CHAPTER FIVE: DISCUSSION

5.1 Introduction

This section discusses the results of this study. The study aimed at investigating the predictors of exclusive breastfeeding among HIV-positive mothers attending Comprehensive Care Clinics (CCCs) in the North Rift Region of western Kenya, where implementation of CCCs is well established. A total of 297 HIV-positive mothers attending five CCCs participated in the study. On average their ages ranged between 26 and 36 years, mainly married with most having acquired basic formal education (primary level); and an equal representation with and without at least secondary education level. This reflects a largely literate population. Majority were from the Kalenjin ethnic community with more than half being of Christian faith.

5.2 Prevalence of HIV-positive mothers Practicing Exclusive Breastfeeding

In this study, we found the prevalence of exclusive breastfeeding in the first 6 months of birth among HIV-positive mothers in the North Rift to be 63%. This proportion although about twice the national prevalence of 32% (KNBS, 2010), is still much lower than the 90% level recommended by WHO (WHO, 2009), confirming concerns of low prevalence in spite of the presence of CCCs; and indicating that further measures are still required to improve the uptake of exclusive breastfeeding. The prevalence of exclusive breastfeeding is varied in other contexts although most have not achieved the recommended target: Higher proportions than found in the current study (74%) were reported in a clinic based cross-sectional study on determinants of adherence to exclusive breastfeeding among HIV positive mothers in Lusaka District, Zambia (Kaliwile and Michelo, 2010); and 80.4% reported by Okanda *et al*,. (2014) in a clinic based cross-sectional study on exclusive breastfeeding among women taking HAART for PMTCT. On the other hand, other studies have shown lower proportions of exclusive breastfeeding than that reported in the current study. In a household descriptive study by Kuzma (2013), on knowledge, attitude and practice related to infant feeding 17% women in rural Papua New Guinea practiced exclusive breastfeeding. In Kenya, a proportion of 32% children are exclusively breastfed (KNBS, 2010) and in a household based cross-sectional study by Nkala and Msuya (2011) 58% women practiced exclusive breastfeeding in Kigoma Municipality,

Tanzania. This reflects a general challenge in achieving exclusive breastfeeding targets across contexts; underpinning the need for relevant measures to improve exclusive breastfeeding may uptake

Insights into how exclusive breastfeeding may be up scaled could be learned from contexts where higher prevalence has been achieved. The prevalence of exclusive breastfeeding varied among the health facilities that were included in the current study in the North Rift. A higher proportion of mothers practicing exclusive breastfeeding were found in Mosoriot and Turbo while a lower proportion was found at MTRH. There is need to further explore these differences in proportion among clinics in the North Rift and in other areas in order to identify and adopt the best practices in areas with higher breastfeeding proportions for application in areas with lower prevalence. This can contribute to achieving the aim of scaling up the proportion of women who exclusively breastfeed; hence advance towards achieving the WHO target. In the North Rift, a starting point would be to learn lessons from Mosoriot and Turbo.

5.3. Socio-Demographic predictors of Exclusive Breastfeeding

In assessing socio-demographic predictors of exclusive breastfeeding, education level, occupation, knowledge and perception were found to influence the practice of exclusive breastfeeding among HIV-positive mothers in the North Rift. Age, parity, marital status and ethnic group did not predict the practice of exclusive breastfeeding.

The level of education influenced mothers' practice on exclusive breastfeeding, with mothers who had attained college/university level being more likely to practice exclusive breastfeeding. These findings are similar with those reported by Dubois *et al*., 2003 and Fadnes *et al.,* (2009) who found higher educational level of the mother to enhance the practice of exclusive breastfeeding. This has similarities with study findings from Nepal (Ulak *et al*., 2012), Tunisia (Bouanene *et al*., 2010) and Tanzania (Nkala and Msuya, 2011). This is explained by the women and health workers, that mothers with higher levels of education may more easily comprehend messages on exclusive breastfeeding in the context of HIV/AIDS compared to those with no formal or lower level of education.

The explanation is corroborated by others (Kingsley and Justice, 2011; Alice, 2002; Elizabeth *et al.*, 2011) that a mother who attends formal school has the opportunities to expose herself to information related to exclusive breast feeding through different kinds of media channel likes posters, family health cards and other electronic information and education materials that might influence exclusive breast feeding practice. Mothers with lower levels or no formal education may therefore face a challenge in understanding messages on exclusive breastfeeding in the context of HIV/AIDS, therefore there is need to explore ways to enhance their knowledge. In contrast Khanal *et al.*, (2011) reported mothers with higher education level and those employed to be less likely to breastfeed their infants than those with lower than secondary education and/or those with no employment. However this does not apply in the current study where the converse was observed.

In the current study occupation was found to be a predictor of whether a mother exclusively breastfeeds the baby or not, with those whose occupation was business or farming being more likely to exclusively breastfeed than housewives. Similar findings were reported by Chudasama *et al.,* (2009), Fadnes, (2009) Otoo, (2009) that occupation positively influenced exclusive breastfeeding. In contrast however, being a housewife has been associated with high prevalence of exclusive breastfeeding, as these women are presumed to have enough time to be with their infants and have more opportunity to practice exclusive breastfeeding (Oche and Umar, 2008), than those who do not have chance to stay at home due to work or other reasons (Ulak *et al*., 2012; Asfaw *et al*., 2015). Hence women who are farmers or businesswomen in the North Rift, unlike those reflected in these studies, are likely to exclusively breastfeed. Reasons for this should be explored.

