

**AN ASSESMENT OF INFANT FEEDING OPTIONS AMONG HIV  
POSITIVE WOMEN ATTENDING COMPREHENSIVE CARE CLINIC AT  
KIAMBU DISTRICT HOSPITAL KENYA.**

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**DECLARATION**

“This thesis is my original work and has not been presented for a degree in any other university”.

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**DEDICATION**

To my late mum Janet Njeri Mwangi who succumbed to liver cancer during my study period and always gave me moral support and encouragement to pursue this course to completion. May our good lord bless you and rest your soul in eternal peace.

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### ABBREVIATIONS AND ACRONYMS

<b>AIDS</b>	-	Acquired Immune Deficiency Syndrome
<b>ART</b>	-	Anti-Retro-Viral Therapy.
<b>CCC</b>	-	Comprehensive Care Clinic
<b>FGD</b>	-	Focus Group Discussion
<b>HIV</b>	-	Human Immune- deficiency Virus
<b>KAIS</b>	-	Kenya Aids Indicator Survey
<b>KDHS</b>	-	Kenya Demographic Health Survey
<b>MCH</b>	-	Maternal and Child Health
<b>MoH</b>	-	Ministry of Health
<b>MTCT</b>	-	Mother To Child Transmission
<b>NACC</b>	-	National AIDS Control Council
<b>NASCOP</b>	-	National AIDS and STD Control Programme
<b>PMTCT</b>	-	Prevention of Mother To Child Transmission
<b>UNAID</b>	-	The joint United Nations programme on HIV/AIDS.
<b>UNICEF</b>	-	United Nations International Children’s Education Fund
<b>VCT</b>	-	Voluntary Counseling and Testing
<b>WHO</b>	-	World Health Organization

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## **ABSTRACT**

In Kenya, limited studies have been conducted to investigate infant feeding choices of HIV positive mothers attending Comprehensive Care Clinic. This study therefore determined infant feeding options of HIV positive mothers attending Comprehensive Care Clinic at Kiambu district hospital. A cross-sectional survey was conducted with a desired sample size of four hundred (400) HIV positive mothers for a period of 12 weeks. Systematic random sampling was used to select respondents for the study. Data was collected using a structured interview schedule and Focus Group Discussion (FGD) and was entered, analyzed using statistical package for social sciences (SPSS) version 12.0. Pearson's Chi-square test was used to test the significance of association between variables. Multiple Logistic Regression was performed to determine the factors independently associated with inappropriate infant feeding option. At the end of the study a total of 390 respondents were interviewed. The factors associated with inappropriate infant feeding option in the multivariate analysis were HIV disclosure (OR=4.91; CI: =1.2-11.3; p=0.0040), Participation in PMTCT program (OR=4.34; CI: =1.4-11.6; p=0.0051), Stigma (OR=2.46; CI: 1.9-12.2; p=0.0178), Counseling on stigma associated with infant feeding (OR=4.73 CI: 1.1-11.2; p=0.0032). The infant feeding experiences of HIV- positive mothers thus have serious implications for the operational effectiveness of programmes that aim to prevent HIV transmission from mother to child and therefore the findings of this study underscore the need by the ministry of health to come up with strategies to increase uptake of PMTCT services in order to increase rates of HIV disclosure, reduce stigma and acquire accurate information on HIV transmission through breastfeeding. There is also need for the ministry of health to launch educational programmes that aim to increase knowledge and create awareness on HIV transmission from an infected mother to her child as well as investigate adequacy of counseling offered at the comprehensive care clinics.

## **CHAPTER 1 INTRODUCTION**

### **1.1 Background**

The number of children with Human Immunodeficiency Virus (HIV) infection continues to increase worldwide and by 2009 two million children under the age of 15 were infected with HIV according to the World Health Organization (WHO), United Nations Children Education Fund (UNICEF) and the United Nations program on HIV/AIDS (UNAIDS) in 2009. The same report indicates that children constitute 14 % (700,000 to 4.9 million) of new global HIV/AIDS

infections, 18 % (570,000 to 3.1 million) of HIV/AIDS deaths annually, and 5.6% (2.3 million of 33.3 million) of the person living with HIV (WHO/UNICEF/UNAIDS, 2009). Sixty (60%) of the world's HIV infected children live in sub-Saharan Africa, which is estimated to have only 10% of the world's population.

Mother To-Child-Transmission accounts for the majority of HIV infections in children and without any interventions about two-thirds of Mother To-Child-Transmission occurs during pregnancy or at delivery and about one –third through inappropriate infant feeding practices (Coovadia *et al.*, 2007). About 90% of Mother To-Child-Transmission infection occurs in Africa, where HIV/AIDS is beginning to reverse decades of steady progress in child survival (WHO/UNICEF/UNAIDS, 2008). The rate of Mother-To-Child Transmission in absence of preventive interventions is about 15-25% among HIV-positive women who do not breastfeed (Becquet *et al.*, 2005) and 25-45% among women who practice customary breastfeeding which involves breastfeeding combined with other fluids or solids (WHO/UNICEF/UNAIDS, 2006).

Most women in Sub-Saharan Africa have their (HIV) status diagnosed during pregnancy because of testing available through programmes for the prevention of mother –to –child (PMTCT) of HIV (Ngacha *et al.*, 2007). A diagnosis of HIV during pregnancy necessitates complex decision making about participation in the PMTCT programmes and infant feeding methods (Leshabari *et al.*, 2007). Patients usually make these decisions alone as disclosure rates remain very low in Sub-Saharan Africa (Doherty *et al.*, 2006). Adherence to a chosen infant feeding method is especially challenging for women with HIV. Avoidance of any breastfeeding eliminates the risk of post-natal mother –to- child transmission of HIV (Thairu *et al.*, 2005). However, for many

women in resource constrained settings, complete avoidance of breastfeeding is either not possible or is not the most favorable option (Ngacha *et al.*, 2005).

The HIV epidemic has significantly altered the context within which women make their decisions about how to feed their infants (Doherty *et al.*, 2006). Recent evidence suggests that exclusive breastfeeding has a lower risk of mother to child transmission of HIV than does mixed feeding (Kiarie *et al.*, 2005). However, neither exclusive breastfeeding nor exclusive-non breastfeeding are norm in most African settings (Thairu *et al.*, 2005). Mixed feeding is the predominant method of infant feeding (Nduati *et al.*, 2005).

In Kenya, as in most of sub-Saharan Africa, national HIV prevalence estimates have been derived primarily from sentinel surveillance in pregnant women (KAIS, 2007). According to KDHS 2008-9, HIV prevalence among women in central province was 6.2 % compared to men which was 4.6%. Kiambu district in central province had the second highest HIV prevalence in the province at 7.6%, indicating a higher risk of Mother to Child Transmission of HIV (KDHS, 2008-9.) Proximity of Kiambu district to the capital city Nairobi, high rates of unemployment among the youth, drug abuse (illicit brews) have increased commercial sex trade resulting in the district having the second highest HIV prevalence in Central province (Kiambu District strategic plan 2005-2010).

The risk of MTCT of HIV can be considerably reduced through using antiretroviral drugs. However, in Kenya coverage of antiretroviral therapy is poor at only 35% among the eligible HIV positive people increasing the need for exploring factors determining infant feeding choices

made by HIV positive women since this will inform other interventions aimed at reducing Mother To Child Transmission of HIV. This research therefore sought to assess factors determining infant feeding choices of HIV positive women in resource constrained setting.

## **1.2 Statement of the Problem.**

There is continued concern that up to 20% of infants born to HIV-positive mothers may acquire HIV through breastfeeding, depending on the duration of breastfeeding, antiretroviral treatment and exposure to other risk factors (Otieno *et al.*, 2007; Kafulafula *et al.*, 2007). Mother to Child Transmission of HIV in Kenya is still high and the Kenya National AIDS/STI Control Programme (NASCOP) estimates that there were 1.2 million babies born in 2006 in Kenya and that as many as 9% of pregnant women in Kenya were living with HIV/AIDS .At least 50,000 to 60,000 infants in Kenya were thought to have been infected with HIV as a result of MTCT that year (NASCOP, 2006). Antiretroviral therapy (ART) is the most effective intervention for prolonging survival in people with HIV, and when taken regularly by breastfeeding mothers it is associated with a 90 percent reduction in mortality (KAIS, 2007). However the coverage of ART in Kenya is low at 35% translating to fewer breastfeeding mothers accessing and adhering to ART services especially in resource constrained settings (KAIS, 2007). The Kenya HIV Prevention Response and Modes of Transmission Analysis study showed that one of the most cost effective methods of reducing MTCT of HIV among HIV positive breastfeeding mothers is adherence to safe infant feeding methods (MoH, 2009). The NASCOP HIV and infant feeding guidelines in Kenya thus recommend that HIV positive women in resource constrained settings should either breastfeed exclusively their babies or use replacement feeding if it is Affordable, Feasible, Acceptable, Sustainable and Safe (AFASS) and strongly discourage

mixed feeding (NASCO, 2010). Mixed feeding has been found to increase the HIV transmission risk substantially more than exclusive breastfeeding (Onyango *et al.*, 2007; Kafulafula *et al.*, 2007; Kagaayi *et al.*, 2008). However, exclusive breastfeeding has been found rarely practiced while early mixed feeding is common in most African countries (Ngacha *et al.*, 2005; Coutoudis *et al.*, 2005). However, the uptake of PMTCT services which includes infant feeding counseling in Kiambu district is low at 22% which has contributed to insufficient knowledge of risk factors associated with HIV transmission through breastfeeding resulting to inappropriate choice of infant feeding option (NASCO, 2007). In spite of the importance of infant feeding in the effectiveness of prevention of mother to child transmission of HIV, quantitative information on knowledge on risk factors associated with HIV transmission through breast feeding and the factors influencing an HIV positive mother choice of infant feeding option is inadequate (NASCO, 2007). This study therefore, determined the level of knowledge and source of information on risk factors associated with HIV transmission through breastfeeding, determined socio-demographic and health related factors influencing choice of infant feeding options among HIV infected mothers and established the relationship between these factors and the infant feeding options

### **1.3 Justification**

Despite the fact that the NASCO guidelines for the Prevention of Mother To Child Transmission (PMTCT) of HIV are quite clear, HIV positive mothers in resource constrained settings in Kenya continue to expose their infants to HIV through use of inappropriate infant feeding options. Preventive measures applied successfully in developed countries cannot be generalized since some of these measures like formula feeding entail infectious and nutritional

risks in health context of low income countries, where they are not economically or socially accessible for all HIV positive mothers. Increased uptake of PMTCT services and improved adherence to appropriate infant feeding practices can be attained if factors influencing the choice of infant feeding options among HIV positive mothers are identified and appropriate interventions put in place which has not effective Kiambu district. The purpose of this study therefore was to determine the level of knowledge and source of information on risk factors associated with HIV transmission through breastfeeding, to determine socio-demographic and health facility related factors influencing choice of infant feeding options and establish the relationship between these factors and infant feeding options among HIV positive mothers.

#### **1.4 Research Questions**

1. What is the level of knowledge and source of information on the risk factors associated with HIV transmission through breastfeeding among HIV positive mothers attending comprehensive care clinic?
2. Which socio-demographic factors influence infant feeding options among HIV infected mothers attending comprehensive care clinic?
3. Which health facility related factors influence choice of infant feeding option among HIV infected mothers attending comprehensive care clinic?
4. What is the relationship between the identified factors and the infant feeding options?

## **1.5 Study Hypothesis**

Ho: Socio-demographic and health facility related factors do not determine choice of infant feeding option among HIV positive women attending comprehensive care clinic at Kiambu district hospital.

## **1.6 Objective of the study**

### **1.6.1 General objective**

To determine factors influencing choice of infant feeding option among HIV infected mothers attending comprehensive care clinic at Kiambu District Hospital.

### **1.6.2 Specific objectives**

1. To determine the level of knowledge and source of information on the risk factors associated HIV transmission through breastfeeding among HIV infected mothers attending comprehensive care clinic at Kiambu district Hospital.
2. To determine socio-demographic factors influencing choice of infant feeding options among HIV infected women attending comprehensive care clinic at Kiambu district hospital.
3. To determine health facility related factors influencing choice of infant feeding options among HIV infected mothers attending comprehensive care clinic at Kiambu district hospital.
4. To establish the relationship between the identified factors and the infant feeding options

### **1.7 Significance of the study**

The results of this study provided the ministry of public health and sanitation with evidence on the challenges HIV positive mothers in resource constrained settings face in making appropriate infant feeding choices and demonstrated the need for comprehensive infant feeding counseling in the PMTCT programs.