In this study knowledge on exclusive breastfeeding was found to influence the practice of exclusive breastfeeding among HIV-positive mothers in the North Rift. Similar findings by Matovu *et al.,* (2008), in a cross sectional study on factors influencing exclusive breastfeeding among HIV-positive mothers in Uganda reported that the knowledge on exclusive breastfeeding as a method of preventing MTCT positively influenced exclusive

breastfeeding. Similarly, Kakute *et al.*, (2005) reported that among factors influencing exclusive breastfeeding is mother's knowledge about HIV transmission; and a study in Zambia by Kaliwile and Michelo (2010) showed that an understanding that exclusive breastfeeding reduces MTCT of HIV, positively influenced the practice of exclusive breastfeeding among HIV-positive mothers. Therefore, there is need to explore ways of enhancing good knowledge among HIV positive lactating mothers in the North Rift region with the aim of scaling up the practice of exclusive breastfeeding. From FGDs maternal clinics were found to be an important source of information on breastfeeding for mothers as compared to friends and other sources. Health facilities and health service providers are trusted sources of knowledge and information and apart from increasing counseling efforts at facilities they should be leading in organizing linkage with community groups regarding breastfeeding (Shirima *et al*., 2000). Thus intensified efforts are needed to make sure that mothers have universal access to current information regarding exclusive breastfeeding and its advantages.

Perceptions on exclusive breastfeeding in the North Rift region were shown to be both correct and incorrect with reference to existig recommendations. Prevention of transmission of HIV by exclusive breastfeeding and increased risk of HIV transmission through mixed feeding were the main correct perceptions. Information from the focus group discussions also supported a common perception that breastfeeding plays a major role in preventing mother-to-child transmission of HIV. Correct perceptions such as "breastfeeding babies do not need other fluids/herbs before six months of age" enhanced exclusive breastfeeding since mothers with these correct perceptions were more likely to exclusively breastfeed their babies. This indicates that these mothers in the North Rift had mainly grasped important underlying information necessary to promote chances of exclusively breastfeeding their infants. The impression that all babies born to HIV-positive mothers were more likely to be infected with HIV was the main incorrect perception which could act to deter HIV positive mothers in this setting from to exclusively breastfeeding their babies.

The finding of the current study that perception influences practice of exclusive breastfeeding corroborates findings by Matovu *et al*., (2008) who reported that HIV-positive mothers who had positive perceptions such as believing that they can produce enough breast milk and exclusive breastfeeding is a method of PMTCT were more likely to exclusively breastfeed their babies. This suggests that facilitating acquisition of good knowledge and addressing common incorrect perceptions on exclusive breastfeeding among HIV-positive mothers may enhance the practice of exclusive breastfeeding and contribute to improving prevailing prevalence of exclusive breastfeeding in the North Rift region. CCCs need to target the common incorrect perceptions with information intended to reverse such perceptions, especially given that CCCs are the main sources of information for mothers seeking services; hence further strengthen such services.

Other studies have reported similar findings which showed that favourable perceptions such as a mother perceiving that exclusive breastfeeding is a method of PMTCT and that a baby can be born without HIV infection enhanced the practice of exclusive breastfeeding (Bentley *et al.,* 2008, Kaliwile & Michelo, 2010). This implies that main correct perceptions identified in this study need to be strengthened as well as identifying effective ways of addressing the incorrect perceptions in order to enhance the practice of exclusive breastfeeding among HIV-positive mothers in the North Rift region and similar areas elsewhere.

Use of other fluids and mixed feeding are still of concern since more than 20% of the mothers either did not agree or were neutral to the practice and that would lead to MTCT of HIV. The common reason reflected in qualitative data for early initiation of complementary food was inadequate breast milk. "Insufficient breast milk" was the main reason for introducing other foods, especially cow's milk, before six months of age. The mother's perception of "insufficient breast milk" is a well-known problem hindering optimal exclusive breastfeeding practice in many communities (Moffat, 2002; WHO, 2007b; Fjeld *et al*., 2008). Leshabari and others (2007) also reported that mothers who perceived that their breast milk is insufficient both in quality and quantity gave supplementary feeds. Mataya *et al*., (2013) in a qualitative study exploring attitudes and

perceptions of HIV-positive mothers on exclusive breastfeeding reported misconceptions as one of the hindrances of adherence to exclusively breastfeeding. Since some of these common perceptions were expressed in focus group discussions, it reflects them to be common perceptions in the study group. Similar areas where this misperception has been recorded by other researchers include Tanzania (Agnarsson *et al*., 2001), Zambia (Fadnes *et al*., 2009), Nigeria (Kamudoni *et al*., 2010), Nigeria (Quresh *et al*., 2011) and India (Aruldas *et al*., 2010). There is need to target this misperception when designing public messages/communications in exclusive breastfeeding. Thus, it is important to constantly and consistently address these issues at the CCCs in improving the correct perceptions on exclusive breastfeeding among HIV-positive mothers in the North Rift region.

5.4 Cultural predictors of Exclusive Breastfeeding

In this study, stigma, traditional beliefs, husband as a final decision maker as well as use of herbal medicine were found to influence the mothers' practice of exclusive breastfeeding. These findings are consistent with those of Nyanga *et al.,* (2012) in their cross-sectional study on factors influencing practice of exclusive breastfeeding, who reported that mothers choice of infant feeding was influenced by traditional beliefs or family members were less likely to exclusively breastfeed their babies. Similarly, Mataya *et al.,* (2013), reported that mothers who had reported influence by spouse and social stigma did not practice exclusive breastfeeding. Kakute *et al.*, (2005) also observed in a study on cultural barriers to exclusive breastfeeding among mothers in a rural area of Cameroon that factors influencing exclusive breastfeeding included family support and disclosure of HIV status. Similarly, Nankunda *et al.,* (2006) reported that women who are HIV positive weaned early to avoid stigmatization by their families and communities, making it difficult for them to exclusively breastfeed their babies.

Qualitative findings from the FGDs conducted in the current study further revealed that male partners who were not supportive to mothers influenced the practice of exclusive breastfeeding negatively, especially where status was not revealed. There is thus need to find ways that should address the support of male partners from the communities within the study area by educating them and creating awareness on exclusive breastfeeding and

negative effects of mixed feeding. The feasibility of this, as well as appropriate forums should be explored, given that male partner support could enhance the practice of exclusive breastfeeding. Additionally, ways of addressing challenges faced by women with male partners who have the final say on decisions including choice of feeding should be explored. Male partners have been shown to be vital in facilitating achievement or adherence to several reproductive, maternal and child health interventions. Male support has been associated with use of skilled birth attendants, use of contraceptives, adherence to PMTCT intervention and increased use of vaccination services (Kiarie *et al*., 2003; Mullick *et al*., 2005). Furthermore, if key gate keepers in the community believe in this misconception, then the advice they would give could deter exclusive breastfeeding interventions. The need for tailored interventions to target this misconception in the study area is thus urgently needed.

The findings that use of herbal medicines is one of the cultural factors that is a barrier to practice of exclusive breastfeeding are also consistent with those of Adejuyigbe *et al.,* (2010) who reported that the common practice of giving infants herbal mixtures for their protection and that breast milk does not contain adequate nutrients for infant growth, led to giving infants extra fluids before the recommended age. Thus there is need to address this challenge in this region if efforts to promote exclusive breastfeeding are to bear any fruits. One strategy that Kenya may consider would be using exclusive breastfeeding promotion peer counselors in the community or women's groups which have recently been shown in community trials to increase the duration of exclusive breastfeeding in African settings (Lewycka *et al*., 2010; Tylleskar *et al*., 2011.

The key characteristics of mothers who achieve success in exclusive breastfeeding are those with ability to resist pressure from the family to introduce other fluids, the strong belief in the benefit of breastfeeding, and a supportive home environment (Laar and Govender, 2011). Understanding the use of additional fluids and the context of their use as some may be dictated by culture, should be investigated in the North Rift region, given that mixed feeding contributes to the reduction of achieving exclusive breastfeeding, results in the increased risk of transmission of HIV and increased morbidity and mortality

among infants and early childhood (UNICEF, 2010). This indicates the importance of involvement of other family members during breastfeeding counseling in this study area.

5.5: Economic predictors of Exclusive Breastfeeding

Family monthly income, as an economic factor was found to influence the practice of exclusive breastfeeding. Mothers falling in the third income tertile (monthly income >Kshs 12,000), when compared to those with a monthly income of Kshs 4,000 shillings, were more likely to practice exclusive breastfeeding. This is similar to a cross-sectional study conducted by Bii *et al*., (2008) on infant feeding among HIV infected women receiving PMTCT services at Kitale District hospital who found that the practice of exclusive breastfeeding was dependent on the socio-economic status of mother. Another study with similar findings was reported in infant and young child feeding practice among mothers living in Harar, Ethiopia and in USA (Sonko and worku, 2015; Alex *et al*., 2005). This might be due to the fact that average monthly incomes of the mother is a proxy for the health care seeking behavior of the mother to visit the health facility for different health related services. Accordingly, as the mother visits the health facilities, the health provider at health facilities have the opportunities to provide the information related to exclusive breast-feeding.

These findings are consistent with those of Leshabari *et al.*, (2007) who in an exploratory descriptive qualitative study found that economic status influenced infant feeding among HIV-positive mothers in Northern Tanzania. The study showed an increase in the practice of exclusive breastfeeding with increase in income. Joshi and others (2014) in a study in Bangladesh found that the mothers from households belonging to a richer wealth quintile were more likely to exclusively breastfeed their infants than those belonging to the poorest wealth quintile. It was suggested these mothers may have better education level, easier access to media and health services which may have increased their awareness and made them relatively more conscious about exclusive breastfeeding. Most of the mothers in this study (about 75%) were engaged in some income generating activity both in formal and informal sector. It may be that these mothers are forced to introduce other foods before resuming work. Another explanation for not attaining the WHO

recommended 90% coverage may be that either mothers have little knowledge on the WHO recommendations of infants feeding, or do not believe exclusive breastfeeding alone is enough for infants' growth in the first six months as observed in the FGDs in this study. More studies on this aspect are recommended.