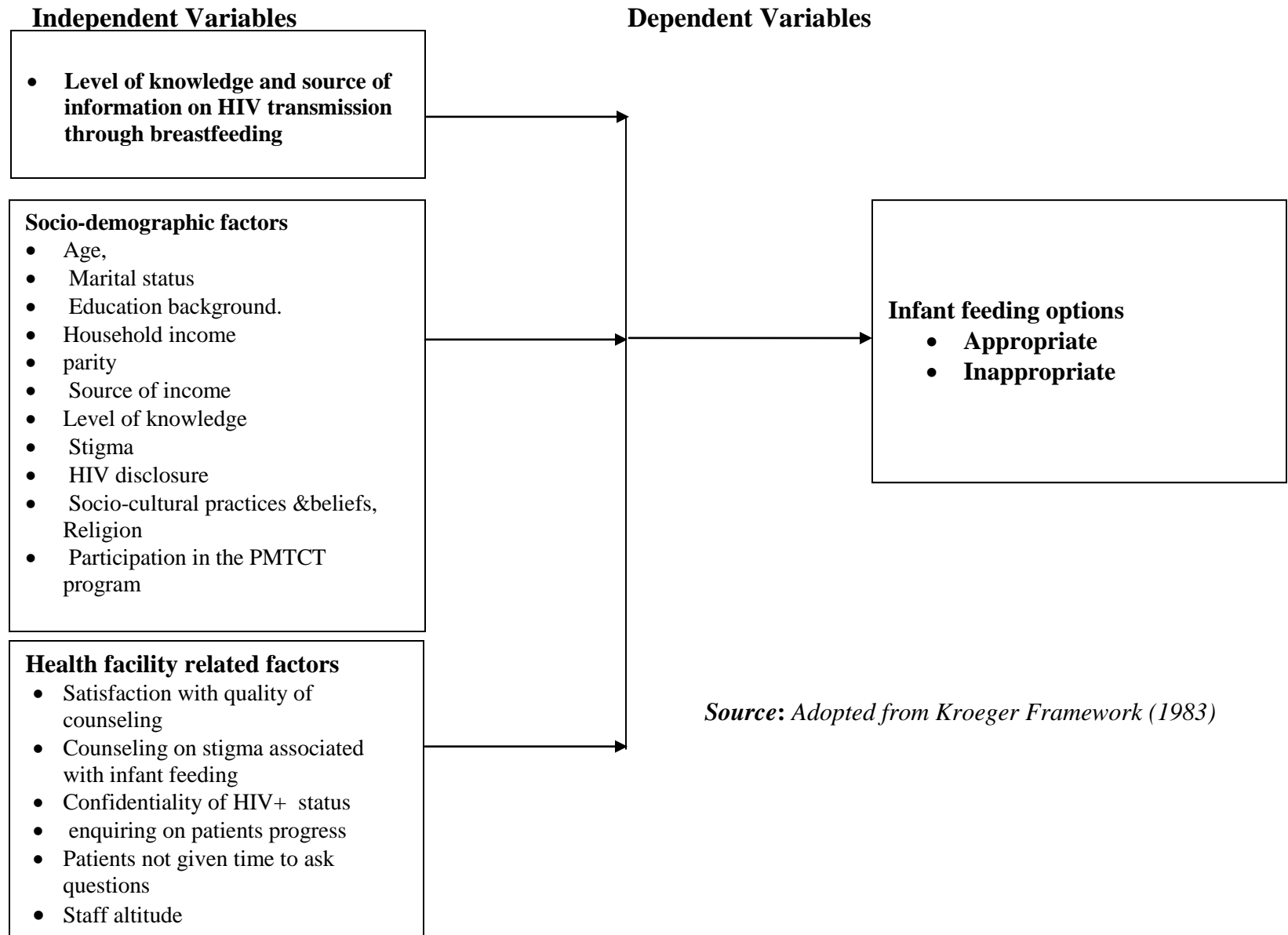
### **1.8 Limitations of the Study**

Stigma associated with some of the infant feeding options may have acted as a barrier in disclosing the infant feeding options practiced by the HIV positive mothers during the interviews. The study failed to capture responses from partners of the HIV positive mothers who could have provided vital information regarding the challenges facing the mothers.

### **1.9 Conceptual framework**

The decision HIV positive mothers make in Kenya on infant feeding options is guided by NASCOP infant feeding guidelines (Appendix 6.7) which aim at preventing MTCT of HIV (Nduati *et al.*, 2005). The guidelines promote fully informed and free choice for HIV infected women. However, putting these recommendations into practice is challenging due to the various factors influencing choice of infant feeding in individual women situations. The conceptual framework (Fig 1.1) outlines these factors and provides a frame work that can be used to mitigate preventive measures to address MTCT of HIV.

**Figure 1.1 Conceptual Frame work**



### 1.10 Operational definition of terms

**Appropriate infant feeding option-** According to WHO/UNICEF international infant feeding guidelines and NASCOP an appropriate infant feeding option is one which does not pose a risk of transmitting HIV from an HIV infected mother to her infant. In this study appropriate infant feeding method included exclusive breastfeeding for six months, Infant formula milk or replacement feeding if it is affordable, feasible, acceptable, sustainable ,safe(AFASS).

**Choice of infant feeding** – The decision made by HIV positive mothers on infant feeding methods they will use to feed their unborn babies.

**Commercial infant feeding formula** –refers to a breast milk substitute formulated industrially in accordance with the applicable codex Alimentarius standards to satisfy nutritional requirements of infants up to six months of age.

**Complementary breast feeding** - refers to feeding an infant on breast milk and other foods when breast milk becomes insufficient to satisfy the nutritional requirements of the infant.

**Complementary formula feeding** - refers to feeding an infant on formula milk and other foods when breast milk becomes insufficient to satisfy the nutritional requirements of the infant.

**Comprehensive Care Clinic-** It's an outpatient clinic dedicated to advancing and coordinating care, treatment and support of people living with HIV.

**Exclusive breastfeeding-** refers to giving an infant no other food or drink (not even water) apart from breast milk.

**Exclusive replacement /formula feeding-** refers to feeding an infant during its first six months of life on breast milk substitutes only if it is AFASS.

**HIV Counseling and Testing-** refers to Voluntary HIV Testing with full informed consent and confidential pre-and post-test counseling.

**HIV Disclosure-** Refers to an HIV positive woman openly declaring her HIV status to close relatives or the community.

**Inappropriate infant feeding method-** According to WHO/UNICEF international infant feeding guidelines and NASCOP inappropriate infant feeding options are those that pose a risk of transmitting HIV from an infected mother to her infant. In this study inappropriate infant feeding choice included mixed feeding, complementary breastfeeding, and complementary formula feeding and cow or goat milk.

**Infant** – refers to a child below one year.

**Level of Knowledge on HIV transmission through breastfeeding** - A measure of how much the HIV positive women know on the mode of HIV transmission, prevention, exact relationship with the various infant feeding options.

**Mixed feeding** – refers to the practice of breastfeeding plus the inclusion of other milks, liquids and food in the diet of infants less than six months old.

**Mother To Child Transmission (MTCT)** - refers to the transmission of HIV to an infant born to an HIV-positive woman during pregnancy, delivery or breastfeeding .Also known as vertical transmission.

**Stigma** – it is a deep rooted belief in the mind and which is related to contextual factors existing in the society towards any particular human behavior.

## **CHAPTER 2**

## **LITERATURE REVIEW**

### **2.1 HIV Transmission**

It is estimated that 33.3 million people are living with HIV; 5.2 million are HIV infected each year, 2million children die annually from AIDS related illness (WHO/UNAIDS/UNICEF, 2008). The joint United Nations Programme of HIV/AIDS states that 90-95 % of the people infected with HIV in the world live in African countries, which are poor and cannot afford antiretroviral drugs and formula milk supplies to prevent MTCT of HIV through breastfeeding. Globally, around 11% of HIV infections are among babies who acquire the virus from their mothers; 10% result from injecting drug use; 5-10% due to sex between men; and 5-10% occur in healthcare settings. Sex between men and women accounts for the remaining proportion – around two thirds of new infections.

Kenya is one of the countries in Sub-Saharan Africa burdened by HIV (KAIS, 2007). The HIV prevalence in Kenya is approximately 7.4% and there are more HIV infected people in the rural areas than in urban areas (KAIS, 2007). In 2007, there were about 100,000 children living with HIV while 19,000 new infections occurred (NASCOP, 2006). MTCT of HIV through breastfeeding remains the leading cause of HIV infections in children in Kenya (NASCOP, 2006). Central province reported 96,321 HIV cases in 2008. Deaths from HIV in the province stood at 10,808 with 3,783 (35%) being children (NASCOP, 2006). Kiambu District has the second highest HIV prevalence in Central Province and in 2007, 32,653 HIV/AIDS cases were reported in the district with 21,526 cases in the rural areas (NACC, 2007). Central province has

more women than men suffering from HIV/AIDS with the women prevalence standing at 6.3% compared to men's 2.9 % (KAIS, 2007).

## **2.2 Mother To Child Transmission of HIV and associated risk factors**

One of the tragic consequences of the HIV/AIDS pandemic is Mother To Child Transmission (MTCT) of HIV. MTCT occurs when an HIV positive woman passes the virus to her baby. This can occur during pregnancy, labour and delivery, or breastfeeding. Without treatment, around 15-30% babies born to HIV positive women will become infected with HIV during pregnancy and delivery. A further 5-20% will become infected through breastfeeding (Ngacha *et al.*, 2005; Doherty *et al.*, 2006; Nduati *et al.*, 2005). If a mother has cracked nipples or mastitis (a type of breast inflammation), or if her baby has infections or sores in its mouth, then the risk of HIV transmission is probably increased (Kaggayi *et al.*, 2008). Another risk factor believed to influence HIV transmission rates is the concentration of virus in a mother's breast milk, which is known as the "viral load" (Coovadia *et al.*, 2008). Breastfeeding is a tradition in Africa, and breast-milk is the major source of nutrition for infants during the first years of life but in context of HIV it will contradict the guidelines on infant feeding among HIV positive mothers Ngacha *et al.*, 2005. In addition, breastfeeding provides psychological support, child-spacing benefits, and reduces infants and child morbidity and mortality by protecting children from diarrhoeal diseases, pneumonia and other infections (Thairu *et al.*, 2005). Unfortunately, between 10 and 20 percent of HIV-infected mothers will pass the virus to their babies through extended breastfeeding up to 2 years (Kagaayi *et al.*, 2008).

Several factors have been found to be associated with an increased risk of MTCT through breastfeeding. High maternal viral load measured during pregnancy (Onyango *et al.*, 2007) or after delivery and a low CD4/CD8 ratio (Medley *et al.*, 2005) has been associated with an increased rate of MTCT through breastfeeding. The risk of HIV transmission through breastfeeding is greatest in early infancy (before six months of age) and persists as long as breastfeeding continues (Otieno, *et al.*, 2007; Nduati *et al.*, 2005). Studies found that a longer duration of breastfeeding is associated with increased risk of MTCT (Onyango *et al.*, 2007; Doherty *et al.*, 2006; Ngacha *et al.*, 2005).

A randomized clinical trial in Nairobi suggested that the volume of milk ingested is an important factor in breast milk transmission of HIV (Otieno *et al.*, 2007). Another study also found that infant oral thrush before six months of age is a risk factor for post-natal infection of children (Ngacha *et al.*, 2005). Some studies found that inflammatory conditions such as mastitis, assessed clinically (Kagaayi *et al.*, 2008; Doherty *et al.*, 2006) or biologically by measuring the sodium level in breast milk (Thairu *et al.*, 2005), fissures (Becquet *et al.*, 2005) and breast abscesses increase the risk of MTCT through breastfeeding.

A carefully designed study conducted in Kwa Zulu Natal in South Africa provided crucial confirmatory evidence that when HIV positive mothers breastfeed exclusively their babies have a significantly lower risk of infection from HIV. Mixed feeding before or after 14 weeks nearly doubled the transmission risk and the addition of solids increased the risk 11-fold. The same study reported that mortality by three months of age for replacement-fed babies was more than

double (15%) that of those who were exclusively breastfed (Coovadia *et al.*, 2007). These findings added to the previous cumulated evidence about the additional risk of HIV transmission for non-exclusive breastfed babies ( Ngacha *et al.*, 2005).

### **2.3 Infant feeding options and post partum Mother to Child transmission of HIV**

As the risk of HIV transmission through breastfeeding becomes more widely understood, HIV-infected African women face the difficult burden of having to decide whether to break with tradition and choose not to breast-feed, or breastfeed and run the risk of infecting their infants with HIV(Tuitoek *et al.*, 2006). In an attempt to minimize risks to her infant, yet hide her own status from neighbours, friends or family, an HIV-infected mother may combine breastfeeding with artificial feeding, the worst of all possibilities as it exposes the infant to both sets of risks(Thairu *et al.*, 2005).