In contrast, Blas and Kurup (2010) in a cross-sectional study in Brazil, reported prevalence of exclusive breastfeeding to be higher among children belonging to the poorest wealth quintile. This implies that income influences the practice of exclusive breastfeeding but depending on the context, this influence could either be positive or negative. In the North Rift, the influence reflected is positive. Therefore any efforts to improve mothers' income may enhance their practice of exclusive breast-feeding, but such improvement would result with achievement of incomes above 4,000 Kenya shillings. It also implies that income can be an important identifier of who should be targeted in attempts to improve the practice of exclusive breastfeeding in the North Rift study area.

5.6: Main predictors of Exclusive Breastfeeding

The main factors that influence exclusive breastfeeding in HIV-positive mothers attending CCCs in the North Rift are education, knowledge, stigma and traditional beliefs. The former two are enhancers and the latter barriers to the practice of exclusive breastfeeding. These findings are consistent with those of Tanya *et al.,* (2006) and Kakute *et al.,* (2005) in descriptive studies which found that the main barriers to exclusive breastfeeding among HIV-positive mothers were stigma and traditional beliefs while good knowledge on exclusive breastfeeding enhanced the practice. Other studies have reported that mothers with secondary or higher education levels were more likely to practice exclusive breastfeeding than those with lower level or no formal education. Maternal education is related to knowledge of good child care practice and a proxy to household wealth.

Female education has severally been described as one of the strongest determinants of the practice of exclusive breastfeeding (Dubois and Girard, 2003). Children from mothers

who attended formal school are more likely to practice exclusive breast feeding when compared to those mothers who had not attended formal education. This can be explained by the fact that a mother who attended formal school has the opportunities to expose herself to information related to exclusive breast feeding through different kinds of media channel likes posters, family health cards and other electronic information and education materials that might influence exclusive breast feeding practice (Kingsley and Justice, 2011; Alice, 2002; Elizabeth *et al*., 2011). This means, in order to scale up the uptake of exclusive breastfeeding among HIV-positive mothers in the North Rift, the priority factors to target are knowledge, stigma and traditional beliefs which stood out to be the main predictors of exclusive breastfeeding.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

1. Prevalence of exclusive breastfeeding in the first 6 months of birth among HIV positive mothers attending CCCs in the North Rift is 63%, which albeit being almost about twice the national prevalence of 32%, is still considerably lower than the 90% level recommended by WHO, even in the presence of CCSs. This prevalence varies from 48.8% at MTRH to 72.5% at Turbo indicating that some areas have more challenges than others in achieving exclusive breastfeeding.

2. Mothers with formal level education, especially college/university level are more likely to practice exclusive breastfeeding than those with no education. Being able to correctly explain what is meant by exclusive breastfeeding, which denoted good knowledge in this study, increases the chances of HIV positive mothers attending comprehensive care clinics in the North Rift practicing exclusive breastfeeding. Mothers aged 26-46 years, with 1-5 children, married or unmarried, from ethnic groups found in the North Rift will not differ in their choice to either exclusively breastfeed their infants or not.

3. Stigma, traditional beliefs, husband as a final decision maker and use herbal medicine are cultural factors that negatively influence the practice of exclusive breastfeeding among HIV positive mothers attending comprehensive care clinics in the North Rift.

4. The practice of exclusive breastfeeding increases with increase in monthly income. In this setting if a HIV positive mother has an income of > 12000 Kshs she is more likely to practice exclusive breastfeeding with higher likelihood of exclusively breastfeeding.

5. Education level, knowledge, stigma and traditional beliefs are the main factors that independently predict the practice of exclusive breastfeeding among HIV-positive mothers in the North Rift, with the former two factors being barriers and the latter two factors enhancers of exclusive breastfeeding. Enhancing mother's ability to understand exclusive breastfeeding, reflected in an ability to correctly explain the

term, exploring ways to reduce fear of stigma and the influence of traditional beliefs that negatively affect the practice of exclusive breastfeeding that is appropriate/acceptable in this setting may enhance exclusive breastfeeding prevalence and contribute to working towards achieving the WHO recommendation of 90% prevalence.

6.2. Recommendations

The following recommendations are made to scale up the practice of exclusive breastfeeding in the study area, and similar areas elsewhere.

1. Given that the prevalence of exclusive breastfeeding still falls below the WHO target, there is need to explore ways of further scaling up the practice among HIV-positive mothers, starting with best practices that should be identified at Turbo and Mosoriot which had a relatively higher proportion of exclusively breastfeeding mothers when compared to the overall breastfeeding prevalence in the North Rift.

2. It is commendable that knowledge of mothers reflected information provided at the CCCs. However, more efforts are needed, especially at health facilities which are the main source of information for both HIV- positive and negative mothers, to correct the misconception that all babies born to HIV-positive mothers are more likely to be already infected with HIV; given that incorrect knowledge is a barrier to practicing exclusive breast feeding.

3. Deliberate efforts should be made at CCCs and communities within the health facility catchment areas to target stigma, traditional beliefs and poor knowledge (operationalised based on study definition of knowledge) which have been identified in this study as the main hindrances to exclusive breastfeeding among HIV- positive mothers.

6.3 Recommendations for Further Research

There is need to:

1. Identify best practices experienced in areas where exclusive breastfeeding prevalence is high; that may be applicable in areas where the prevalence of exclusive breastfeeding is low in order to scale up the practice among HIV positive women in developing countries. A suggested starting point is the CCCs at Turbo and Mosoriot.
2. Explore methods that can effectively reverse incorrect perceptions and enhance good knowledge on exclusive breastfeeding among HIV-positive mothers in the North Rift.

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APPENDICES
APPENDIX 1: CONSENT FORM

(To be read and explained in the language that is understood by the respondent)

MOI TEACHING AND REFERRAL HOSPITAL/MOI UNIVERSITY
INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE

INFORMED CONSENT STATEMENT FOR

Prevalence and Determinants of Exclusive Breastfeeding among HIV-positive mothers in North Rift, Kenya.

Investigator: Nicholas K Rutto (Maseno University)

Supervisors:
1. Prof. Rosebella Onyango (Maseno University)
2. Dr. Pauline Andang'o (Maseno University)

Introductory Statement

This is a research consent form used for study in pursuit of Master of Public Health degree at Maseno University. We are carrying out a study whose aim is to investigate the determinants of exclusive breastfeeding among HIV-infected mothers in North Rift, Kenya. You were randomly selected among other mothers, as one of our study subjects and everything that you tell us will be kept confidential. Your honest responses will contribute to achieving the aim of this study. Your participation is voluntary. Before you are enrolled into this study, you will be informed all about it and you are free to ask any questions. If you accept to participate in this study, you will be asked to sign this consent form and may keep a copy.

Purpose of the Study

We would like to investigate the predictors of exclusive breastfeeding among HIV-infected mothers in North Rift, Kenya. It is hoped that the study will provide crucial information in developing interventions for successful exclusive breastfeeding among HIV-positive mothers in North Rift.

Procedure for study

Subject inclusion criteria will be HIV-positive mothers attending AMPATH comprehensive care clinics who accept to participate in the study. Those who accept will be interviewed for about for about 30 minutes on matters relating to exclusive breastfeeding. Subjects are free to withdraw their consent at any time.

Benefits

You will receive no personal benefits from participating in this study. However, the information generated from this study will be available for policy makers to develop interventions for successful exclusive breastfeeding among HIV-positive mothers in the prevention of MTCT.

Subjects Right to Confidentiality

No names shall be used in the study as all study subjects shall be coded with a number. All your personal information will be kept confidential and may only be revealed if required by law. Copies of consent forms will be kept under lock and key. The results of the study may be published and or presented in a conference. In all situations you will not be identified in any way.

Risks to subject

There will be no physical, psychological or social risks associated with your participation in the study.

The study has been discussed with me and all questions have been answered. I am aware that any additional questions regarding the study can also be directed to the investigators. I agree with the terms above and acknowledge that I have accepted voluntarily.

……. …….

Signature of the participant Date

…… ……

Signature of investigator Date

For any questions or further information required related to this study, kindly contact:-

1. Nicholas K Rutto Phone Number 0722 490104

Or

2. Prof. Rosebella Onyango Phone Number 0722 378477 Maseno University
3. Dr. Pauline Andang'o Phone Number 0728 485729 Maseno University

APPENDIX II: FOCUS GROUP DISCUSSION GUIDE

MASENO UNIVERSITY SCHOOL OF PUBLIC HEALTH AND COMMUNITY DEVELOPMENT (SPHCD)

PREDICTORS OF EXCLUSIVE BREAST FEEDING AMONG HIV-POSITIVE MOTHERS IN NORTH RIFT, KENYA

FOCUS GROUP DISCUSSION GUIDE

GROUP NO……..

PARTICULARS……...

……

MODERATOR…….

NOTE TAKER…….

DATE……..

Instructions:

This tool is used to facilitate discussion with HIV-positive mothers attending comprehensive care clinics.

Respondents: HIV-positive mothers

Description of the discussants
The discussants are randomly selected groups of HIV-positive mothers attending comprehensive care clinics in the North Rift selected health facilities. They are in the best position to explain the challenges they encounter in exclusive breastfeeding.

Thematic areas

- Socio-demographic factors influencing exclusive breastfeeding
- Knowledge and practice on exclusive breastfeeding
- Cultural factors influencing exclusive breastfeeding
- Perception of HIV-positive mothers on exclusive breastfeeding

- Economic status influencing exclusive breastfeeding

Theme 1: Knowledge and practice on exclusive breastfeeding

I. What is exclusive breastfeeding?

II. What are the benefits of exclusive breastfeeding?

III. What do you do when you discover the baby has mouth sores or breaks in oral mucosa during exclusive breastfeeding?

Theme 2: Socio-demographic factors influencing exclusive breastfeeding

What are the socio-demographic factors that influence exclusive breastfeeding?