Iiff *et al* (2005) showed the cumulative risk of HIV- transmission at 6 months being 1.31% and 4.4% for exclusively breastfed babies and babies who received mixed breastfeeding respectively, and 6.94% and 13.92% at 18 months. These were significant differences. Mixed feeding (breastfeeding mixed with bottle feeding of water or formula, or providing other foods) is not recommended because studies suggest it carries a higher risk than exclusive breastfeeding. This may be because mixed feeding damages the epithelial lining of the baby's stomach and intestine and thus makes it easier for HIV in breast milk to infect the baby. Unfortunately mixed feeding is more common in Africa compared to exclusive breastfeeding posing a risk of HIV transmission in the context of HIV (Doherty *et al.*, 2006).

The longer an HIV-positive mother breastfeeds, the more likely she is to infect her baby (NASCO, 2010). Half of the breastfeeding-related infections may occur after 6 months with continued breastfeeding into the second year of life (Nduati *et al.*, 2005; Mioti *et al.*, 2005). A study has shown that exclusive breastfeeding in the first 3 months of life may carry a lower risk of HIV transmission than mixed feeding (Coutsoudis, 2008). Kiarie *et al.* (2005) highlighted in their study that breastfed babies had approximately two times higher chance of HIV-1 infection than non-breastfed babies. The HIV epidemic has significantly altered the context within which women make decisions about how they will feed their infants (MOH, 2008). The results of a study in Zimbabwe found that babies given a mixed diet were much more likely to become infected with HIV than those who were exclusively breastfed (Illif *et al.*, 2005).

The NASCO guidelines on infant feeding for HIV positive mothers recommend that, “when replacement feeding is acceptable, feasible, affordable, sustainable and safe, avoidance of all breastfeeding by HIV-infected mothers is recommended. Otherwise, exclusive breastfeeding is recommended during the first months of life” (NASCO, 2010). However, the most appropriate infant feeding option for an HIV-infected mother should continue to depend on her individual circumstances, including her health status and local situation, but should take greater consideration of the health services available, the counselling and support she is likely to receive (NASCO, 2010). Putting these recommendations into practice is far from easy. In many societies, especially in sub-Saharan Africa, it is normal practice for a baby to be given water, tea, porridge or other foods as well as breast milk, even during the first few weeks of life. Evaluation

of PMTCT programmes have found that rates of exclusive infant feeding, both breastfeeding and formula feeding, are suboptimal (Omari *et al.*, 2005; Nduati, 2005 and Shapiro *et al.*, 2005).

A study done in Nairobi, Kenya (Nduati *et al.*, 2005), randomized 425 pregnant women into two groups, one using infant formula at birth (no breastfeeding), and the other breastfeeding. In the breastfed group, there was 96 percent compliance with “any breastfeeding” but mixed breastfeeding in early infancy was common. In the formula-fed group, only 70 percent of women completely avoided breastfeeding, suggesting the difficulty of implementing this type of intervention.

#### **2.4 Level of knowledge and source of information on the risk factors associated with HIV transmission through breastfeeding.**

The Prevention of Mother To Child Transmission Guidelines in Kenya recommend that in context of HIV, all HIV infected women are expected to have adequate knowledge about risk factors associated with HIV transmission through breastfeeding as a preventive strategy for mother to child transmission of HIV (NASCO,2010). Counseling regarding infant feeding options can reduce the risk of transmitting HIV from mother to child (Kuhn *et al.*, 2005). Counseling provides women with knowledge about the risks, benefits and costs of the various feeding alternatives, including breastfeeding, so that the mother can make her own informed decision about how best and most safely to feed her newborn child ( Nduati *et al.*, 2005).

Quality of counseling services in the health facilities affects the acquisition of accurate information on HIV and infant feeding. A study at Homabay PMTCT clinic in Kenya found that nurse counselors were over worked in the CCC and lacked accurate information on infant

feeding (Onyango *et al.*, 2007). HIV positive mothers who do not access CCC in the community and have low literacy levels thus acquire inaccurate information from their peers on HIV and infant feeding indicating the need to give accurate and factual information at the CCC (Leshabari *et al.*, 2007).

A study in Malawi found that most HIV infected mothers who had poor levels of knowledge mixed fed their babies resulting to high infant morbidity & mortality due to resulting HIV/AIDS infection (Leroy *et al.*, 2007). This study also indicated that mothers who joined PMTCT program had a higher level of knowledge and were able to make safer choices of infant feeding (Leroy *et al.*, 2007). Another study in Kenya linked pamphlets and newspapers to insufficient sources of information on the risk factors associated with HIV transmission through breastfeeding, probably because they required translation into the HIV positive mothers local languages (Kiarie *et al.*, 2005).

### **2.5 Socio-demographic factors associated with choice of infant feeding options.**

A number of studies have been able to raise some relevant issues regarding infant feeding choices by HIV infected mothers. A study to describe the maternal acceptability of formula-feeding in Abidjan, Cote d'Ivoire established that the significant post-natal determinants for refusing formula-feeding were: depending on a partner for financial support, being Muslim, low amount of household income and having not disclosed her HIV status (Illif *et al.*, 2005) while in a similar study in Kibera Kenya, the women who were employed and had a regular income disclosed their status to their partners (Ngacha *et al.*, 2007).

Women who mixed fed were either due to stigma or poor knowledge levels (Leroy *et al.*, 2007). A study in Uganda found that HIV infected women abandoned formula milk supplies in the clinics due to stigma associated with formula milk feeding (Kagaayi *et al.*, 2008). Participation in PMTCT program was found to increase HIV infected women knowledge levels of HIV transmission through breastfeeding (Kuhn *et al.*, 2005) while a study in Zambia found stigma and lack of confidentiality as major barriers to the uptake of PMTCT services (Piwoz *et al.*, 2006)

Quality of counselling and support determined HIV positive mothers success in adhering to chosen infant feeding option (Leshabari *et al.*, 2007). A study in Kenya (Nduati *et al.*, 2005) associated unsafe choice of infant feeding to inadequate counselling and support service at the health facility. Although NASCOP guidelines on infant feeding promote fully informed and free choice for HIV infected women, a study in Kenya (Kiarie *et al.*, 2005) found nurse counsellors gave inaccurate information to HIV infected mothers, were unfriendly resulting to unsafe choice of infant feeding. Despite the fact that an HIV infected woman makes a decision on how to feed her infant during or after counselling, she may as well simply be unable to execute that decision in practice because her mother, partner or other relatives wish it otherwise (Onyango *et al.*, 2007).

One of the major challenges facing women in adopting and adhering to current recommendations is access to accurate information (Thairu *et al.*, 2005). Staff shortages and the associated lack of time to counsel effectively, even for those adequately trained, infant feeding counsellors are

further barriers to the provision of informed infant feeding choices (Doherty *et al.*, 2006). The stigma of HIV in developing countries continues to be so heavy that many women fail to formula feed because doing so will be equivalent to disclosing their HIV status (Kuhn *et al.*, 2005 and De Cock *et al.*, 2005). Lack of culturally sensitive tools and the stigma associated with both replacement feeding and exclusive breastfeeding make appropriate and effective infant feeding counselling difficult (Thairu *et al.*, 2005).

Prevention of mother to child transmission (PMTCT) programmes are rapidly expanding throughout Sub-Saharan Africa, with several key intervention pillars: voluntary counselling and testing (VCT), antiretroviral prophylaxis and infant feeding counselling (Coutinho *et al.*, 2005). Hence, once a mother knows that she is HIV-positive, intervention options include the use of antiviral prophylaxis, elective caesarean section, and replacement feeding (Thairu *et al.*, 2005). The WHO consensus statement on HIV and infant feeding (WHO, 2006) highlights critical issues in the continuing debate on whether the HIV transmission resulting from breastfeeding can be superseded by the benefits of breastfeeding and therefore justified. Findings from emerging evidence encourages developing countries to reassess their positions on infant feeding by HIV-infected mothers and balance the policies that support breastfeeding and formula feeding by HIV-infected mothers (Otieno *et al.*, 2007).

It is therefore worth noting that an estimated 5-15 percent of children born to HIV-positive women are infected through mother's milk (UNAIDS, 2005). However breastfeeding is a tradition in Africa (Ngacha, 2005), and mixed feeding is the predominant method of infant

feeding. According to a study conducted in Kenya, mixed feeding is still high among mothers on exclusive infant formula feeding option (Nduati *et al.*, 2005). But mixed feeding (breastfeeding mixed with bottle feeding of water or formula, or providing other foods) is not recommended because studies suggest that it carries a higher risk of HIV transmission than exclusive breastfeeding (Coutsoudis *et al.*, 2008). Although formula feeding is certainly the correct choice for some HIV-positive women who meet all the criteria of the WHO guidelines, exclusive breastfeeding for the first 6 months for majority of HIV-infected mothers who are poor reflects the optimum balance between advantages and disadvantages. In disadvantaged settings, programmes offering formula milk are not easy to implement safely. Providing formula milk to poor populations with high HIV prevalence cannot neither be justified by the evidence, by respect for local traditions nor by economic outcomes (Nduati *et al.*, 2005). In a South African study, despite the provision of free formula milk, over one – third of mothers had run out of formula milk within the first 3 months (Doherty *et al.*, 2006). The consequences of this type of aid to low-income countries may be similar to those that have often undermined human health and development (Coutsoudis *et al.*, 2008).

## **2.6 Health facility related factors influencing choice of infant feeding options**

HIV/AIDS pandemic has affected the performance of the health system by increasing the demand for both quality, quantity of services and by reducing the supply for services by its impact on the number and performance of health care providers (Muthoni, 2007). A study in Kenya, Migori district hospital on barriers to PMTCT, showed that the shortage of staff in the comprehensive care clinics resulted to increased waiting time for the clients (Onyango *et al.*,

2007). The same study showed that the increased workload among the health care workers affected the attitude and time to comprehensively attend to the various issues raised by the clients during counseling. While Antenatal clinic clients are increasing, health facilities are not expanding at the same pace creating a problem of space particularly for counseling HIV positive client's thereby compromising confidentiality and privacy of clients (Doherty *et al.*, 2006).

A study in Kenya associated poor adherence to recommended infant feeding options to inadequate human capacity development. The study found that the counselors inadequately explored feasibility and acceptability of the infant feeding options because they lacked adequate knowledge and time (Kiarie *et al.*, 2005). A health workers survey carried out in 2006 in Kenya, showed that majority of the health care workers lacked training in HIV counseling and thus lacked confidence while giving information to the clients (NASCOP, 2006). Comprehensively well trained health care workforce is crucial in ensuring good quality PMTCT service delivery to HIV positive mothers and their infants (Kiarie *et al.*, 2005).

## **CHAPTER 3                      METHODOLOGY**

### **3.1 Study area**

The study was conducted at Kiambu District Hospital in Kiambu District one of the seven districts of Central province (Appendix 6.1). Kiambu district extends between 36°54 and 36°85 North and between 0°75 and 1°20 South. It shares boundaries with Nairobi city and Kajiado district to the South, Thika District to the East, and Nakuru District to the West. The population of Kiambu district is estimated to be 865,123 (Republic of Kenya, 2009). Kiambu District has a high population density thus land has been fragmented into small pieces resulting to decline in productivity and poverty. It has a high HIV prevalence especially among women in the age group of 25-34 years due to unsafe sex, drug abuse and drinking of illicit brews among the youths (Kiambu District strategic plan, 2005-2011). Kiambu District Hospital which is the main referral hospital in the district mainly attends to patients from the coffee, tea farms and other resource constrained areas in the district and offers HTC and other PMTCT components. Median duration of breastfeeding in the District is 22.6 months while the median duration of exclusive breastfeeding is only about one month. A mixed feeding pattern is common (MoH, 2006).

### **3.2 Study design**

A cross-sectional study was conducted in which both qualitative and quantitative data was collected.

### **3.3 Variables**

#### **3.3.1 Dependent variable**

Infant feeding options among HIV positive women was used as the dependent variable for the study.

### **3.3.2 Independent variables**

The independent variables for the study included socio-demographic factor (age, marital status, level of education, religion, main source of income, amount of household income, HIV disclosure, parity, level of knowledge on risk factors associated with HIV transmission through breastfeeding, stigma & socio-cultural practices and beliefs, participation in the PMTCT program), health facility related factors (satisfaction with the quality of counseling, counseling on stigma associated with infant feeding, confidentiality of patient status, enquiring on patient progress, being given time to ask questions, staff attitude) .

### **3.4 Target population**

The target population constituted of women attending Comprehensive Care Clinic.

### **3.5 Study population**

The study population constituted HIV positive women attending the Comprehensive Care Clinic at Kiambu District Hospital.

### **3.6 Inclusion criteria**

HIV-positive mothers who?

- a) Were attending Comprehensive Care Clinic at Kiambu District Hospital.
- b) Aged between 18-49 years
- c) Had infant aged 0-6months.
- d) Consented to participate in the study.

### 3.7 Exclusion criteria

HIV-positive mothers who?

- a) Were not attending Comprehensive Care Clinic at Kiambu District Hospital.
- b) Aged below 18years and above 49 years
- c) Had infants older than 6 months of age.
- d) Failed to consent to participate in the study.