Theme 3: Cultural factors influencing exclusive breastfeeding

I. What are the cultural practices that influence exclusive breast feeding?

II. How do cultural practices influence exclusive breastfeeding?

Theme 4: Perception of HIV-positive mothers on exclusive breastfeeding

What are your views concerning the role of exclusive breastfeeding in PMTCT?

Theme 5: Economic status influencing exclusive breastfeeding

What are the economic status of HIV-positive mothers that influence exclusive breastfeeding?

APPENDIX III: QUESTIONNAIRE

MASENO UNIVERSITY SCHOOL OF PUBLIC HEALTH AND COMMUNITY DEVELOPMENT (SPHCD)

PREDICTORS OF EXCLUSIVE BREAST FEEDING AMONG HIV-POSITIVE MOTHERS IN NORTH RIFT, KENYA

Instructions to the interviewer

1. Please do not write the name of the respondent on this interviewer schedule.
2. Please insert number of the most appropriate option in the boxes provided alongside the questions. For the questions with more than one option, insert numbers of all the appropriate answers.
3. Please do not leave any question blank

Date…….. Recorder/interviewer ……..

Respondent no…….. Location……

SECTION 1: SOIO-DEMOGRAPHIC INFORMATION			***For Official use Only***
1	**How old were you at your last birthday (age in completed years)**		
2.	**What is your marital status?** 1= Single 2= married 3= widowed 4= separated/divorced 5= Others (Specify)……		
3.	**How many times have you given birth?** 1= 1 to 2 times 2= 3 to 4 times 3= 5 or more times		
4.	**What is your highest level of education attained?** 1=none 2=primary 3=secondary 4=college/university		
5.	**What is your ethnic group?**		
6	**What kind of work do you mainly do?** 1= business 2= farmer 3= salaried 4= casual laborer 5= house wife other (specify)……		
7.	**To which religion do you belong?** 1= Christian 2= Muslim 4=other (specify)……		

SECTION 3: KNOWLEDGE AND PRACTICE ON EXCLUSIVE BREASTFEEDING

---

8. ***Have you heard of exclusive breastfeeding?***

1*= Yes* *2= No*

If No indicate N/A for questions 9 and 10, then proceed to question 11

9. **If Yes to question 8 above, what is exclusive breastfeeding?**

……
……
…….

10. **Where did you obtain information on exclusive breastfeeding?**

1=Comprehensive care clinic 2= PMTCT clinic
3=Learned from a friend 4=Other
(specify)…….

11. **Have you delivered a baby since you discovered your HIV status?**

1= Yes 2= No

12. **If yes in question 11 above, how did you feed your baby for the first six months?**

1= exclusive breastfeeding 2= mixed feeding
3= formula feeding
4= Other (specify)
……

SECTION 3: PERCEPTION OF EXCLUSIVE BREASTFEEDING			***For official use only***
13.	**To what extent do you agree with the following statements?** a. All babies born to HIV positive mothers are likely to be infected with HIV b. Exclusive breastfeeding can prevent transmission of HIV from mother to child c. Breast feeding babies also need other fluids/herbs before six months of age d. Infants born to HIV positive mothers who receive mixed feeding are at higher risk of HIV infection than those exclusively breastfed	1=Agree 2=Neutral 3=Disagree	

SECTION: 4 CULTURAL PRACTICES ON EXCLUSIVE BREASTFEEDING

14. ***In question 12 you indicated that used (Mention appropriate mode of feeding as per note below) to feed your baby before six months of age, did any of these factors influence your decision?***
1=stigma 2= Traditional beliefs 3= Husband as final decision maker
4= Use of herbal medicine 5= None

15. **Are there any other factors not mentioned here that may have influenced your decision (List)**
1……
2……
3……
4..……..
5……

SECTION 6: ECONOMIC PRACTICES ON EXCLUSIVE BREASTFEEDING	***For official use only***

16. **What is your family monthly average income (in Ksh)?**
…….
…….

APPENDIX IV: KEY INFORMANT INTERVIEW GUIDE

MASENO UNIVERSITY SCHOOL OF PUBLIC HEALTH AND COMMUNITY DEVELOPMENT

(SPHCD)

PREDICTORS OF EXCLUSIVE BREAST FEEDING AMONG HIV-POSITIVE MOTHERS IN NORTH RIFT, KENYA

KEY INFORMANT INTERVIEW GUIDE

KEY INFORMANT NO…….

INTERVIEWER……..

DATE……..

SESSION NO…….

INSTRUCTIONS:

This guideline is divided into two sections. The respondents will include health and social workers from comprehensive care clinics.

Section1.

Respondents: Health workers.

Description of the respondents
The health workers selected include; community health nurses trained in PMTCT, nutritionists/nutrition technologists and clinical officers designated as PMTCT CO who are currently working at comprehensive clinics in the North Rift. They are expected to give information on knowledge of mothers

Thematic areas

- Knowledge on exclusive breastfeeding
- Practice of exclusive breastfeeding

Theme 1 Knowledge of mothers on exclusive breastfeeding

I. What are your views concerning HIV-positive mothers knowledge on exclusive breastfeeding?

Theme 2 Practice of exclusive breastfeeding

I. What are your views concerning mothers practice on exclusive breastfeeding?

II. What form of support do you offer to the mothers?

Section 2

Respondents: Social Workers

Description of the respondents

Social workers currently working in the comprehensive clinics in the North Rift are selected. The selection is based on the fact that they are acquainted with the culture and social activities of people living in North Rift. They are therefore, in the best position to give information on cultural factors affecting exclusive breastfeeding.