### 3.8 Sample size and sampling technique

The sample size was determined using the following formula by fisher *et al* (1983) and is worked out below:-

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

Where

nf = desired sample size. (When the target population is less than 10,000)

n = desired sample size. (When the target population is more than 10,000)

N = the estimate of the population size.

$$n = \frac{Z^2 pq}{d^2}$$

Z = the standard normal deviate at the required confidence level.

P = proportion in the target population estimated to have the characteristics being measured (sample proportion of HIV positive mothers with infants aged 1-6 months attending Comprehensive Care clinic and practicing an infant feeding method was assumed to be 50%) (Doherty *et al.*, 2006).

q = 1-p

d = Level of statistical significance set (0.05)

$$n = \frac{(1.96)^2 (0.50) (0.50)}{(0.05)^2}$$

= 384 patients.

Therefore,

$$\begin{aligned} nf &= \frac{384}{(1+384)/400} \\ &= 400 \end{aligned}$$

### 3.8.1 Sampling technique

The Kiambu District Hospital was sampled purposively because it served a population with a high HIV/AIDS prevalence with majority of the people being poor. It is also the main referral hospital in Kiambu district and it offered a comprehensive PMTCT program. Individual study participants were sampled using systematic random sampling method. In systematic random sampling, the sampling interval (K) is obtained by dividing the sampling frame (N) by the sample size (n). The sampling frame (800 HIV-positive mothers with infant aged 1-6 months) was obtained from the register at the Comprehensive Care Clinic where all the health characteristics of the mothers are monitored.

$$\begin{aligned} \text{Sampling interval (K)} &= \text{Sampling frame (N)} / \text{Sample size (n)} \\ &= 800/400 \\ &= 2 \end{aligned}$$

Therefore, every 2<sup>nd</sup> respondent was selected for the interview.

### 3.8.2 Sampling procedure

The study participants were recruited on the basis of their willingness to participate between May 2008 and September 2008. Recruitment was always done after the study participants were seen

by the doctor and the counsellors. They were briefed about what was expected of them. This study therefore applied an exit form of an interview where HIV-positive mothers with infants aged between 0-6 months were interviewed after the mothers were seen by the health worker at the Comprehensive Care Clinic. The study participants had to give consent first before being interviewed. They were required to sign a consent form (Appendix 6.2) However, those participants who were unable to sign the consent form, but gave a verbal consent were also considered for the study. Focus group discussions with the HIV positive mothers with infant aged 0-6 months (Appendix 6.4) and the nurse counsellors (Appendix 6.5) were sampled using convenient (volunteer) sampling and therefore only those who consented were interviewed.

### **3.9 Research instruments**

A Structured Interview Schedule (Appendix 6.3) with open and closed questions was used to collect the data on the HIV positive mothers with infants aged 1-6months attending the Comprehensive Care Clinic. A rough draft was prepared, giving due thought to the appropriate sequence of putting questions. Technical defects were minutely scrutinized and removed after re-examining. The questions contained simple but straightforward directions for the respondents so that they could not feel any difficulty in answering the questions. This instrument captured level of knowledge and source of information on risk factor associated with HIV transmission through breastfeeding, socio-demographic factors , health facility related factors that associated with infant feeding. It targeted HIV positive mothers who had infants aged zero to six months attending Comprehensive Care Clinic

Focus Group Discussions (FGDs) were also carried out with the HIV positive mothers with infants aged 0-6months and the nurse counsellors with questions targeting stigma, disclosure, confidentiality of HIV status, socio-cultural beliefs, counselling services, implementation of infant feeding guidelines. These responses were used to supplement the findings of the study.

### **3.10 Pre-testing**

Pre- testing of the research instruments was done before the actual data collection to enhance the validity and reliability of the responses. Pre-testing was done using a purposive sample of 30 respondents from Tigoni Sub-District Hospital. These included mothers with similar characteristics to those attending the Comprehensive Care Clinic programme at Kiambu District Hospital with infants aged 0-6months. Vague questions were rephrased to convey the same meaning to all participants while some comments made by the respondents were incorporated into the final questionnaire.

### **3.11 Validity**

For complex variables like knowledge and source of information on HIV transmission through breastfeeding, HIV disclosure and stigma, a series of questions addressing each variable was incorporated in the questionnaire, in-depth literature review was done and expert advice sought from research supervisors.

### **3.12 Reliability**

The semi-structured questionnaire was administered by research assistants who had undergone thorough training in enumeration before and after pre-testing. An adequate number of questionnaires were pre-tested and ambiguities clarified.

### **3.13 Methods of data collection**

Personal interview method was used to obtain data from the respondents. This involved asking questions in a face-to-face contact. A structured interview schedule (Appendix 6.3) with closed and open-ended questions was used. The respondents were fully informed of the study by the researcher and also the nurse counsellors at the CCC and were required to sign a consent form if they chose to participate in the study (Appendix 6.2). Translation of questions to Kiswahili or Kikuyu in cases of language barrier or illiteracy was done. Focused interview guide (Appendix 6.4& 6.5) was used for the focus group discussions to explore, ideas, experiences and possible divergent views of the respondents and nurse counsellors in the subject of study. Three focus group discussions (FGDs) with 7 participants each for the HIV positive mothers were held while two FGDs with 5 participants was held with the nurse counsellors. The individual interviews were recorded in writing. The interviews were conducted in Kiswahili or Kikuyu which was the language acceptable to all. The responses obtained were used to validate the information collected from the study participants.

### **3.14 Data analysis**

Data was coded, sorted, entered into the computer and processed using SPSS software version 12.0. Descriptive statistics performed include determining the means, medians, standard

deviations (SD) and range, and presented in frequencies and proportions and tables. Chi-square test was used to test the presence of significant association between the variables. Infant feeding options was dichotomized in to; appropriate (exclusive breastfeeding, exclusive formula feeding) and inappropriate (mixed feeding, complimentary breastfeeding, complementary formula feeding and cow's milk). The univariate analysis involved comparing each independent variable with the infant feeding options. The significance of the associations was tested using Chi Square and an association was statistically significant when the p- value was less than 0.05 ( $p < 0.05$ ). The variables with a p- value  $< 0.05$  in the univariate analysis were included in the Multiple Logistic Regression Analysis where Odds Ratio (OR) and associated Confidence Interval (95% CI) was used to measure the strength of association between the independent variables and Infant feeding options. Responses from open-ended questions, FGDs were analyzed qualitatively according to emerging themes and then used to supplement, explain and interpret quantitative data.

### **3.14.1 Scoring**

Level of knowledge on risk factors associated with HIV transmission through breastfeeding was measured using a scoring system adopted from Institute of research in social sciences(Stanford university,2007) as follows:-

A score of 1 was awarded for each correct response while an incorrect response was awarded a score of 0. A summary indicator for knowledge was calculated as follows:  $\geq 3$  correct responses ( $> 50\%$ ) = Poor knowledge, 4- 5 correct responses (50% - 79%) = Average knowledge, 6 - 7 correct responses ( $\leq 80\%$  - 100%) = Good knowledge.

### **3.15 Ethical consideration**

Permission to carry out the study was given by the relevant authorization bodies: Kenyatta University Graduate School (Appendix 6.7), the Ministry of Science and Technology (Appendix 6.8) and Kiambu District Hospital (Appendix 6.9) Informed consent was sought from all the study participants. Anonymity, confidentiality and privacy of the study participants were safeguarded and these ensured only codes were used instead of names, research assistant were fully trained on ensuring confidentiality and privacy, interviews were conducted in private room inside the CCC far away from the public. Information given by respondents was not shared with anybody in the health facility not even the nurse counsellors and was safely kept by the research assistants.

## CHAPTER 4

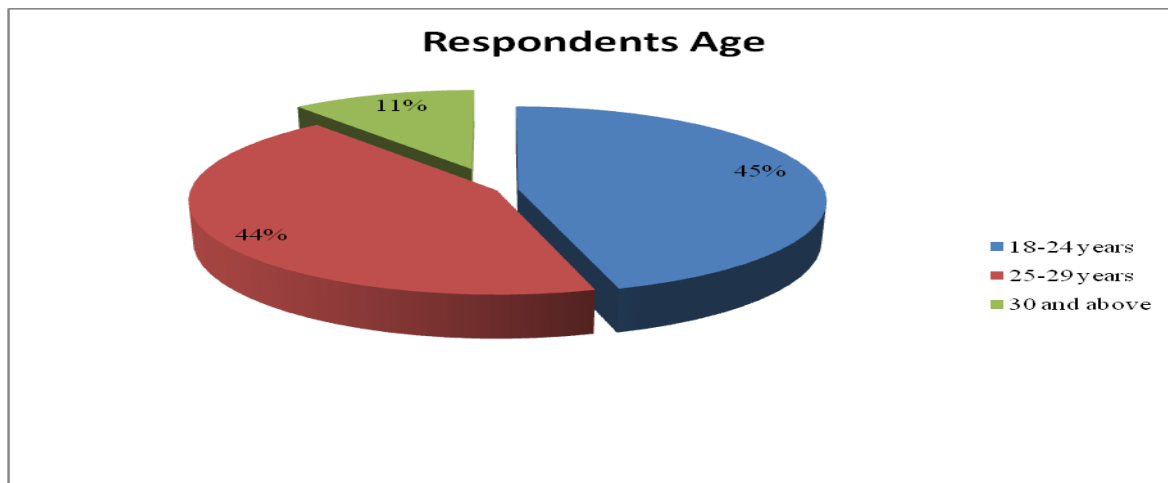
## RESULTS AND DISCUSSION

### 4.1 Socio-demographic characteristics of the respondents

#### 4.1.1 Age of the respondents (Yrs)

Three hundred and ninety (390) study subjects were interviewed at Kiambu District Hospital representing (97.5%) of the sample. Majority of the respondents (89%) were aged below 30 years with a mean and median age of 23.2 and 22.3 years respectively which meant they were of reproductive age and interventions to prevent mother to child transmission of HIV for future children would be important. This result was similar to study conducted at Homabay District Hospital where the larger proportion of study subjects (47%) were aged between 18-24 years (Onyango *et al.*.,2007)

**Fig 4.1 Age distribution of the respondents.**



#### **4.1.2 Education, Marital status, Religion, Main source of income and Level of household income of the respondents.**

The table below summarizes other socio-demographic, socio-economic, and socio-cultural characteristics of the respondents in terms educational level, marital status, their religious background, main source of income and level of household income. The results showed that a greater number of the respondents were married, had an educational background below college level and had a catholic religious background. Sixty (60.3%) of the respondents depended on their spouses for financial support and had an average income of less than Kshs.7, 000 (Table 4.1). A similar study in Nairobi showed a higher number of respondents (76.6%) depended on their spouses for financial support and had an average of less than Kshs. 5,000 (Kiarie *et al.*, 2005). This meant that infant feeding decisions by these women were more likely to be influenced by male partners for the married participants. Education level could have affected understanding of instruction and acquisition of knowledge on infant feeding. The income level showed that most of the women were poor and could not afford to formula milk for the infants. It also showed that they could not meet most of the prerequisite conditions for exclusive formula feeding.

**Table 4.1 Socio-demographic characteristics of the respondents.**

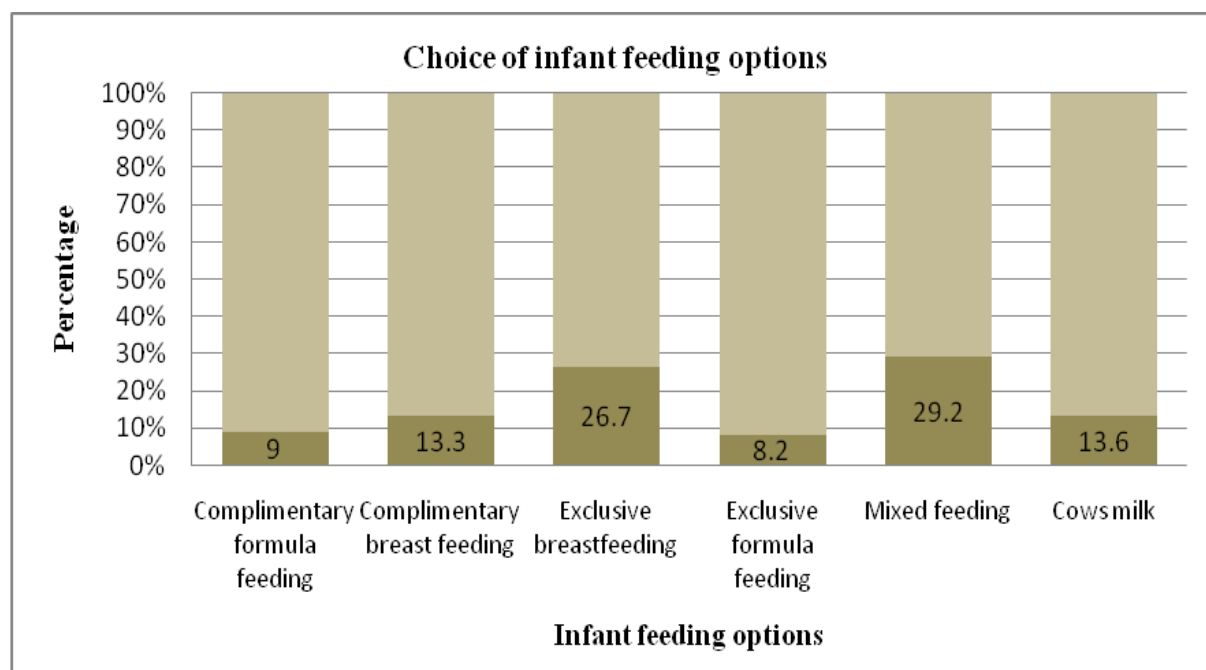
Characteristic	Frequency n = 390	Proportion (%)
<b>Education background of the respondent</b>		
None	30	7.7
Primary	189	48.5
Secondary	117	30.0
Tertiary	54	13.8
<b>Marital status of the respondent</b>		
Married	190	48.7
Single	72	18.5
Cohabiting	74	19.0
Divorced	21	5.4
Separated	20	5.1
Widowed	13	3.3
<b>Religious background of the respondent</b>		
Christians	255	65.4
Muslims	61	15.6
Pagans	74	19.0
<b>Main source of house hold income</b>		
Self	155	39.7
Spouse	235	60.3
<b>Amount of household income</b>		
<Kshs. 5000	41	10.5
Kshs.5001-6000	54	13.8
Kshs. 6001-7,000	166	42.6
Kshs.7001-8,000	63	16.1
Kshs.8,001-9,000	28	7.2
Kshs.9,001-10,000	12	3.1
>Kshs.10,000	26	6.7
<b>Total</b>	<b>390</b>	<b>100</b>

#### **4.2 Infant feeding options among HIV positive women attending Comprehensive Care Clinic at Kiambu district Hospital.**

The infant feeding options were dichotomized into appropriate infant feeding choice (exclusive breastfeeding, infant formula milk feeding ) and inappropriate infant feeding choice (mixed

feeding, complimentary breast feeding, complimentary formula feeding, ,cow's milk).In this study exclusive breastfeeding was defined as giving an infant less than six months no other food or drink apart from breast milk , infant formula milk feeding was defined as giving an infant less than six months breast milk substitutes when it is Affordable, Feasible, Acceptable, sustainable and Safe, Mixed feeding was defined as giving an infant less than six months breast milk and other foods & liquids, complimentary formula feeding was defined as giving an infant breast milk substitutes ,food and liquids, complimentary breastfeeding was defined as giving an infant breast milk and other foods when breast milk becomes insufficient to satisfy the nutritional requirements of the infant , cow's milk was defined as milk from either cow or goat fed on an infant who is less than six months. The findings showed that although exclusive breastfeeding was among the most popular choice of infant feeding option, mixed feeding was also widely practiced (Fig 4.2). Similarly, a study at Migori District showed that majority of the respondents (67.5%) mixed fed their infant and exclusive breast feeding was sub-optimal (Omari *et al.*,2005). This was probably because mixed feeding is a culturally acceptable form of infant feeding among many African communities.

**Fig 4.2: Infant feeding options among HIV positive mothers at Kiambu District Hospital.**



#### **4.3. Infant feeding options by level of knowledge and source of information on the risk factors associated with HIV transmission through breastfeeding.**

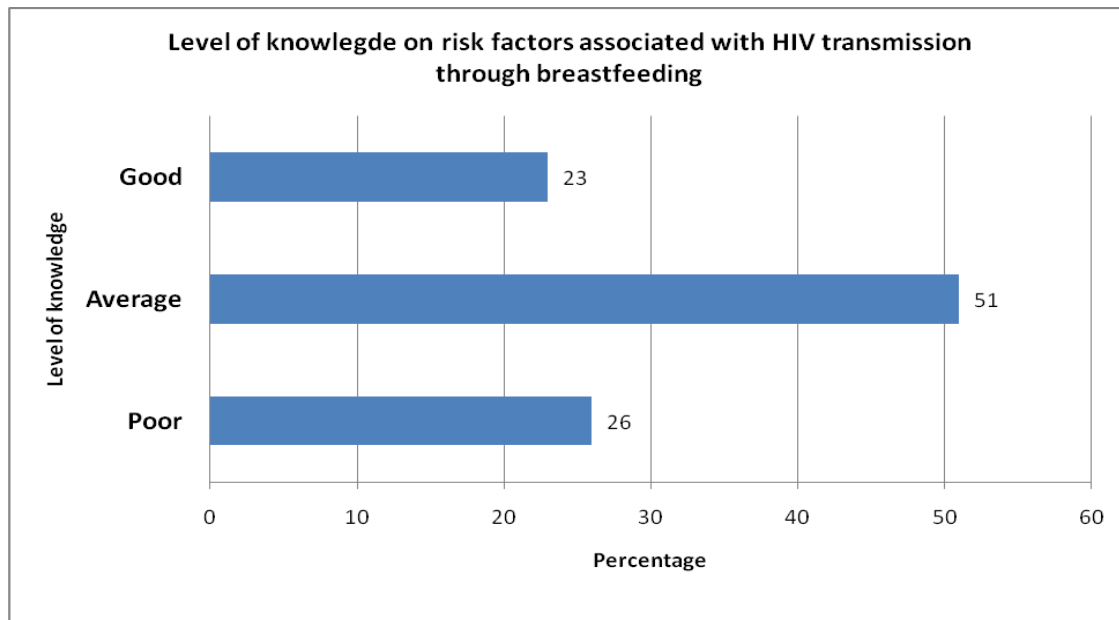
The respondents' knowledge of HIV transmission was assessed in several areas including adult methods, different infant feeding methods, rating the risks associated with infant feeding options and methods of HIV prevention. Some of the questions asked included identifying infant feeding methods which can transmit HIV from mother to the child, gauging the understanding of various infant feeding methods, rating risk of HIV transmission to the child through the various infant feeding methods, how HIV gains entry into the child during breastfeeding etc. The findings showed that a large proportion of respondents 199 (51%) had an average knowledge score while 100 (25.6%) had a poor knowledge score on risk factors associated with HIV

transmission through breast feeding (Fig 4.3). In Malawi a similar study showed that (132) 78.8% of respondents had good knowledge score on HIV transmission through infant feeding (Leroy *et al.*, 2007) and this was attributed to continued adherence to the PMTCT program. Respondents knowledge of adult HIV transmission was good however only 176 (45%) gave correct responses to the critical question on HIV/AIDS transmission through sex, sharing utensils, razor blades and injecting needles. A greater number of the respondents 215(55%) could not associate HIV transmission with the different infant feeding methods meaning the respondent could not choose an infant feeding method in view of HIV transmission. As a result only 117(30%) could rate the risk of HIV transmission through the different infant feed method correctly. A greater number 265(68%) of the respondents had a better understanding of HIV transmission through breast milk but had a lower score 176(45%) on transmission through broken breast skin, cracked nipples, sores in babies mouth which indicated a poor association of conditions in a breastfeeding mother and baby with damage to the gastro-intestinal tract. However, 253(65%) of the respondents had a good understanding of preventive measures for MTCT including avoidance of breastfeeding, use of formula milk and use of ARVs.

Level of knowledge on risk factors associated with HIV transmission through breastfeeding was measured using a scoring system adopted from Institute of research in social sciences,2007 (Stanford university) as follows:- A score of 1 was awarded for each correct response while an incorrect response was awarded a score of 0. A summary indicator for knowledge was calculated as follows:  $\geq 3$  correct responses ( $> 50\%$ ) = Poor knowledge, 4- 5 correct responses (50% - 79%)

= Average knowledge, 6 - 7 correct responses ( ≤ 80% - 100%) = Good knowledge (Kenneth,2005).

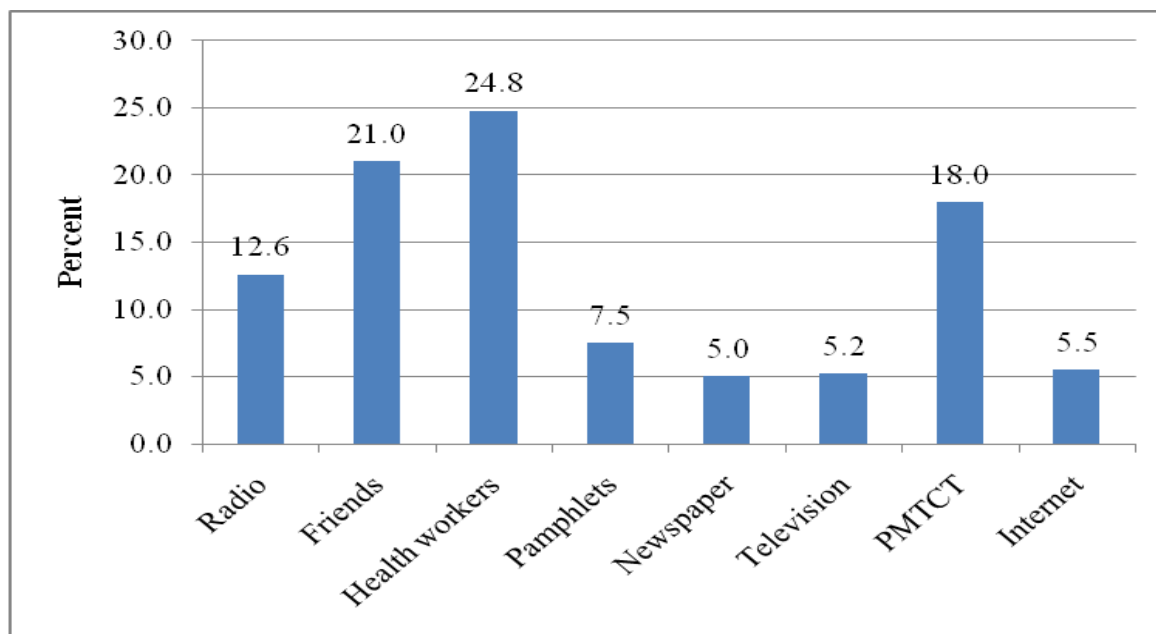
**Fig 4.3: Respondents knowledge score.**



#### **4.3.1 Source of information on the risk factors associated with HIV transmission through breast feeding.**

The findings showed that a greater number of the respondents got information from friends and health workers thus there is need to constantly empower the health workers and the community with accurate and updated information on the risk of HIV transmission through breastfeeding. In Uganda a similar study linked Pamphlets and newspapers to insufficient source information on HIV transmission through breastfeeding (Kagaayi *et al.*, 2008). This was probably because majority of the respondents (67%) had low levels of education (Fig 4.4).

**Fig 4.4: Source of information on the risk factors associated with HIV transmission through infant feeding.**



#### **4.4 Association between age, level of education, marital status, religious background, main source of income, household income, HIV disclosure, level of knowledge and infant feeding options.**

This section presents the relationship between age, level of education, marital status, religious background, main source of income, household income, HIV disclosure, level of knowledge and infant feeding options.

##### **4.4.1 Infant feeding options by HIV status disclosure**

The results showed that respondents who had disclosed their HIV status to their relatives and friends made appropriate infant feeding options compared to those who had not disclosed probably because they enjoyed support from their families (Table 4.2). A similar study at

Homabay District Hospital PMTCT clinic showed that majority of respondents (67%) who had disclosed their HIV status to their spouse made appropriate infant feeding choices (Onyango *et al.*, 2007). There was a statistically significant relationship between HIV/AIDS disclosure and appropriate infant feeding option ( $\chi^2=56.078$ ,  $df=1$ ,  $p=0.0001$ ). This meant that respondents who disclosed their HIV status to their family and friends made safer infant feeding choices. This was probably due to the support given by the family and friends.

#### **4.4.2 Infant feeding options by level of knowledge on the risk factors associated with HIV transmission through infant feeding.**

The findings showed that respondents with poor knowledge level on risk factors associated with HIV transmission through breastfeeding made inappropriate choice of infant feeding compared to those with good and average levels of knowledge (Table 4.2). There was a statistically significant relationship between respondents level of knowledge on risk factors associated with HIV transmission through breastfeeding and infant feeding option ( $\chi^2=8.058$ ,  $df=2$ ,  $p=0.011$ ). There was also a statistically significant relationship between level knowledge on risk factors associated with HIV transmission through breastfeeding and participation in PMTCT program ( $\chi^2=23.472$ ,  $df=2$ ,  $p=0.001$ ). This meant that HIV+ mothers who participated in the PMTCT program acquired accurate information on the risk factors associated with HIV transmission through breastfeeding. A similar study in Malawi showed that majority of respondents (67.7%) who had good levels of knowledge on risk factors associated with HIV transmission through breastfeeding made appropriate infant feeding choice (Leroy *et al.*, 2007).