Thematic Areas

- **Cultural factors affecting exclusive breastfeeding**
- **Social factors affecting exclusive breastfeeding**

Theme 1: Cultural factors affecting exclusive breast feeding

I. What are the cultural factors that hinder exclusive breastfeeding among HIV-positive mothers in North Rift?

II. What do you think could be done to enhance better exclusive breastfeeding among HIV-positive mothers?

Theme 2: Social factors affecting exclusive breastfeeding

I. What are the social factors that hinder exclusive breastfeeding among HIV-positive mothers?

II. What do you think could be done to enhance exclusive breastfeeding among HIV-positive mothers?

APPENDIX V: EXAMPLE FGD AND KII RESULTS

EXAMPLE FGD RESULTS

Themes	Quotes/ Characteristics	FGD Number
Theme 1 (Socio-demographic factors)		
Education Level	Good level of education helps us to understand messages on exclusive breastfeeding.	FGD 2
Occupation	Whenever we leave our babies under the care of relatives or other people, they (the other people) end up giving the baby other foods	FGD 2
	Those of us who are employed and stay at work for longer hours, are not able to exclusively breastfeed.	FGD 1
	When a woman is working, she has to leave her baby at home and so she cannot feed the baby on only breast milk	FGD 3
Knowledge on exclusive breastfeeding	Exclusive breastfeeding involves giving the baby breast milk alone without introducing other food up to when the baby is six months old	FGD 1
	Information we get when we have health education from the health workers help us to feed our babies on breast milk only. Our support groups which we hold monthly at the CCCs also help us to feed our babies on breast milk only	FGD 2
	We mainly get information from the clinic and support groups.	FGD 1,
Perceptions on exclusive breastfeeding	Babies need other fluids in addition to breast milk for good health. They cry most of the time because the breast milk alone is not enough. The child does not cry when we also give cow's milk	FGD 3
	From the clinic, we understand that exclusive breastfeeding prevents transmission of AIDS to the baby but we think water is also good for the baby's health.	FGD 2
	A baby can feed on breast milk alone for maximum of three months after which other foods need to be introduced	FGD 1
	We attribute the success of exclusive breastfed to support groups at CCCs and health education from health workers,	FGD 2
	Generally if the baby is to be protected from being infected by the mother through breastfeeding, then exclusive breastfeeding is the way to go,	FGD 2

Theme 2 (Cultural factors)		
Stigma	Older women and relatives would want to see the baby fed with other foods and if we resist then, they treat us with suspicion because some of them have heard that if you HIV positive then you don't give the baby other food	FGD 3
Traditional beliefs	Babies are routinely fed on cow's milk before six months of age.	FGD 1
	We are influenced by older women in decisions related to infant feeding where they recommend that babies be fed on other foods apart from breast milk.	FGD 3
Male partner support	We women do not get support from our husbands to only feed our babies on breast milk especially if we have not disclosed our HIV-status. Many husbands do not understand about feeding babies on breast milk alone and want to see that cultural beliefs and norms such as giving baby cow's milk- are followed	FGD 1
	When we get support from our husbands and other relatives, especially when we have disclosed our status we are able to feed our babies on breast milk only	FGD 2
	Male partners rarely accompany their spouses to the comprehensive care clinics or antenatal clinics, thus miss the opportunity to receive information on facts about the role of exclusive breastfeeding in prevention of mother-to child transmission of HIV	FGD 1
Use of herbal medicine	In our culture [Kalenjin] we commonly use herbal medicine, to prevent illness and treat infant illness before babies attain the age of six months, and cannot give breastmilk alone when the child is ill	FGD 3
	We normally give babies herbal medicine as a cultural norm.	FGD 1
Theme 3 (Economic factors)		
Family income	Due to low income, we do not feed well hence do not produce enough breast milk so we also feed their babies with cow or formula milk	FGD 3
	with good income we are able to make our own decisions on breastfeeding.	FGD 2

APPENDIX VI: EXAMPLE RESULTS FROM KIIs

Themes	Quotes/ Characteristics	KII
Views on HIV-positive mothers knowledge on exclusive breastfeeding	Mothers have good knowledge on exclusive breastfeeding generally because health workers share important messages on exclusive breast when they visit the CCCs	KII 8
	Generally mothers have good knowledge on exclusive breastfeeding	KII 4
Views on HIV-positive mothers' practice on exclusive breastfeeding	Mothers who are supported through the CCC generally exclusively breastfeed their babies	KII 7
Social factors	Having attained secondary level of education help mothers understand the concepts of mother-to-child transmission of HIV, thus enabled them to breastfeed the babies for six months without introducing other foods	KII 6
	Mothers who leave babies at home for long hours introduce other foods early	KII 10
Cultural factors	Mothers normally give babies herbal medicine because they do not view it as additional fluid, yet it increases chances of MTCT of HIV	KII 1
	Male partners traditionally make key decisions on infant feeding yet may not be adequately informed on exclusive breastfeeding in prevention of HIV	KII 3
	Mothers exclusively breastfeed their babies only for about three months then initiate mixed feeding because they think that breast milk alone is not enough for the baby after some time	KII 2