**Table 4.2 Association between age, level of education, marital status, religious background, main source of income, household income, HIV disclosure, level of knowledge and infant feeding options.**

<b>Characteristic</b>	<b>Inappropriate infant feeding option. n(%)</b>	<b>Appropriate infant feeding option. n(%)</b>	<b>Total n=390</b>	<b>Significance level</b>
<b>Age</b> < 25 years > 25 years	76(42.9) 115(54.0)	101(57.1) 98(46.0)	177 213	$\chi^2 = 2.226$ df=1 p=0.30
<b>Level of education</b> None Primary Secondary / above	17(56.7) 88(46.6) 86(50.3)	13(43.3) 101(53.4) 85(49.7)	30 189 171	$\chi^2 = 1.270$ df=2 p=0.530
<b>Marital status</b> With partner Without partner	116(43.9) 75(59.5)	148(56.1) 51(40.3)	264 126	$\chi^2 = 5.678$ df=1 p=0.092
<b>Religious background</b> Christians Muslims Pagans	143(45.5) 36(60.0) 11(74)	171(54.5) 24(40.0) 5(26)	314 60 16	$\chi^2 = 4.736$ df=2 p= 0.113
<b>Main source of income</b> Self Spouse	67(43.2) 103(43.8)	88(56.8) 132(56.2)	155 235	$\chi^2 = 1.769$ df=1 p=0.184
<b>Household income</b> Below 7,000 Above 7,000	134(51.3) 57(44.2)	127(48.7) 72(55.8)	261 129	$\chi^2 = 6.262$ df=1 p=0.098
<b>HIV disclosure</b> Yes No	71(32.87) 120(68.96)	145(67.3) 54(31.04)	216 174	$\chi^2 = 56.708$ df=1 p=0.0001
<b>Level of Knowledge</b> Good Average Poor	37(41.1) 83(41.7) 75(74.25)	53(58.9) 116(58.3) 26(25.74)	90 199 101	$\chi^2 = 8.058$ df=2 p=0.011

#### **4.5 Association between parity, cultural practices/beliefs, PMTCT participation, stigma/discrimination and infant feeding options.**

This section presents the relationship between parity, cultural practices/beliefs, PMTCT participation, stigma/discrimination and infant feeding options.

##### **4.5.1 Infant feeding options by respondents' participation in the PMTCT program**

The findings showed that a greater number of respondents who participated in PMTCT program made appropriate infant feeding choices compared to those who did not participate probably because they received support from the health workers and support groups (Table 4.3). There was a statistically significant relationship between participation in the PMTCT program and infant feeding option ( $\chi^2=25.542$  df=1, p=0.001). There was also a statistically significant relationship between participation in the PMTCT program and HIV/AIDS disclosure ( $\chi^2=43.753$  df =1, p=0.0001). This meant that the PMTCT programme enabled the respondent acquire accurate information on HIV transmission through breast feeding and provided support needed to disclose HIV positive status to their family and friends. Kuhn *et al.*, (2005) in a similar study in Kenya found that respondents who participated in the PMTCT made appropriate infant feeding choices.

##### **4.5.2 Infant feeding options by respondents who experienced Stigma**

The findings showed that a greater number of respondents who experienced stigma from relatives and friends made inappropriate infant feeding choices compared to those who did not experience stigma (Table 4.3). There was a statistically significant relationship between stigma and choice of infant feeding option ( $\chi^2=54.223$  df=1, p=0.0001). There was also a statistically

significant relationship between stigma and HIV disclosure ( $\chi^2=57.270$  df=1, p=0.0001). This meant that respondents who experienced stigma were not confident enough to use infant feeding methods associated with a HIV positive status. Kagaayi *et al.*, (2005) in a similar study in Uganda showed that HIV positive mothers abandoned formula milk supplies at the clinic because of the stigma associated with the infant feeding option.

**Table 4.3 Association between parity, cultural practices/beliefs, PMTCT Program participation, stigma/discrimination and infant feeding options**

<b>Characteristic</b>	<b>Inappropriate infant feeding option. n(%)</b>	<b>Appropriate infant feeding option. n(%)</b>	<b>Total n=390</b>	<b>Significance level</b>
<b>Parity</b>				$\chi^2=0.394$ df=2 P=0.821
One	89(49.7)	90(50.3)	179	
Two	72(49.7)	73(50.3)	145	
Three or more	30(45.5)	36(54.5)	66	
<b>Cultural practices /beliefs</b>				$\chi^2=1.228$ df=1 P=0.268
Yes	16(59.3)	11(40.7)	27	
No	175(48.2)	188(51.8)	363	
<b>PMTCT program participation</b>				$\chi^2=25.542$ df=1 P=0.001
Yes	75(35.21)	138(64.78)	213	
No	116(65.54)	61(34.46)	177	
<b>Stigma/discrimination</b>				$\chi^2=54.223$ df=1 p=0.0001
Yes	157(63.6)	90(36.4)	247	
No	34(23.8)	109(76.2)	143	

#### **4.6 Association between the infant feeding option and health facility related factors.**

This section presents the relationship between infant feeding options and health facility related factors.

##### **4.6.1 Infant feeding options by satisfaction with counseling services at the comprehensive care clinic**

The results showed that majority of the respondents who felt dissatisfied with the quality of counseling at the CCC made inappropriate infant feeding choices probably because they didn't have confidence with the services being offered and as a result refused to trust the information they received (Table 4.4). This was elaborated during the focused group discussion where clients said different nurse counselors gave different information on the same infant feeding recommendation resulting in confusion. There was a statistically significant relationship between respondent's satisfaction with quality of counseling services and infant feeding choice ( $\chi^2=8.290$  df=1, p=0.014). This meant that the respondent lacked confidence in the quality of services offered at the health facility and this affected their choice of infant feeding. A similar study in Tanzania associated inappropriate infant feeding method to inadequate counseling and support services at the health facility (Leshabari *et al.*, 2006).

##### **4.6.2 Infant feeding options by counseling on stigma associated with infant feeding.**

The findings showed that majority of the respondents who reported that they were counseled on stigma associated with infant feeding made appropriate infant feeding choice compared to those who reported that they were not counseled (Table 4.4). This was probably because the HIV positive women who were counseled on stigma got self confidence to handle stigma thus it did

not affect their decision making. There was a statistically significant relationship between counseling on stigma associated with infant feeding and infant feeding method ( $\chi^2=51.833$  df=1, p=0.0001). This meant that respondents who were counseled on stigma received information to support their infant feeding choice. Doherty *et al.*, (2006) in a similar study in South Africa found that nurse counselors were over worked due to shortages of health care workers and this affected the amount of time a counselor spent with the clients during counseling. This compromised the quality of counseling.

**Table 4.4 Association between infant feeding options and health facility related factors.**

<b>Characteristic</b>	<b>Inappropriate choice of infant feeding option n(%)</b>	<b>Appropriate choice of infant feeding option n (%)</b>	<b>Total n=390</b>	<b>Significance level</b>
<b>Satisfaction with counseling services</b> Yes No	91(44.8) 100(53.5)	112(55.2) 87(46.5)	203 187	$\chi^2 = 8.290$ df=1 P=0.014
<b>Counseled on stigma</b> Yes No	65(37.7) 126(68.11)	140(68.29) 59(31.89)	205 185	$\chi^2 = 51.833$ df=1 P=0.0001
<b>Confidentiality of respondents status</b> Yes No	21(45.7) 178(51.7)	25(54.3) 166(48.3)	46 344	$\chi^2 = 0.603$ df=1 P=0.438
<b>Inquiry of respondent health progress</b> Yes No	159(50.2) 32(43.8)	158(49.8) 41(56.2)	317(81.3) 73(18.7)	$\chi^2 = 0.949$ df=1 P=0.330
<b>Respondents given time to ask questions</b> Yes No	81(47.9) 110(49.8)	88(52.1) 111(50.2)	169(43.3) 221(56.7)	$\chi^2 = 0.130$ df=1 P=0.738
<b>Medical staff altitude at the CCC.</b> Kind & polite unkind & rude	99(48.1) 92(50.37)	107(51.9) 91(49.7)	206 183	$\chi^2 = 0.190$ df=1 P=0.663

## **4.7 Determinants of infant feeding option**

### **4.7.1 Multiple Logistic Regression Analysis**

Logistic regression was applied to assess the effect of factors that were identified to be associated with the choice of infant feeding options and therefore explained the relationship between the independent variables and the dependent variable. The dependent variable is dichotomous, that is, a mother is either feeding appropriately or not. The odds ratio will give the likelihood of a variable influencing the infant feeding option. The factors found to be significantly associated with inappropriate infant feeding choice in the univariate analysis were; socio-demographic factors: ( HIV disclosure ( $p = 0.0001$ ), Level of knowledge on risk factors associated with HIV transmission through breastfeeding ( $p=0.011$ ) participation in the PMTCT program ( $p = 0.001$ ) , experiencing stigma from relatives and friends  $p=0.0001$ ) and Health facility related factors (satisfaction with the quality of counseling  $p=0.014$  and counseling on stigma associated with infant feeding  $p=0.0001$ ). The null hypothesis was thus rejected concluding that there were socio-demographic and health facility related factors associated with choice of infant feeding option among HIV infected women.

Regression analysis was performed to show the net effect that each significant factor mentioned above has on choice of infant feeding method. The results are presented on table 4.5.

The findings showed that HIV disclosure had a significant effect on the choice of infant feeding method. The odds of non-disclosure of status was 4.91 times more likely to influence choice of inappropriate infant feeding methods as compared to mothers who disclosed their status. The odd of not participating in the PMTCT program was 4.34 times more likely to influence choice

of inappropriate feeding as compared to mothers who participated in the PMTCT program. The odd of experiencing stigma was 2.46 times more likely to influence choice of infant feeding as compared to mothers who did not experience stigma. The odds of not being counseled on stigma associated with infant feeding was 4.73 times more likely to influence choice of infant feeding as compared to mothers who were counseled on stigma associated with infant feeding.

In order to establish the effect of confounding factors co-relation analysis was done and it was established that there were no co-related variables hence no confounding factors in the regression.

**Table 4.5 Predictors of inappropriate infant feeding choice (n = 390)**

<b>Risk Factor</b>	<b>Odds Ratio 95%CI</b>	<b>P-value</b>
HIV disclosure	4.91(1.2-11.3)	0.0040
Participation in the PMTCT program.	4.34(1.4-11.6)	0.0051
Stigma	2.46(1.9-12.2)	0.0178
Counseling on stigma associated with infant feeding.	4.73(1.1-11.2)	0.0032
Constant	1.184	0.127

## **4.8 Discussion**

### **4.8.1 HIV and infant feeding**

Infant-feeding options for HIV-infected women have largely been governed by guidelines by WHO, the United Nations Children's Fund (UNICEF) and the Joint United Nations Programme on HIV/AIDS (WHO, UNICEF, UNAIDS, 2009). In Kenya these guidelines have been adopted to the Kenyan setting by the Ministry of health. These guidelines offered women a reasonable framework in which to make choices on infant feeding appropriate to their socio-economic conditions. However, the task of weighing risks and benefits created considerable difficulties for policy-makers and for health-care workers in the field. Among the 390 HIV positive women interviewed in this study only 34.9% made appropriate infant feeding choices (exclusive breastfeeding, exclusive formula milk feeding) the recommended safer infant feeding options for HIV infected mothers while 65.1% made inappropriate infant feeding choices ( mixed feeding, complimentary formula feeding , complimentary breastfeeding, animal milk feeding ) despite the fact that they had the potential of exposing the infants to the HIV virus thereby suggesting the difficulty of implementing this type of intervention. This was consistent with a previous study in Nairobi where 42.5% of the mothers practiced appropriate infant feeding options while 57.5% practiced inappropriate infant feeding options (Nduati *et al*, 2005). However, a similar study in South Africa Kwa zulu Natal found that 72.8% of HIV positive mothers practiced appropriate infant feeding options, probably because formula milk was issued free in all government public health facilities (Coutsoudis *et al.*, 2005).

Choice of infant feeding option for HIV infected women in resource constrained setting has thus become a great challenge due to the cultural, economic and social issues surrounding infant feeding (Ngacha *et al.*, 2005).

#### **4.8.2 Level of knowledge and source of information on risk factors associated with HIV transmission through breast feeding.**

A higher number of HIV positive women with poor knowledge levels on risk factors associated with HIV transmission through breastfeeding practiced inappropriate infant feeding options compared to those with good and average knowledge levels because they had a poor understanding of HIV transmission through contaminated breast milk, broken breast skin, cracked nipples, sores in the baby's mouth which showed a poor association of conditions in a breast-feeding mother and baby with damage to gastro-intestinal lining. Majority of the women with poor knowledge on the risks of HIV transmission through breastfeeding got information from their friends while a majority with high knowledge levels got information from health care workers during PMTCT of HIV sessions. This could be due to inaccurate information from the friends or inadequate counseling on risk factors associated with HIV transmission through breastfeeding by the PMTCT counselors as well as lack of reinforcement during antenatal clinic and post-natal attendance by service providers. Thus HIV positive women with poor knowledge levels on the risks of HIV transmission through breastfeeding pose a risk of infecting their infants with HIV through breastfeeding due to poorly perceived susceptibility and the inability to make an informed decision on appropriate infant feeding methods.