APPENDIX VII: MASENO UNIVERSITY SGS PERMISSION LETTER

TEL: (057) 51622/51267/51110
FAX: (057) 51221/51153/51011

School of Public Health and
Community Development
Siriba Campus
Private Bag
MASENO.
KENYA

REF: MU/ESPUDEC/PG/MPH/047/06 17-03-2010

The Chairman
IREC
Moi University and MRTH and
ELDORET

Dear Sir,

RE: MR. NICHOLUS K. RUTTO (PG/MPH/047/06).
The above named person is an MPH student in the School of Public Health and Community Development.

His research is on the Impact of **Determinants of Exclusive Breast Feeding among HIV-positive mothers in North Rift, Kenya**.

The objective of Mr. Rutto's study is to investigate the factors that hinder or enhance exclusive breast feeding among HIV-positive mothers with regard to protection of infants from HIV infection.

The study will be carried out in selected AMPATH comprehensive care clinics in MTRH. We Support this study because its findings and recommendations will be passed on to the relevant policy makers to help them put in place actions that can help in the reduction of HIV infection in infants.

I therefore, request you to support this study and allow Mr. Rutto to collect his data in the samples he has selected.

Yours sincerely,

SCHOOL OF PUBLIC HEALTH AND COMMUNITY DEVELOPMENT
17 MAR 2010
ESPUDEC
MASENO UNIVERSITY

Dr. Rosebella O. Onyango
Chairperson, Postgraduate Studies Committee
School of Public Health and Community Development.

APPENDIX VIII: PERMISSION TO CONDUCT RESEARCH FROM AMPATH

USAID | AMPATH PARTNERSHIP

Academic Model Providing Access To Healthcare
P.O Box 4606 ELDORET

RESEARCH OFFICE

Ref: RES/STUD/16/2010 **September 15, 2010**

To:

AMPATH Module 1,
Kitale,
Turbo,
Mosoriot,
Kabarnet

In Charge,

RE: PERMISSION TO CONDUCT RESEARCH AT AMPATH

This is to kindly inform you that **Nicholas Kopkochil Rutto**, Masters of Public Health Student at Maseno University School of Public Health and Community Development has been granted permission to conduct research at AMPATH Module 1 clinic. His study; *"Determinants of Exclusive Breastfeeding among HIV-Positive Mothers in North Rift Kenya"* has been reviewed by IREC and assessed by the Research Office.

His research activities should not in any way interfere with the care of patients. This approval does not support access to AMRS data at AMPATH.

The researcher is to submit a final report of his findings to the AMPATH research office.

Should the researcher wish to publish his findings, permission has to be sought from AMPATH Publications Committee. Please contact the Research Office in case of any enquiry regarding this matter.

AMPATH CENTRE RESEARCH 15 SEP 2010 P.O Box 4606-30100 Eldoret

Thank you,

J. Kiplagat
Research Manager, AMPATH

CC.

- Program Manager, AMPATH
- Associate Program Manager for Research

APPENDIX IX: FORMAL RESEARCH APPROVAL FROM INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE

INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE (IREC)

MOI TEACHING AND REFERRAL HOSPITAL
P.O. BOX 3
ELDORET
Tel: 33471//2/3

MOI UNIVERSITY
SCHOOL OF MEDICINE
P.O. BOX 4606
ELDORET
Tel: 33471/2/3

Reference: IREC/2010/39
Approval Number: 000537

4th June, 2010

Nicholas Kipkochil Rutto,
P.O. Box 401-30400,
KABARNET, KENYA.

Dear Mr. Kipkochil,

RE: FORMAL APPROVAL

The Institutional Research and Ethics Committee has reviewed your research proposal titled:

"Determinant's of Exclusive Breast Feeding among HIV-Positive Mothers in North Rift, Kenya."

Your proposal has been granted a Formal Approval Number: **FAN: IREC 000537** on 4th June, 2010. You are therefore permitted to begin your investigations.

Note that this approval is for 1 year; it will thus expire on 3rd June, 2011. If it is necessary to continue with this research beyond the expiry date, a request for continuation should be made in writing to IREC Secretariat two months prior to the expiry date.

You are required to submit progress report(s) regularly as dictated by your proposal. Furthermore, you must notify the Committee of any proposal change (s) or amendment (s), serious or unexpected outcomes related to the conduct of the study, or study termination for any reason. The Committee expects to receive a final report at the end of the study.

Yours Sincerely,

INSTITUTIONAL RESEARCH & ETHICS COMMITTEE
APPROVED
04 JUN 2010
P.O. Box 4606 ELDORET

DR. OMAR ALY
CHAIRMAN
INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE

cc: Director - MTRH
Dean - SOM
Dean - SPH
Dean - SOD

APPENDIX X: MAP OF THE STUDY AREA

AMPATH CARE CLINICS IN NORTH RIFT & WESTERN KENYA

Source: AMPATH 2009.