Leroy *et al.*, (2007) in a related study in South Africa reported that HIV positive women with good knowledge levels on HIV transmission through breastfeeding practiced appropriate infant feeding options reducing the risk of transmitting HIV to their infants and increasing child survival. However, in related studies in Zambia knowledge of HIV transmission through breastfeeding did not influence a HIV positive mother infant feeding choice probably because formula milk was issued free in the public health clinic (Chopra *et al.*, 2005).

This study found that there was an adequate flow of information from various sources, including friends, pamphlets, radio, television, the internet, PMTCT and Newsletter. The fact that friends were the main source of information meant that there was a need to ensure the community; especially women of child-bearing age had accurate information on MTCT of HIV so that correct information can be passed among the community members. De Cock *et al.*, (2005) in a related study in South Africa found that information on HIV/AIDS was mainly acquired through the radio and television possibly because the study was done in the city where more people had access to television.

### **4.8.3 Socio-demographic factors influencing choice of Infant feeding options**

#### **4.8.3.1 HIV/AIDS status disclosure**

HIV infected women who had not disclosed their HIV status to their spouses or relatives practiced inappropriate infant feeding options particularly mixed feeding and avoided formula milk feeding. Studies from Sub-Saharan Africa document high rates of mixed feeding among HIV positive mothers who have not disclosed their HIV status to their partners or relatives

(Leroy *et al.*, 2007, Chopra *et al.*, 2005 and Leshabari *et al.*, 2007). Lack of social support from the family members who are not aware of the HIV status makes them practice mixed feeding which is a more acceptable and normative pattern of infant feeding but one which has the highest risk of transmitting HIV to their infants.

Formula milk feeding may be interpreted as a sign of HIV positive status, especially if no good and legitimate explanation for formula milk feeding, such as caesarean section, can be produced. As knowledge of HIV transmission through breast feeding is disseminated into local communities, a woman who opts for formula milk feeding will be carefully watched. The costs involved, combined with the scorn and suspicion that it is perceived to foster, thus make formula milk feeding an option only for women who have disclosed their HIV status to their partner, or who are not married, or who are not living in close proximity to another family member (Thairu *et al.*, 2005). Disclosure of HIV status to the partner is usually a major condition for successful infant feeding adherence. However, disclosure of HIV-positive status to a partner was, in this study as in many other studies, greatly feared by the study participants, and this had a bearing on and was an obstacle to adherence to appropriate infant feeding option. This was captured during the focus group discussion where a 26 year old mother had this to say *“I can’t feed my baby on formula milk because people will say I have the virus and my husband will chase me away with my three children.”* (Focus group discussion at Kiambu district Hospital, 2008).

Kiarie *et al.*, (2005) similarly assert that fear of disclosure may be an impediment to choosing exclusive breastfeeding for six months or exclusive formula feeding, and a similar study in Uganda found that women who succeeded in adhering to exclusive breastfeeding or formula

milk feeding had family support (Kaggayi *et al.*,2008) . In context of continued HIV-related stigma, disclosure of HIV positive status demands immense confidence and self-determination. In this study a higher number of women who had disclosed their HIV status to their partners choose an appropriate infant feeding method.

#### **4.8.3.2 Participation in PMTCT program.**

The PMTCT programme plays a vital role in the transmission of accurate information on MTCT of HIV and in this study only 54.6% of the respondents participated in the PMTCT programme despite the fact that all HIV positive mothers are encouraged to go for pre-test counseling and join the programme. This was probably because of stigma associated with HIV positive status. In this study mothers who participated in the PMTCT program practiced appropriate infant feeding options particularly exclusive breastfeeding and formula milk feeding and avoided mixed feeding which are safer choices of infant feeding as they pose less risk of infecting their infants with HIV. This meant they understood the risk of HIV transmission through the various infant feeding options. Doherty *et al* (2006) in a similar study in South Africa found that low coverage of PMTCT interventions acted as a barrier to appropriate infant feeding options. However, Leroy *et al* (2005) in a study in Zambia reported that participation in the PMTCT program did not influence a HIV positive mother's choice of infant feeding option probably because HIV positive mothers in the study had strong support groups which supplemented the efforts of the PMTCT programs.

Majority of the mothers who did not participate in the PMTCT program had not also disclosed their HIV status to their partners/ relatives and had poor levels of knowledge of risk factors associated with HIV transmission through breast feeding. This was probably because despite the fact that participation in the PMTCT program would improve their knowledge of risk factors associated with HIV transmission through breastfeeding, it posed a risk of revealing their HIV status to their partners, relative and the community hence subjecting them to rejection and stigma associated with it. This finding was consistent with a study in Homabay District Hospital in Kenya where mothers who participated in the PMTCT program had better knowledge of MTCT of HIV, could handle stigma and as a result practiced appropriate infant feeding options of infant (Onyango *et al.*, 2007). There is therefore need for PMTCT counselors to encourage and support HIV positive mothers to disclose their HIV status to their partners by probably involving the partners in the antenatal and Post- natal services so that HIV counseling and testing is conducted on both the partners to reduce the stigma, discrimination and rejection associated with positive results.

#### **4.8.3.3 Stigma**

The findings showed that mothers who experienced stigma and discrimination practiced inappropriate infant feeding options particularly mixed feeding and avoided formula milk feeding. In a related study in Zambia HIV infected women who experienced stigma mixed fed their infants, and avoided replacement feeding (Leroy *et al.*, 2007). This was probably because in communities where breastfeeding is the norm like the Sub-Saharan Africa, formula milk feeding has been noted to alert a woman's family or community that she is HIV-positive, and may result

in stigma or other negative repercussions while mixed feeding is the prevailing form of breastfeeding in Africa thus it is more acceptable (Leshabari *et al.*, 2007). This was captured during the focus group discussion where a 30 year old mother of two had this to say *“I was really scared when I tested positive because of the way I had seen my friends stigmatized...no one wanted to talk to them, one of my friends had to close her kiosk because people stopped buying from her shop... stigma is bad ...i don’t want anybody to know that am HIV positive... I can’t give my son formula milk even if I can afford, I give him breast milk and sometimes porridge when he is very hungry”* (Focus group discussion at Kiambu district Hospital, 2008). This illustrates that stigma is a major barrier to appropriate infant feeding choice among HIV positive mothers especially in Sub-Saharan Africa where breastfeeding is normative and mixed feeding is widely practiced .

However, in related studies in South Africa formula milk feeding adherence was high for mothers who experienced stigma and discrimination probably because it was strongly encouraged and offered free in all public health facilities (Shapiro *et al.*, 2005).

#### **4.8.3.4 Health Facility related factors influencing choice of infant feeding**

Reducing MTCT through improved infant feeding requires greater attention to the quality of counseling and support provided to the HIV positive mothers (Chopra *et al.*, 2005). This study found that HIV positive mothers who reported that they were dissatisfied with the quality of counseling services in the CCC and were not adequately counseled on stigma associated with infant feeding practiced inappropriate infant feeding options. This finding was consistent with a study in Tanzania where rates of mixed feeding were high among HIV positive mothers despite

having received counseling during antenatal and post-natal clinic (Leshabari *et al.*, 2007). This indicated that the quality of counseling offered might have been poor and inadequate. NASCOP guidelines on infant feeding recommend that all HIV positive women should receive counseling which include general information about the benefits and risks of various infant feeding options and specific guidance in selecting the option most likely to be suitable for their situation. However, shortcomings in the implementation of the guidelines have been found in many countries.

Nduati *et al.*, (2005) notes that inadequate training of health workers, particularly infant feeding counselors, about the relative risks associated with infant feeding in the context of HIV, lack of culturally sensitive counseling tools, and the stigma associated with replacement feeding, all make appropriate and effective infant feeding counseling difficult. This was captured during the focus group discussion with the nurse counselors where a 39 year old nurse counselor had this to say: *“The work is a lot and patients keep on coming, sometime we tell them to come another day when we are less busy. We even don’t have time to go for lunch. The government should employ more counselors, increase our pay and give us up to date information through training”*.

The findings showed that within the context of busy antenatal clinics, the quality of infant feeding counseling is generally poor; staff shortages and associated lack of time to counsel properly are major barriers to the provision of informed infant feeding choices. In contrast, an intervention study in rural KwaZulu-Natal, South Africa that provided intensive training and support to counselors found appropriate feeding choices being made by HIV positive women (Leroy *et al.*, 2007).

## **CHAPTER 5 CONCLUSION AND RECOMMEDATIONS**

### **5.1 Conclusions**

From the study findings it was evident that HIV positive women who participated in the PMTCT program made appropriate and safe infant feeding choices and this was also one of the main sources of accurate information on HIV transmission through breastfeeding. This means that mothers who test positive for HIV should be encouraged to participate in the PMTCT program. Disclosure of HIV status was difficult for most mothers but 67.3% of those who disclosed their status in this study made appropriate choices of infant feeding options. Stigma from partners, relatives and the community made it difficult for HIV positive mothers to disclose their status but among those who reported as having received counseling on stigma related to infant feeding 68.29% made appropriate choices of infant feeding. According to this study socio-demographic factors that were associated with infant feeding option included HIV disclosure, Level of knowledge on risk factors associated with infant feeding, participation in the PMTCT program, stigma and discrimination while health facility related factors that were associated with infant feeding option included satisfaction with quality of counseling at the Comprehensive Care Clinic and counseling on stigma associated with infant feeding.

### **5.2 Recommendations.**

- The ministry of health should strengthen dissemination of accurate information on HIV/ AIDs in the community and in the health facilities through the District AIDS and STI Coordinators (DASCO).
- The Ministry of health should develop a policy to enforce participation in the PMTCT

programs by all mothers who test positive for HIV at the health facility level.

- The Ministry of Health should increase the number of nurse counselors and build their capacity through continuous training so that they can effectively implement infant feeding counseling guidelines as stipulated.

### **5.3 Recommendations for Further Research**

- An investigation into the adequacy of the information given during the counseling sessions on the risk of HIV transmission through infant feeding method.
- There is need for research into barriers of PMTCT of HIV uptake in resource constrained settings.

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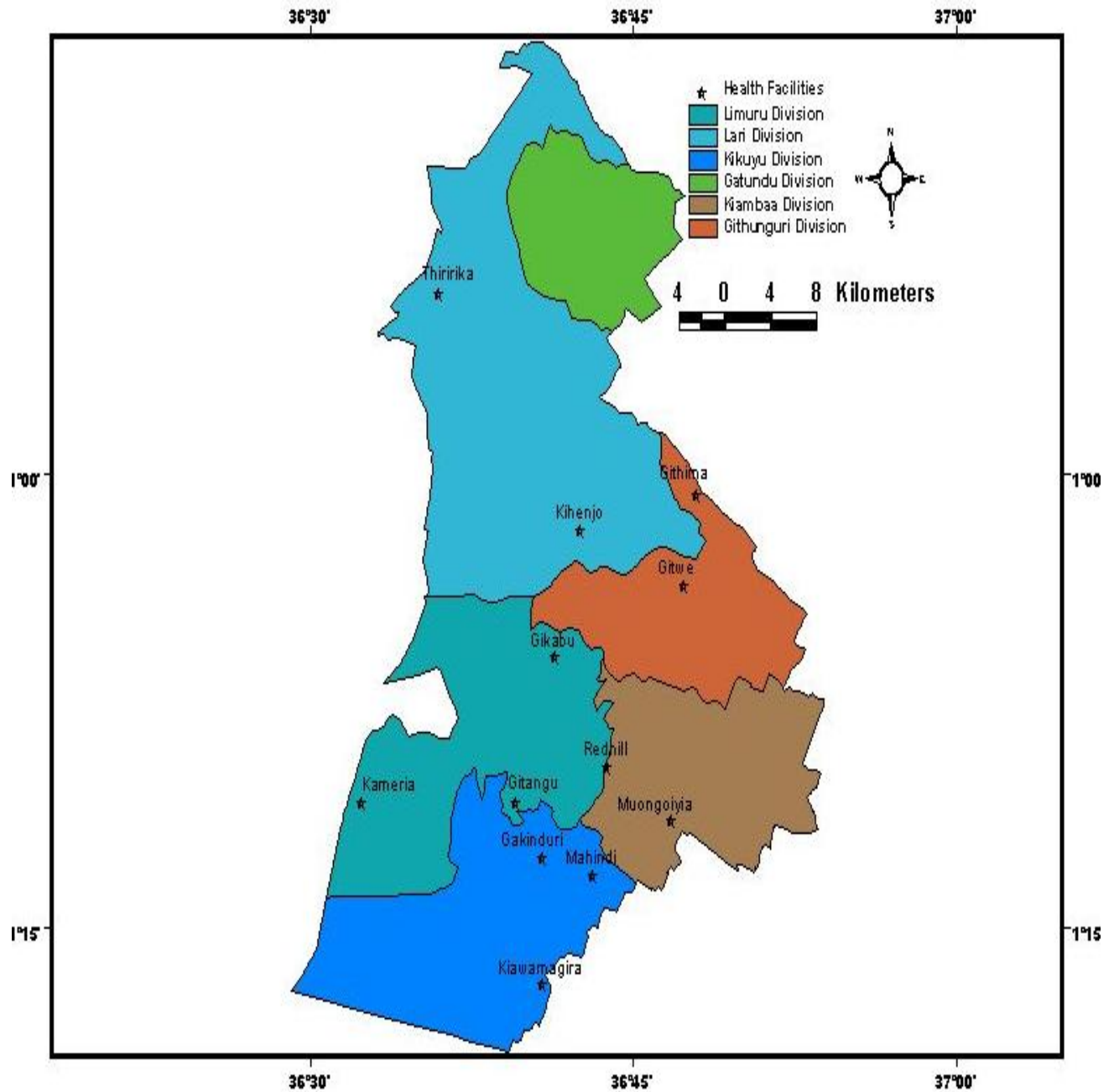
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## 6.0 APPENDICES

### 6.1 Map of Kiambu district showing the study area



**6.2 Consent Form**

I ..... (Name) give consent to Catherine Mwangi to interview me to get information for her Master of Public Health degree. I understand that I have the right to withdraw from the study at anytime, my name will not be included in the questionnaire, answers given are confidential and the information will only be used for the purpose of this study.

Signed at .....

Witness 1.....

Witness 2.....

### 6.3 Structured Interview Schedule

**Interviewees: HIV Positive women with infants aged 1 month to 6 months attending Comprehensive Care Clinic at Kiambu District Hospital**

**Questionnaire No -----**

**Date of interview. -----**

**Name of interviewer-----**

**Respondents administrative Division -----**

#### PART A

#### SOCIO-DEMOGRAPHIC CHARACTERISTIC OF THE RESPONDENTS

- 1) Age of the participants?(years)-----
- 2) What is your marital status?
  - 1) Married
  - 2) Single
  - 3) Cohabiting (not married but lives with a partner)
  - 4) Divorced
  - 5) Widowed
  - 6) Separated (currently not living together but not divorced)
- 3) What is your highest level of education?
  - 1) None
  - 2) Primary
  - 3) Secondary
  - 4) Tertiary.
- 4) What is your religious background?
  - 1) Christian
  - 2) Muslim
  - 3) Pagan
- 5). Who is the main source of income in the family?

- 1) Self
- 2) Spouse

6). In the last 3 month, what was the income of your household? (Kenya Shillings)?

- 1) Less than Kshs 4000
- 2) Kshs 5001 - 6000
- 3) Kshs 6001 - 7000
- 4) Kshs 7001 - 8,000
- 5) Kshs 8001 - 9000
- 6) Kshs 9001 - 10,000
- 7) <Kshs 10,001

7). Have you disclosed your HIV status to your partner, relatives and family?

- 1) Yes
- 2) No

## **PART B**

### **LEVEL OF KNOWLEDGE AND SOURCE OF INFORMATION ON HIV/AIDS TRANSMISSION THROUGH BREASTFEEDING FEEDING**

8). How is HIV transmitted from one person to the other?

- |                         |                        |
|-------------------------|------------------------|
| 1) Sex                  | 6) breastfeeding       |
| 2) Contact with blood.  | 7) sores on the breast |
| 3) Saliva               | 8) During pregnancy    |
| 4) Sharing utensils     | 9) During delivery     |
| 5) Sharing razor blades | 10) kissing            |
|                         | (11) Hugging           |

9). HIV is transmitted from mother to the child through which of the following methods?

- 1) Complementary breastfeeding before six months
- 2) Exclusive breastfeeding
- 3) Exclusive formula feeding
- 4) Mixed feeding

10). What is your understanding of the following infant feeding methods?

*Complementary breastfeeding*

- 1) Giving the child mainly breast milk and formula
- 2) Giving the child only breast milk
- 3) Giving the child breast milk, liquids and other foods.
- 4) Giving the child mainly formula milk, breast milk and other foods.
- 5) Giving the child only formula milk.

*Exclusive breastfeeding*

- 1) Giving the child mainly breast milk and formula milk.
- 2) Giving the child only breast milk
- 3) Giving the child formula milk, breast milk and other foods
- 4) Giving the child formula milk only
- 5) Giving the child breast milk and other foods

*Mixed feeding*

- 1) Giving the child mainly breast milk and formula
- 2) Giving the child only breast milk
- 3) Giving the child formula milk, breast milk, and other food.
- 4) Giving the child less than six months breast milk other foods and liquids
- 5) Giving the child only formula milk.

*Complementary formula feeding*

- 1) Giving the child mainly breast milk and formula milk.
- 2) Giving the child only breast milk.
- 3) Giving the child formula milk, breast milk and other foods
- 4) Giving the child formula milk, liquids and other foods.
- 5) Giving the child only formula milk.

*Exclusive formula feeding*

- 1) Giving the child mainly breast milk and formula milk
- 2) Giving the child only breast milk



**PART C****QUESTIONS ON PARITY, INFANT FEEDING CHOICE, STIGMA, PARTICIPATION  
IN THE PMTCT PROGRAM, CULTURAL PRACTICES/ BELIEF.**

15). How many children do you have?

- 1) One
- 2) Two
- 3) Three or more

16). If one or more children, what method did you use to feed your previous baby/babies?

- 1) Complimentary formula feeding
- 2) Complementary breast feeding
- 3) Exclusive breast – feeding
- 4) Exclusive formula feeding
- 5) Mixed feeding
- 6) Cows/goats Milk

17). What method of infant feeding are you using to feed your child?

- 1) Complimentary formula feeding
- 2) Complementary breast feeding
- 3) Exclusive breast – feeding
- 4) Exclusive formula feeding
- 5) Mixed feeding
- 6) Cows/goat Milk.

18). What would be the reason for choice of infant feeding method?

- 1) Nutritious to the baby
- 2) Less risk of transmitting HIV
- 3) Cheap and readily available
- 4) Mother did not have enough milk
- 5) Mother too ill or too weak to breastfeed
- 6) Baby left in other care while mother went to work
- 7) Cosmetic reasons

19). By what feeding method would your family members expect you to feed the new child?

- 1) Complimentary formula feeding
- 2) Complementary breast feeding
- 3) Exclusive breast – feeding
- 4) Exclusive formula feeding

- 5) Mixed feeding
- 6) Cows/goat Milk

20). Do you have any cultural beliefs or practices associated with infant feeding?

- a) Yes
- b) No

21). Have you been part of prevention of mother to child transmission program?

- a) Yes
- b) No

Comment on your response-----

22). Have you experienced stigma /discrimination from your spouse, relative's friends or the community because of your HIV status and the infant feeding option you are practicing?

- a) Yes
- b) No

**PART D**

**QUESTIONS ON HEALTH FACILITY RELATED FACTORS INFLUENCING CHOICE OF INFANT FEEDING.**

23). Are you satisfied with the quality of counseling services offered at the CCC?

- a) Yes
- b) No

24). Have you been counseled on how to handle stigma associated with some choice of infant feeding options available?

- a) Yes
- b) No

25). Does the Comprehensive care clinic staff observe confidentiality of patient status?

- a) Yes
- b) No

26). Does the medical staff at the Comprehensive care clinic inquire about your health progress throughout the time of the visit?

- a) Yes
- b) No

27). Does the medical staff at the Comprehensive care clinic give you time to ask questions whenever you need clarification?

a) Yes

b) No

28). Which of the following describes the altitude of the medical staff at the Comprehensive Care clinic?

a) Kind and polite

b) unkind and rude

#### **6.4 Focus Group Discussions guide with HIV infected mothers.**

1. Have you disclosed your HIV status to your husband/relatives? If not, why?
2. Have you been part of Prevention of Mother To Child Transmission (PMTCT) Program? If 'yes' of what help has it been to you? And if 'No' why haven't you joined?
3. Apart from your husband who else makes decision on how your baby will be fed?
4. Does fear of discrimination keep mothers from seeking /continuing with PMTCT services, if so how does stigma manifest itself in health services and in communities?
5. Are there cultural practices, taboo or beliefs in your community associated with infant feeding?
6. What are the feeling of the community concerning exclusive breastfeeding and formula feeding?
7. Does the nurse counselor explain the advantages and disadvantages of each infant feeding method and does she/he explain how to handle stigma associated with some the infant feeding methods?
8. How do you feel about the services offered at the comprehensive care clinic and what would want improved?

## **6.5 Focus Group Discussions topic Guide with nurse –counselors**

1. What are the common feeding practices for babies in this community?
2. What are your views concerning adherence to the infant feeding methods chosen during counseling sessions at the comprehensive /PMTCT clinic?
3. Do you know the estimated risks of MTCT of HIV in the absence of any interventions?
4. How do you feel being a counselor for counseling HIV positive mothers on infant feeding besides your role as a nurse?
5. What are the challenges or problems you are facing when counseling HIV positive mothers on how to safely feed their babies?
6. What do you think are the reasons behind the problems or challenges you are facing when counseling mothers and how can they be mitigated?

## **6.6 Statement of Ethical Consent**

- This research is being undertaken by Catherine .W. Mwangi, a student of Master of Public Health at the Department of Public Health, School of Health Sciences of Kenyatta University.
- The research is purely for academic purpose and will not be used for any monetary gain.
- All the information you give will be strictly confidential. Your name or address is not required and will not appear anywhere on the questionnaire.
- No reward/ token will be given to you for participating in this study.

## **6.7 International guidelines on HIV and infant feeding 1992-2010**

### **1992 statement by WHO, UNICEF AND UNAIDS.**

*“Where infectious diseases and malnutrition are the main cause of infant deaths and the infant mortality rate is high, breastfeeding should be the usual advice given to pregnant women including those who are infected. This is because their baby’s risk of HIV infection through breast milk is likely to be lower than the risk of death from other causes if it is not breastfed”*

### **1997 statement by WHO, UNICEF and UNAIDS**

*“When children born to HIV infected women can be assured of uninterrupted access to nutritionally adequate breast milk substitutes that are safely prepared and fed to them, they are at less risk of illness and death if they are not breastfed. However, when these conditions cannot be met -in particular in environments where infectious diseases and malnutrition are the primary causes of death during infancy then artificial feeding substantially increases children’s risk of illness and death. The policy objective must be to minimize all infant feeding risks and to urgently expand access to adequate alternatives so that HIV infected women have a range of choices. The policy should stipulate what measures are being taken to make breast milk substitutes available and affordable; to teach the safest means of feeding them to infants; and to provide the conditions which will diminish the risks using them”*

### **1998 statement by WHO, UNICEF and UNAIDS**

*“The principle recommendation is for mothers to receive counseling that will enable them to make fully informed decision appropriate to their situations and resources. The responsibility of*

*the policy –maker is to provide the necessary support to enable mothers to make and carry out their choices, whether to breastfeed or use replacement feeds. The guidelines accommodate all reasonable infant feeding options for mothers with HIV, and support a fully informed choice which will allow mothers to be provided with better information as it becomes available”*

**2001 statement by WHO Technical consultation on behalf of the UNICEF/WHO/UNAIDS interagency task team on MTCT of HIV.**

*“When replacement feeding is acceptable affordable, sustainable and safe, avoidance of all breastfeeding by HIV infected mothers is recommended. All HIV infected mothers should receive counseling which includes provision of general information about the risks and benefits of various infant feeding options and specific guidance in selecting the options most likely to be suitable for their situations”*

**2006 statement by WHO Technical consultation on behalf of the UNICEF/WHO/UNAIDS interagency task team on MTCT of HIV.**

*“All HIV infected mothers should receive counseling which includes provision of general information about risks and benefits of various infant feeding options and specific guidance selecting the option most likely to be suitable for the situation. Adequate numbers of people, who can counsel HIV-infected women on infant feeding should be trained deployed, supervised and supported. Such support should include updated training as new information and recommendations emerge”*

**2010 statement by WHO Technical consultation on behalf of the UNICEF/WHO/UNAIDS interagency task team on MTCT of HIV.**

*“Mothers known to be HIV-infected should be provided with lifelong antiretroviral therapy or antiretroviral prophylaxis interventions to reduce HIV transmission through breastfeeding”.*

*“Mothers known to be HIV-infected (and whose infants are HIV uninfected or of unknown HIV status) should exclusively breastfeed their infants for the first 6 months of life, introducing appropriate complementary foods thereafter, and continue breastfeeding for the first 12 months of life”.*

*“Mothers known to be HIV-infected who decide to stop breastfeeding at any time should stop gradually within one month. Mothers or infants who have been receiving ARV prophylaxis should continue prophylaxis for one week after breastfeeding is fully stopped.”*